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**EXTENT AND COST OF WEED CONTROL  
WITH HERBICIDES AND AN EVALUATION  
OF IMPORTANT WEEDS, 1968**

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This report updates ARS 34-102, "Extent and Cost of Weed Control with Herbicides and an Evaluation of Important Weeds, 1965," issued in 1968.

# PREFACE

This publication, the fourth of a series of reports that has appeared during the last 10 years, updates the information on the extent and cost of weed control with herbicides in the United States to 1968. It also contains evaluations of important weeds. These evaluations are much more comprehensive than those in any of the three preceding publications. Thus, this publication represents the most recent evaluation of the current status of herbicide usage in all States and the important weeds against which herbicides are directed. In conjunction with summary data from the earlier publications, it serves as a prospectus of chemical weed control for the immediate future.

The four publications in this series have each been based on surveys during specified years--1959, 1962, 1965, and 1968, respectively. In each instance, questionnaires were prepared and distributed to State weed specialists at the end of the year that was being surveyed. For the first three surveys, a minimum of 2 years was required to gather, process and then release the data in published form. This 1968 survey has required almost 3 years.

Two main factors contributed to the additional year's delay in publication of this report: first, obvious misinterpretation of certain key questions on treated acreages by a few contributing weed specialists required a resurvey of all contributors to ensure accuracy and uniformity in data; second, the expanded coverage of the survey increased the volume of work involved. However, the reconciled data corrected several deficiencies in the earlier publications and now reflect more accurately recent expansions in weed control technology.

The data presented are critically needed by public and private agencies and individuals for planning research, development, regulatory, and educational programs, and for evaluating the economics of chemical weed control.

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# EXTENT AND COST OF WEED CONTROL WITH HERBICIDES AND AN EVALUATION OF IMPORTANT WEEDS, 1968<sup>1</sup>

## INTRODUCTION

For ages, the figure of a man with a hoe has symbolized the farmer. A better symbol would be difficult to find. To the farmer, probably no effort in crop production is more universal or more characteristic than his constant battle with weeds. The hoe symbolizes this effort.

Until a generation ago, the farmer's solution to his weed problems had been a relatively straightforward attack with physical force. His weapons were tillage implements, mowing, and even his hands or handtools. Herbicides have greatly increased the farmer's ability to control weeds. At the same time, herbicides have complemented other adjustments in crop production technology and are needed to replace the diminishing supply of farm labor. Weed control with herbicides continues to fit into the scheme of increased mechanization of agriculture. However, with the advances in weed control systems have come changes in the weed problems--the enemy has also changed tactics!

The dramatically effective and selective herbicide 2,4-D was the first organic herbicide widely adopted by farmers for killing weedy broadleaf vegetation in grain crops, pastures, and other areas. However, 2,4-D was no panacea. Tolerant broadleaf weeds and resistant grasses survived treatment and increased in numbers. Wherever individual herbicides have been widely used over a period of years, tolerant weeds have increased--particularly where cultivation and hand hoeing were not practiced as in the past. It is evident that no single herbicide is sufficient and that our weed problems constantly change.

The U.S. Department of Agriculture recognizes that all measures for controlling weeds must be used to reduce losses in crop production. Integrated weed control programs must include time-tested control measures, such as cultivation, mowing, burning, use of weed-free seed, crop rotation, and fertilizer practices, as well as herbicide control measures. Some biological controls have been developed and integrated into the programs; others are being developed. In the foreseeable future, however, herbicides will continue to hold the greatest promise for checking and reducing the losses caused by weeds in many programs of production. The current survey has been designed to provide more precise basic information on the economics, costs, and effectiveness of herbicides and the weeds against which they are used.

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<sup>1</sup>Information was compiled by L. L. Jansen, L. L. Danielson, W. B. Ennis, Jr., P. A. Frank, J. T. Holstun, Jr., and D. L. Klingman, Agricultural Research Service; J. R. Paulling and R. A. Wearne, Extension Service; and A. S. Fox, Economic Research Service, U.S. Department of Agriculture. Information was supplied by specialists in the Cooperative State Extension Services and in the State Agricultural Experiment Stations.



Today we have a growing force of chemically armed farmers, advised by a dedicated group of trained weed specialists. Their efforts against weeds are aided by an efficient staff of industrial organizations, weed scientists, and teachers who provide needed materials, new and improved methods, and trained personnel for replacement and expansion. However, achievement of desired goals--effective allocation of weed control efforts, maximum utilization of energies, and economy and safety of operation--depends upon constant reappraisal of progress on old problems and definition of new problems. This report provides a basis for assessing these needs.

These results of the fourth survey on the extent and cost of weed control with herbicides offer an updated evaluation of some of the more important weed problems. Previous surveys had been made in 1959, 1962, and 1965; the present survey was conducted during 1968. The data are especially important in establishing trends in usage, costs, effectiveness, areas of application, and intensification of problems.

Analysis of trends and new evaluations of specific problems can help us focus attention on problems of greatest importance. What are the costs? What costs are becoming critical? In what crops and geographical areas are the needs for better control of weeds most pressing? In which crops should we develop better alternative treatments? Where do residue hazards exist? Are we directing our efforts against the most important weeds? How important are certain weeds nationally, regionally, Statewise, cropwise? These are only a few of the questions for which some answers may be forthcoming to help map future strategy. This fourth survey provides our best overall appraisal of the extent and costs of weed control and extended insight into the status of important weed problems.

This study was made possible by the close cooperation of State research and extension workers and three agencies of the U.S. Department of Agriculture: the Economic Research Service, the Agricultural Research Service, and the Extension Service. All shared in planning the study and in writing the report.

## GENERAL LIMITATIONS

Tabular data and associated discussions in this report are based on information provided in returned questionnaires.

In 1968, specialists reported the acreages treated with herbicides in three categories: (1) areas treated by preemergence methods only; (2) areas treated by postemergence methods only; and (3) areas which received combinations of both preemergence and postemergence treatments (a new category).<sup>2</sup> The total land area treated with herbicides in 1968 is the sum of the three categories. In the earlier years, only two categories were distinguished, and the total land area treated was actually less than the sum of the acreages of the two. Acreages treated by combinations of preemergence and

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<sup>2</sup>Preemergence--before emergence of specified weed or crop; postemergence--after emergence of specified weed or crop.

postemergence methods were counted twice, once in each category. The total acreage figures reported for 1959, 1962, and 1965 were correct only for acreages treated but did not reflect the true land area involved.

Some crops are grown in only a few States. Some States did not report on a specific crop, although the crop was grown. In several instances, reports were received on specific weed problems but not on associated costs and the extent of weed control. Consequently, the number of States reporting on different aspects of problems in a crop or area varies. Regional and national averages, totals, and percentages in the summary tables were calculated from the individual reports and weighted for acreages involved.

Persistence problems discussed in this report have been limited to soil persistence, except for persistence in the water of treated aquatic areas. Figures tabulated on persistence problems reflect the number of "yes" or "no" replies to the question "Are herbicidal residues in the soil becoming a problem?" Positive replies are interpreted as indicating that herbicidally active residues persist in the soil (or water) for a sufficient period of time to injure either the crop to which applied or succeeding crops, or otherwise to interfere with traditional programs of cropping, land management, or water use. For each positive reply, State specialists also estimated the percentage of the crop acreage that was affected by residue problems in 1968. Herbicides that persist in the soil do not necessarily cause other environmental contamination, and many residue problems are resolved by adjusting the crop rotations.

Data were not available for providing quantitative answers to several questions. In these instances, reporting specialists used their best judgment in making estimates.

These general limitations should be considered in interpreting this report. References are made to other specific limitations at appropriate places.

## PURPOSE OF THE SURVEY AND PROCEDURE

The primary objectives of this survey were to update previous information on chemical control of weeds and to identify more exactly the extent and status of the major weed problems that contribute to the losses and costs of agriculture. The data have been evaluated and presented in a form suited to the varied requirements of both public and private agencies for program reviews and analyses. The report provides a source of information useful for establishing priorities in short-term and long-range research planning, for implementing research, development, regulatory, and educational programs, and for effectively guiding the leadership efforts of extension personnel.

National and international emphasis on world food problems recognizes the importance of weed control in crop production. The avoidance of damage to the environment continues to be a foremost consideration in the application of herbicide technology to achieve more efficient agricultural production. As agricultural technology advances to provide higher levels of production, any



factor that limits or reduces yields becomes increasingly important. Information on weed control--one of the major and most costly inputs in time, energy, and materials in crop production--must be updated continually to keep abreast of other developments.

The questionnaire used in the current survey (conducted in 1968) followed the general format of questionnaires used in earlier surveys.<sup>3,4,5</sup> Questions covered items that provide consolidated information on:

- (1) The costs of herbicidal control measures, the extent of their use in different crop or noncrop situations, their effectiveness, usage trends, and residue problems, and
- (2) The relative importance of specific weeds as major problems with respect to their geographical distributions and the extent and trends of their infestations in individual crop or noncrop situations.

The Extension Service supervised the distribution of the questionnaires to extension specialists charged with educational leadership in weed control in the 50 States. Each specialist was asked to assume responsibility for the reports from his State but was requested to solicit support from all staff members who could contribute to a sound appraisal of the weed problems. Separate reports were requested for each of the crop or noncrop situations covered in the tables. The number of crops and other situations was expanded from the 28 covered in 1965 to 49 in 1968. Reports were received from all 50 States. Results were more complete for the fourth survey than for any previous one.

The Economic Research Service tabulated the information. Weed specialists in the Agricultural Research Service interpreted and evaluated the summarized information for each of the crop or other situations surveyed. In most instances, State specialists reported the weeds by the names approved by the Weed Science Society of America. Some colloquial names were changed to approved common names or to common names given in standard reference volumes. Binomial nomenclature for most of the common names can be found in the Appendix.

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<sup>3</sup>Agricultural Research Service and Federal Extension Service, U.S. Department of Agriculture. A survey of extent and cost of weed control and specific weed problems. ARS 34-23. 1962.

<sup>4</sup>Agricultural Research Service and Federal Extension Service, U.S. Department of Agriculture. A survey of extent and cost of weed control and specific weed problems. ARS 34-23-1. 1965.

<sup>5</sup>Agricultural Research Service, Federal Extension Service, and Economic Research Service, U.S. Department of Agriculture. Extent and cost of weed control with herbicides and an evaluation of important weeds, 1965. ARS 34-102. 1968.

# CHEMICAL WEED CONTROL BY FARMERS

## (See General Limitations)

The use of herbicides continues to increase in the United States. In 1968, over 150 million acres were treated with herbicides as compared with 120 million acres in 1965, over 70 million acres in 1962, and 53 million acres in 1959 (table 1). The largest increases in acreages since 1965 were on land devoted to the cultivation of corn, small grains, cotton, soybeans, and sorghum.

Although much of the earlier increase resulted from using larger quantities of such older organic herbicides as 2,4-D,<sup>6</sup> a considerable part of the recent increase was due to the use of some more-recently developed herbicides, such as atrazine, trifluralin, and chloramben.<sup>7</sup> Many of the newer herbicides possess various properties that make them useful for controlling many species of weeds or for controlling specific weeds in particular crops and under different soil and climatic conditions.

Herbicidal control of weeds is an essential part of improved crop production technology that also includes the use of fertilizers, improved crop varieties, and larger and newer types of machinery and equipment. Many of the recent developments have reduced labor requirements (fig. 1) and at the same time increased the attractiveness of using more herbicides. The use of herbicides helps to reduce the risk of weeds that cannot be controlled because of unfavorable weather conditions. For example, the use of herbicides as preemergence treatments allows the grower several opportunities to control weeds. If the preemergence application is not effective, he still has the alternatives of using herbicides as postemergence treatments, or cultivation, or both.

The use of herbicides alone or combined with other methods of weed control offers unusual promise for increasing crop yields. Effective weed control also improves crop quality and reduces costs of harvesting and processing the crop.

Herbicide use affects overall crop production patterns in the choice of crops grown and the variety of crops planted. It influences seedbed preparation, methods of seeding, seeding rates, row spacing, plant spacing in the row, and plant populations per acre. It facilitates the modification of associated fertilizer practices, which include the type of fertilizer used, the time of application, and the placement of fertilizer. More directly, the use of herbicides affects the cultivation practices, such as the number and type of cultivations. The use of herbicides also facilitates irrigation practices, harvesting procedures, seed cleaning operations, erosion control, and fallow

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<sup>6</sup>(2,4-dichlorophenoxy)acetic acid.

<sup>7</sup>2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (atrazine),  $\alpha,\alpha,\alpha$ -trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (trifluralin), and 3-amino-2,5-dichlorobenzoic acid (chloramben).

Table 1.--Estimated extent of chemical weed control in the United States, 1959, 1962, 1965, and 1968

Crop or area	Acres treated							
	Total number <u>1/</u>				Percent of total acres <u>2/</u>			
	1959	1962	1965	1968 <u>3/</u>	1959	1962	1965	1968
	-----1,000 acres-----				-----Percent-----			
Corn-----	20,051	25,302	45,012	48,930	25	39	68	76
Cotton-----	1,554	5,433	12,479	9,245	10	35	92	91
Sorghum-----	2,093	2,665	5,391	7,363	14	23	32	42
Soybeans-----	556	2,827	7,832	22,302	2	10	23	55
All small grains-----	20,723	18,931	28,735	35,949	22	24	36	43
Wheat-----	---	---	---	(21,255)	--	--	--	38
Other small grains-----	---	---	---	(14,694)	--	--	--	53
Rice-----	502	940	1,390	1,920	32	53	78	82
Tobacco-----	---	---	---	72	--	--	--	8
Peanuts-----	35	310	797	1,270	2	22	55	88
Sugarbeets-----	125	362	495	850	14	33	40	60
Sugarcane-----	---	---	---	582	--	--	--	95
All forage seeds-----	282	439	221	458	8	16	9	25
Legume seeds-----	---	---	---	(246)	--	--	--	18
Grass seeds-----	---	---	---	(212)	--	--	--	40
Sweet corn-----	---	30	308	461	--	5	56	66
Other vegetables <u>4/</u> -----	276	1,164	779	2,313	10	18	13	36
Fruits and nuts-----	10	267	540	2,941	5	10	19	96
Ornamentals-----	2	51	84	89	1	25	40	<u>5/</u> 43
Lawns-----	60	672	1,134	3,826	1	5	14	<u>5/</u> 19
Hay-----	272	412	1,269	1,276	<u>6/</u>	<u>6/</u>	2	2
Pastures <u>7/</u> -----	2,400	4,714	6,671	4,685	<u>6/</u>	2	2	<u>5/</u> 2
Rangeland <u>8/</u> -----	2,011	2,262	3,156	4,373	<u>6/</u>	<u>6/</u>	<u>6/</u>	<u>5/6/</u>
Forest plantings-----	---	274	117	463	--	--	--	--
Noncropland-----	1,971	3,612	3,306	1,659	--	--	--	--
Aquatics-----	---	---	84	216	--	--	--	--
Total-----	52,923	70,667	119,800	151,243	--	--	--	--

1/ Data for 1959, 1962, and 1965 include acres treated preemergence plus acres treated postemergence; those acres treated both preemergence and postemergence are counted twice. This double counting lowers the average cost per acre (see table 2). In 1968, acres treated both preemergence and postemergence were reported separately from acres treated preemergence only or postemergence only.

2/ Harvested acreage where crops were harvested (see table 4 for 1968).

3/ Numbers in parentheses not included in total because of duplication. Information for sugarcane and tobacco was not available for earlier years.

4/ Root crops, cucurbits, vegetable legumes, vegetables, and vegetable seed crops other than sweet corn. Information was reported for more vegetables in 1968 than in earlier years. See individual tables for vegetables included in this report.

5/ Estimated.

6/ Less than 1 percent.

7/ Annual, perennial improved, and perennial unimproved. See individual tables for more detailed information.

8/ Mountain, prairie, arid, and rainbelt. See individual tables for more detailed information.

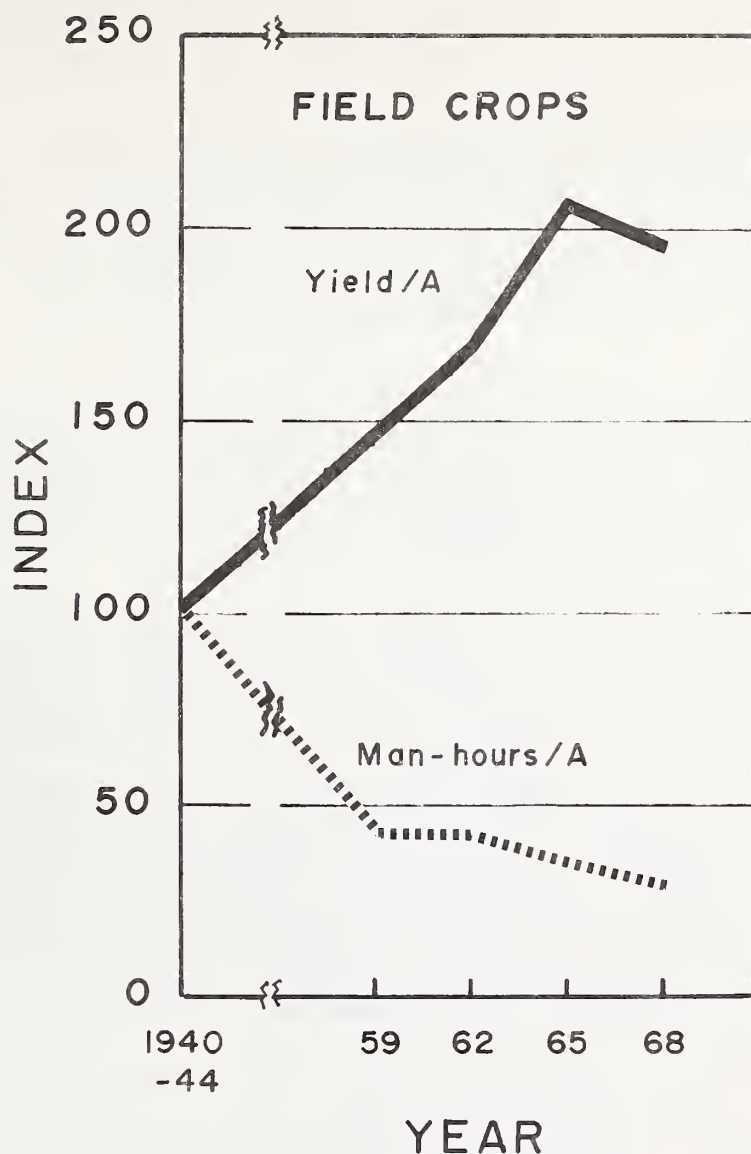


Figure 1. Effects of agricultural technology on productivity and labor requirements in field crop production since 1940-44; index values weighted for harvested acres of food and feed grains, oil crops, sugar crops, cotton, and tobacco; 1940-44 index=100. (Based on data from Agricultural Statistics, 1954 and 1970.)

practices for weed control. In addition, the extensive use of herbicides helps to improve disease and insect control and land and equipment use.

Weed specialists estimated that farmers treated 26 percent more acres in 1968 than in 1965, and that the directly related costs of materials and the cost of application for all herbicide treatments increased about 68 percent. Average costs per acre increased 35 percent, from \$4.12 to \$5.55 per acre



(table 2). In 1968 costs ranged from slightly more than \$2 per acre for treatments on small grains to more than \$20 per acre for treatments on lawns, ornamentals, and aquatic areas.

Farmers generally treated most of the acreages themselves. This was especially true for the more important row crops--corn, cotton, soybeans, and sorghum--as well as for fruits, nuts, and most vegetables. Large acreages of small grains and rangeland were often treated by aircraft that are generally owned and furnished by custom operators. Some specialty crops, e.g., rice (which requires flooding and irrigation), are conventionally treated by aircraft (table 3).

Preemergence use of herbicides continued to grow in importance. Acreage treated preemergence constituted slightly less than 8 percent of the total treated acreage of all crops in 1959, while in 1968, 34 percent was treated preemergence only, and 16 percent both preemergence and postemergence (table 4). The increase in preemergence treatments was especially noticeable on such crops as corn and soybeans.

Herbicides were still used extensively as postemergence treatments. This usage accounted for about one-half of the acres treated with all herbicides. It accounted for nearly all of the treated small grain acreage, and for most of the treated acreages of pasture, rangeland, and noncropland.

The average cost per acre of application and materials for herbicides used preemergence alone was almost twice as much as for those used postemergence alone (table 5). Most of this difference resulted from higher costs or higher rates (or both) of materials for preemergence weed control, particularly on corn, cotton, sorghum, and soybeans. On vegetables, ornamentals, and fruit and nut crops, differences between the costs of using herbicides preemergence and postemergence were not as great. However, preemergence use of herbicides was generally more expensive than postemergence treatments.

Weed specialists reported that the herbicides available were effective in controlling many weeds in numerous crops (table 6). However, reports from many States indicated an urgent need for better herbicides on certain crops, particularly soybeans, sugarbeets, vegetables, ornamentals, hay, and pasture (table 7).

Specialists indicated some significant problems arising from herbicide residues in soils or aquatic areas. Persistence problems were noticed particularly on corn, sorghum, tobacco, sweet corn, and ornamentals. There appeared to be little difficulty with persistence of herbicides on small grains, rice, sugarcane, and pasture and rangelands (table 7).

Overall trends of herbicide use continued upward (table 7). Specialists in a few States reported that in 1968 the use of herbicides was lower on some crops than that reported in previous studies.

Table 2.--Estimated cost of chemical weed control in the United States, 1959, 1962, 1965, and 1968

Crop or area	Cost of herbicides including cost of application and materials for all treatments							
	Total				Average per acre			
	1959	1962	1965	1968 <u>1/</u>	1959	1962	1965	1968
	-----1,000 dollars-----				-----Dollars-----			
Corn-----	37,980	57,600	144,267	204,483	1.89	2.28	3.21	4.18
Cotton-----	4,709	16,805	59,678	89,342	3.03	3.09	4.78	9.66
Sorghum-----	6,512	5,258	22,121	33,841	3.11	1.97	4.10	4.60
Soybeans-----	2,315	10,835	35,249	124,402	4.16	3.83	4.50	5.58
All small grains-----	37,095	29,579	53,375	78,442	1.79	1.56	1.86	2.18
Wheat-----	---	---	---	(47,610)	---	---	---	2.24
Other small grains-----	---	---	---	(30,832)	---	---	---	2.10
Rice-----	889	6,250	12,638	21,935	1.77	6.65	9.09	11.42
Tobacco-----	---	---	---	835	---	---	---	11.68
Peanuts-----	116	2,565	6,337	12,493	3.31	8.27	7.95	9.84
Sugarbeets-----	625	2,237	4,179	8,146	5.00	6.18	8.44	9.58
Sugarcane-----	---	---	---	8,617	---	---	---	14.81
All forage seeds-----	1,868	2,416	1,527	3,438	6.62	5.50	6.91	7.51
Legume seeds-----	---	---	---	(2,026)	---	---	---	8.24
Grass seeds-----	---	---	---	(1,412)	---	---	---	6.66
Sweet corn-----	---	187	1,750	2,790	---	6.23	5.68	6.05
Other vegetables <u>2/</u> -----	1,418	10,415	7,969	24,476	5.14	8.95	10.23	10.58
Fruits and nuts-----	98	2,397	7,029	29,720	9.80	8.98	13.02	10.11
Ornamentals-----	45	969	1,743	1,810	22.50	19.00	20.75	20.26
Lawns-----	1,489	15,368	26,750	112,708	24.82	22.87	23.59	29.46
Hay-----	1,692	1,794	5,224	7,697	6.22	4.35	4.12	6.03
Pastures <u>3/</u> -----	5,789	13,340	16,551	13,700	2.41	2.83	2.48	2.92
Rangeland <u>4/</u> -----	6,174	6,265	15,748	22,736	3.07	2.77	4.99	5.20
Forest plantings-----	---	2,752	1,492	6,175	---	10.04	12.75	13.35
Noncropland-----	19,738	83,714	68,470	26,785	10.01	23.18	20.71	16.15
Aquatics-----	---	---	1,922	4,422	---	---	22.88	20.50
Total or average-----	128,552	270,746	494,019	838,993	2.43	3.83	4.12	5.55

1/ Numbers in parentheses not included in total because of duplication. Information for sugarcane and tobacco was not available for earlier years.

2/ Root crops, cucurbits, vegetable legumes, vegetables, and vegetable seed crops other than sweet corn. Information was reported for more vegetables in 1968 than in earlier years. See individual tables for vegetables included in this report.

3/ Annual, perennial improved, and perennial unimproved. See individual tables for more detailed information.

4/ Mountain, prairie, arid, and rainbelt. See individual tables for more detailed information.

Table 3.--Estimated extent and cost of chemical weed control in the United States, 1968

Crop or area <u>1/</u>	States reporting	Acres treated		Total cost, all acres	Average cost per acre	Acres treated by	
		Total number	Percent of total acres <u>2/</u>	treated		Farmers	Custom
	Number	1,000 acres	Percent	1,000 dollars	Dollars	Percent	Percent
Corn-----	48	48,930	76.1	204,483	4.18	76	24
Cotton-----	18	9,245	91.0	89,342	9.66	64	36
Sorghum-----	27	7,363	42.2	33,841	4.60	63	37
Soybeans-----	30	22,302	54.9	124,402	5.58	84	16
Wheat-----	38	21,255	38.4	47,610	2.24	54	46
Other small grains-----	45	14,694	52.6	30,832	2.10	62	38
Rice-----	5	1,920	81.6	21,935	11.42	13	87
Tobacco <u>3/</u> -----	12	72	8.1	835	11.68	94	6
Peanuts-----	9	1,270	88.4	12,493	9.84	84	16
Sugarbeets-----	17	850	60.0	8,146	9.58	78	22
Sugarcane <u>3/</u> -----	3	582	95.0	8,617	14.81	90	10
Legume seeds-----	19	246	18.4	2,026	8.24	69	31
Grass seeds-----	13	212	40.2	1,412	6.66	76	24
Sweet corn-----	31	461	65.6	2,790	6.05	65	35
Other vegetables <u>4/</u> -----	48	2,313	35.9	24,476	10.58	70	30
Fruit and nuts-----	38	2,941	95.9	29,720	10.11	85	15
Ornamentals-----	26	89	<u>5/</u> 42.5	1,810	20.26	71	29
Lawns-----	39	3,826	<u>5/</u> 19.1	112,708	29.46	79	21
Hay-----	37	1,276	2.0	7,697	6.03	76	24
Pastures <u>4/</u> -----	41	4,685	2.0	13,700	2.92	74	26
Rangeland <u>7/</u> -----	18	4,373	1.0	22,736	5.20	17	83
Forest plantings-----	22	463	---	6,175	13.35	58	42
Noncropland-----	27	1,659	---	26,785	16.15	48	52
Aquatic areas-----	20	216	---	4,422	20.50	25	75
All crops-----	50	151,243	---	838,993	5.55	--	--

1/ Does not include flax or summer fallow.

2/ Harvested acreage where crops were harvested. See table 4.

3/ Tobacco and sugarcane are not included in table 1.

4/ Root crops, cucurbits, vegetable legumes, vegetable seed crops, solanaceous crops, and all vegetables except sweet corn. See individual tables.

5/ Estimated.

6/ Annual, perennial improved, and perennial unimproved. See individual tables for more detailed information.

7/ Mountain, prairie, arid, and rainbelt. See individual tables for more detailed information.

Table 4.--Estimated extent of chemical weed control in the United States, 1968

Crop or area	Total harvested acres <u>1/</u>	Acres treated			Acres treated as percent of total		
		Pre- emer- gence only	Post- emer- gence only	Pre- + post- emer- gence	Pre- emer- gence only	Post- emer- gence only	Pre- + post- emer- gence
		-----1,000 acres-----			-----Percent-----		
Corn-----	64,263	20,415	18,887	9,628	31.8	29.4	15.0
Cotton-----	10,160	3,450	1,183	4,612	34.0	11.6	45.4
Sorghum-----	17,429	2,882	4,014	467	16.5	23.0	2.7
Soybeans-----	40,659	15,543	1,624	5,135	38.2	4.0	12.6
Wheat-----	55,309	584	20,331	340	1.1	36.8	.6
Other small grains (oats, barley, rye)---	27,931	473	12,864	1,357	1.7	46.1	4.9
Rice-----	2,353	15	1,890	15	.6	80.3	.6
Tobacco <u>2/</u> -----	880	23	48	1	2.6	5.5	<u>3/</u>
Peanuts-----	1,436	844	169	257	58.8	11.8	17.9
Sugarbeets-----	1,417	635	125	90	44.8	8.8	6.4
Sugarcane <u>2/</u> -----	613	118	271	193	19.3	44.2	31.5
Legume seeds-----	1,336	77	165	4	5.8	12.4	.3
Grass seeds-----	527	153	56	3	29.0	10.6	.6
Sweet corn-----	703	309	109	43	44.0	15.5	6.1
Other vegetables <u>4/</u> ---	6,446	1,633	411	269	25.3	6.4	4.2
Fruits and nuts-----	3,065	2,166	487	287	70.7	15.9	9.4
Ornamentals-----	210 <u>5/</u>	58	25	6	<u>5/</u> 27.5	<u>5/</u> 12.0	<u>5/</u> 3.0
Lawns-----	20,000 <u>5/</u>	893	2,455	478	<u>5/</u> 4.5	<u>5/</u> 12.3	<u>5/</u> 2.4
Hay-----	62,570	202	918	156	.3	1.5	.2
Pastures <u>6/</u> -----	310,000 <u>5/</u>	225	4,300	160	<u>5/</u> .1	<u>5/</u> 1.4	<u>5/</u> .1
Rangeland <u>7/</u> -----	630,000 <u>5/</u>	---	4,373	---	---	<u>5/</u> .1	---
Forest plantings-----	---	53	399	11	---	---	---
Noncropland-----	---	138	1,520	1	---	---	---
Aquatic areas-----	---	17	199	---	---	---	---
Total-----	---	50,906	76,823	23,513	---	---	---

1/ Harvested acreage where crops were harvested. From Agricultural Statistics, 1969.

2/ Tobacco and sugarcane are not included in table 1.

3/ Less than .05.

4/ Root crops, cucurbits, vegetable legumes, vegetable seed crops, solanaceous crops, and all vegetables except sweet corn. See individual tables.

5/ Estimated.

6/ Annual, perennial improved, and perennial unimproved. See individual tables for more detailed information.

7/ Mountain, prairie, arid, and rainbelt. See individual tables for more detailed information.



Table 5.--Estimated cost of chemical weed control in the United States, 1968  
(Costs are for herbicides and application)

Crop or area	Total cost <u>1/</u>			Average cost per acre <u>2/</u>		
	Pre-emergence only	Post-emergence only	Pre- + Post-emergence	Pre-emergence only	Post-emergence only	Pre- + Post-emergence
	-----1,000 dollars-----			-----Dollars-----		
Corn-----	98,809	46,462	59,212	4.84	2.46	6.15
Cotton-----	22,563	5,347	61,432	6.54	4.52	13.32
Sorghum-----	18,157	12,042	3,643	6.30	3.00	7.80
Soybeans-----	83,155	4,840	36,407	5.36	2.95	6.72
Wheat-----	2,208	44,322	1,081	3.78	2.18	3.18
Other small grains----	2,091	25,213	3,528	4.42	1.96	2.60
Rice-----	240	21,395	300	16.00	11.32	20.00
Tobacco <u>3/</u> -----	207	623	5	9.16	12.85	13.00
Peanuts-----	8,204	992	3,297	9.72	5.87	12.83
Sugarbeets-----	6,020	866	1,260	9.48	6.93	14.00
Sugarcane <u>3/</u> -----	2,174	3,618	2,826	18.42	13.35	14.64
Legume seeds-----	611	1,360	55	7.94	8.24	13.75
Grass seeds-----	1,215	177	20	7.94	3.16	6.67
Sweet corn-----	2,063	430	297	6.67	3.94	6.96
Other vegetables <u>4/</u> ----	16,648	2,892	4,936	10.20	7.04	18.35
Fruit and nuts-----	18,278	6,284	5,158	8.44	12.90	17.95
Ornamentals-----	1,220	467	123	21.10	18.38	20.16
Lawns-----	37,081	41,908	33,718	41.52	17.07	70.54
Hay-----	1,489	4,563	1,646	7.37	4.97	10.55
Pastures <u>5/</u> -----	1,165	11,772	762	5.18	2.74	4.76
Rangeland <u>6/</u> -----	---	22,736	---	---	5.20	---
Forest plantings-----	418	5,601	156	7.85	14.04	14.89
Noncropland-----	2,806	23,925	55	20.33	15.74	55.00
Aquatic areas-----	1,742	2,680	---	101.28	13.50	---
Total or average----	328,564	290,515	219,917	6.45	3.78	9.35

1/ Calculated from United States totals shown on individual tables as acres treated times the average costs, for acreages on which costs were reported.

2/ Total costs divided by acreage treated (see table 4) do not always equal average costs from individual tables because of grouping and rounding on summary tables.

3/ Tobacco and sugarcane are not included in table 2.

4/ Root crops, cucurbits, vegetable legumes, vegetable seed crops, solanaceous crops, and all vegetables except sweet corn. See individual tables.

5/ Annual, perennial improved, and perennial unimproved. See individual tables for more detailed information.

6/ Mountain, prairie, arid, and rainbelt. See individual tables for more detailed information.

Table 6.--Effectiveness of herbicides, by number of States reporting, 1968

Crop or area	Preemergence			Postemergence			Pre- + postemergence		
	only			only					
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Corn-----	38	8	1	29	17	1	26	7	0
Cotton-----	14	4	0	12	5	0	12	2	0
Sorghum-----	14	12	0	16	8	1	11	1	0
Soybeans-----	11	18	1	3	19	4	7	9	0
Wheat-----	2	5	0	26	12	0	4	2	0
Other small grains-----	6	5	0	30	14	1	6	2	0
Rice-----	1	0	0	4	1	0	1	0	0
Tobacco-----	3	5	0	2	6	0	0	1	0
Peanuts-----	5	4	0	2	5	0	4	3	0
Sugarbeets-----	7	9	1	5	7	2	5	3	0
Sugarcane-----	2	1	0	1	2	0	1	1	0
Legume seeds-----	0	8	0	5	10	0	1	2	0
Grass seeds-----	2	0	0	8	4	1	3	0	0
Sweet corn-----	28	2	0	15	9	1	12	3	0
Other vegetables <u>1/</u> <u>2/</u> -----	45	33	11	22	20	5	19	12	3
Fruits and nuts <u>2/</u> -----	19	16	1	23	19	0	16	3	0
Ornamentals <u>2/</u> -----	18	16	0	13	7	1	7	2	0
Lawns <u>2/</u> -----	24	10	1	27	13	0	15	5	0
Hay-----	14	8	0	16	17	2	6	3	0
Pastures <u>2/</u> <u>3/</u> -----	7	6	0	22	21	1	6	0	0
Rangeland <u>2/</u> <u>4/</u> -----	--	--	--	13	8	1	--	--	--
Forest plantings-----	5	3	0	11	9	0	2	1	0
Noncropland-----	7	2	0	12	14	0	3	0	0
Aquatic areas-----	4	2	0	9	9	1	--	--	--

\*A zero entry means that, of the States reporting the use of herbicides on a particular crop, no State reported in this category. A dash entry means that no State reported herbicide use for preemergence only or preemergence plus postemergence treatment.

1/ Root crops, cucurbits, vegetable legumes, vegetable seed crops, solanaceous crops, and all vegetables except sweet corn. Total grouping of 11 vegetable crops or crop groups.

2/ Each State counted only once in each column; however, within each grouping, a State could report in more than one column under each major heading. See individual tables within groupings.

3/ Annual, perennial improved, and perennial unimproved. Three groupings.

4/ Mountain, prairie, arid, and rainbelt. Four groupings.

Table 7.--Herbicide usage trend, need for better herbicides, and residue problems, by number of States reporting, United States, 1968

Crop or area	Herbicide usage trend			Need for better herbicides <u>1/</u>			Herbicide persistence problem <u>1/</u>		
	Up	Stationary	Down	Urgent	Some	Little	No	Yes	Percent of treated acres affected
	Number of States reporting								Percent
Corn-----	42	6	0	4	40	4	16	32	11
Cotton-----	13	5	0	0	16	2	11	7	5
Sorghum-----	19	8	0	3	21	3	15	12	31
Soybeans-----	28	2	0	13	16	1	26	4	1
Wheat-----	16	21	1	4	29	5	36	2	1
Other small grains-----	20	23	2	2	37	6	43	2	<u>2/</u>
Rice-----	3	2	0	1	4	0	5	0	0
Tobacco-----	10	2	0	1	10	1	7	5	29
Peanuts-----	5	4	0	3	6	0	7	2	7
Sugarbeets-----	11	6	0	9	8	0	10	7	5
Sugarcane-----	2	1	0	2	1	0	3	0	0
Legume seeds-----	13	6	0	6	11	2	17	2	6
Grass seeds-----	8	5	0	2	9	2	11	2	2
Sweet corn-----	20	11	0	3	24	4	14	17	24
Other vegetables <u>3/</u> <u>4/</u> -----	44	30	2	36	44	16	48	13	2
Fruits and nuts <u>3/</u> -----	33	12	0	14	32	9	36	6	<u>2/</u>
Ornamentals <u>3/</u> -----	28	5	0	12	23	2	26	5	11
Lawns <u>3/</u> -----	37	1	0	5	30	4	32	5	1
Hay-----	21	13	2	10	22	4	31	5	6
Pastures <u>3/</u> <u>5/</u> -----	26	16	0	7	30	6	40	0	0
Rangeland <u>3/</u> <u>6/</u> -----	13	4	1	4	14	2	18	0	0
Forest plantings-----	19	1	2	5	13	4	21	1	1
Noncropland-----	20	7	0	6	20	1	23	4	1
Aquatic areas-----	17	2	1	7	13	0	15	5	3

\* A zero entry means that of the States reporting herbicide usage trends, quality needs, or persistence problems, no State reported in this category.

1/ Identifies problem areas needing additional research.

2/ Less than 1 percent.

3/ Each State counted only once in each column; however, within each grouping, a State could report in more than one column under each major heading. See individual tables within groupings.

4/ Root crops, cucurbits, vegetable legumes, vegetable seed crops, solanaceous crops, and all vegetables except sweet corn. Total grouping of 11 vegetable crops or crop groups.

5/ Annual, perennial improved, and perennial unimproved. Three groupings.

6/ Mountain, prairie, arid, and rainbelt. Four groupings.

# NATIONAL, REGIONAL, AND AGRICULTURAL SIGNIFICANCE OF THE MOST FREQUENTLY REPORTED WEEDS

(See General Limitations)

The weed questionnaire of the 1968 survey covered 49 crops and land-use areas. For each crop or area, State specialists were requested to: (1) List the five weeds that remain the greatest problems despite existing technology; (2) estimate the percent of the acreage infested by each weed listed; and (3) indicate whether the intensity of each infestation was generally stationary, up, or down.

Instructions for completing the 1968 questionnaire were more explicit than for the 1965 questionnaire; consequently, weed reports submitted by State specialists in 1968 greatly improved. A total of 5,531 individual crop-weed listings was included on the completed questionnaires for 1968, and increase of 59 percent over the 3,469 for 1965. From these listings, individual weeds were identified as (1) species (e.g. giant foxtail), (2) generic complexes (e.g. foxtails), or (3) intergeneric or mixed complexes (e.g. annual grasses).<sup>8</sup> A comparison of the number of identifiable weeds listed during the 2 years shows:

<u>Weeds identified as--</u>	<u>1965</u>		<u>1968</u>	
	<u>Number</u>	<u>Pct.</u>	<u>Number</u>	<u>Pct.</u>
Species-----	250	64	364	68
Generic complexes-----	120	30	147	27
Intergeneric complexes-	22	6	26	5
Total-----	392	100	537	100

While an overall increase in all categories was expected because of the expanded crop coverage, the proportion of the weeds reported as species in 1968 was 4 percent greater, and those reported as generic and intergeneric complexes were 3 percent and 1 percent less, respectively than in 1965. Also, the 37 percent increase in the total number of weeds listed was much less than the percentage increase in total listings (59 percent). Thus, the 1968 survey provided for a better assessment of the relative importance of the various weeds in two ways: first, weeds were listed more specifically; and second, individual weeds were reported more frequently.

The total frequency with which a given weed was reported is only one measure of the weed's relative importance. The geographical distribution, measured by the number of States reporting a weed, and the agricultural distribution, measured by the number of crops in which reported, also influence the overall standing of one weed in comparison with other weeds. All three of

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<sup>8</sup>All weeds listed in this report are identified by botanical names in the Appendix.



these major criteria--reporting frequency, geographical distribution, and agricultural distribution--as well as modifying ranking scores for relative importance by regions, crop groupings, and estimated acreages, were considered in assessing the relative rank of the 25 most frequently reported weeds (tables 8, 9, and 10). Table 8 shows the detailed derivation of the composite scores for pigweeds and docks, which were ranked first and last among the top 25 weeds. Composite scoring compensated in part for an inherent bias in reporting that favored the 36 separate crops surveyed and discriminated against some of the noncrop situations, such as rangelands, which are somewhat more regional in character and which may be larger in total land areas than all cultivated areas combined. This discrepancy in the reporting system is a general limitation to be considered in all evaluations reported.

Although two-thirds of the weeds in tables 9 and 10 were listed as generic complexes, in the majority of instances, tabulations indicated the predominance of a single species in each complex. For example, the 415 reports for pigweeds (and other amaranths) may be reduced to 147 reports for redroot pigweed, 254 for pigweed, 13 for spiny amaranth (Florida only), and 1 for amaranth (also Florida). While only two species appear to be involved, the questionable identity of the generic listings made it advisable to pool all the listings for assessment as "type" weeds. Intergeneric complexes were not included.

From overall considerations the 10 top-ranked weeds in the United States in decreasing order, were pigweeds, crabgrasses, quackgrass, foxtails, thistles, ragweeds, lamsquarters, nutsedges, johnsongrass, and chickweeds (table 9). All showed the following common characteristics: composite score greater than 80, reporting frequency greater than 150, occurrence in at least 50 percent of the States and in 50 percent of the crops and land-use areas, and scores greater than 30 for relative importance in the four regions and 10 groupings of crops or other situations. In fact, from among the top 10 weeds reported most frequently in each region, eight weeds from the northeastern region, seven from the north central region, six from the southern region, and five from the western region were included among the top 10 in the United States.

Of the weeds ranked 11 through 25 in importance, only barnyardgrass (no. 11) and bindweeds (no. 14) occurred among the top 10 weeds of more than one region. Most of the importance of the last 15 weeds, then, arises from specific regional significance. The weeds of specific regional significance, in addition to those in the top 10 for the United States, were:

- . Northeastern Region--dandelions and panicums.
- . North Central Region--barnyardgrass, bindweeds, and smartweeds.
- . Southern Region--bermudagrass, cocklebur, morningglories, and henbit.
- . Western Region--barnyardgrass, bindweeds, bromes, bluegrasses, and kochia.

Mustards, purslane, and docks did not rank among the top 10 for any one region. Mustards were reported about equally in all four regions but mainly in small grains. Purslane was reported most frequently in horticultural crops; and docks in hay and pastures.

Table 8.--Examples of derivation of composite scores (pigweeds and docks) for establishing relative rank among the 25 most frequently reported weeds and weed complexes

Scoring criteria	Pigweeds		Docks	
	Rank	Score	Rank	Score
General scoring (1-25): <u>1</u> /				
Total number of reports-----	1	25	25	1
Number of States-----	1	25	21	5
Number of crops or situations-----	3	23	24	2
Modifying scores (0-10): <u>2</u> /				
Regions--				
Northeastern-----	3	8	---	0
North Central-----	2	9	---	0
Southern-----	2	9	---	0
Western-----	1	10	---	0
Crop or situation groupings--				
Agronomic crops-----	1	10	---	0
Vegetable crops-----	1	10	---	0
Fruit and nut crops-----	3	8	---	0
Ornamental crops-----	4	7	---	0
Turf areas-----	---	0	---	0
Hay crops-----	6	5	10	1
Pastures-----	4	7	3	8
Rangelands-----	---	0	---	0
Forest plantings-----	2	9	---	0
Noncroplands-----	---	0	---	0
Acreage categories--				
Total acreage infested-----	2	9	---	0
Percent reported "up"-----	---	0	---	0
Composite score		174		17

1/ Based on numerical arrays for the 25 most frequently reported weeds (see table 9); scored 1 to 25 in order of increasing values.

2/ Based on numerical arrays by number of reports for the 10 weeds or weed complexes reported most frequently in each criterion; scored 0 if not included in the top ten 10 (see tables 9 and 10 and individual crop tables).

Table 9.--Relative rank of the 25 most frequently reported weeds and weed complexes in the United States, based on a composite score determined from total frequency of reporting (number of reports), numbers of States and crops in which reported, and occurrence among top 10 weeds in four regions and 10 groupings of crops or land-use areas, 1968

Rank	Weed or Complex	Composite score 1/	Number of-- 2/			Number of reports by regions-- 3/				Regional and crop score 4/
			Reports	States	Crops	North-eastern	North Central	Southern	Western	
1	Pigweeds-----	174	415	46	38	*81	* 83	*155	*96	92
2	Crabgrasses----	157	380	43	40	*65	* 63	*235	17	78
3	Quackgrass-----	136	221	29	36	*89	* 74	9	*49	75
4	Foxtails-----	115	214	33	38	*46	*113	19	*36	44
5	Thistles-----	107	168	37	28	25	* 71	14	*58	53
6	Ragweeds-----	106	174	34	38	*51	* 44	* 77	2	46
7	Lambsquarters--	105	248	41	34	*86	* 56	33	*73	41
8	Nutsedges-----	91	201	31	33	*69	20	* 89	23	31
9	Johnsongrass---	89	162	26	36	5	11	*118	28	34
10	Chickweeds-----	84	152	40	26	*36	27	* 58	31	34
11	Barnyardgrass--	74	149	34	37	29	* 27	14	*79	19
12	Bermudagrass---	59	98	18	35	2	1	* 71*	24	19
13	Dandelions-----	58	93	34	12	*34	20	12	27	21
14	Bindweeds-----	56	110	23	31	17	* 39	6	*48	21
15	Cocklebur-----	53	98	26	25	--	18	* 68	12	10
16	Mustards-----	53	90	35	30	18	22	21	29	2
17	Bromes-----	43	77	25	20	2	26	9	*40	19
18	Bluegrasses----	34	67	28	18	9	13	15	*30	13
19	Purslane-----	33	72	21	20	18	23	20	11	6
20	Morningglories--	29	83	24	25	8	9	* 63	3	4
21	Panicums-----	29	72	26	25	*31	18	19	4	1
22	Smartweeds-----	27	69	25	23	11	*42	9	7	3
23	Kochia-----	19	57	12	24	--	20	2	*35	2
24	Henbit-----	17	64	18	18	8	6	*48*	2	3
25	Docks-----	17	52	22	16	4	3	40	5	9

1/ Maximum score possible, 235; see 2/, 4/, and Table 9.

2/ Weeds scored from 1 to 25 in order of increasing numbers listed in the separate columns for reports, States, and crops (or land-use areas). Maximum number of States, 50; of crops or land-use areas, 49.

3/ Asterisk (\*) designates weed or complex among the 10 most frequently reported in each region.

4/ The 10 most frequently reported weeds scored from 1 to 10 in order of increasing frequency of reporting in each region and in the following crop and land-use groupings: agronomic crops, vegetable crops, fruit and nut crops, ornamental crops, lawn and other turf areas, hay crops, all pastures, all rangelands, forest plantings, and noncroplands. None of the 10 most frequently reported weeds in aquatic areas occurred in the above list. See separate sections and tables in remainder of this report.

Table 10.--Estimates of acres of selected cultivated crops infested by the 25 most frequently reported weeds: total acreage, acres reported in an upward trend, and percent of total infested acreage reported "up," 1968

Weed or complex	Acres of selected crops infested <sup>1/</sup>		
	Total	Intensity trend "up"	
	: 1,000 acres	: 1,000 acres:	Percent
:			
1. Pigweeds-----:	*59,479	4,242	7
2. Crabgrasses-----:	*25,664	7,317	28
3. Quackgrass-----:	*18,645	1,584	8
4. Foxtails-----:	*69,358	17,638	25
5. Thistles-----:	11,825	4,657	*39
:			
6. Ragweeds-----:	7,956	2,330	24
7. Lambsquarters-----:	*15,060	53	< 1
8. Nutsedges-----:	7,492	6,653	*89
9. Johnsongrass-----:	*18,581	9,739	*52
10. Chickweeds-----:	2,764	600	22
:			
11. Barnyardgrass-----:	10,331	4,316	*42
12. Bermudagrass-----:	229	156	*68
13. Dandelions-----:	2,412	1,796	*74
14. Bindweeds-----:	13,893	3,249	23
15. Cocklebur-----:	*28,134	10,581	38
:			
16. Mustards-----:	*26,369	3,488	13
17. Bromes-----:	*15,691	6,435	41
18. Bluegrasses-----:	128	1	1
19. Purslane-----:	3,116	2,891	*93
20. Morningglories-----:	9,140	3,732	41
:			
21. Panicums-----:	14,182	7,923	*56
22. Smartweeds-----:	*18,425	1,629	9
23. Kochia-----:	9,630	5,820	*60
24. Henbit-----:	4,384	2,380	*54
25. Docks-----:	854	285	33

<sup>1/</sup> Harvested acreages (millions of acres) 1968: agronomic crops 224.4; vegetable crops (excluding vegetable seed crops) 7.0; all hay 62.7; total for selected crops 294.1. Figures marked with an asterisk (\*) were the 10 top-ranked weeds for total areas of infestations and for percent reported in an upward trend; values were scored as described in footnote <sup>4/</sup> of table 9 and are included in the composite scores shown in table 9.



Because State specialists provided information on the percent of the crop acreages infested and classified the infestations by intensity trends, the actual acreages reported infested can be estimated for many of the crops. State acreages are available for all of the agronomic and vegetable crops, except vegetable seed crops, and for all hay crops in Agricultural Statistics, published annually by the U.S. Department of Agriculture. The selected crops represented 294 of the 300 million acres of all crops harvested in 1968. Table 10 includes estimates of the total acreages reported infested by the 25 most frequently reported weeds in the selected crops and acreages on which the infestation trends were reported as intensifying ("up").

From the acreage estimates (table 10), the relative seriousness of a weed can be assessed in two ways: first, in overall scope or extent of the problem; and second, in whether the weed, when reported was increasing in intensity. Presumably, those that were reported as "up," or intensifying, are resistant to control pressures being applied or cannot be controlled effectively by existing technology. Even when the number of acres infested is small, weeds that are increasing in intensity can constitute serious threats to future production. Of those weeds that constituted the top 10 in number of acres infested, only one, johnsongrass, was also a problem as one of the top 10 that had a high percentage reported as "up." The five weeds that had the largest reported acreages of infestation were: foxtails, pigweeds, cocklebur, mustards, and crabgrasses. However, the five reported as intensifying most (highest percentages reported "up") were: purslane, nutsedges, dandelions, bermudagrass, and kochia. The data of table 10 should provide a base for monitoring future changes in the importance of individual weeds as national and regional problems.

Some of the changes in relative importance and trends of problem weeds were interpreted from an analysis of the top 15 agronomic weeds reported in 1965 and 1968 (table 11). During this period, crabgrasses, cocklebur, nutsedges, and ragweeds increased in relative importance (reporting rank), while johnsongrass, lambsquarters, morningglories, and bindweeds decreased. However, the relative rank of the other seven weeds remained the same. In 1968, the harvested acreage of agronomic crops was about 3 percent greater than in 1965, chiefly because of increases in the acreage of soybeans and small grains. Proportionally, six weeds showed much greater increases in acreages infested. These were: barnyardgrass (+79 percent), cocklebur (+54 percent), bindweeds (+27 percent), pigweeds (+9 percent), nutsedges (+8 percent), and crabgrasses (+7 percent). Weeds which decreased significantly were morningglories (-38 percent), lambsquarters (-38 percent), thistles (-23 percent), johnsongrass (-22 percent), mustards (-15 percent), and ragweeds (-10 percent). Acreages reported infested with foxtails, quackgrass, and wild oat remained about the same.

Significant shifts in acreages for the three trends are also shown in table 10. Morningglories, nutsedges, quackgrass, thistles, ragweeds, and wild oat intensified markedly on some acreages that were earlier classified as stationary or "down." Infestations of pigweeds, foxtails, crabgrasses, lambsquarters, and bindweeds were more stabile (stationary). Greater proportions of the acreages of both johnsongrass and cocklebur infestations were reported as down; however, only johnsongrass decreased in total agronomic acreage. The proportional increase in the down acreage of cocklebur may represent an

actual increase in cocklebur infestations that were not yet severe in 1968. These shifts in infestation trends probably reflect the relative effectiveness of weed control technology against specific weeds in the various crops and the broader application of effective weed control measures in all crops.

Table 11. Comparison of the 15 weeds reported most frequently in agronomic crops, 1965 and 1968: number of reports, acres reported infested, and percentages by trends

Weed or complex	Number of reports <sup>1/</sup>		Acres infested <sup>2/</sup>		Percentage of acreage by trend <sup>3/</sup>					
	1,000 acres		1,000 acres		1965			1968		
	1965	1968	1965	1968	: Sta.	Up	Down:	: Sta.	Up	Down
Pigweeds-----	* 109	* 121	49,633	54,134	60	28	12	85	7	8
Foxtails-----	* 77	* 87	64,465	63,772	26	73	1	76	23	1
Johnsongrass---	* 63	* 66	22,341	17,459	39	55	6	22	54	24
Crabgrasses----	* 60	* 71	20,770	22,205	28	51	21	47	33	20
Lambsquarters--	* 55	55	19,501	12,077	74	14	12	97	< 1	3
Morningglories-	51	47	14,651	9,077	72	27	1	53	41	6
Cocklebur-----	44	* 56	18,102	27,973	56	43	1	39	38	23
Nutsedges-----	41	50	6,682	7,208	21	79	0	10	90	> 1
Mustards-----	39	49	28,276	24,158	39	19	42	42	14	44
Barnyardgrass--	35	49	5,180	9,292	31	49	20	43	43	14
Quackgrass-----	35	43	10,318	10,271	54	2	44	54	13	33
Thistles-----	25	38	11,335	8,698	58	12	30	75	25	0
Bindweeds-----	20	32	10,811	13,735	55	30	0	76	24	0
Ragweeds-----	19	37	5,915	5,332	77	23	< 1	60	40	< 1
Oat, wild-----	19	25	21,135	21,611	77	7	16	67	33	0

<sup>1/</sup> Asterisks (\*) designate the five most frequently reported weeds in each year.

<sup>2/</sup> In 1965, 217.4 million acres of agronomic crops harvested, not including tobacco and sugarcane; in 1968, 224.4 million acres, including 1.4 million acres of tobacco and sugarcane.

<sup>3/</sup> Acreage estimates of infestations classified by intensity trends and expressed as percentage of the total acreage reported infested each year. Sta.--stationary.

# AGRONOMIC CROPS

## (See General Limitations)

The 1968 survey included 13 agronomic crops: corn, cotton, sorghum, soybeans, wheat, other small grains (oats, rye, and barley as a group), rice, tobacco, peanuts, sugarbeets, sugarcane, legume seeds, and grass seeds. In the 1965 survey, tobacco and sugarcane were not included, wheat was combined with other small grains, and legume and grass seeds were reported jointly as forage seeds.

In 1968, herbicides were applied on 128.9 million acres of agronomic crops, or on approximately 57 percent of the 224.3 million acres harvested. Of the treated acres, 45.2 million received only preemergence treatment at an average cost of \$5.43 per acre; 61.6 million received postemergence treatment only (\$2.71 per acre); and 22.1 million received both preemergence and postemergence treatments at an average cost of \$7.83 per acre. Preemergence treatments were applied on 67.3 million acres and postemergence treatments were applied on 83.7 million. The total cost of herbicides, including cost of application, was approximately \$586 million (average cost \$4.55 per acre).

A new feature that appeared in the 1968 survey was the reporting of acres that were treated preemergence only, acres treated postemergence only, and acres which received both preemergence and postemergence treatment. Combination of both preemergence and postemergence treatments were used on approximately 50 percent of the treated cotton acreage, 33 percent of the treated sugarcane acreage, 19 to 23 percent of the treated acreages of corn, soybeans, and peanuts, and 7 to 10 percent of the treated acreages of sorghum, small grains other than wheat or rice, and sugarbeets. Only 1 or 2 percent of the treated acreages of wheat, rice, tobacco, legume seeds, and grass seeds received both preemergence and postemergence treatments.

The total acreages treated preemergence and the total acreages treated postemergence are not presented in the tables, but these totals can be calculated by adding the acreage treated both preemergence and postemergence to the acreage treated preemergence only or to the acreage treated postemergence only, whichever is appropriate. Since 1962, the acreages of agronomic crops treated with herbicides have increased almost threefold. The ratio of acres treated postemergence to acres treated preemergence has declined from 3.42 in 1962 to 2.07 in 1965 to 1.24 in 1968. In 1968, a total of 4.83 acres was treated preemergence only or postemergence only for each acre that received both types of treatments. For all agronomic crops, expenditures for herbicides and their application have increased from \$133 million in 1962 to \$339 million in 1965 and to \$586 million in 1968.

The 10 weeds reported most frequently in agronomic crops in 1968, in decreasing order of frequency, were: pigweeds, foxtails, crabgrasses, johnsongrass, cocklebur, lambsquarters, nutsedges, barnyardgrass, mustards, and morningglories. Weeds which appeared to be increasing in relative importance in at least one crop are: quackgrass, bindweeds, panicums, sidas, thistles, smartweeds, pigweeds, kochia, bulrushes, signalgrass, sprangletop, cocklebur, and beggarweed. Weeds which declined in relative importance in at least one



crop were: shattercane, sandburs, barnyardgrass, foxtails, lambsquarters, quackgrass, ragweeds, bromes, and knawel. The relative importance of a weed can go up or down without variation in the problem it causes, because other weeds may become more or less serious in any one crop. The continued frequency with which pigweeds and crabgrasses were reported was surprising, because methods for controlling these species were generally good. The abundance of pigweeds and crabgrasses, however, may give them a degree of notoriety even though effective control measures are available.

Tables 1 through 7 present national aspects of the extent, cost, effectiveness, usage trends, and persistence problems associated with herbicides used in individual crops. Tables 8 through 11 summarize important weed problems, and tables 12 through 63 present similar data on a State and regional basis. Each crop is discussed separately. All tables for the crops included in Agronomic Crops are grouped at the end of the discussions (see pages 31 through 80).

## Corn

In 1968, herbicides were applied on 48.9 million acres of corn, or on approximately 76 percent of the 64.3 million acres harvested (tables 1, 3, and 4). Of the treated acres, 20.4 million received only preemergence treatment at a cost of \$4.84 per acre; 18.9 million received postemergence treatment only (\$2.46 per acre); and 9.6 million received both preemergence and postemergence treatments (\$6.15 per acre) (tables 4, 5, and 12). Farmers treated 76 percent of this acreage with their own equipment, while custom operators treated 24 percent (tables 3 and 12). The cost of herbicides used in corn, including cost of application, was \$204.5 million (tables 2 and 3).

Preemergence treatments used in 1968 appeared slightly more effective than those used in 1965, and postemergence treatments appeared less effective than in 1965. Combinations of preemergence and postemergence treatments were rated good in 26 States and fair in seven States. No State rated them poor. Texas, New Mexico, Utah, and Hawaii reported an urgent need for better herbicides. The herbicide usage trend was up in 42 States, stationary in six, and down in none. Problems of herbicides persisting in soil in 1968 appeared to have increased slightly since 1965. In 1968, 32 States reported problems of persistence, while 16 States reported no major problems with persistence. Persistence problems affected 11 percent of the total acreage treated and were most severe in the western region (tables 6, 7, and 13).

Weeds listed among the five most important in at least four States were: pigweeds, crabgrasses, lambsquarters, quackgrass, foxtails, nutsedges, Canada thistle, johnsongrass, barnyardgrass, bindweeds, cocklebur, morningglories, panicums, kochia, velvetleaf, and witchgrass. Newcomers to this list since 1965 were: bindweeds, panicums, kochia, and witchgrass. Major weeds that appeared to have decreased in relative importance since 1965 were shattercane and sandburs (tables 14 and 15).

## Cotton

In 1968, herbicides were applied on 9.2 million acres of cotton. This was approximately 91 percent of the 10.2 million acres harvested (tables 1, 3,

and 4). Of the treated acres, 3.4 million received only preemergence treatment at a cost of \$6.54 per acre; 1.2 million received postemergence treatment only (\$4.52 per acre); and 4.6 million received both preemergence and postemergence treatments (\$13.32 per acre) (tables 4, 5, and 16). Farmers treated 64 percent of these acreages with their own equipment, while custom operators treated the remaining 36 percent (tables 3 and 16). The cost of herbicides used in cotton, including cost of application, was \$89.3 million (tables 2 and 3).

Preemergence treatments used in 1968 appeared about the same in effectiveness as those used in 1965, and postemergence treatments appeared more effective than in 1965. Combinations of preemergence and postemergence treatments were rated good in 12 States and fair in two. No State rated them poor, and no State reported an urgent need for better herbicides. The herbicide usage trend was up in 13 States, stationary in five, and down in none. Problems of herbicides persisting in soil in 1968 appeared to have decreased slightly since 1965. In 1968, seven States reported problems of persistence, and 11 reported no major problems with persistence. Persistence problems affected 5 percent of the treated acreage and were most severe in the western region (tables 6, 7, and 17).

Weeds listed among the five most important in at least four States were: pigweeds, crabgrasses, nutsedges, johnsongrass, cocklebur, morningglories, and sidas. The only newcomer to this list since 1965 was the complex of sidas. The only major weed that appeared to have decreased in relative importance since 1965 was barnyardgrass (tables 18 and 19).

## Sorghum

In 1968, herbicides were applied on 7.4 million acres of sorghum. This represented approximately 42 percent of the 17.4 million acres harvested (tables 1, 3, and 4). Of the treated acres, 2.9 million received only preemergence treatment at a cost of \$6.30 per acre; 4.0 million received postemergence treatment only (\$3 per acre); and 500,000 received both preemergence and postemergence treatments (\$7.80 per acre) (tables 4, 5, and 20). Farmers treated 63 percent of this acreage with their own equipment, while custom operators treated the remaining 37 percent (tables 3 and 20). The cost of herbicides used in sorghum, including cost of application, was \$33.8 million (tables 2 and 3).

The preemergence and postemergence treatments used in 1968 appeared more effective than those used in 1965. Combinations of preemergence and postemergence treatments were rated good in 11 States and fair in one. No State rated them poor. Texas, New Mexico, and Hawaii reported an urgent need for better herbicides. The herbicide usage trend was up in 19 States, stationary in eight, and down in none. Problems of herbicides persisting in soil in 1968 appeared to be about the same as in 1965. In 1968, 12 States reported problems of persistence, while 15 reported no major problems with persistence. Persistence problems affected 31 percent of the treated acreage, principally in the southern and western regions (tables 6, 7, and 21).

Weeds listed among the five most important in at least four States were: pigweeds, crabgrasses, lambsquarters, foxtails, johnsongrass, barnyardgrass,

field bindweed, cocklebur, and morningglories. The only newcomer to this list since 1965 was field bindweed. No major weeds decreased in relative importance since 1965 (tables 22 and 23).

## Soybeans

In 1968, herbicides were applied on 22.3 million acres of soybeans. This represented approximately 55 percent of the 40.7 million acres harvested (tables 1, 3, and 4). Of the treated acres, 15.5 million received only pre-emergence treatment at a cost of \$5.36 per acre; 1.6 million received post-emergence treatment only (\$2.95 per acre); and 5.1 million received both preemergence and postemergence treatments (\$6.72 per acre) (tables 4, 5, and 24). Farmers treated 84 percent of this acreage with their own equipment, while custom operators treated the remaining 16 percent (tables 3 and 24). The cost of herbicides used in soybeans, including cost of application, was \$124.4 million (tables 2 and 3).

Preemergence treatments in 1968 appeared much more effective than those used in 1965, and postemergence treatments appeared about equal to those in 1965. Combinations of preemergence and postemergence treatments were rated good in seven States and fair in 12. No State rated them poor. Four States in the north central region and nine States in the southern region reported an urgent need for better herbicides. The herbicide usage trend was up in 28 States, stationary in two, and down in none. Problems of herbicides persisting in soil in 1968 appeared to be about the same as in 1965. In 1968, four States reported problems of persistence, and 26 reported no major problems with persistence. Persistence problems affected only about 1 percent of the treated acreage (tables 6, 7, and 25).

Weeds listed among the five most important in at least four States were: pigweeds, crabgrasses, lambsquarters, foxtails, nutsedges, ragweeds, johnsongrass, cocklebur, morningglories, smartweeds, jimsonweed, and velvetleaf. There was no change in this list since 1965, except that smartweeds were erroneously listed as red sorrel in 1965 (tables 26 and 27).

## Wheat

In 1968, herbicides were applied on 21.3 million acres of wheat, or on approximately 38 percent of the 55.3 million acres harvested (tables 1, 3, and 4). Of the treated acres, 600,000 received only preemergence treatment at a cost of \$3.78 per acre; 20.3 million received postemergence treatment only (\$2.18 per acre; and 300,000 received both preemergence and postemergence treatments (\$3.18 per acre) (tables 4, 5, and 28). Farmers treated 54 percent of these acreages with their own equipment, while custom operators treated 46 percent (tables 3 and 28). The cost of herbicides used in wheat, including the cost of application, was \$47.6 million (tables 2 and 3).

Preemergence treatments of wheat appeared slightly less effective in 1968 than those reported for all small grains in 1965, and postemergence treatments appeared slightly more effective than in 1965. Combinations of preemergence and postemergence treatments were rated good in four States and fair in two. No State rated them poor. New York, Oklahoma, Oregon, and Utah reported an urgent need for better herbicides. The herbicide usage trend was up in 16



States, stationary in 21, and down in one. Problems of herbicides persisting in soil appeared to be minor. In 1968, only two States reported problems of persistence, while 36 reported no major problems with persistence. Persistence problems affected only about 1 percent of the treated acreage (tables 6, 7, and 29).

Weeds listed among the five most important in at least four States were: thistles, chickweeds, bindweeds, mustards, bromes, henbit, smartweeds, kochia, docks, wild buckwheat, cockles, wild garlic, knawel, wild oat, field pennycress, pepperweeds, wild radish, sunflowers, and Russian thistle. Newcomers to this list since 1965 were: thistles, kochia, cockles, field pennycress, pepperweeds, wild radish, and Russian thistle. Major weeds that appeared to have decreased in relative importance since 1965 were foxtails, lambsquarters, quackgrass, and ragweeds. In 1965, smartweeds were erroneously listed as red sorrel in small grains (tables 30 and 31).

## Other Small Grains

In 1968, herbicides were applied on 14.7 million acres of oats, barley, and rye, or on approximately 53 percent of the 27.9 million acres harvested (tables 1, 3, and 4). Of the treated acres, 500,000 received only preemergence treatment at a cost of \$4.42 per acre; 12.9 million received postemergence treatment only (\$1.96 per acre); and 1.4 million received both preemergence and postemergence treatments (\$2.60 per acre) (tables 4, 5, and 32). Farmers treated 62 percent of these acreages with their own equipment, while custom operators treated 38 percent (tables 3 and 32). The cost of herbicides used in oats, barley, and rye, including cost of application, was \$30.8 million (tables 2 and 3).

Preemergence treatments used in oats, barley, and rye appeared slightly more effective in 1968 than those used in all small grains in 1965, and postemergence treatments appeared considerably more effective than in 1965. Combinations of preemergence and postemergence treatments were rated good in six States and fair in two. No State rated them poor. Oklahoma and Utah reported an urgent need for better herbicides. The herbicide usage trend was up in 20 States, stationary in 23, and down in two. Problems of herbicides persisting in soil were minor in oats, barley, and rye in 1968. In 1968, only two States reported problems of persistence, and 43 reported no major problems with persistence. The acreage affected by persistence problems was less than 1 percent of the total acreage treated (tables 6, 7, and 33).

Weeds listed among the five most important in at least four States were: pigweeds, lambsquarters, foxtails, thistles, chickweeds, bindweeds, mustards, henbit, smartweeds, kochia, dock, wild buckwheat, wild garlic, knawel, wild-oat, and wild radish. Newcomers to this list since 1965 were: pigweeds, thistles, kochia, and wild radish. Major weeds that appeared to have decreased in relative importance since 1965 are quackgrass, ragweeds, downy brome, and knawel. In 1965, smartweeds in small grains were erroneously reported as red sorrel (tables 34 and 35).

## Rice

In 1968, herbicides were applied on 1.9 million acres of rice. This represented approximately 82 percent of the 2.4 million acres harvested (tables 1, 3, and 4). Of the treated acres, 15,000 received only preemergence treatment at a cost of \$16 per acre; 1.9 million received postemergence treatment only (\$11.32 per acre); but only 15,000 received both preemergence and postemergence treatments (\$20 per acre) (tables 4, 5, and 36). Farmers treated only 13 percent of these acreages with their own equipment, while custom operators treated the remaining 87 percent (tables 3 and 36). The cost of herbicides used in rice, including cost of application, was \$21.9 million (tables 2 and 3).

Preemergence and postemergence treatments used in 1968 appeared about equal in effectiveness to those used in 1965. Combinations of preemergence and postemergence treatments were rated good in California, the only State reporting any use of both preemergence and postemergence treatments. Texas reported an urgent need for better herbicides. The herbicide usage trend was up in three States, stationary in two, and down in none. No problems of herbicides persisting in soil were reported in 1965 or in 1968 (tables 6, 7, and 37).

Weeds listed among the five most important in at least two States were: barnyardgrass, bulrushes, ducksalad, red rice, hemp sesbania, signalgrasses, and sprangletops. Newcomers to this list since 1965 were: bulrushes, signalgrasses, and sprangletops. No major weeds decreased in relative importance since 1965 (tables 38 and 39).

## Tobacco

In 1968, herbicides were applied on 72,000 acres of tobacco, or on approximately 8 percent of the 880,000 acres harvested (tables 1, 3, and 4). Of the treated acres, 22,600 received only preemergence treatment at a cost of \$9.16 per acre; 48,500 received postemergence treatment only (\$12.85 per acre); and 400 received both preemergence and postemergence treatments (\$13 per acre) (tables 4, 5, and 40). Farmers treated 94 percent of these acreages with their own equipment, while custom operators treated the remaining 6 percent (tables 3 and 40). The cost of herbicides used in tobacco, including cost of application, was \$835,000 (tables 2 and 3).

Preemergence treatments were rated good in three States and fair in five States in 1968. Postemergence treatments were rated good in two States and fair in six. Combinations of preemergence and postemergence treatments, used only in Florida, were rated fair. Kentucky reported an urgent need for better herbicides. The herbicide usage trend was up in 10 States, stationary in two, and down in none. In 1968, five States reported problems with herbicides persisting in soil, and seven reported no major problems with persistence. Persistence problems affected 29 percent of the treated acreage (tables 6, 7, and 41).

Weeds listed among the five most important in at least three States were: pigweeds, crabgrasses, lambsquarters, Florida pusley, nutsedges, ragweeds,



bermudagrass, and carpetweed. Tobacco was not included in the report on weeds in the 1965 survey (tables 42 and 43).

## Peanuts

In 1968, herbicides were applied on 1.3 million acres of peanuts. This represented approximately 88 percent of the 1.4 million acres harvested (tables 1, 3, and 4). Of the treated acres, 844,000 received only preemergence treatment at a cost of \$9.72 per acre; 169,000 received postemergence treatment only (\$5.87 per acre); and 257,000 received both preemergence and postemergence treatments (\$12.83 per acre) (tables 4, 5, and 44). Farmers treated 84 percent of these acreages with their own equipment, while custom operators treated the remaining 16 percent (tables 3 and 44). The cost of herbicides used in peanuts, including cost of application, was \$12.5 million (tables 2 and 3).

Preemergence and postemergence treatments used in 1968 appeared about equal in effectiveness to those used in 1965. Combinations of preemergence and postemergence treatments were rated good in four States and fair in three. No State rated them poor. Texas, Virginia, and New Mexico reported an urgent need for better herbicides. The herbicide usage trend was up in five States, stationary in four, and down in none. Problems of herbicides persisting in soil in 1968 appeared to have increased slightly since 1965. In 1968, two States reported problems of persistence, while seven reported no major problems with persistence. Persistence problems affected only 7 percent of the treated acreage in the United States but 70 percent of the acreage in Oklahoma (tables 6, 7, and 45).

Weeds listed among the five most important in at least three States were: pigweeds, crabgrasses, nutsedges, cockleburrs, morningglories, panicum, beggarweeds, and sicklepod. Newcomers to this list since 1965 were cockleburrs and beggarweeds. The only major weed or complex that appeared to have decreased in relative importance since 1965 was sandburrs (tables 46 and 47).

## Sugarbeets

In 1968, herbicides were applied on 850,000 acres of sugarbeets, or on approximately 60 percent of the 1.4 million acres harvested (tables 1, 3, and 4). Of the treated acres, 635,000 received only preemergence treatment at a cost of \$9.48 per acre; 125,000 received postemergence treatment only (\$6.93 per acre); and 90,000 received both preemergence and postemergence treatments (\$14 per acre) (tables 4, 5, and 48). Farmers treated 78 percent of the treated acreage with their own equipment, and custom operators treated the remaining 22 percent (tables 3 and 48). The cost of herbicides used in sugarbeets, including cost of application, was \$8.1 million (tables 2 and 3).

Both preemergence and postemergence treatments used in 1968 appeared more effective than those used in 1965. Combinations of preemergence and postemergence treatments were rated good in five States and fair in three. No State rated them poor. One State in the northeastern region, two in the north central region, and six in the western region reported an urgent need for better herbicides. The herbicide usage trend was up in 11 States, stationary in six, and down in none. Problems of herbicides persisting in soil in 1968

appeared to be about the same as in 1965. In 1968, seven States reported problems of persistence, and 10 reported no major problems with persistence. Persistence problems were most severe in the northeastern region, but affected only 5 percent of the total acreage treated in the United States (tables 5, 7, and 49).

Weeds listed among the five most important in at least four States were: pigweeds, lambsquarters, foxtails, barnyardgrass, mustards, kochia, and wild oat. There were no changes in this list since 1965 (tables 50 and 51).

## Sugarcane

In 1968, herbicides were applied on 582,000 acres of sugarcane, or on approximately 95 percent of the 613,000 acres harvested (tables 1, 3, and 4). Of the treated areas, 118,000 received only preemergence treatment at a cost of \$18.42 per acre; 271,000 received postemergence treatment only (\$13.35 per acre); and 193,000 received both preemergence and postemergence treatments (\$14.64 per acre) (tables 4, 5, and 52). Farmers treated 90 percent of these acreages with their own equipment, while custom operators treated the remaining 10 percent (tables 3 and 52). The cost of herbicides used in sugarcane, including the cost of application, was \$8.6 million (tables 2 and 3).

Preemergence treatments were rated good in Florida and Louisiana and fair in Hawaii. Postemergence treatments were rated good in Florida and fair in the other two states. Combinations of preemergence and postemergence treatments were rated good in Florida, fair in Louisiana, and were not reported as being used in Hawaii. Florida and Hawaii reported an urgent need for better herbicides. The herbicide usage trend was up in Florida and Louisiana and stationary in Hawaii. There were no indications of problems of herbicides persisting in soil in 1968 in any of these three States (tables 5, 7, and 53).

Weeds listed among the five most important in Florida, Hawaii, and Louisiana were: crabgrasses, johnsongrass, three-lobed morningglory, panicums, alexandergrass, guineagrasses, napiergrass, paragrass, and wingleaf passionflower. Sugarcane was not included in this survey in 1965 (tables 54 and 55).

## Legume Seed Crops

In 1968, herbicides were applied on 246,000 acres of legume seed crops. This was approximately 18 percent of the 1.3 million acres harvested (tables 1, 3, and 4). Of the treated acres, 77,000 received only preemergence treatment at a cost of \$7.94 per acre; 165,000 received postemergence treatment only (\$8.24 per acre); and 4,000 received both preemergence and postemergence treatments (\$13.75 per acre) (tables 4, 5, and 56). Farmers treated 69 percent of these acreages with their own equipment, while custom operators treated the remaining 31 percent (tables 3 and 56). The cost of herbicides used in legume seed crops, including cost of application, was \$2.0 million (tables 2 and 3).

Preemergence treatments used in 1968 were rated fair in eight States. Postemergence treatments were rated good in five States and fair in 10. Combinations of preemergence and postemergence treatments were rated good in one State and fair in two. None of the treatments were considered poor.

Pennsylvania, Minnesota, California, Oregon, Utah, and Wyoming reported an urgent need for better herbicides. The herbicide usage trend was up in 13 States, stationary in six, and down in none. Problems of herbicides persisting in soil in 1968 were reported by two States, and 17 States reported no major problems with persistence. Persistence problems affected 6 percent of the acreage treated (tables 6, 7, and 57).

Weeds listed among the five most important in at least four States were: pigweeds, crabgrasses, quackgrass, foxtails, ragweeds, thistles, johnsongrass, bromes, docks, wild carrot, white cockle, dodders, plantains, and yellow rocket. Weeds of legume and grass seed crops were not reported separately for the 1965 survey, so that no comparisons have been made between 1968 and 1965 (tables 58 and 59).

## Grass Seed Crops

In 1968, herbicides were applied on 212,000 acres of grass seed crops, or on approximately 40 percent of the 527,000 acres harvested (tables 1, 3, and 4). Of the treated acres, 153,000 received only preemergence treatment at a cost of \$7.94 per acre; 56,000 received postemergence treatment only (\$3.16 per acre); and 3,000 received both preemergence and postemergence treatments (\$6.67 per acre) (tables 4, 5, and 60). Farmers treated 76 percent of these acreages with their own equipment, while custom operators treated the remaining 24 percent (tables 3 and 60). The cost of herbicides used in grass seed crops, including the cost of application, was \$1.4 million (tables 2 and 3).

Preemergence treatments used in 1968 were rated good in the two States that reported their use. Postemergence treatments were rated good in eight States, fair in four, and poor in one. Combinations of preemergence and postemergence treatments were rated good in the three States that reported their use. Minnesota and Virginia reported an urgent need for better herbicides. The herbicide usage trend was up in eight States, stationary in five, and down in none. Problems of herbicides persisting in soil in 1968 were reported by Texas and Idaho, while 11 States reported no major problems with persistence. Persistence problems affected only 2 percent of the total acreage treated (tables 6, 7, and 61).

Weeds listed among the five most important in at least three States were: pigweeds, crabgrasses, lambsquarters, quackgrass, foxtails, thistles, annual bluegrass, bromes, kochia, wild garlic, plantains, and sandburs. In the report on the 1965 survey, weeds of grass seed crops and legume seed crops were combined, so that no comparisons between 1968 and 1965 for these crops have been made (tables 62 and 63).



Table 12.--Corn: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre 1/			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	30	8	4	9.00	7.00	15.00	45	55
Delaware-----	120	20	20	6.00	7.50	10.00	75	25
Maine-----	12	2	---	7.00	2.50	---	80	20
Maryland-----	300	95	30	5.50	2.25	6.00	90	10
Massachusetts-----	26	3	2	9.00	5.00	10.00	35	65
New Hampshire-----	3	1	1	8.50	8.50	8.50	60	40
New Jersey-----	50	10	5	4.50	3.00	6.50	80	20
New York-----	400	300	50	8.00	5.00	11.00	70	30
Pennsylvania-----	350	560	---	7.50	7.50	---	70	30
Rhode Island-----	2	1	1	8.00	5.00	10.00	90	10
Vermont-----	10	10	1	9.00	9.00	18.00	75	25
West Virginia-----	50	20	8	8.00	5.00	9.00	75	25
Northeastern-----	1,353	1,030	122	7.05	6.19	9.43	73	27
Illinois-----	4,000	2,300	2,300	4.00	1.50	5.50	75	25
Indiana-----	1,680	1,920	480	6.00	2.00	8.00	80	20
Iowa-----	4,000	3,000	2,000	4.00	1.50	5.50	90	10
Kansas-----	500	387	---	7.00	3.00	---	70	30
Michigan-----	400	1,000	---	6.00	4.75	---	55	45
Minnesota-----	1,800	500	1,400	4.50	2.00	6.50	70	30
Missouri-----	1,200	700	900	5.00	2.00	7.00	75	25
Nebraska-----	1,067	1,748	815	5.13	2.36	3.48	80	20
North Dakota-----	66	114	---	4.50	2.50	---	95	5
Ohio-----	880	1,600	600	4.75	1.70	6.50	75	25
South Dakota-----	400	1,400	25	6.00	1.70	7.00	60	40
Wisconsin-----	894	976	108	6.65	4.75	10.70	70	30
North Central-----	16,887	15,945	8,628	4.41	2.19	5.91	77	23
Alabama-----	200	70	250	5.00	3.00	6.50	90	10
Arkansas-----	1	10	5	8.00	3.00	11.00	99	1
Florida-----	25	75	---	4.50	1.50	---	50	50
Georgia-----	310	38	20	10.00	3.00	13.00	70	30
Kentucky-----	300	500	80	5.00	2.75	2.25	82	18
Louisiana-----	50	20	10	3.00	2.00	5.00	90	10
Mississippi-----	100	120	75	5.00	2.00	7.00	90	10
North Carolina-----	200	400	250	7.00	2.50	9.50	80	20
Oklahoma-----	20	5	---	5.50	1.75	---	95	5
South Carolina-----	90	55	150	10.00	3.00	11.00	75	25
Tennessee-----	320	85	10	8.50	2.50	10.00	60	40
Texas-----	140	12	10	5.25	2.25	7.50	40	60
Virginia-----	300	123	10	6.50	3.20	6.00	40	60
Southern-----	2,056	1,513	870	6.90	2.60	7.99	73	27
Arizona-----	1	1	---	5.00	3.00	---	75	25
California-----	10	100	5	7.00	5.00	12.00	60	40
Colorado-----	30	175	---	4.00	2.00	---	75	25
Idaho-----	6	26	1	9.00	3.00	12.00	60	40
Montana-----	10	30	---	3.50	2.00	---	95	5
New Mexico-----	4	1	---	8.00	8.00	---	100	--
Oregon-----	4	20	---	7.00	3.00	---	90	10
Utah-----	2	26	---	12.00	2.50	---	76	24
Washington-----	30	10	---	5.00	2.00	---	90	10
Wyoming-----	20	10	1	6.00	2.00	8.00	70	30
Hawaii-----	2	---	1	25.00	---	45.00	100	--
Western-----	119	399	8	5.78	2.92	15.62	74	26
United States-----	20,415	18,887	9,628	4.84	2.46	6.15	76	24

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 13.--Corn: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	Fair	Fair	Fair	Sta.	Some	Yes	5
Delaware-----	Good	Good	Good	Sta.	Some	Yes	10
Maine-----	Good	Good	----	Sta.	Some	Yes	10
Maryland-----	Good	Fair	Good	Up	Some	Yes	1
Massachusetts-----	Good	Good	Good	Sta.	Some	Yes	5
New Hampshire-----	Good	Fair	Good	Up	Some	No	--
New Jersey-----	Good	Good	Good	Up	Some	No	--
New York-----	Good	Fair	Good	Up	Some	No	--
Pennsylvania-----	Good	Good	----	Up	Some	No	--
Rhode Island-----	Good	Fair	Good	Up	Some	No	--
Vermont-----	Good	Good	Good	Up	Some	No	--
West Virginia-----	Good	Fair	Fair	Up	Some	Yes	10
Northeastern-----	11-Good 1-Fair	6-Good 6-Fair	8-Good 2-Fair	8-Up 4-Sta.	12-Some	6-Yes 6-No	1
Illinois-----	Good	Good	Good	Up	Some	Yes	2
Indiana-----	Fair	Fair	Fair	Up	Some	Yes	--
Iowa-----	Good	Good	Good	Up	Some	Yes	20
Kansas-----	Good	Good	----	Up	Some	Yes	10
Michigan-----	Good	Good	----	Up	Some	Yes	3
Minnesota-----	Fair	Good	Good	Up	Some	Yes	10
Missouri-----	Good	Good	Good	Up	Some	Yes	40
Nebraska-----	Good	Good	Good	Up	Some	Yes	19
North Dakota-----	Fair	Fair	----	Up	Some	Yes	50
Ohio-----	Good	Good	Good	Up	Some	Yes	5
South Dakota-----	Good	Good	Good	Up	Some	Yes	5
Wisconsin-----	Good	Fair	Good	Up	Some	Yes	15
North Central-----	9-Good 3-Fair	9-Good 3-Fair	8-Good 1-Fair	12-Up	12-Some	12-Yes	12
Alabama-----	Good	Fair	Good	Up	Some	No	--
Arkansas-----	Good	Good	Good	Sta.	Little	No	--
Florida-----	Poor	Fair	----	Up	Some	No	--
Georgia-----	Good	Good	----	Up	Some	No	--
Kentucky-----	Good	Fair	Fair	Up	Some	Yes	30
Louisiana-----	----	Poor	Fair	Up	Some	No	--
Mississippi-----	Good	Good	Good	Up	Some	No	--
North Carolina-----	Good	Good	Good	Up	Some	No	--
Oklahoma-----	Good	Fair	----	Up	Some	Yes	70
South Carolina-----	Good	Good	Good	Up	Little	No	--
Tennessee-----	Good	Good	Good	Up	Some	No	5
Texas-----	Fair	Good	Good	Up	Urgent	Yes	60
Virginia-----	Fair	Fair	Fair	Up	Some	Yes	5
Southern-----	9-Good 2-Fair 1-Poor	7-Good 5-Fair 1-Poor	7-Good 3-Fair	12-Up 1-Sta.	1-Urgent 10-Some 2-Little	4-Yes 9-No	9
Arizona-----	Good	Good	----	Sta.	Little	Yes	10
California-----	Fair	Good	Good	Up	Some	Yes	25
Colorado-----	Good	Fair	----	Up	Some	Yes	50
Idaho-----	Good	Good	Good	Up	Some	Yes	20
Montana-----	Good	Good	----	Up	Some	Yes	15
New Mexico-----	Good	Good	----	Up	Urgent	Yes	10
Oregon-----	Good	Good	----	Up	Little	Yes	--
Utah-----	Good	Fair	----	Up	Urgent	Yes	20
Washington-----	Good	Fair	----	Up	Some	Yes	30
Wyoming-----	Good	Good	Fair	Up	Some	Yes	70
Hawaii-----	Fair	----	Good	Up	Urgent	No	--
Western-----	9-Good 2-Fair	7-Good 3-Fair	3-Good 1-Fair	10-Up 1-Sta.	3-Urgent 6-Some 2-Little	10-Yes 1-No	35
United States-----	38-Good 8-Fair 1-Poor	29-Good 17-Fair 1-Poor	26-Good 7-Fair	42-Up 6-Sta.	4-Urgent 40-Some 4-Little	32-Yes 16-No	11

1/ Sta., stationary.



Table 14.--Corn: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area 1,000 acres
		NE	NC	S	W	Stationary		Up		Down		
						No.	Area 1,000 acres	No.	Area 1,000 acres	No.	Area 1,000 acres	
Apple-of-Peru-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
*Barnyardgrass-----	14	4	2	1	7	8	436	4	2,553	2	30	3,019
Bermudagrass-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Bindweeds-----	7	3	2	--	2	5	1,633	2	179	--	---	1,812
Burcucumber-----	1	1	--	--	--	--	---	1	10	--	---	10 1/
*Cocklebur-----	10	--	2	7	1	5	3,322	3	1,069	2	5,168	9,559
*Crabgrasses-----	21	8	3	9	1	10	2,786	9	5,006	2	1,144	8,936
Crotalaria-----	1	--	--	1	--	--	---	--	---	1	22	22
*Foxtails-----	19	2	12	1	4	12	30,773 2/	6	5,836 1/3/	1	52	36,661 1/2/3/
Horsenettle-----	2	2	--	--	--	1	60	1	19	--	---	79
Jimsonweed-----	2	1	--	--	1	2	108	--	---	--	---	108
*Johnsongrass-----	16	2	2	11	1	5	509	10	1,850	1	442	2,801
Junglerice-----	1	--	--	1	--	--	---	1	22	--	---	22
Kikuyugrass-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
Kochia-----	5	--	1	1	3	2	386	3	276	--	---	662
Lambsquarters-----	7	1	1	--	5	4	5,101	--	---	3	33	5,134
Milkweed-----	2	1	1	--	--	--	---	1	1,108	1	75	1,183
Millet, Texas-----	1	--	--	1	--	--	---	1	112	--	---	112
*Morningglories-----	9	--	--	9	--	3	466	5	1,069	1	445	1,980
Mustard, wild-----	1	--	1	--	--	1	476	--	---	--	---	476
*Nutsedges-----	17	10	4	3	--	3	55	13	3,501	1	1	3,557
Oat, wild-----	1	--	--	--	1	1	34	--	---	--	---	34
*Panicums-----	18	7	4	6	1	2	295	16	6,204 1/	--	---	6,499 1/
*Pigweeds-----	25	2	5	8	10	17	16,770	3	1,261	5	533	18,564
*Quackgrass-----	17	9	4	--	4	10	3,152	3	327	4	2,923	6,402
Ragweeds-----	3	1	1	1	--	3	1,387	--	---	--	---	1,387
Sandburs-----	3	--	--	--	3	1	3	2	242	--	---	245
Shattercane-----	1	--	1	--	--	1	283	--	---	--	---	283
Sicklepod-----	3	--	--	3	--	2	758	1	502	--	---	1,260
Signalgrass-----	2	--	--	2	--	--	---	2	181	--	---	181
Smartweeds-----	3	--	2	--	1	3	7,670	--	---	--	---	7,670
Sorghum (crop)-----	1	--	--	--	1	1	8	--	---	--	---	8
Sunflower-----	2	--	1	--	1	--	---	1	1,000	1	15	1,015
Switchgrass-----	1	--	--	--	1	--	---	1	29	--	---	29
Thistle, Canada-----	7	2	4	--	1	4	3,793	3	361	--	---	4,154
Velvetleaf-----	5	--	5	--	--	3	8,883	2	2,930	--	---	11,813
Watergrasses-----	1	--	--	--	1	1	8	--	---	--	---	8
Witchgrass-----	5	3	2	--	--	--	---	5	3,363	--	---	3,363

1/ No acreages estimated for problem weeds in Hawaii.

2/ Includes 635,000 acres of yellow foxtail in North Dakota but does not include 635,000 acres of green foxtail.

3/ Includes 2,693,000 acres of green foxtail in Wisconsin but does not include 943,000 acres of giant foxtail.

Table 15.-Corn: Five most important weeds listed in 11 critical regions, States with infestation trend, and infestation trend, 1968

Region and State	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Pct.
<b>Northeastern:</b>									
Connecticut	Barleygrass	20 Up	Crabgrass	40 Up	Panicum, fall	15 Up	Quackgrass	15 Down	15 Up
Delaware	Bindweed, field	10 Sta.	Crabgrass	50 Sta.	Nutsedge	20 Sta.	Nutsedge	10 Sta.	10 Up
Maine	Barleygrass	30 Sta.	Crabgrass	20 Sta.	Nutsedge	15 Sta.	Quackgrass	75 Sta.	--
Maryland	Foxtail	50 Sta.	Johnsongrass	35 Up	Panicum, fall	15 Up	Pigweed	60 Sta.	15 Up
Massachusetts	Barleygrass	20 Sta.	Crabgrass	85 Sta.	Nutsedge, yellow	15 Up	Panicum, fall	35 Sta.	20 Sta.
New Hampshire	Bindweed	15 Sta.	Bindweed	5 Sta.	Crabgrass	5 Sta.	Nutsedge	10 Down	20 Sta.
New Jersey	Bindweed	15 Sta.	Burdock	10 Up	Horsenettle	20 Up	Nutsedge	35 Sta.	60 Up
New York	Crabgrass, large	20 Up	Milkweed	10 Down	Nutsedge, yellow	20 Up	Quackgrass	50 Sta.	15 Up
Pennsylvania	Foxtail, giant	40 Up	Horsenettle	5 Sta.	Nutsedge	30 Up	Quackgrass	50 Down	15 Up
Rhode Island	Crabgrass	50 Up	Nutsedge	10 Up	Panicum, fall	30 Up	Quackgrass	25 Sta.	50 Sta.
Vermont	Crabgrass	30 Up	Nutsedge	25 Down	Nutsedge, yellow	45 Up	Pigweed, redroot	25 Down	40 Down
West Virginia	Johnsongrass	20 Up	Nutsedge	30 Up	Panicum, fall	25 Up	Quackgrass	40 Sta.	25 Up
<b>North Central:</b>									
Illinois	Foxtail, giant	50 Sta.	Nutsedge	10 Up	Panicum, fall	15 Up	Smartweed	25 Sta.	25 Sta.
Indiana	Johnsongrass	6 Up	Nutsedge	5 Up	Panicum, fall	10 Up	Quackgrass	2 Sta.	1 Sta.
Iowa	Cocklebur	50 Sta.	Foxtails	90 Sta.	Smartweed, Pa.	50 Sta.	Smartweed	40 Up	60 Sta.
Kansas	Barleygrass	15 Sta.	Crabgrass	30 Up	Foxtail	50 Sta.	Smartweed	20 Sta.	20 Sta.
Michigan	Bindweed, field	10 Up	Crabgrass	30 Up	Nutsedge	20 Up	Smartweed	40 Up	30 Up
Minnesota	Foxtail, giant	100 Sta.	Lambsquarters, common	90 Sta.	Pigweed, redroot	90 Sta.	Quackgrass	50 Sta.	60 Sta.
Missouri	Cocklebur, common	75 Sta.	Foxtail, giant	90 Sta.	Pigweed, redroot	90 Sta.	Velvetleaf	50 Up	80 Up
Nebraska	Barleygrass	50 Up	Crabgrass	75 Up	Foxtail	100 Sta.	Velvetleaf	50 Up	100 Sta.
North Dakota	Foxtail, green	100 Sta.	Foxtail, yellow	100 Sta.	Kochia	40 Up	Mustard, wild	75 Sta.	20 Sta.
Ohio	Foxtails	40 Sta.	Johnsongrass	5 Up	Nutsedge, yellow	12 Up	Quackgrass	10 Up	20 Sta.
South Dakota	Bindweed, field	50 Sta.	Foxtails	100 Sta.	Milkweed	35 Up	Ragweed, common	25 Sta.	3 Up
Wisconsin	Foxtail, giant	35 Up	Foxtail, green	100 Up	Pigweed, redroot	100 Sta.	Quackgrass	85 Down	50 Up
<b>Southern:</b>									
Alabama	Cocklebur	50 Up	Crabgrass	100 Sta.	Johnsongrass	35 Sta.	Morningglory	70 Up	85 Sta.
Arkansas	Cocklebur, common	10 Sta.	Crabgrass, large	70 Sta.	Johnsongrass	25 Sta.	Morningglory	20 Up	15 Sta.
Florida	Cocklebur	15 Sta.	Crotalaria	5 Down	Millet, Texas	25 Up	Morningglory, cypr. 2/	10 Up	20 Sta.
Georgia	Cocklebur	40 Up	Johnsongrass	30 Up	Morningglory	20 Up	Pigweed	40 Up	30 Up
Kentucky	Crabgrass	60 Up	Foxtail, giant	30 Sta.	Johnsongrass	35 Up	Panicum, fall	20 Up	40 Sta.
Louisiana	Barleygrass	75 Sta.	Crabgrass	75 Sta.	Johnsongrass	30 Up	Morningglory	80 Up	75 Up
Mississippi	Cocklebur	40 Down	Crabgrass	60 Sta.	Johnsongrass	30 Sta.	Pigweed	25 Sta.	15 Up
North Carolina	Cocklebur	40 Sta.	Morningglory	30 Down	Nutsedge	50 Up	Panicum, fall	20 Up	40 Sta.
Oklahoma	Crabgrass	95 Sta.	Johnsongrass	40 Up	Jungleweed	30 Up	Kochia	20 Up	95 Sta.
South Carolina	Cocklebur	65 Sta.	Johnsongrass	20 Sta.	Nutsedge	25 Up	Panicum, fall	5 Up	50 Up
Tennessee	Crabgrass	90 Down	Johnsongrass	20 Up	Morningglory	25 Sta.	Panicum, fall	30 Up	40 Sta.
Texas	Crabgrass	75 Down	Johnsongrass	75 Down	Morningglory	30 Sta.	Panicum, Texas	50 Sta.	75 Down
Virginia	Crabgrass	65 Sta.	Johnsongrass	5 Up	Morningglory	15 Sta.	Nutsedge	15 Up	15 Up
<b>Western:</b>									
Arizona	Johnsongrass	30 Sta.	Pigweed	50 Sta.	Sorghum (crop)	--	Watergrasses 3/	30 Sta.	--
California	Barleygrass	80 Up	Crabgrass, large	70 Sta.	Lambsquarters	25 Sta.	Pigweed, redroot	70 Sta.	25 Sta.
Colorado	Foxtail	85 Sta.	Kochia	75 Sta.	Lambsquarters	75 Sta.	Pigweed, redroot	80 Up	50 Up
Idaho	Barleygrass	40 Sta.	Pigweed, redroot	80 Sta.	Quackgrass	10 Up	Smartweed	10 Sta.	50 Sta.
Montana	Foxtail, green	75 Up	Kochia	50 Sta.	Lambsquarters	50 Sta.	Oats, wild	50 Sta.	50 Sta.
New Mexico	Barleygrass	23 Down	Cocklebur	15 Sta.	Lambsquarters	24 Down	Pigweed	30 Down	30 Sta.
Oregon	Barleygrass	60 Down	Lambsquarters	10 Up	Pigweed	50 Down	Quackgrass	20 Sta.	10 Sta.
Utah	Barleygrass	50 Up	Bindweed, field	15 Sta.	Kochia	15 Up	Pigweed, redroot	90 Sta.	20 Up
Washington	Barleygrass	50 Sta.	Lambsquarters	75 Sta.	Pigweed, redroot	15 Sta.	Quackgrass	40 Sta.	--
Wyoming	Barleygrass	50 Sta.	Bindweed, field	25 Sta.	Foxtail, green	90 Down	Pigweed, redroot	75 Down	50 Up
Hawaii	Anole-of-Peru	60 Sta.	Bermudagrass	20 Sta.	Foxtail, bristly	25 Up	Kikuyugrass	60 Up	40 Sta.

1/Sta., stationary.  
2/Morningglory, cypr. 2/.  
3/Watergrass complex.

Table 16.--Cotton: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Missouri-----	100	100	109	6.00	5.00	11.00	80	20
North Central-----	100	100	109	6.00	5.00	11.00	80	20
Alabama-----	280	---	250	4.00	----	6.00	90	10
Arkansas-----	50	---	900	6.00	----	15.00	95	5
Florida-----	8	---	10	6.00	----	10.00	80	20
Georgia-----	30	20	357	13.00	7.00	12.00	80	20
Kentucky-----	1	2	---	5.00	2.10	----	98	2
Louisiana-----	---	---	400	----	----	11.00	90	10
Mississippi-----	70	20	990	4.00	3.00	19.00	75	25
North Carolina-----	75	20	80	9.00	4.00	13.00	80	20
Oklahoma-----	200	30	20	4.00	3.50	6.50	80	20
South Carolina-----	150	35	200	7.00	5.00	12.00	90	10
Tennessee-----	180	10	145	5.00	3.00	7.00	90	10
Texas-----	2,000	750	1,000	7.00	4.00	11.00	30	70
Virginia-----	4	1	1	6.00	2.50	8.00	90	10
Southern-----	2,948	888	4,353	6.46	4.05	13.37	62	38
Arizona-----	70	70	80	6.00	8.00	14.00	80	20
California-----	300	100	50	7.50	5.00	12.50	75	25
Nevada-----	2	---	---	8.00	----	----	100	--
New Mexico-----	30	25	20	7.50	7.50	15.00	95	5
Western-----	402	195	150	7.24	6.40	13.63	79	21
United States-----	3,450	1,183	4,612	6.54	4.52	13.32	64	36

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 17.--Cotton: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Missouri-----	Good	Good	Good	Sta.	Some	No	---
North Central-----	1-Good	1-Good	1-Good	1-Sta.	1-Some	1-No	---
Alabama-----	Good	Good	Good	Up	Some	No	---
Arkansas-----	Good	Good	Good	Sta.	Some	Yes	5
Florida-----	Fair	Fair	Fair	Up	Some	No	---
Georgia-----	Good	Good	---	Up	Some	No	---
Kentucky-----	Good	Fair	---	Up	Some	No	---
Louisiana-----	Good	Good	Good	Sta.	Little	No	---
Mississippi-----	Good	Good	Good	Sta.	Some	Yes	5
North Carolina-----	Fair	Fair	Good	Up	Some	No	---
Oklahoma-----	Fair	Fair	Good	Up	Little	Yes	60
South Carolina-----	Good	Good	Good	Up	Some	Yes	20
Tennessee-----	Good	Good	Good	Up	Some	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	Fair	Fair	Fair	Sta.	Some	No	---
Southern-----	9-Good 4-Fair	8-Good 5-Fair	9-Good 2-Fair	9-Up 4-Sta.	11-Some 2-Little	4-Yes 9-No	4
Arizona-----	Good	Good	Good	Up	Some	Yes	10
California-----	Good	Good	Good	Up	Some	Yes	35
Nevada-----	Good	---	---	Up	Some	No	---
New Mexico-----	Good	Good	---	Up	Some	Yes	5
Western-----	4-Good	3-Good	2-Good	4-Up	4-Some	3-Yes 1-No	25
United States-----	14-Good 4-Fair	12-Good 5-Fair	12-Good 2-Fair	13-Up 5-Sta.	16-Some 2-Little	7-Yes 11-No	5

1/ Sta., stationary.

Table 18.--Cotton: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	: Number :	: Reports by region :				: Infestation trend :						Total area
	: of :	: NE : NC : S : W :				: Stationary :		: Up :		: Down :		
	: reports :	No.:	Area	No.:	Area	No.:	Area	No.:	Area			
		<u>1,000</u>		<u>1,000</u>		<u>1,000</u>		<u>1,000</u>		<u>1,000</u>		
			<u>acres</u>		<u>acres</u>		<u>acres</u>		<u>acres</u>		<u>acres</u>	
Anoda, spurred-----	1	--	--	--	1	--	---	1	23	--	---	23
*Barnyardgrass-----	3	--	--	1	2	--	---	1	5	2	492	497
Beggarweed, Florida-	1	--	--	1	--	--	---	1	1	--	---	1
Bermudagrass-----	2	--	--	2	--	1	1	--	---	1	2	3
*Cocklebur-----	10	--	1	7	2	4	1,457	4	272	2	776	2,505
*Crabgrasses-----	6	--	--	6	--	1	13	--	---	5	1,781	1,794
Flaveria-----	1	--	--	--	1	--	---	1	9	--	---	9
Foxtails-----	1	--	1	--	--	--	---	1	171	--	---	171
Groundcherry-----	2	--	--	--	2	--	---	1	172	1	89	261
*Johnsongrass-----	15	--	1	10	4	5	471	2	219	8	1,726	2,416
*Morningglories-----	7	--	--	6	1	6	1,173	1	118	--	---	1,291
*Nutsedges-----	9	--	--	8	1	3	261	6	1,680	--	---	1,941
*Panicums-----	2	--	--	2	--	--	---	1	152	1	2,838	3,040
*Pigweeds-----	6	--	1	4	1	3	3,813	--	---	3	505	4,318
Purslane, common----	1	--	--	1	--	--	---	1	2,888	--	---	2,888
*Ragweeds-----	3	--	--	3	--	1	57	2	351	--	---	408
Redvine 1/-----	1	--	--	1	--	1	332	--	---	--	---	332
*Sidas-----	7	--	1	6	--	1	57	6	2,016	--	---	2,073
Spurge, hyssop-----	1	--	--	--	1	--	---	1	30	--	---	30
Trumpetcreeper (see Redvine)												
Watergrasses (complex)	1	--	--	--	1	1	148	--	---	--	---	148

1/ Redvine and trumpetcreeper were included in the same report from Mississippi.



Table 19.--Cotton: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend

Region and State	1/			1/			1/			1/		
	Weed	Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend	Pct.
North Central:												
Missouri-----	Cocklebur, common---	75 Sta.	Foxtails-----	90 Up	Johnsongrass-----	50 Down	Pigweed, redroot---	90 Sta.	Sida, prickly-----	90 Up		
Southern:												
Alabama-----	Cocklebur-----	90 Sta.	Johnsongrass-----	30 Down	Morningglory-----	25 Sta.	Nutsedge-----	30 Up	Sida, prickly-----	70 Up		
Arkansas-----	Cocklebur, common---	60 Sta.	Crabgrass, large---	80 Down	Johnsongrass-----	20 Down	Morningglory-----	65 Sta.	Sida, prickly-----	75 Up		
Florida-----	Barryardgrass-----	40 Up	Beggarweed, Florida	5 Up	Bermudagrass-----	15 Down	Crabgrass-----	100 Sta.	Nutsedge-----	8 Up		
Georgia-----	Cocklebur-----	40 Up	Johnsongrass-----	30 Sta.	Morningglory-----	30 Up	Nutsedge-----	40 Up	Ragweed-----	50 Up		
Louisiana-----	Crabgrass-----	75 Down	Johnsongrass-----	30 Sta.	Morningglory-----	35 Sta.	Nutsedge-----	25 Sta.	Sida species-----	60 Up		
Mississippi-----	Cocklebur-----	60 Down	Johnsongrass-----	30 Down	Nutsedge-----	30 Up	Redvine, etc. 2/	30 Sta.	Sida, prickly-----	40 Up		
North Carolina-----	Cocklebur-----	60 Down	Johnsongrass-----	25 Up	Nutsedge-----	30 Sta.	Ragweed-----	30 Sta.	Sida, prickly-----	40 Up		
Oklahoma-----	Cocklebur-----	25 Up	Crabgrass-----	95 Down	Johnsongrass-----	60 Sta.	Panicum, Texas-----	40 Up	Pigweed-----	90 Sta.		
South Carolina-----	Cocklebur-----	75 Sta.	Morningglory-----	20 Sta.	Nutsedge-----	30 Sta.	Pigweed-----	80 Down	Ragweed-----	15 Up		
Tennessee-----	Crabgrass-----	90 Down	Johnsongrass-----	20 Down	Morningglory-----	25 Sta.	Pigweed-----	40 Down	Sida-----	15 Up		
Texas-----	Johnsongrass-----	20 Down	Nutsedge-----	20 Up	Panicum, browntop--	70 Down	Pigweed-----	80 Sta.	Purslane, common---	70 Up		
Virginia-----	Bermudagrass-----	20 Sta.	Crabgrass-----	60 Down	Johnsongrass-----	10 Sta.						
Western:												
Arizona-----	Groundcherry-----	30 Down	Johnsongrass-----	10 Down	Pigweed-----	30 Down	Spurge, hyssop-----	10 Up	Watergrass-----	50 Sta.		
California-----	Barryardgrass-----	70 Down	Groundcherry-----	25 Up	Johnsongrass-----	25 Up	Morningglory 2/	15 Sta.	Nutsedge-----	30 Up		
Nevada-----	Cocklebur-----	50 Up	Johnsongrass-----	50 Sta.								
New Mexico-----	Anoda, spurred-----	15 Up	Barryardgrass-----	8 Down	Cocklebur-----	12 Up	Flaveria-----	6 Up	Johnsongrass-----	12 Down		

1/Sta., stationary

2/Reported as redvine and trumpet creeper.

3/Morningglory, three-lobed.

Table 20.--Sorghum: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre + post-emergence	Pre-emergence	Post-emergence	Pre + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Massachusetts-----	---	1	---	---	5.00	---	50	50
Pennsylvania-----	5	15	---	4.00	7.00	---	90	10
Northeastern-----	5.	16	---	4.00	6.88	---	88	12
Illinois-----	4	2	1	4.00	1.00	5.00	80	20
Indiana-----	1	2	---	5.00	2.00	---	50	50
Iowa-----	1	10	11	1.50	1.50	3.00	95	5
Kansas-----	407	1,000	---	7.00	3.00	---	70	30
Minnesota-----	1	1	1	4.00	2.00	6.00	100	--
Missouri-----	60	56	25	6.00	2.00	8.00	75	25
Nebraska-----	387	896	128	9.93	2.21	4.12	80	20
South Dakota-----	60	183	---	6.00	1.70	---	60	40
North Central-----	921	2,150	166	8.08	2.52	4.65	74	26
Alabama-----	2/	1	---	5.00	4.00	---	100	--
Arkansas-----	5	20	20	5.00	2.00	7.00	99	1
Florida-----	1	5	2	4.00	1.50	5.50	80	20
Kentucky-----	1	1	---	5.00	2.00	---	95	5
Louisiana-----	10	20	---	3.00	2.00	---	90	10
Mississippi-----	15	20	20	5.00	2.00	7.00	80	20
North Carolina-----	3	3	2	7.00	2.50	9.50	90	10
Oklahoma-----	90	40	---	4.50	1.50	---	90	10
South Carolina-----	4	2	7	8.00	2.25	8.50	95	5
Tennessee-----	3	1	---	8.50	3.00	---	60	40
Texas-----	1,750	1,500	250	5.50	3.50	10.00	50	50
Virginia-----	1	10	---	6.25	4.25	---	85	15
Southern-----	1,883	1,623	301	5.45	3.39	9.53	53	47
Arizona-----	10	80	---	4.00	5.00	---	50	50
California-----	2	90	---	9.00	5.00	---	50	50
Colorado-----	5	40	---	4.00	2.00	---	50	50
New Mexico-----	55	15	---	6.00	6.50	---	95	5
Hawaii-----	1	---	2/	25.00	---	45.00	100	--
Western-----	73	225	2/	5.83	4.57	45.00	61	39
United States-----	2,882	4,014	467	6.30	3.00	7.80	63	37

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 500 acres.

Table 21.--Sorghum: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of treated acres
Massachusetts-----	---	Good	---	Sta.	Some	No	---
Pennsylvania-----	Good	Good	---	Up	Some	No	---
Northeastern-----	1-Good	2-Good	---	1-Up 1-Sta.	2-Some	2-No	---
Illinois-----	Good	Good	Good	Sta.	Little	No	---
Indiana-----	Fair	Fair	---	Up	Some	Yes	---
Iowa-----	Good	Good	Good	Up	Some	No	---
Kansas-----	Good	Fair	---	Up	Some	Yes	20
Minnesota-----	Fair	Fair	Good	Sta.	Little	Yes	10
Missouri-----	Good	Good	Good	Sta.	Some	No	---
Nebraska-----	Good	Good	Good	Up	Some	No	---
South Dakota-----	Good	Good	---	Up	Some	Yes	5
North Central-----	6-Good 2-Fair	5-Good 3-Fair	5-Good	5-Up 3-Sta.	6-Some 2-Little	4-Yes 4-No	9
Alabama-----	Fair	Fair	---	Up	Some	No	---
Arkansas-----	Good	Good	Good	Up	Some	No	---
Florida-----	Fair	Fair	Fair	Up	Some	No	---
Kentucky-----	Good	Poor	---	Sta.	Little	No	---
Louisiana-----	Good	Good	---	Up	Some	No	---
Mississippi-----	Good	Good	Good	Up	Some	No	---
North Carolina-----	Fair	Good	Good	Sta.	Some	No	---
Oklahoma-----	Fair	Fair	---	Up	Some	Yes	80
South Carolina-----	Good	Good	Good	Sta.	Some	Yes	20
Tennessee-----	Good	---	---	Up	Some	No	---
Texas-----	Fair	Good	Good	Up	Urgent	Yes	50
Virginia-----	Fair	Fair	---	Up	Some	Yes	5
Southern-----	6-Good 6-Fair	6-Good 4-Fair 1-Poor	5-Good 1-Fair	9-Up 3-Sta.	1-Urgent 10-Some 1-Little	4-Yes 8-No	49
Arizona-----	Fair	Good	---	Up	Some	Yes	10
California-----	Fair	Good	---	Up	Some	Yes	35
Colorado-----	Fair	Fair	---	Sta.	Some	Yes	20
New Mexico-----	Good	Good	---	Up	Urgent	Yes	75
Hawaii-----	Fair	---	Good	Up	Urgent	No	---
Western-----	1-Good 4-Fair	3-Good 1-Fair	1-Good	4-Up 1-Sta.	2-Urgent 3-Some	4-Yes 1-No	34
United States-----	14-Good 12-Fair	16-Good 8-Fair 1-Poor	11-Good 1-Fair	19-Up 8-Sta.	3-Urgent 21-Some 3-Little	12-Yes 15-No	31

1/ Sta., stationary.

Table 22.--Sorghum: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region				Infestation trend						Total area
	of reports	NE	NC	S	W	Stationary	Up	Down				
		No.	Area	No.	Area	No.	Area	No.	Area			
			1,000 acres		1,000 acres		1,000 acres		1,000 acres		1,000 acres	
Apple-of-Peru-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
*Barnyardgrass-----	7	--	2	2	3	3	1,209	3	778 1/	1	55	2,042 1/
Bermudagrass-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
*Bindweeds-----	4	--	1	--	3	3	363	1	(1/)	--	---	363 1/
*Cocklebur-----	9	--	2	5	2	5	245	2	93	2	40	378
*Crabgrasses-----	11	1	2	7	1	7	3,235	4	1,579 1/	--	---	4,814 1/
Crotalaria-----	1	--	--	1	--	--	---	--	---	1	(1/)	(1/)
Dallisgrass-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
Flixweed-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
*Foxtails-----	10	2	6	1	1	8	4,383 1/	2	5 1/	--	---	4,388 1/
Goosegrass-----	1	--	--	1	--	1	14	--	---	--	---	14
*Johnsongrass-----	13	--	--	10	3	3	87	9	6,393 1/	1	24	6,504 1/
Junglerice-----	2	--	--	2	--	1	5,522	1	234	--	---	5,756
Kikuyugrass-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
Kochia-----	3	--	1	--	2	1	44	2	426 1/	--	---	470 1/
*Lambsquarters-----	4	3	--	--	1	3	(1/)	--	---	1	227	227 1/
Millet, Texas-----	1	--	--	1	--	--	---	1	(1/)	--	---	(1/)
*Morningglories-----	3	--	--	7	1	4	92	2	52	2	71	215
Nutsedges-----	3	2	--	1	--	1	1	2	(1/)	--	---	1 1/
*Panicums-----	3	1	1	1	--	2	2,945 1/	1	982	--	---	3,927 1/
*Pigweeds 2/------	21	3	5	9	4	15	10,235 1/	3	53	3	546	10,884 1/
Quackgrass-----	1	1	--	--	--	--	---	--	---	1	(1/)	(1/)
Ragweeds-----	3	1	--	2	--	3	28 1/	--	---	--	---	28 1/
Sandburs-----	2	--	--	--	2	--	---	2	481	--	---	481
Gesbania, hemp-----	1	--	--	1	--	1	20	--	---	--	---	20
Shattercane-----	2	--	1	1	--	--	---	2	1,103	--	---	1,103
Sicklepod-----	2	--	--	2	--	1	20	1	(1/)	--	---	20 1/
Signalgrass-----	1	--	--	1	--	--	---	1	10	--	---	10
Smartweeds-----	2	1	1	--	--	2	5 1/	--	---	--	---	5 1/
Sunflowers-----	2	--	1	1	--	1	20	--	---	1	2,945	2,965
Thistle, Russian----	1	--	1	--	--	1	44	--	---	--	---	44
Velvetleaf-----	3	--	3	--	--	3	254	--	---	--	---	254
Watergrasses (complex)	1	--	--	--	1	1	177	--	---	--	---	177
Witchgrass-----	1	--	1	--	--	--	---	1	261	--	---	261

1/ Figures do not include estimates of less than 500 acres for weeds reported in Massachusetts, New Jersey, Pennsylvania, Florida, Utah, and Hawaii.

2/ Includes amaranths.



Table 23.--Sorghum: Five most important weeds listed alphabetically by State within regions, acreage infested, and infestation trend, 1961

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>												
Massachusetts	Crabgrass	70	Up	Foxtails	80	Sta.	Pigweed, redroot	80	Sta.	Smartweed	30	Sta.
New Jersey	Lambsquarters	40	Sta.	Nutsedge	15	Sta.	Pigweed	15	Sta.	Ragweed	60	Sta.
Pennsylvania	Foxtail, yellow	25	Sta.	Lambsquarters	30	Sta.	Pigweed	30	Up	Quackgrass	45	Down
<b>North Central:</b>												
Illinois	Cocklebur	10	Sta.	Foxtail, giant	30	Sta.	Smartweed	20	Sta.	Velvetleaf	10	Sta.
Iowa	Foxtails	20	Sta.	Sunflower	20	Sta.	Velvetleaf	20	Sta.	Shattercane	20	Up
Kansas	Barleygrass	20	Sta.	Crabgrass	50	Sta.	Pigweed	90	Sta.	Witchgrass	90	Up
Missouri	Cocklebur, common	75	Sta.	Foxtails	95	Sta.	Velvetleaf	80	Sta.	Pigweed	100	Sta.
Nebraska	Barleygrass	30	Up	Crabgrass	75	Up	Panicum, fall	50	Up	Thistle, Russian	10	Sta.
South Dakota	Bindweed, field	5	Sta.	Foxtails	100	Sta.	Kochia	10	Sta.			
<b>Southern:</b>												
Alabama	Crabgrass	100	Sta.	Johnsongrass	60	Up	Morningglory	50	Sta.	Sicklepod	50	Sta.
Arkansas	Cocklebur	75	Up	Crabgrass, large	85	Sta.	Morningglory	15	Sta.	Pigweed	40	Up
Florida	Amaranth, spiny	5	Up	Cocklebur	15	Sta.	Crotalaria, Texas	75	Sta.	Sicklepod	20	Up
Kentucky	Crabgrass	60	Up	Foxtail, giant	30	Up	Pigweed	40	Sta.			
Louisiana	Barleygrass	75	Sta.	Crabgrass	75	Sta.	Johnsongrass	10	Up	Pigweed	80	Up
Mississippi	Cocklebur	25	Down	Johnsongrass	75	Up	Morningglory	15	Up			
North Carolina	Cocklebur	20	Up	Johnsongrass	25	Up	Pigweed	80	Down	Ragweed	30	Sta.
Oklahoma	Barleygrass	20	Up	Crabgrass	95	Sta.	Johnsongrass	80	Up	Shattercane	25	Up
South Carolina	Cocklebur	50	Sta.	Johnsongrass	30	Up	Junglerice	25	Sta.	Pigweed	40	Sta.
Tennessee	Crabgrass	90	Up	Johnsongrass	30	Up	Morningglory	60	Up	Pigweed	85	Sta.
Texas	Johnsongrass	50	Up	Junglerice	40	Sta.	Pigweed	50	Sta.	Sunflower	40	Down
Virginia	Crabgrass	20	Sta.	Johnsongrass	75	Sta.	Nutsedge	5	Sta.	Pigweed	10	Sta.
<b>Western:</b>												
Arizona	Cocklebur	10	Down	Johnsongrass	10	Down	Pigweed	75	Sta.	Watergrass	75	Sta.
California	Barleygrass	80	Sta.	Bindweed, field	15	Sta.	Pigweed, redroot	50	Sta.			
Colorado	Bindweed, field	50	Sta.	Kochia	75	Up	Pigweed, redroot	25	Up	Sandbur	75	Up
New Mexico	Barleygrass	15	Down	Cocklebur	8	Up	Johnsongrass	20	Down	Sandbur	20	Down
Utah	Barleygrass	60	Up	Bindweed, field	20	Up	Pigweed	25	Sta.	Kochia	40	Up
Hawaii	Apple-of-Peru	60	Up	Bermudagrass	60	Sta.	Foxtail, bristly	20	Up	Kikuyugrass	15	Up

1/ Sta., stationary.

Table 24.--Soybeans: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Delaware-----	80	---	---	3.00	----	----	80	20
Maryland-----	90	1	---	4.50	4.50	----	90	10
New Jersey-----	28	---	---	3.00	----	----	90	10
New York-----	2	---	---	8.00	----	----	70	30
Pennsylvania-----	11	---	---	9.00	----	----	85	15
Northeastern-----	211	1	---	4.00	4.50	----	86	14
Illinois-----	3,930	30	37	5.00	3.00	8.00	75	25
Indiana-----	1,361	60	30	5.00	2.00	7.00	100	---
Iowa-----	3,000	5	500	5.00	1.50	7.50	90	10
Kansas-----	260	4	---	8.00	4.00	----	80	20
Michigan-----	200	---	---	5.00	----	----	100	---
Minnesota-----	1,500	10	10	5.00	4.00	8.00	70	30
Missouri-----	913	10	913	8.00	2.00	10.00	75	25
Nebraska-----	287	12	309	6.49	2.94	5.33	85	15
North Dakota-----	45	4	---	5.00	2.50	----	99	1
Ohio-----	650	15	3	6.50	3.50	8.50	80	20
South Dakota-----	45	1	---	6.00	4.00	----	60	40
Wisconsin-----	74	---	---	8.85	----	----	70	30
North Central-----	12,265	151	1,802	5.43	2.62	8.40	82	18
Alabama-----	159	15	10	5.00	2.50	7.00	90	10
Arkansas-----	500	50	1,500	3.50	2.00	5.50	90	10
Florida-----	20	---	---	4.00	----	----	80	20
Georgia-----	190	43	2	5.00	5.00	8.00	90	10
Kentucky-----	100	20	10	7.00	3.00	10.00	95	5
Louisiana-----	410	600	315	5.00	3.50	5.50	90	10
Mississippi-----	500	300	800	5.00	2.50	7.50	80	20
North Carolina-----	300	100	85	6.00	3.50	9.50	90	10
Oklahoma-----	30	2	1	4.50	3.00	7.50	98	2
South Carolina-----	288	227	515	6.00	2.50	7.00	90	10
Tennessee-----	380	100	90	5.00	2.00	7.00	90	10
Texas-----	100	10	5	7.00	2.00	11.00	60	40
Virginia-----	90	5	2/	7.25	8.00	10.00	90	10
Southern-----	3,067	1,472	3,333	5.13	3.02	6.38	88	12
United States-----	15,543	1,624	5,135	5.35	2.98	7.09	84	16

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 500 acres.

Table 25.--Soybeans: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and Region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Delaware-----	Good	Fair	---	Up	Some	No	---
Maryland-----	Fair	Fair	---	Up	Some	No	---
New Jersey-----	Good	---	---	Up	Some	No	---
New York-----	Good	---	---	Sta.	Little	Yes	80
Pennsylvania-----	Fair	Fair	---	Up	Some	No	---
Northeastern-----	3-Good 2-Fair	3-Fair	---	4-Up 1-Sta.	4-Some 1-Little	1-Yes 4-No	1
Illinois-----	Good	Fair	Good	Up	Some	Yes	1
Indiana-----	Fair	Poor	Fair	Up	Urgent	No	---
Iowa-----	Good	Good	Good	Up	Some	No	---
Kansas-----	Fair	Fair	---	Up	Urgent	No	---
Michigan-----	Good	---	---	Up	Some	No	---
Minnesota-----	Fair	Poor	Fair	Up	Some	No	---
Missouri-----	Good	Fair	Good	Up	Some	No	---
Nebraska-----	Fair	Fair	Fair	Up	Urgent	Yes	3
North Dakota-----	Fair	Fair	---	Up	Some	No	---
Ohio-----	Fair	Poor	Fair	Up	Urgent	No	---
South Dakota-----	Good	Fair	---	Up	Some	No	---
Wisconsin-----	Fair	---	---	Up	Some	No	---
North Central-----	5-Good 7-Fair	1-Good 6-Fair 3-Poor	3-Good 4-Fair	12-Up	4-Urgent 8-Some	2-Yes 10-No	---
Alabama-----	Fair	Fair	Fair	Up	Urgent	No	---
Arkansas-----	Good	Fair	Good	Up	Urgent	No	---
Florida-----	Good	Good	---	Sta.	Some	No	---
Georgia-----	Fair	Fair	Fair	Up	Urgent	No	---
Kentucky-----	Fair	Poor	Fair	Up	Urgent	No	---
Louisiana-----	Fair	Fair	Good	Up	Some	No	---
Mississippi-----	Fair	Fair	Fair	Up	Urgent	No	---
North Carolina-----	Fair	Fair	Good	Up	Urgent	No	---
Oklahoma-----	Fair	Fair	Fair	Up	Some	Yes	40
South Carolina-----	Fair	Fair	Fair	Up	Urgent	No	10
Tennessee-----	Poor	Fair	Fair	Up	Urgent	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	Fair	Fair	Fair	Up	Urgent	No	---
Southern-----	3-Good 9-Fair 1-Poor	2-Good 10-Fair 1-Poor	4-Good 8-Fair	12-Up 1-Sta.	9-Urgent 4-Some	1-Yes 12-No	1
United States-----	11-Good 18-Fair 1-Poor	3-Good 19-Fair 4-Poor	7-Good 12-Fair	28-Up 2-Sta.	13-Urgent 16-Some 1-Little	4-Yes 26-No	1

1/ Sta., stationary.

Table 26.--Soybeans: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area
		NE	NC	S	W	Stationary No.	Area	Up No.	Area	Down No.	Area	
							1,000 acres		1,000 acres		1,000 acres	
Barnyardgrass-----	3	--	1	2	--	2	167	1	598	--	---	765
Beggarweed, Florida-	1	--	--	1	--	--	---	1	6	--	---	6
*Cocklebur-----	19	--	6	13	--	7	4,634	11	8,881	1	583	14,098
*Crabgrasses-----	6	--	1	5	--	4	3,314	1	622	1	1,133	5,069
*Foxtails-----	18	6	11	1	--	9	6,940 <u>1/</u>	7	8,078 <u>2/3/</u>	2	482	15,500 <u>1/2/3/</u>
*Jimsonweed-----	7	3	2	2	--	3	224	4	1,121	--	---	1,345
*Johnsongrass-----	12	2	1	9	--	7	2,603	4	978	1	1,795	5,376
Lambsquarters-----	5	3	2	--	--	3	3,383	--	---	2	5 <u>2/</u>	3,388 <u>2/</u>
*Morningglories-----	15	3	3	9	--	7	2,961 <u>2/</u>	8	2,348	--	---	5,309 <u>2/</u>
Mustard, wild-----	2	--	2	--	--	2	195	--	---	--	---	195
*Nutsedges-----	8	3	2	3	--	--	---	8	824	--	---	824
*Pigweeds-----	17	2	6	9	--	12	10,356 <u>2/</u>	4	2,632	1	281	13,269 <u>2/</u>
Pusley, Florida-----	1	--	--	1	--	1	127	--	---	--	---	127
Quackgrass-----	2	1	1	--	--	1	2	1	959	--	---	961
Ragweeds-----	8	4	--	4	--	2	100	6	1,283	--	---	1,388
Sesbania, hemp-----	2	--	--	2	--	1	223	1	848	--	---	1,071
Sicklepod-----	3	--	--	3	--	1	390	2	268	--	---	658
Signalgrass-----	1	--	--	1	--	1	1,060	--	---	--	---	1,060
Smartweeds-----	5	--	5	--	--	4	6,586	1	332	--	---	6,918
Sunflowers-----	2	--	2	--	--	1	60	1	500	--	---	560
Thistle, Canada-----	3	--	3	--	--	2	2,259	1	9	--	---	2,268
*Velvetleaf-----	12	2	10	--	--	7	8,362	4	2,157	1	(2/)	10,519 <u>2/</u>
Witchgrass-----	1	1	--	--	--	--	---	--	---	--	---	1

- 1/ Does not include duplication of 220,000 acres reported by North Dakota for both green and yellow foxtails.  
2/ Figures do not include estimates of less than 500 acres for weeds reported in West Virginia.  
3/ Includes estimates of 161,000 acres of green foxtail in Wisconsin but does not include 64,000 acres of giant foxtail.



Table 27.--Insects: Five most important weeds listed alphabetically, by States within regions, acreage infested, and infestation trend, 1965

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Pct.	Acres Trend		Pct.	Acres Trend		Pct.	Acres Trend		Pct.	Acres Trend
Northeastern:												
Delaware	Foxtail	25	Up	Jimsonweed	50	Sta.	Johnsongrass	10	Up	Morningglory	75	Sta.
Maryland	Foxtail	60	Sta.	Jimsonweed	35	Up	Johnsongrass	30	Up	Morningglory	50	Up
New Jersey	Foxtail	45	Sta.	Jimsonweed	15	Sta.	Nutsedge	35	Up	Ragweed	60	Up
New York	Foxtail, yellow	70	Down	Lambsquarters	80	Down	Nutsedge, yellow	20	Up	Quackgrass	30	Sta.
Pennsylvania	Foxtail, giant	15	Up	Lambsquarters	75	Sta.	Nutsedge	20	Up	Pigweed	70	Sta.
West Virginia	Foxtails	35	Up	Lambsquarters	30	Down	Morningglory	10	Sta.	Pigweed, rough	45	Sta.
North Central:												
Illinois	Foxtail, giant	60	Sta.	Morningglory	25	Sta.	Pigweed	30	Sta.	Smartweed	25	Sta.
Indiana	Cocklebur	10	Sta.	Jimsonweed	25	Up	Johnsongrass	1	Sta.	Morningglory	2	Sta.
Iowa	Cocklebur	50	Sta.	Foxtails	50	Up	Smartweed, Pa.	20	Sta.	Sunflower	50	Up
Kansas	Cocklebur	25	Sta.	Foxtail	50	Down	Morningglory	15	Sta.	Pigweed	30	Sta.
Michigan	Jimsonweed	30	Sta.	Nutsedge	70	Up	Velvetleaf	35	Sta.	Pigweed	30	Sta.
Minnesota	Cocklebur	40	Up	Quackgrass	30	Up	Smartweed, Pa.	50	Sta.	Thistle, Canada	60	Sta.
Missouri	Cocklebur, common	95	Sta.	Foxtail, giant	80	Up	Lambsquarters, common	90	Sta.	Pigweed, redroot	95	Sta.
Nebraska	Crabgrass	75	Up	Foxtail	100	Sta.	Pigweed	100	Sta.	Smartweed	40	Up
North Dakota	Foxtail, green	100	Sta.	Foxtail, yellow	100	Sta.	Lambsquarters, common	60	Sta.	Velvetleaf	75	Sta.
Ohio	Foxtails	60	Sta.	Nutsedge, yellow	10	Up	Smartweed	60	Sta.	Velvetleaf, redroot	75	Sta.
South Dakota	Cocklebur	15	Sta.	Foxtails	100	Sta.	Mustard, wild	15	Sta.	Thistle, Canada	20	Sta.
Wisconsin	Barnyardgrass	65	Sta.	Foxtail, giant	40	Up	Foxtail, green	100	Up	Pigweed, redroot	100	Sta.
Southern:												
Alabama	Cocklebur	90	Up	Johnsongrass	45	Sta.	Morningglory	80	Up	Joshunia, hemp	40	Sta.
Arkansas	Barnyardgrass	15	Up	Cocklebur, common	80	Up	Crabgrass, large	50	Sta.	Johnsongrass	45	Down
Florida	Beggarweed, Florida	5	Up	Cocklebur	25	Up	Nutsedge	5	Up	Pasley, Florida	100	Sta.
Georgia	Cocklebur	60	Up	Johnsongrass	40	Sta.	Morningglory	50	Up	Pigweed	50	Up
Kentucky	Cocklebur	15	Sta.	Foxtail, giant	40	Sta.	Morningglory	30	Up	Pigweed	40	Sta.
Louisiana	Cocklebur	35	Up	Crabgrass	70	Sta.	Johnsongrass	60	Up	Pigweed, giant	85	Up
Mississippi	Cocklebur	80	Up	Johnsongrass	60	Up	Pigweed, hemp	75	Sta.	Signalgrass	50	Sta.
North Carolina	Cocklebur	60	Down	Jimsonweed	20	Up	Morningglory	80	Sta.	Nutsedge	25	Up
Oklahoma	Cocklebur	40	Up	Crabgrass	95	Sta.	Johnsongrass	80	Sta.	Pigweed	35	Up
South Carolina	Cocklebur	70	Up	Morningglory	20	Up	Nutsedge	25	Up	Pigweed	75	Up
Tennessee	Cocklebur	50	Up	Crabgrass	95	Down	Johnsongrass	40	Sta.	Morningglory	20	Sta.
Texas	Barnyardgrass	20	Sta.	Cocklebur	20	Sta.	Crabgrass	45	Sta.	Johnsongrass	20	Sta.
Virginia	Cocklebur	20	Up	Jimsonweed	25	Up	Johnsongrass	10	Up	Morningglory	45	Up
1/ Sta., stationary.												

Table 28.--Wheat: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region:	Acres treated			Average cost per acre 1/			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Delaware-----	---	5	---	---	3.00	---	95	5
Maryland-----	---	8	---	---	1.50	---	98	2
New York-----	---	4	---	---	5.00	---	90	10
Pennsylvania-----	---	45	---	---	4.50	---	65	35
West Virginia-----	---	2	---	---	3.00	---	90	10
Northeastern----	---	64	---	---	3.99	---	74	26
Illinois-----	---	13	---	---	1.50	---	80	20
Indiana-----	---	20	---	---	1.50	---	80	20
Iowa-----	---	5	5	---	1.50	1.50	95	5
Kansas-----	---	787	---	---	1.75	---	20	80
Michigan-----	---	500	---	---	2.50	---	45	55
Minnesota-----	25	700	100	4.00	2.00	6.00	60	40
Missouri-----	---	25	25	---	2.00	4.00	75	25
Nebraska-----	---	67	---	---	2.50	---	40	60
North Dakota-----	215	7,500	---	4.00	1.75	---	60	40
Ohio-----	---	200	---	---	1.50	---	80	20
South Dakota-----	4	2,000	5	4.50	1.35	5.85	35	65
Wisconsin-----	---	13	---	---	1.80	---	80	20
North Central----	244	11,830	135	4.01	1.73	5.46	53	47
Alabama-----	---	5	---	---	2.00	---	85	15
Florida-----	---	5	---	---	1.50	---	80	20
Kentucky-----	---	30	---	---	1.00	---	98	2
Louisiana-----	---	70	---	---	2.25	---	90	10
Mississippi-----	---	10	---	---	2.00	---	100	---
North Carolina-----	---	44	---	---	2.50	---	80	20
Oklahoma-----	---	130	---	---	1.50	---	60	40
South Carolina-----	---	50	---	---	2.25	---	65	35
Tennessee-----	---	10	---	---	2.00	---	90	10
Texas-----	---	500	---	---	2.00	---	70	30
Virginia-----	---	16	---	---	3.50	---	60	40
Southern-----	---	870	---	---	1.98	---	72	28
California-----	2	175	---	6.00	3.00	---	25	75
Colorado-----	---	600	---	---	2.00	---	30	70
Idaho-----	13	572	5	6.00	3.00	9.00	30	70
Montana-----	225	2,600	200	1.50	3.00	1.50	60	40
New Mexico-----	---	3	---	---	3.50	---	100	---
Nevada-----	---	5	---	---	1.00	---	50	50
Oregon-----	100	600	---	8.00	3.00	---	50	50
Utah-----	---	62	---	---	4.31	---	50	50
Washington-----	---	2,800	---	---	3.00	---	60	40
Wyoming-----	---	150	---	---	1.50	---	30	70
Western-----	340	7,567	205	5.61	2.90	1.68	53	47
United States-----	584	20,331	340	3.78	2.18	3.18	54	46

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 29.--Wheat: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Delaware-----	---	Good	---	Sta.	Some	No	---
Maryland-----	---	Fair	---	Sta.	Some	No	---
New York-----	---	Fair	---	Sta.	Urgent	Yes	90
Pennsylvania-----	---	Good	---	Up	Some	No	---
West Virginia-----	---	Fair	---	Sta.	Little	No	---
Northeastern-----	---	2-Good 3-Fair	---	1-Up 4-Sta.	1-Urgent 3-Some 1-Little	1-Yes 4-No	6
Illinois-----	---	Fair	---	Sta.	Some	No	---
Indiana-----	---	Fair	---	Sta.	Some	No	---
Iowa-----	---	Good	Good	Sta.	Little	No	---
Kansas-----	---	Good	---	Sta.	Some	No	---
Michigan-----	---	Good	---	Sta.	Some	No	---
Minnesota-----	Fair	Good	Good	Up	Some	No	---
Missouri-----	---	Good	Good	Sta.	Little	No	---
Nebraska-----	---	Good	---	Up	Some	No	---
North Dakota-----	Fair	Good	---	Sta.	Some	No	---
Ohio-----	---	Good	---	Sta.	Some	No	---
South Dakota-----	Good	Good	Good	Up	Some	No	---
Wisconsin-----	---	Good	---	Sta.	Some	No	---
North Central-----	1-Good 2-Fair	10-Good 2-Fair	4-Good	3-Up 9-Sta.	10-Some 2-Little	12-No	---
Alabama-----	---	Fair	---	Sta.	Some	No	---
Florida-----	---	Fair	---	Up	Some	No	---
Kentucky-----	---	Good	---	Down	Some	No	---
Louisiana-----	---	Good	---	Up	Little	No	---
Mississippi-----	---	Good	---	Sta.	Little	No	---
North Carolina-----	---	Fair	---	Sta.	Some	No	---
Oklahoma-----	---	Fair	---	Up	Urgent	No	---
South Carolina-----	---	Good	---	Sta.	Some	No	---
Tennessee-----	---	Good	---	Up	Some	No	---
Texas-----	---	Fair	---	Up	Some	No	---
Virginia-----	---	Good	---	Up	Some	No	---
Southern-----	---	6-Good 5-Fair	---	6-Up 4-Sta. 1-Down	1-Urgent 8-Some 2-Little	11-No	---
California-----	Fair	Good	---	Sta.	Some	No	---
Colorado-----	---	Good	---	Sta.	Some	No	---
Idaho-----	Fair	Good	Fair	Up	Some	No	---
Montana-----	Fair	Fair	Fair	Up	Some	No	---
Nevada-----	---	Good	---	Up	Some	No	---
New Mexico-----	---	Good	---	Sta.	Some	No	---
Oregon-----	Good	Good	---	Up	Urgent	No	---
Utah-----	---	Fair	---	Up	Urgent	No	---
Washington-----	---	Good	---	Sta.	Some	Yes	5
Wyoming-----	---	Good	---	Up	Some	No	---
Western-----	1-Good 3-Fair	6-Good 2-Fair	2-Fair	6-Up 4-Sta.	2-Urgent 8-Some	1-Yes 9-No	2
United States-----	2-Good 5-Fair	26-Good 12-Fair	4-Good 2-Fair	16-Up 21-Sta. 1-Down	4-Urgent 29-Some 5-Little	2-Yes 36-No	1

1/ Sta., stationary.

Table 30.--Wheat: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	: Number :	: Reports by region :					: Infestation trend :					Total area 1,000 acres
	: of :	: Stationary :					: Up :		: Down :			
	: reports :	: NE :	: NC :	: S :	: W :	: No.:	: Area :	: No.:	: Area :	: No.:	: Area :	
							1,000 acres		1,000 acres		1,000 acres	
Barley, little-----	1	--	--	1	--	1	21	--	---	--	---	21
Barnyardgrass-----	2	--	1	--	1	2	964	--	---	--	---	964
*Bindweeds-----	7	--	2	2	3	4	4,940	3	2,320	--	---	7,760
*Eromes 1/-----	14	--	4	3	7	8	6,343	6	8,261	--	---	14,604
*Buckwheat, wild-----	7	--	4	--	3	4	8,711	3	3,564	--	---	12,275
Buttercup, testiculate	1	--	--	--	1	--	---	1	26	--	---	26
Chamomile, corn-----	3	3	--	--	--	2	90	1	64	--	---	154
Chickweeds-----	5	2	--	3	--	3	84	2	77	--	---	161
Cockles-----	4	3	--	1	--	3	84	--	---	1	5	89
Darnel-----	2	--	--	2	--	2	28	--	---	--	---	28
Docks-----	5	--	--	5	--	2	112	3	164	--	---	276
Eveningprimroses-----	2	--	--	2	--	1	22	1	765	--	---	787
Fiddlenecks-----	3	--	--	--	3	2	2,169	1	114	--	---	2,283
Fleabane, rough-----	1	--	1	--	--	--	---	1	639	--	---	639
Flixweed-----	1	--	--	--	1	1	235	--	---	--	---	235
Foxtails-----	3	--	3	--	--	3	1,660	--	---	--	---	1,660
*Garlic, wild-----	14	4	4	6	--	12	1,221	2	318	--	---	1,539
Geranium, Carolina--	1	--	--	1	--	1	27	--	---	--	---	27
Goatgrass-----	1	--	--	--	1	--	---	1	455	--	---	455
Gromwells-----	1	--	--	--	1	--	---	1	455	--	---	455
*Henbit-----	7	--	1	6	--	4	690	3	1,673	--	---	2,363
Knapweed, Russian---	1	--	--	--	1	--	---	1	2	--	---	2
Knawel-----	4	2	--	2	--	3	120	1	40	--	---	160
Kochia-----	4	--	3	--	1	2	2,555	2	2,386	--	---	4,941
Ladysthumb-----	1	--	1	--	--	1	18	--	---	--	---	18
Lambsquarters-----	2	--	1	--	1	2	63	--	---	--	---	63
Mayweed-----	1	--	--	1	--	--	---	1	8	--	---	8
Mustards-----	18	1	6	7	4	11	4,909	4	3,024	3	6,724	14,717
Nutsedges-----	1	1	--	--	--	--	---	1	79	--	---	79
Oat, wild-----	7	--	3	--	4	5	8,436	2	3,963	--	---	12,404
Peas, wild winter---	1	--	--	1	--	1	42	--	---	--	---	42
Pennycress-----	5	--	3	--	2	5	3,064	--	---	--	---	3,064
Pepperweeds-----	5	2	1	2	--	3	1,679	1	4	1	(2/)	1,683 2/
Pigweeds-----	3	--	1	1	1	1	1,895	--	---	2	2,244	4,139
Quackgrass-----	3	1	2	--	--	3	582	--	---	--	---	582
Radish, wild-----	4	2	1	1	--	3	77	--	---	1	3	80
Ragweeds-----	3	1	--	2	--	2	1,551	1	276	--	---	1,827
Rockets-----	2	--	1	--	1	2	293	--	---	--	---	293
Ryegrass-----	1	--	--	--	1	1	196	--	---	--	---	196
Shepherdspurse-----	3	2	1	--	--	2	309	1	6	--	---	315
Smartweeds-----	5	--	5	--	--	3	420	1	254	1	490	1,164
Sunflowers-----	4	--	1	--	3	1	196	1	1	2	160	357
Tansymustards-----	3	--	--	1	2	3	2,712	--	---	--	---	2,712
Thistle, Russian---	5	--	1	--	4	3	3,425	1	3	1	116	3,544
Thistles 3/-----	6	1	3	1	1	2	117	4	964	--	---	1,081
Vetch-----	2	--	--	2	--	2	61	--	---	--	---	61
Whitetop-----	1	--	--	--	1	--	---	1	2	--	---	2
Wintercress-----	1	--	1	--	--	--	---	--	---	1	152	152
Witchgrass-----	1	--	1	--	--	1	790	--	---	--	---	790

1/ Includes cheat.

2/ Less than 500 acres estimated for pepperweeds reported by Indiana.

3/ Does not include Russian thistle.





Table 32.--Other small grains: Estimated extent and cost of chemical weed control,  
by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Delaware-----	---	5	---	---	3.00	---	95	5
Maryland-----	---	5	---	---	1.50	---	98	2
Massachusetts-----	---	2	---	---	4.00	---	75	25
New Jersey-----	---	18	---	---	1.75	---	75	25
New York-----	---	200	---	---	3.00	---	80	20
Pennsylvania-----	---	310	---	---	4.50	---	80	20
Vermont-----	---	2	---	---	3.50	---	75	25
West Virginia-----	---	6	---	---	3.00	---	90	10
Northeastern-----	---	548	---	---	3.80	---	80	20
Illinois-----	---	8	---	---	1.50	---	80	20
Indiana-----	---	4	---	---	3.00	---	100	--
Iowa-----	---	1,000	1,000	---	1.50	1.50	95	5
Kansas-----	---	369	---	---	2.00	---	10	90
Michigan-----	---	188	---	---	2.00	---	90	10
Minnesota-----	50	3,000	30 30	4.00	2.00	6.00	70	30
Missouri-----	---	32	---	---	2.00	---	50	50
Nebraska-----	---	102	---	---	2.00	---	50	50
North Dakota-----	40	1,500	---	4.00	1.75	---	60	40
Ohio-----	---	40	---	---	1.50	---	80	20
South Dakota-----	4	1,900	5	4.50	1.35	5.85	35	65
Wisconsin-----	---	726	---	---	1.55	---	80	20
North Central-----	94	8,869	1,035	4.02	1.72	1.65	65	35
Alabama-----	---	10	---	---	2.00	---	85	15
Arkansas-----	---	5	---	---	2.00	---	20	80
Florida-----	---	15	---	---	1.50	---	80	20
Georgia-----	---	25	---	---	3.00	---	10	90
Kentucky-----	---	10	---	---	1.00	---	99	1
Louisiana-----	---	30	---	---	2.25	---	90	10
Mississippi-----	---	10	---	---	2.00	---	100	--
North Carolina-----	---	40	---	---	2.50	---	80	20
Oklahoma-----	---	56	---	---	2.00	---	95	5
South Carolina-----	---	150	---	---	2.25	---	65	35
Tennessee-----	---	3	---	---	2.00	---	90	10
Texas-----	---	480	---	---	2.00	---	30	70
Virginia-----	---	18	---	---	3.50	---	60	40
Southern-----	---	852	--	---	2.12	---	48	52
Arizona-----	---	5	---	---	2.00	---	80	20
California-----	5	900	---	6.00	3.00	---	75	75
Colorado-----	---	150	---	---	2.00	---	60	40
Idaho-----	2	175	2	6.00	2.00	8.00	40	60
Montana-----	300	600	300	4.00	1.50	5.50	70	30
Nevada-----	---	5	---	---	1.00	---	50	50
New Mexico-----	---	2	---	---	3.50	---	100	--
Oregon-----	20	300	---	8.00	3.00	---	60	40
Utah-----	1	107	---	6.00	2.31	---	81	19
Washington-----	50	200	20	6.00	2.00	8.00	70	30
Wyoming-----	---	150	---	---	1.50	---	50	50
Alaska-----	1	1	---	6.00	4.00	---	90	10
Western-----	379	2,595	322	4.52	2.33	5.67	54	46
United States-----	473	12,864	1,357	4.42	1.96	2.60	62	38

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 33.--Other small grains: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for : better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Delaware-----	---	Good	---	Sta.	Some	No	---
Maryland-----	---	Fair	---	Sta.	Some	No	---
Massachusetts-----	---	Good	---	Sta.	Some	No	---
New Jersey-----	---	Fair	---	Sta.	Little	No	---
New York-----	---	Good	---	Up	Some	Yes	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Vermont-----	---	Good	---	Down	Some	No	---
West Virginia-----	---	Fair	---	Up	Some	No	---
Northeastern-----	---	5-Good 3-Fair	---	3-Up 4-Sta. 1-Down	7-Some 1-Little	1-Yes 7-No	---
Illinois-----	---	Fair	---	Sta.	Some	No	---
Indiana-----	---	Fair	---	Sta.	Some	No	---
Iowa-----	---	Good	Good	Sta.	Little	No	---
Kansas-----	---	Fair	---	Sta.	Some	No	---
Michigan-----	---	Good	---	Sta.	Some	No	---
Minnesota-----	Fair	Good	Good	Up	Some	No	---
Missouri-----	---	Poor	---	Sta.	Little	No	---
Nebraska-----	---	Good	---	Up	Some	No	---
North Dakota-----	Fair	Good	---	Sta.	Some	No	---
Ohio-----	---	Good	---	Sta.	Some	No	---
South Dakota-----	Good	Good	Good	Up	Some	No	---
Wisconsin-----	---	Fair	---	Sta.	Some	No	---
North Central-----	1-Good 2-Fair	7-Good 4-Fair 1-Poor	3-Good	3-Up 9-Sta.	10-Some 2-Little	12-No	---
Alabama-----	---	Fair	---	Sta.	Some	No	---
Arkansas-----	---	Good	Good	Sta.	Little	No	---
Florida-----	---	Fair	---	Up	Some	No	---
Georgia-----	---	Good	---	Up	Little	No	---
Kentucky-----	---	Good	---	Down	Some	No	---
Louisiana-----	---	Good	---	Up	Little	No	---
Mississippi-----	Good	Good	Good	Up	Some	No	---
North Carolina-----	---	Fair	---	Sta.	Some	No	---
Oklahoma-----	---	Good	---	Up	Urgent	No	---
South Carolina-----	---	Good	---	Sta.	Some	No	---
Tennessee-----	---	Good	---	Up	Some	No	---
Texas-----	---	Fair	---	Up	Some	No	---
Virginia-----	---	Good	---	Up	Some	Yes	1
Southern-----	1-Good	9-Good 4-Fair	2-Good	8-Up 4-Sta. 1-Down	1-Urgent 9-Some 3-Little	1-Yes 12-No	---
Arizona-----	---	Good	---	Sta.	Some	No	---
California-----	Fair	Good	---	Sta.	Some	No	---
Colorado-----	---	Good	---	Sta.	Some	No	---
Idaho-----	Fair	Good	Fair	Sta.	Some	No	---
Montana-----	Fair	Fair	Fair	Up	Some	No	---
Nevada-----	---	Good	---	Up	Some	No	---
New Mexico-----	---	Good	---	Sta.	Some	No	---
Oregon-----	Good	Good	---	Up	Some	No	---
Utah-----	Good	Fair	---	Up	Urgent	No	---
Washington-----	Good	Good	---	Sta.	Some	No	---
Wyoming-----	---	Good	Good	Up	Some	No	---
Alaska-----	Good	Fair	---	Up	Some	No	---
Western-----	4-Good 3-Fair	9-Good 3-Fair	1-Good 2-Fair	6-Up 6-Sta.	1-Urgent 11-Some	12-No	---
United States-----	6-Good 5-Fair	30-Good 14-Fair 1-Poor	6-Good 2-Fair	20-Up 23-Sta. 2-Down	3-Urgent 37-Some 6-Little	2-Yes 43-No	---

1/ Sta., stationary.

Table 34.--Other small grains: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area acres
		NE	NC	S	W	Stationary		Up		Down		
						No.	Area	No.	Area	No.	Area	
							1,000 acres	1,000 acres		1,000 acres		1,000 acres
Barley, little-----	1	--	--	1	--	1	30	--	---	--	---	30
Barnyardgrass-----	2	--	1	--	1	2	219 1/	--	---	--	---	219 1/
* Bindweed-----	9	--	2	1	6	7	3,543	2	214	--	---	3,757
Bluegrass-----	1	--	--	--	1	--	---	1	(2/)	--	---	(2/)
Bromes-----	3	--	--	1	2	3	231	--	---	--	---	231
Buckwheat, wild-----	5	--	4	--	1	3	5,694	2	1,302	--	---	6,996
Chamomile, corn-----	2	2	--	--	--	2	94	--	---	--	---	94
Cheat-----	2	--	--	2	--	1	3	1	132	--	---	135
* Chickweeds-----	7	1	--	5	1	5	149 2/	2	187	--	---	336 2/
Cocklebur-----	1	--	1	--	--	1	1,000	--	---	--	---	1,000
Cockles-----	3	2	--	--	1	3	470	--	---	--	---	470
Crabgrasses-----	2	2	--	--	--	--	---	2	2 2/	--	---	2 2/
Darnel-----	2	--	--	2	--	2	9	--	---	--	---	9
Dock-----	5	--	--	5	--	2	20	3	71	--	---	91
Eveningprimrose, cutleaf	1	--	--	1	--	1	4	--	---	--	---	4
Fiddlenecks-----	2	--	--	--	2	1	193	1	596	--	---	794
Fleabane-----	1	--	1	--	--	--	---	1	146	--	---	146
* Foxtails-----	3	2	4	--	2	6	3,535 2/	2	325	--	---	3,910 2/
* Garlic, wild-----	10	--	2	3	--	9	491	2	73	--	---	498 2/
Germanium, Carolina--	1	--	--	1	--	1	6	--	---	--	---	6
Henbit-----	1	--	--	--	1	--	---	1	(2/)	--	---	(2/)
* Henbit-----	8	--	--	7	1	4	131	4	303	--	---	484
Johnsongrass-----	1	--	--	--	1	1	18	--	---	--	---	18
Knapweed, Russian--	1	--	--	--	1	--	---	1	3	--	---	3
Knawel-----	4	2	--	2	--	2	43	2	108	--	---	151
Kochia-----	4	--	2	--	2	2	584	2	1,225	--	---	1,809
Ladysthumb-----	1	--	1	--	--	1	545	--	---	--	---	545
* Lambsquarters-----	9	3	3	--	3	7	2,520 2/	1	10	1	(1/)	2,530 1/
Lettuce, prickly----	2	--	1	--	1	2	212	--	---	--	---	212
Mayweed-----	1	--	--	1	--	--	---	1	10	--	---	10
Milkweed-----	1	--	1	--	--	--	---	1	456	--	---	456
* Mustards-----	19	1	5	10	3	12	4,262	4	394	3	3,873	8,529
Nutsedges-----	2	2	--	--	--	--	---	2	203	--	---	203
* Oat, wild-----	10	--	3	--	7	5	5,705	5	3,137	--	---	8,902
Peas, wild winter----	1	--	--	1	--	1	6	--	---	--	---	6
Pennycress-----	3	--	1	--	2	3	414	--	---	--	---	414
Pepperweeds-----	3	--	1	2	--	1	4	1	34	--	---	60 3/
* Pigweeds-----	9	3	2	1	3	8	1,275 2/	1	238	--	---	1,513 2/
Quackgrass-----	3	1	2	--	--	1	1,635	--	---	2	530	2,165
Radish, wild-----	4	2	1	1	--	2	364	--	---	2	14	373
Ragweeds-----	3	--	--	--	--	--	---	--	---	--	---	---
Ragweed, tall-----	1	--	--	--	--	--	---	--	---	--	---	---
Ragweed, wild-----	1	--	--	--	1	1	119	--	---	--	---	119
Shepherdspurse-----	1	--	1	--	--	1	146	--	---	--	---	146
Smartweeds-----	6	2	4	--	--	4	535 2/	1	1,002	--	---	1,574 2/3/

See footnotes at end of table.



Table 34.--Other small grains: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968--continued

Weed or complex	: Number : of : reports	: Reports by region					: Infestation trend					: Total : area	
		: NE	: NC	: S	: W	: No.:	: Stationary		: Up		: Down		
							: No.:	: Area	: No.:	: Area	: No.:		: Area
						<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>	
Dowthistles-----	1	--	--	--	1	1	18	--	---	--	---		18
Spurry, corn-----	1	--	--	--	1	--	---	1	(2/)	--	---		(2/)
Sunflowers-----	3	--	1	--	2	1	75	1	1,000	1	1		1,076 2/
Tansymustards-----	3	--	--	--	3	3	537	--	---	--	---		537
Thistle, Russian----	2	--	--	--	2	1	158	1	62	--	---		220
*Thistles-----	9	1	3	2	3	3	269	5	783	--	---		1,056 3/
Vetch-----	2	--	--	2	--	2	12	--	---	--	---		12
Whitetop-----	1	--	--	--	1	--	---	1	3	--	---		3
Wintercress-----	1	--	1	--	--	--	---	--	---	--	---		7 3/

1/ Figures do not include estimates of less than 500 acres for weeds reported in New Mexico.

2/ Acreage figures do not include estimates for weeds reported in Massachusetts and Alaska.

3/ Reports and acreage estimates for weeds in Indiana included in totals but not in figures for infestation trends.

Table 35.--Other small grains: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1966

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Pct.
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/	
Northeastern:													
Delaware-----	Radish, wild-----	5	Sta.	Chickweed-----	30	Sta.	Cockle, corn-----	35	Sta.	Garlic, wild-----	60	Sta.	30 Up
Maryland-----	Chamomile, corn-----	70	Up	Foxtail-----	45	Sta.	Lambsquarters-----	85	Sta.	Pigweed, redroot-----	85	Sta.	30 Sta.
Massachusetts-----	Crabgrass-----	55	Sta.	Cockle, white-----	40	Sta.	Garlic, wild-----	20	Sta.	Knave-----	10	Sta.	10 Sta.
New Jersey-----	Lambsquarters-----	25	Up	Mutsedge-----	30	Up	Pigweed-----	20	Sta.	Quackgrass-----	20	Up	25 Down
Pennsylvania-----	Crabgrass-----	40	Up	Foxtail-----	20	Sta.	Mustard, wild-----	50	Down	Nutsedge, yellow-----	20	Up	25 Sta.
Vermont-----	Lambsquarters-----	40	Up	Pigweed, redroot-----	30	Sta.	Radish, wild-----	25	Down	Ragweed, common-----	50	Up	25 Sta.
North Central:													
Illinois-----	Foxtail, giant-----	40	Sta.	Lambsquarters-----	30	Sta.	Mustard, wild-----	25	Down	Quackgrass-----	20	Down	35 Sta.
Indiana-----	Garlic, wild-----	5	Sta.	Pepperweed, field-----	6	Sta.	Smartweed-----	10	Sta.	Thistle, Canada-----	1	Sta.	2 Sta.
Iowa-----	Cocklebur-----	100	Sta.	Foxtails-----	100	Sta.	Sunflower-----	100	Up	Wintercress-----	2	Sta.	2 Sta.
Minnesota-----	Buckwheat, wild-----	25	Up	Foxtails-----	50	Sta.	Mustard, wild-----	70	Sta.	Oats, wild-----	20	Sta.	25 Up
Missouri-----	Barnyardgrass-----	75	Sta.	Fleabane, rough-----	50	Up	Foxtails-----	90	Sta.	Pennycress, field-----	60	Sta.	50 Sta.
Nebraska-----	Buckwheat, wild-----	50	Up	Kochia-----	60	Sta.	Lambsquarters, common-----	25	Sta.	Lettuce, prickly-----	25	Sta.	95 Sta.
North Dakota-----	Bindweed, field-----	30	Sta.	Buckwheat, wild-----	75	Sta.	Kochia-----	25	Up	Mustard, wild-----	75	Down	85 Sta.
Ohio-----	Garlic, wild-----	10	Sta.	Mustard, wild-----	30	Up	Pigweed-----	10	Sta.	Smartweed-----	35	Sta.	25 Sta.
South Dakota-----	Bindweed, field-----	30	Sta.	Buckwheat, wild-----	40	Sta.	Milweed-----	15	Up	Oats, wild-----	70	Up	12 Up
Wisconsin-----	Ladystumb-----	30	Sta.	Lambsquarters, common-----	100	Sta.	Mustard, wild-----	40	Sta.	Quackgrass-----	90	Sta.	20 Sta.
Southern:													
Alabama-----	Chickweed-----	50	Up	Dock, curly-----	90	Up	Garlic, wild-----	90	Up	Henbit-----	60	Up	55 Sta.
Arkansas-----	Bromes-----	40	Sta.	Dock, curly-----	10	Sta.	Garlic, wild-----	15	Sta.	Henbit-----	30	Sta.	30 Sta.
Florida-----	Eveningprimrose2/-----	40	Sta.	Geranium, Carolina-----	50	Sta.	Mustard, wild-----	5	Down	Pepperweed-----	40	Sta.	5 Down
Georgia-----	Dock-----	20	Up	Garlic, wild-----	20	Sta.	Mustard-----	20	Up	Pepperweed-----	20	Up	Thistle, blessed-----
Kentucky-----	Garlic, wild-----	80	Sta.										
Louisiana-----	Darnel-----	25	Sta.	Dock, curly-----	40	Up	Henbit-----	10	Up	Mustard, wild-----	20	Sta.	20 Sta.
Mississippi-----	Cheat-----	5	Sta.	Darnel-----	1	Sta.	Mustard-----	1	Sta.	Peas, wild winter-----	10	Sta.	10 Sta.
North Carolina-----	Chickweed-----	80	Up	Garlic, wild-----	30	Sta.	Henbit-----	70	Up	Knave-----	30	Up	Mustard-----
Oklahoma-----	Bindweed-----	40	Up	Cheat-----	30	Up	Henbit-----	30	Up	Mustard, wild-----	20	Up	Pigweed-----
South Carolina-----	Barley, little-----	25	Sta.	Chickweed, common-----	30	Sta.	Garlic, wild-----	20	Sta.	Mustard, wild-----	25	Sta.	Thistle, blessed-----
Tennessee-----	Chickweed-----	30	Sta.	Dock, curly-----	20	Sta.	Garlic, wild-----	86	Up	Henbit-----	90	Sta.	Mustard, wild-----
Virginia-----	Chickweed-----	25	Sta.	Garlic, wild-----	40	Sta.	Henbit-----	20	Sta.	Knave-----	20	Sta.	Mayweed-----
Western:													
Arizona-----	Johnsongrass-----	10	Sta.	Lambsquarters-----	25	Sta.	Oats, wild-----	40	Sta.	Rocket, London-----	50	Sta.	Southistle-----
California-----	Bindweed, field-----	50	Sta.	Fiddleneck, Douglas-----	40	Up	Oats, wild-----	35	Up	Rocket, London-----	30	Sta.	Tansymustard-----
Colorado-----	Foxtail-----	60	Up	Kochia-----	70	Sta.	Oats, wild-----	70	Up	Pigweed, redroot-----	75	Up	Thistle, Canada-----
Idaho-----	Bindweed, field-----	20	Sta.	Mustards-----	40	Sta.	Oats, wild-----	40	Up	Pennycress, field-----	25	Sta.	Thistle, Canada-----
Montana-----	Bindweed, field-----	15	Sta.	Buckwheat, wild-----	60	Sta.	Cockle, corn-----	30	Sta.	Foxtail, green-----	10	Up	Oats, wild-----
Nevada-----	Brome, downy-----	30	Sta.	Knave-----	15	Up	Whiteweed-----	15	Up				
New Mexico-----	Barnyardgrass-----	2	Sta.	Kochia-----	5	Up	Lambsquarters-----	2	Down	Oats, wild-----	2	Sta.	Sunflower-----
Oregon-----	Bindweed-----	10	Sta.	Brome, downy-----	50	Sta.	Fiddleneck-----	50	Sta.	Rye, grass-----	30	Sta.	Thistle, Russian-----
Utah-----	Bindweed, field-----	25	Up	Mustard, black-----	90	Sta.	Oats, wild-----	60	Up	Pigweed, redroot-----	90	Sta.	Sunflower-----
Washington-----	Henbit-----	20	Sta.	Lettuce, prickly-----	20	Sta.	Pennycress, field-----	30	Sta.	Tansymustard-----	40	Sta.	Thistle, Russian-----
Wyoming-----	Bindweed, field-----	30	Sta.	Mustard, wild-----	30	Up	Pigweed, redroot-----	75	Sta.	Tansymustard-----	60	Sta.	Thistle, Canada-----
Alaska-----	Bluegrass, annual-----	15	Up	Chickweed-----	90	Sta.	Hempnettle-----	25	Up	Lambsquarters-----	90	Sta.	Spurry, corn-----

1/Sta., stationary.  
2/Eveningprimrose, cutleaf.

1/Sta., stationary.  
2/Eveningprimrose, cutleaf.

Table 36.--Rice: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Arkansas-----	---	500	---	---	16.00	---	1	99
Louisiana-----	---	490	---	---	8.00	---	25	75
Mississippi-----	---	50	---	---	6.50	---	25	75
Texas-----	---	500	---	---	12.00	---	20	80
Southern-----	---	1,540	---	---	11.85	---	16	84
California-----	15	350	15	16.00	9.00	20.00	3	97
Western-----	15	350	15	16.00	9.00	20.00	3	97
United States-----	15	1,890	15	16.00	11.32	20.00	13	87

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 37.--Rice: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Arkansas-----	---	Good	---	Sta.	Some	No	---
Louisiana-----	---	Good	---	Up	Some	No	---
Mississippi-----	---	Good	---	Sta.	Some	No	---
Texas-----	---	Fair	---	Up	Urgent	No	---
Southern-----	---	3-Good 1-Fair	---	2-Up 2-Sta	3-Some 1-Urgent	4-No	---
California-----	Good	Good	Good	Up	Some	No	---
Western-----	1-Good	1-Good	1-Good	1-Up	1-Some	1-No	---
United States-----	1-Good	4-Good 1-Fair	1-Good	3-Up 2-Sta.	1-Urgent 4-Some	5-No	---

<sup>1/</sup> Sta., stationary.

Table 38.--Rice: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the three weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region					Infestation trend					Total area	
		NE	NC	S	W	No.	Stationary		Up		Down		
							Area	No.	Area	No.	Area		
							<u>1,000</u> acres		<u>1,000</u> acres		<u>1,000</u> acres	<u>1,000</u> acres	
Alligatorweed-----	1	--	--	1	--	--	---	1	136	--	---	136	
*Barnyardgrass-----	5	--	--	4	1	3	774 <u>1/</u>	--	---	2	748	1,522 <u>1/</u>	
Baronetgrass-----	1	--	--	1	--	--	---	--	---	1	298	298	
Bulrushes-----	2	--	--	--	2	1	86	1	65	--	---	151	
Cattail, common-----	1	--	--	--	1	--	---	1	86	--	---	86	
*Ducksalad-----	3	--	--	3	--	1	( <u>1/</u> )	2	730	--	---	730 <u>1/</u>	
Jointvetch, northern	1	--	--	1	--	--	---	--	---	1	119	119	
Rice, red-----	2	--	--	2	--	2	620	--	---	--	---	620	
*Sesbania, hemp-----	3	--	--	3	--	2	515 <u>1/</u>	--	---	1	119	634 <u>1/</u>	
Signalgrasses-----	2	--	--	2	--	2	172 <u>1/</u>	--	---	--	---	172 <u>1/</u>	
Smartweeds-----	1	--	--	1	--	1	( <u>1/</u> )	--	---	--	---	( <u>1/</u> )	
Spikerush-----	1	--	--	1	--	--	---	1	233	--	---	233	
Sprangletops-----	2	--	--	1	1	--	---	2	137	--	---	137	

1/ Figures do not include acreage estimates for weeds reported in Mississippi.





Table 40.--Tobacco: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	0.2	---	450.00	20.00	---	2	98
Maryland-----	2	---	---	10.00	---	---	90	10
Pennsylvania-----	6	---	---	7.75	---	---	90	10
Northeastern-----	8.0	.2	---	8.31	20.00	---	88	12
Ohio-----	---	.5	---	---	9.00	---	95	5
Wisconsin-----	.5	---	---	---	30.00	---	60	40
North Central-----	.5	.5	---	30.00	9.00	---	78	22
Florida-----	.1	.3	0.4	5.00	8.00	13.00	60	40
Georgia-----	---	14	---	---	12.00	---	95	5
Kentucky-----	4	20	---	5.00	12.00	---	96	4
North Carolina-----	4	10	---	10.00	12.00	---	100	---
South Carolina-----	5	---	---	10.00	---	---	100	---
Tennessee-----	1	---	---	15.00	---	---	50	50
Virginia-----	---	3.5	---	---	12.00	---	80	20
Southern-----	14.1	47.8	.4	8.90	11.97	13.00	95	5
United States-----	22.6	48.5	.4	9.16	12.85	13.00	94	6

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 41.--Tobacco: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <sup>1/</sup>	Need for : better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication : of problem	Percent of : treated acres
Connecticut-----	Fair	Good	---	Up	Little	Yes	1
Maryland-----	Good	---	---	Up	Some	Yes	15
Pennsylvania-----	Good	---	---	Sta.	Some	No	---
Northeastern-----	2-Good 1-Fair	1-Good	---	2-Up 1-Sta.	2-Some 1-Little	2-Yes 1-No	4
Ohio-----	---	Fair	---	Up	Some	Yes	1
Wisconsin-----	Good	---	---	Up	Some	No	---
North Central-----	1-Good	1-Fair	---	2-Up	2-Some	1-Yes 1-No	1
Florida-----	Fair	Fair	Fair	Up	Some	No	---
Georgia-----	---	Fair	---	Up	Some	No	---
Kentucky-----	Fair	Fair	---	Up	Urgent	Yes	80
North Carolina-----	Fair	Fair	---	Up	Some	No	5
South Carolina-----	---	Good	---	Sta.	Some	No	---
Tennessee-----	Fair	---	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Some	Yes	15
Southern-----	4-Fair	1-Good 5-Fair	1-Fair	6-Up 1-Sta.	1-Urgent 6-Some	2-Yes 5-No	33
United States-----	3-Good 5-Fair	2-Good 6-Fair	1-Fair	10-Up 2-Sta.	1-Urgent 10-Some 1-Little	5-Yes 7-No	29

<sup>1/</sup> Sta., stationary.

Table 42.--Tobacco: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	: Number	: Reports by region				: Infestation trend						Total area
	: of	: NE : NC : S : W				: Stationary		: Up		: Down		
	: reports	: No. : Area				: No. : Area		: No. : Area				
		100 acres				100 acres		100 acres		100 acres		
*Bermudagrass-----	3	1	--	2	--	3	161	--	---	--	---	161
*Carpetweed-----	3	1	1	1	--	3	1,119	--	---	--	---	1,119
*Cocklebur-----	2	--	--	2	--	2	1,244	--	---	--	---	1,244
*Crabgrasses-----	10	2	1	7	--	8	6,428	1	66	1	528	7,022
Foxtails-----	2	1	1	--	--	2	109	--	---	--	---	109
Galinsoga-----	1	1	--	--	--	1	42	--	---	--	---	42
Goosegrass-----	1	--	--	1	--	--	---	--	---	1	352	352
*Lambsquarters-----	7	3	1	3	--	6	1,774	--	---	1	94	1,863
Morningglories-----	2	--	--	2	--	1	172	1	470	--	---	642
Nightshades-----	1	--	--	1	--	1	1,206	--	---	--	---	1,206
*Nut-edges-----	4	--	--	4	--	1	726	3	406	--	---	1,132
*Panicum, fall-----	2	--	1	1	--	1	24	1	1,034	--	---	1,058
*Pigweeds-----	3	3	1	4	--	7	2,430	--	---	1	84	2,564
Purslanes-----	2	1	1	--	--	2	90	--	---	--	---	90
*Pusley, Florida-----	3	--	--	3	--	3	843	--	---	--	---	843
*Ragweeds-----	4	2	1	1	--	1	28	2	1,263	1	74	1,370
Sicklepod-----	1	--	--	1	--	1	46	--	---	--	---	46
Velvetleaf-----	1	--	1	--	--	1	31	--	---	--	---	31

Table 43.--Tobacco: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1908

Region and State	1/			1/			1/			1/			1/		
	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend
Northeastern:															
Connecticut-----	Carpentweed-----	90	Sta.	Crabgrass-----	90	Up	Lambsquarters-----	90	Sta.	Pigweeds-----	65	Sta.	Parslane-----	50	Sta.
Maryland-----	Bermudagrass-----	10	Sta.	Crabgrass-----	70	Sta.	Lambsquarters-----	40	Sta.	Pigweed-----	60	Sta.	Ragweed-----	60	Up
Pennsylvania-----	Foxtail-----	15	Sta.	Gallinsofs-----	20	Sta.	Lambsquarters-----	45	Down	Pigweed-----	40	Down	Ragweed-----	35	Down
North Central:															
Ohio-----	Carpentweed-----	20	Sta.	Crabgrass-----	60	Sta.	Panicum, fall-----	25	Sta.	Ragweed-----	30	Sta.		--	--
Wisconsin-----	Foxtail, yellow-----	100	Sta.	Lambsquarters, common-----	100	Sta.	Pigweed, redroot-----	100	Sta.	Parslane, common-----	70	Sta.	Velvetleaf-----	40	Sta.
Southern:															
Florida-----	Bermudagrass-----	20	Sta.	Crabgrass-----	30	Sta.	Nutsedge-----	30	Up	Pusley, Florida-----	50	Sta.	Sicklepod-----	30	Sta.
Georgia-----	Crabgrass-----	90	Sta.	Morningglory-----	30	Sta.	Nutsedge-----	30	Up	Pigweed-----	30	Sta.	Pusley, Florida-----	90	Sta.
Kentucky-----	Crabgrass-----	60	Sta.	Crabgrass-----	70	Sta.	Nightshade-----	70	Sta.	Panicum, fall-----	60	Up	Pigweed-----	80	Sta.
North Carolina-----	Cocklebur-----	30	Sta.	Crabgrass-----	90	Sta.	Lambsquarters-----	20	Sta.	Nutsedge-----	20	Sta.	Ragweed-----	30	Up
South Carolina-----	Cocklebur-----	25	Sta.	Crabgrass-----	95	Sta.	Nutsedge-----	30	Up	Pigweed-----	25	Sta.	Pusley, Florida-----	40	Sta.
Tennessee-----	Crabgrass-----	90	Down	Goosegrass-----	60	Down	Lambsquarters-----	60	Sta.	Morningglory-----	80	Up	Pigweed-----	80	Sta.
Virginia-----	Bermudagrass-----	15	Sta.	Crabgrass-----	80	Sta.	Lambsquarters-----	65	Sta.		--	--		--	--
1/ Sta., stationary.															

1/ Sta., stationary.



Table 44.--Peanuts: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Alabama-----	90	71	21	7.00	2.75	9.00	95	5
Florida-----	20	35	5	10.00	10.00	20.00	70	30
Georgia-----	387	7	100	12.00	2.00	8.00	75	25
North Carolina-----	80	15	50	12.00	4.50	16.00	90	10
Oklahoma-----	100	20	5	5.00	3.50	7.50	95	5
South Carolina-----	6	1	6	10.00	5.00	15.00	95	5
Texas-----	150	---	10	6.00	---	8.00	90	10
Virginia-----	10	20	60	12.00	14.50	20.00	90	10
Southern-----	843	169	257	9.72	5.87	12.83	84	16
New Mexico-----	1	---	---	9.50	---	---	100	---
Western-----	1	---	---	9.50	---	---	100	---
United States-----	844	169	257	9.72	5.87	12.83	84	16

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 45.--Peanuts: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Alabama-----	Good	Good	Good	Sta.	Some	No	---
Florida-----	Fair	Fair	Fair	Up	Some	No	---
Georgia-----	Good	Good	Good	Up	Some	No	---
North Carolina-----	Fair	Fair	Good	Up	Some	No	---
Oklahoma-----	Fair	Fair	Good	Sta.	Some	Yes	70
South Carolina-----	Good	Fair	Fair	Sta.	Some	No	---
Texas-----	Good	---	---	Up	Urgent	No	---
Virginia-----	Fair	Fair	Fair	Sta.	Urgent	Yes	5
Southern-----	4-Good 4-Fair	2-Good 5-Fair	4-Good 3-Fair	4-Up 4-Sta.	2-Urgent 6-Some	2-Yes 6-No	7
New Mexico-----	Good	---	---	Up	Urgent	No	---
Western-----	1-Good	---	---	1-Up	1-Urgent	1-No	---
United States-----	5-Good 4-Fair	2-Good 5-Fair	4-Good 3-Fair	5-Up 4-Sta.	3-Urgent 6-Some	2-Yes 7-No	7

<sup>1/</sup> Sta., stationary.

Table 46.--Peanuts: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area
		NE	NC	S	W	No.:	Area	No.:	Area	No.:	Area	
							<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>
Barnyardgrass-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
*Beggarweeds-----	3	--	--	3	--	--	---	3	398	--	---	398
*Bermudagrass-----	2	--	--	2	--	1	5	1	59	--	---	64
*Cocklebur-----	4	--	--	4	--	1	67	3	238	--	---	305
Copperleaf, Virginia	1	--	--	1	--	--	---	1	18	--	---	18
Crabgrasses-----	5	--	--	5	--	4	244	--	---	1	294	538
Foxtails-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
*Goosegrass-----	1	--	--	1	--	1	100	--	---	--	---	100
Johnsongrass-----	1	--	--	1	--	1	97	--	---	--	---	97
Kochia-----	1	--	--	--	1	--	---	1	1	--	---	1
Lambsquarters-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Millet, Texas-----	1	--	--	1	--	--	---	1	45	--	---	45
*Morningglories-----	3	--	--	3	--	2	136	1	48	--	---	184
Nutsedges-----	6	--	--	6	--	1	348	5	142	--	---	490
*Panicum-----	3	--	--	3	--	--	---	2	263	1	118	381
Pigweeds-----	3	--	--	2	1	3	256 1/	--	---	--	---	256 1/
*Pusley, Florida-----	2	--	--	2	--	2	56	--	---	--	---	56
Ragweeds-----	1	--	--	1	--	--	---	1	84	--	---	84
*Sicklepod-----	4	--	--	4	--	2	13	2	289	--	---	302
Signalgrass-----	1	--	--	1	--	--	---	--	---	1	( )	59

1/ Does not include estimates of less than 500 acres for weeds reported in New Mexico.

Table 17.--Peanuts: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	1/			1/			1/			1/			1/		
	Infestation Acres Trend	Weed	Pct.	Infestation Acres Trend	Weed	Pct.	Infestation Acres Trend	Weed	Pct.	Infestation Acres Trend	Weed	Pct.	Infestation Acres Trend	Weed	Pct.
Southern:															
Alabama-----	80 Up	Cocklebur-----	20 Up	Millet, Texas-----	Nutsedge-----	25 Up	Nutsedge-----	25 Up	Sicklepod-----	25 Up	Sicklepod-----	50 Up	Sta.	50 Up	Sta.
Florida-----	10 Up	Crabgrass-----	100 Sta.	Nutsedge-----	Pusley, Florida-----	10 Up	Pusley, Florida-----	100 Sta.	Sicklepod-----	100 Sta.	Sicklepod-----	20 Sta.	Sta.	20 Sta.	Sta.
Georgia-----	50 Up	Cocklebur-----	40 Up	Nutsedge-----	Panicum, Texas-----	70 Sta.	Panicum, Texas-----	50 Up	Sicklepod-----	50 Up	Sicklepod-----	40 Up	Up	40 Up	Up
North Carolina--	40 Sta.	Goosegrass-----	60 Sta.	Morningglory-----	Nutsedge-----	45 Sta.	Nutsedge-----	25 Up	Ragweed-----	25 Up	Ragweed-----	50 Up	Up	50 Up	Up
Oklahoma-----	15 Up	Crabgrass-----	90 Sta.	Johnsongrass-----	Morningglory-----	80 Sta.	Morningglory-----	40 Up	Pigweed-----	40 Up	Pigweed-----	90 Sta.	Sta.	90 Sta.	Sta.
South Carolina--	25 Up	Crabgrass-----	60 Sta.	Nutsedge-----	Pusley, Florida-----	30 Up	Pusley, Florida-----	30 Up	Sicklepod-----	40 Sta.	Sicklepod-----	20 Sta.	Sta.	20 Sta.	Sta.
Texas-----	20 Up	Cocklebur-----	100 Down	Panicum, Texas-----	Pigweed-----	40 Down	Pigweed-----	50 Sta.	Signalgrass-----	50 Sta.	Signalgrass-----	20 Down	Down	20 Down	Down
Virginia-----	5 Sta.	Crabgrass-----	75 Sta.	Morningglory-----	Nutsedge-----	60 Sta.	Nutsedge-----	60 Sta.	Panicum, fall-----	45 Up	Panicum, fall-----	15 Up	Up	15 Up	Up
Western:															
New Mexico-----	3 Sta.	Foxtail, green-----	3 Sta.	Kochia-----	Lambsquarters-----	8 Up	Lambsquarters-----	3 Sta.	Pigweed-----	3 Sta.	Pigweed-----	5 Sta.	Sta.	5 Sta.	Sta.
1/ Sta., stationary.															

Table 48.--Sugarbeets: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
New York-----	---	5	---	---	10.00	---	60	40
Pennsylvania-----	3	1	---	6.50	2.00	---	80	20
Northeastern-----	3	6	---	6.50	8.67	---	68	32
Iowa-----	3	---	3	4.00	---	4.00	100	--
Michigan-----	75	1	---	8.50	3.00	---	80	20
Minnesota-----	70	10	30	5.00	3.00	8.00	90	10
Nebraska-----	21	---	21	15.00	---	15.00	22	78
North Dakota-----	50	10	---	4.50	3.00	---	95	5
Ohio-----	27	2	1	7.00	4.00	9.00	95	5
North Central-----	246	23	55	7.03	3.09	10.47	80	20
California-----	80	50	30	12.00	8.00	20.00	90	10
Colorado-----	90	20	---	12.00	6.00	---	90	10
Idaho-----	84	10	1	14.00	8.00	22.00	30	70
Montana-----	56	5	3	9.50	8.00	15.00	95	5
New Mexico-----	1	---	---	6.00	---	---	60	40
Oregon-----	10	2	---	8.00	5.00	---	90	10
Utah-----	18	3	---	7.65	7.65	---	75	25
Washington-----	2	1	---	16.00	15.00	---	90	10
Wyoming-----	45	5	1	6.00	11.00	17.00	70	30
Western-----	386	96	35	11.07	7.74	19.54	77	23
United States-----	635	125	90	9.48	6.93	14.00	78	22

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.



Table 49.--Sugarbeets: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides: usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
New York-----	Fair	Good	---	Sta.	Some	Yes	100
Pennsylvania-----	Good	Good	---	Sta.	Urgent	Yes	25
Northeastern-----	1-Good 1-Fair	2-Good	---	2-Sta.	1-Urgent 1-Some	2-Yes	67
Iowa-----	Good	---	Good	Sta.	Some	No	---
Michigan-----	Good	Good	---	Up	Some	No	---
Minnesota-----	Fair	Fair	Good	Up	Some	No	---
Nebraska-----	Fair	---	Fair	Up	Urgent	No	---
North Dakota-----	Good	Good	---	Up	Urgent	No	---
Ohio-----	Good	Fair	Good	Up	Some	No	---
North Central-----	4-Good 2-Fair	2-Good 2-Fair	3-Good 1-Fair	4-Up 2-Sta.	2-Urgent 4-Some	6-No	---
California-----	Fair	Fair	Good	Up	Urgent	Yes	10
Colorado-----	Good	Good	---	Sta.	Urgent	Yes	10
Idaho-----	Fair	Fair	Fair	Up	Some	No	---
Montana-----	Good	Fair	Fair	Up	Some	Yes	20
New Mexico-----	Fair	---	---	Up	Some	No	---
Oregon-----	Fair	Fair	---	Up	Urgent	Yes	---
Utah-----	Fair	Poor	---	Up	Urgent	No	---
Washington-----	Poor	Poor	---	Sta.	Urgent	Yes	30
Wyoming-----	Fair	Fair	Good	Up	Urgent	No	---
Western-----	2-Good 6-Fair 1-Poor	1-Good 5-Fair 2-Poor	2-Good 2-Fair	7-Up 2-Sta.	6-Urgent 3-Some	5-Yes 4-No	8
United States-----	7-Good 9-Fair 1-Poor	5-Good 7-Fair 2-Poor	5-Good 3-Fair	11-Up 6-Sta.	9-Urgent 8-Some	7-Yes 10-No	5

<sup>1/</sup> Sta., stationary.

Table 50.--Sugarbeets: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	: Number	:	: Reports by region					: Infestation trend					:
	: of	:	: Stationary					: Up	:	: Down		:	
	: reports	:	NE	NC	S	W	: No.:	Area	: No.:	Area	: No.:	Area	:
								1,000		1,000		1,000	
							acres		acres		acres		
Barley (crop)-----	1	--	--	--	1	1	7	--	---	--	---	7	
*Barnyardgrass-----	11	3	3	--	5	8	238 1/	2	26	1	1	265 1/	
*Bindweed, field-----	3	--	2	--	1	1	15	2	24	--	---	39	
Buckwheat, wild-----	1	--	1	--	--	1	79	--	---	--	---	79	
*Foxtails-----	13	2	6	--	5	9	497 1/2/	1	20	3	64	581 1/2/	
Goosefoot, nettleleaf	1	--	--	--	1	1	127	--	---	--	---	127	
Groundcherry-----	1	--	--	--	1	--	---	1	33	--	---	33	
Johnsongrass-----	1	--	1	--	--	1	23	--	---	--	---	23	
Knotweed, silversheath	1	--	--	--	1	1	64	--	---	--	---	64	
*Kochia-----	7	--	2	--	5	2	58	5	303	--	---	366	
*Lambsquarters-----	15	4	4	--	7	11	474 1/	1	18	3	39	531 1/	
Mallow-----	1	--	--	--	1	--	---	1	3	--	---	3	
Millet-----	1	1	--	--	--	--	---	1	11	--	---	11	
*Mustards-----	6	3	2	--	1	5	164 1/	--	---	1	17	181 1/	
*Nightshades-----	3	--	--	--	3	--	---	2	58	1	19	77	
*Oat, wild-----	5	--	2	--	3	4	257	1	7	--	---	264	
*Pigweeds-----	18	4	5	--	9	15	574 1/	1	152	2	19	745 1/	
*Quackgrass-----	3	2	1	--	--	3	28 1/	--	---	--	---	28 1/	
Ragweeds-----	2	1	1	--	--	1	(1/)	--	---	1	11	11 1/	
Rockets, London-----	1	--	--	--	1	1	8	--	---	--	---	8	
Smartweeds-----	1	--	1	--	--	1	29	--	---	--	---	29	
Thistle, Russian-----	1	--	--	--	1	1	18	--	---	--	---	18	
Thistles-----	1	--	--	--	1	1	9	--	---	--	---	9	
Watergrasses, (complex)	1	--	--	--	1	1	8	--	---	--	---	8	

1/ No acreages estimated for weeds reported in New Hampshire, and less than 500 acres estimated for lambsquarters and foxtails in New Mexico.

2/ Figures do not include duplicate estimates of 38,000 acres of green and yellow foxtails in North Dakota.

Table 51.--Sugarbeets: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Infestation Acres Trend 1/			Weed	Infestation Acres Trend 1/			Weed	Infestation Acres Trend 1/			
	Pct.				Pct.				Pct.			
Northeastern:												
Maine-----	Barnyardgrass-----	50	Up	Lambsquarters-----	50	Sta.	Millet-----	50	Up	Mustard-----	75	Down
New Hampshire--	Barnyardgrass-----	60	Sta.	Lambsquarters-----	90	Sta.	Mustard, wild-----	60	Sta.	Pigweed, redroot-----	60	Sta.
New York-----	Barnyardgrass-----	60	Sta.	Lambsquarters-----	60	Sta.	Mustard, wild-----	60	Sta.	Pigweed, redroot-----	60	Sta.
Pennsylvania---	Foxtail, giant-----	15	Sta.	Foxtail, yellow-----	20	Sta.	Lambsquarters-----	35	Sta.	Pigweed, redroot-----	30	Sta.
North Central:												
Iowa-----	Barnyardgrass-----	50	Sta.	Foxtails-----	50	Sta.	Lambsquarters, common	50	Sta.	Pigweed, redroot-----	50	Sta.
Kansas-----	Barnyardgrass-----	100	Sta.	Bindweed, field-----	40	Sta.	Johnsongrass-----	60	Sta.	Kochia-----	100	Sta.
Michigan-----	Bindweed, field-----	20	Up	Quackgrass-----	30	Sta.	Mustard, wild-----	60	Sta.	Oats, wild-----	50	Sta.
Minnesota-----	Foxtail-----	100	Sta.	Lambsquarters, common	65	Sta.	Mustard, wild-----	40	Up	Lambsquarters, common	40	Sta.
Nebraska-----	Barnyardgrass-----	30	Sta.	Foxtail-----	100	Sta.	Kochia-----	100	Sta.	Mustard, wild-----	50	Sta.
North Dakota---	Buckwheat, wild-----	90	Sta.	Foxtail, green-----	100	Sta.	Foxtail, yellow-----	50	Down	Ragweed-----	30	Down
Ohio-----	Foxtails-----	40	Down	Lambsquarters-----	40	Down	Pigweed-----	50	Down	Smartweed-----	80	Sta.
Western:												
Arizona-----	Barley-----	40	Sta.	Mallow-----	20	Up	Pigweed-----	40	Sta.	Rocket, London-----	50	Sta.
California-----	Barnyardgrass-----	45	Sta.	Goosefoot, nettleleaf	50	Sta.	Groundcherry, Wright	15	Up	Knotweed, silv.-----	25	Sta.
Colorado-----	Foxtail-----	90	Sta.	Kochia-----	95	Up	Nightshade-----	30	Up	Oats, wild-----	50	Sta.
Idaho-----	Kochia-----	50	Up	Lambsquarters-----	60	Sta.	Pigweed, redroot-----	80	Sta.	Thistle, Russian-----	5	Sta.
Montana-----	Foxtail, green-----	30	Up	Kochia-----	30	Sta.	Nightshade-----	10	Up	Oats, wild-----	25	Sta.
New Mexico-----	Barnyardgrass-----	15	Down	Foxtail, green-----	10	Down	Kochia-----	15	Up	Lambsquarters-----	12	Down
Oregon-----	Barnyardgrass-----	90	Sta.	Lambsquarters-----	90	Sta.	Mustard-----	90	Sta.	Oats, wild-----	30	Up
Utah-----	Barnyardgrass-----	50	Up	Bindweed, field-----	20	Up	Foxtail, green-----	65	Sta.	Lambsquarters, common	60	Up
Washington to n--	Barnyardgrass-----	75	Sta.	Lambsquarters-----	75	Sta.	Pigweed, redroot-----	75	Sta.	Lambsquarters-----	90	Sta.
Wyoming-----	Foxtail, green-----	80	Down	Kochia-----	40	Up	Lambsquarters-----	40	Down	Nightshade, black-----	30	Down

1/Sta., Stationary

2/Knotweed, silversheath.

Table 52.--Sugarcane: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Florida-----	5	185	4	35.00	10.00	45.00	98	2
Louisiana-----	54	27	189	7.50	6.50	14.00	90	10
Southern-----	59	212	193	9.83	9.55	14.64	93	7
Hawaii-----	59	59	---	27.00	27.00	----	75	25
Western-----	59	59	---	27.00	27.00	----	75	25
United States-----	118	271	193	18.42	13.35	14.64	90	10

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 53.--Sugarcane: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides :	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication : of : problem	Percent of : treated : acres
Florida-----	Good	Good	Good	Up	Urgent	No	---
Louisiana-----	Good	Fair	Fair	Up	Some	No	---
Southern-----	2-Good	1-Good 1-Fair	1-Good 1-Fair	2-Up	1-Urgent 1-Some	2-No	---
Hawaii-----	Fair	Fair	---	Sta.	Urgent	No	---
Western-----	1-Fair	1-Fair	---	1-Sta.	1-Urgent	1-No	---
United States-----	2-Good 1-Fair	1-Good 2-Fair	1-Good 1-Fair	2-Up 1-Sta.	2-Urgent 1-Some	3-No	---

1/ Sta., stationary.



Table 54.--Sugarcane: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

Weed or complex	Number	Reports by region					Infestation trend						Total area
	of					Stationary	Up		Down				
	reports	NE	NC	S	W	No.:	Area	No.:	Area	No.:	Area		
							<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>		<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>	
Alexandergrass-----	2	--	--	1	1	--	---	2	53	--	---	53	
Crabgrasses-----	1	--	--	1	--	1	94	--	---	--	---	94	
Guineagrasses-----	1	--	--	--	1	--	---	1	24	--	---	24	
Johnsongrass-----	1	--	--	1	--	--	---	--	---	1	198	198	
Morningglory, threelobe	1	--	--	--	1	--	---	1	24	--	---	24	
Napiergrass-----	1	--	--	1	--	--	---	1	38	--	---	38	
Panicums-----	1	--	--	1	--	--	---	1	47	--	---	47	
Paragrass-----	1	--	--	--	1	--	---	1	24	--	---	24	
Passionflower, wingleaf	1	--	--	--	1	--	---	1	2	--	---	2	

Table 55.--Sugarcane: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/	
		Pct.			Pct.			Pct.			Pct.	
Southern:												
Florida-----	Alexandergrass-----	25	Up	Crabgrass-----	50	Sta.	Napiergrass-----	20	Up	Panicum Species-----	25	Up
Louisiana-----	Johnsongrass-----	65	Down	-----	-----	-----	-----	-----	-----	-----	-----	-----
Western:												
Hawaii-----	Alexandergrass-----	5	Up	Guineagrasses-----	20	Up	Morningglory <sup>2/</sup> -----	20	Up	Paragrass-----	20	Up
1/Sta., stationary.												
2/Morningglory, three-lobed.												
3/Passionflower, wingleaf.												
										Passionflower <sup>3/</sup> -----	2	Up

Table 56.--Legume seed crops: Estimated extent and cost of chemical weed control,  
by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre- emergence	Post- emergence	Pre- + post- emergence	Pre- emergence	Post- emergence	Pre- + post- emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Pennsylvania-----	---	3	---	---	5.25	---	95	5
Vermont-----	---	2	---	---	11.00	---	25	75
West Virginia-----	---	2/	---	---	3.00	---	100	--
Northeastern-----	---	5	---	---	7.38	---	68	32
Illinois-----	---	2	---	---	6.00	---	50	50
Minnesota-----	---	10	---	---	4.00	---	50	50
North Central-----	---	12	---	---	4.33	---	50	50
Oklahoma-----	5	---	---	4.00	---	---	100	--
South Carolina-----	1	---	1	7.00	---	7.00	90	10
Tennessee-----	---	1	---	---	2.00	---	50	50
Texas-----	---	3	---	---	2.50	---	50	50
Virginia-----	---	2/	---	---	2.25	---	100	--
Southern-----	6	4	1	4.50	2.37	7.00	80	20
California-----	30	88	2	10.00	9.00	15.00	75	25
Idaho-----	3	30	1	6.00	12.00	18.00	50	50
Montana-----	4	1	---	6.50	1.75	---	95	5
Nevada-----	2/	3	---	9.00	5.00	---	10	90
New Mexico-----	---	1	---	---	7.00	---	100	--
Oregon-----	30	---	---	4.00	---	---	60	40
Utah-----	4	---	---	30.00	---	---	20	80
Washington-----	---	20	---	---	4.00	---	90	10
Wyoming-----	---	1	---	---	6.00	---	100	--
Western-----	71	144	3	8.23	8.76	16.00	69	31
United States-----	77	165	4	7.94	8.24	13.75	69	31

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 57.--Legume seed crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Pennsylvania-----	---	Fair	---	Up	Urgent	No	---
Vermont-----	---	Good	---	Up	Some	No	---
West Virginia-----	---	Fair	---	Up	Little	No	---
Northeastern-----	---	1-Good 2-Fair	---	3-Up	1-Urgent 1-Some 1-Little	3-No	---
Illinois-----	---	Good	---	Sta.	Little	No	---
Minnesota-----	---	Fair	---	Up	Urgent	No	---
North Central-----	---	1-Good 1-Fair	---	1-Up 1-Sta.	1-Urgent 1-Little	2-No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
South Carolina-----	Fair	---	Fair	Sta.	Some	No	---
Tennessee-----	---	Fair	---	Sta.	Some	No	---
Texas-----	---	Fair	---	Up	Some	No	---
Virginia-----	---	Fair	---	Sta.	Some	No	---
Southern-----	2-Fair	3-Fair	1-Fair	2-Up 3-Sta.	5-Some	5-No	---
California-----	Fair	Fair	Good	Up	Urgent	Yes	10
Idaho-----	Fair	Fair	Fair	Up	Some	No	---
Montana-----	Fair	Fair	---	Up	Some	No	---
Nevada-----	Fair	Good	---	Sta.	Some	No	---
New Mexico-----	---	Good	---	Up	Some	No	---
Oregon-----	Fair	---	---	Up	Urgent	No	---
Utah-----	Fair	---	---	Sta.	Urgent	No	---
Washington-----	---	Good	---	Up	Some	Yes	20
Wyoming-----	---	Fair	---	Up	Urgent	No	---
Western-----	6-Fair	3-Good 4-Fair	1-Good 1-Fair	7-Up 2-Sta.	4-Urgent 5-Some	2-Yes 7-No	7
United States-----	8-Fair	5-Good 10-Fair	1-Good 2-Fair	13-Up 6-Sta.	6-Urgent 11-Some 2-Little	2-Yes 17-No	6

1/ Sta., stationary.

Table 58.--Legume seed crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region				Infestation trend						Total area
	of reports	NE	NC	S	W	No.	Area	No.	Area	No.	Area	
							1,000 acres		1,000 acres		1,000 acres	1,000 acres
Alfalfa-----	1	--	--	--	1	1	52	--	---	--	---	52
Alyssum, hoary-----	1	--	1	--	--	--	---	1	10	--	---	10
Annuals, winter-----	1	--	--	1	--	--	---	1	11	--	---	11
Barley, foxtail-----	1	--	--	--	1	1	2	--	---	--	---	2
Barnyardgrass-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Bindweed-----	1	--	--	1	--	1	4	--	---	--	---	4
Bromes-----	4	--	1	--	3	2	66	2	12	--	---	78
Carrot, wild-----	4	3	--	--	1	4	19 2/	--	---	--	---	19 2/
Catchfly, nightflowering	3	2	1	--	--	1	10	2	4 2/	--	---	14 2/
Chickweeds-----	2	1	--	1	--	--	---	1	15	1	(2/)	15 2/
Chicory-----	1	1	--	--	--	--	---	1	(2/)	--	---	(2/)
Cinquefoil-----	1	1	--	--	--	1	(2/)	--	---	--	---	(2/)
Cockle, white-----	4	2	2	--	--	1	39	3	22 2/	--	---	61 2/
*Crabgrasses-----	6	--	2	4	--	5	163 2/	1	71	--	---	234 2/
Crotalaria-----	1	--	--	1	--	1	(2/)	--	---	--	---	(2/)
Dandelions-----	3	3	--	--	--	--	---	3	10 2/	--	---	10 2/
*Docks-----	7	--	1	4	2	6	73 3/	--	---	1	4	77 3/
*Dodders-----	12	--	--	4	8	3	13 1/2/	8	96	1	3	112 1/2/
Dogfennel-----	1	--	--	1	--	1	(2/)	--	---	--	---	(2/)
Flixweed-----	1	--	--	--	1	--	---	1	18	--	---	18
*Foxtails-----	6	--	4	1	1	3	143	2	96	1	6	245
Gumweed-----	1	--	--	1	--	1	5	--	---	--	---	5
Henbit-----	3	--	1	2	--	1	7	2	88	--	---	95
*Johnsongrass-----	5	--	--	4	1	3	8	1 2/	4	1	11	23
Kochia-----	3	--	1	--	2	--	---	3	21 1/	--	---	21 1/
Lambsquarters-----	2	--	1	--	1	2	10	--	---	--	---	10
Lettuce-----	2	--	--	--	2	1	26	1	30	--	---	56
Morningglories-----	1	--	--	1	--	--	---	1	5	--	---	5
Mustards-----	2	--	1	--	1	2	60	--	---	--	---	60
Oat, wild-----	1	--	--	--	1	1	7	--	---	--	---	7
Pennycress-----	2	--	2	--	--	--	---	2	54	--	---	54
*Pigweeds 4/-----	7	--	3	2	2	7	184 2/	--	---	--	---	184 2/
*Plantains-----	9	3	1	3	2	8	91 2/	1	5	--	---	96 2/
*Quackgrass-----	7	4	3	--	--	3	61	3	12 2/	1	(2/)	73 2/
*Ragweed-----	6	--	2	4	--	6	40	--	---	--	---	40
Rocket, yellow-----	4	3	1	--	--	2	4 2/	2	18	--	---	22 2/
Ryegrasses-----	2	--	--	--	2	2	54	--	---	--	---	54
Smartweed-----	3	--	2	1	--	2	11	1	23	--	---	34
Sneezeweed, bitter--	2	--	--	2	--	2	5	--	---	--	---	5
Sowthistle, perennial	1	--	1	--	--	1	23	--	---	--	---	23
Sumpweed, rough-----	1	--	--	1	--	1	4	--	---	--	---	4
Tansymustard-----	2	--	--	--	2	--	---	1	35	1	1	36
*Thistles-----	8	2	3	--	3	5	57	3	1 2/	--	---	58
Whitetop-----	3	--	--	--	3	--	---	2	7	1	3	10

<sup>1/</sup> Does not include estimates of less than 500 acres in New Mexico.

<sup>2/</sup> Does not include estimates of less than 500 acres for all weeds reported in Connecticut, Vermont, West Virginia, Florida, and Nevada.

<sup>3/</sup> Does not include estimates of less than 500 acres in Virginia.

<sup>4/</sup> Includes amaranths.



Table 59.---Legume seed crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>												
New Hampshire	Carrot, wild	20	Sta.	Catchfly, nightfl. 2/	40	Up	Quackgrass	100	Up	Rocket, yellow	40	Sta.
New York	Carrot, wild	20	Sta.	Catchfly, nightfl. 2/	40	Up	Quackgrass	100	Up	Rocket, yellow	40	Sta.
Pennsylvania	Carrot, wild	15	Sta.	Dandelion	40	Up	Quackgrass	30	Sta.	Rocket, yellow	30	Up
Vermont	Chickweed	40	Down	Chicory	70	Up	Cinquefoil	60	Sta.	Quackgrass	75	Down
West Virginia	Dandelion	60	Up	Plantain, blackseed	50	Sta.	Plantain, buckhorn	50	Sta.	Thistle, musk	20	Up
<b>North Central:</b>												
Illinois	Dock	25	Sta.	Foxtail, giant	40	Sta.	Pigweed	20	Sta.	Thistle, Canada	15	Sta.
Iowa	Ragweed, common	25	Sta.	Smartweed	30	Sta.	Foxtails	100	Sta.	Smartweed, perennial	60	Sta.
Minnesota	Catchfly, nightfl. 2/	25	Sta.	Cockle, white	100	Sta.	Foxtails	85	Up	Smartweed, wild	60	Sta.
Missouri	Brome, Japanese	75	Sta.	Crabgrass, large	85	Up	Foxtails	100	Sta.	Smartweed	40	Up
Nebraska	Crabgrass	30	Sta.	Foxtail	100	Sta.	Pigweed, redroot	15	Sta.	Thistle, Canada	10	Sta.
North Dakota	Kochia	25	Up	Lambsquarters, common	15	Sta.	Pennygrass, field	20	Up	Rocket, yellow	50	Up
Wisconsin	Alyssum, Hoary	50	Up	Cockle, white	90	Up	Ragweed	30	Sta.	Sumpweed, rough	30	Sta.
<b>Southern:</b>												
Arkansas	Dodder	25	Down	Quackgrass	40	Sta.	Ragweed	30	Sta.	Plantain, buckhorn	30	Sta.
Florida	Amaranth species	5	Up	Crabgrass	5	Sta.	Foxtail, green	20	Down	Smartweed	40	Sta.
Kentucky	Annuals, winter	20	Up	Crabgrass	100	Sta.	Dodder	15	Up	Smartweed, bitter	90	Sta.
Oklahoma	Chickweed	20	Up	Crabgrass	95	Sta.	Dodder	30	Sta.	Smartweed	50	Sta.
South Carolina	Dock	40	Sta.	Dodder	20	Up	Johnsongrass	15	Up	Smartweed	20	Sta.
Tennessee	Crabgrass	85	Sta.	Dock, curly	40	Sta.	Johnsongrass	10	Up	Smartweed	15	Sta.
Texas	Bindweed, field	10	Sta.	Dock, curly	10	Down	Dodder	20	Sta.	Smartweed	10	Sta.
Virginia	Dock, curly	5	Sta.	Plantain, broadleaf	20	Sta.	Plantain, buckhorn	35	Up	Smartweed	35	Sta.
<b>Western:</b>												
California	Alfalfa, volunteer	50	Sta.	Dock, curly	30	Sta.	Dodder species	50	Sta.	Smartweed	25	Sta.
Idaho	Dodder	30	Up	Lettuce, prickly	60	Up	Pigweed, redroot	20	Down	Smartweed	10	Down
Montana	Brome, downy	2	Sta.	Dodder	10	Up	Foxtail, green	20	Down	Smartweed	30	Down
Nevada	Dodder	15	Sta.	Dodder	5	Sta.	Johnsongrass	20	Sta.	Smartweed	30	Down
New Mexico	Barnyardgrass	30	Sta.	Dodder	30	Sta.	Lettuce, China	60	Up	Smartweed	10	Sta.
Oregon	Carrot, wild	30	Up	Dodder, field	75	Up	Flixweed	25	Sta.	Smartweed	20	Up
Utah	Brome, downy	15	Up	Lambsquarters	30	Sta.	Oats, wild	30	Sta.	Smartweed	20	Sta.
Washington	Dodder	25	Sta.	Brome, downy	60	Up	Dock, curly	30	Sta.	Smartweed	20	Up
Wyoming	Burley, foxtail	25	Sta.	Brome, downy	60	Up	Dock, curly	30	Sta.	Smartweed	20	Up

1/Sta., stationary.

2/Catchfly, nightflowering.

3/Minnesota also reported: lamb's-ear, Canada 60 Sta.

4/Missouri also reported: Pennygrass, field 60 Up.

Table 60.--Grass seed crops: Estimated extent and cost of chemical weed control,  
by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre- emergence	Post- emergence	Pre- + post- emergence	Pre- emergence	Post- emergence	Pre- + post- emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Pennsylvania-----	---	1	---	---	4.60	---	84	16
Northeastern-----	---	1	---	---	4.60	---	84	16
Kansas-----	---	2	---	---	2.00	---	50	50
Minnesota-----	---	25	---	---	2.50	---	50	50
North Central-----	---	27	---	---	2.46	---	50	50
Florida-----	---	1	---	---	4.00	---	100	---
South Carolina-----	---	1	1	---	1.00	1.00	65	35
Tennessee-----	---	2	---	---	2.00	---	50	50
Texas-----	3	3	2	5.00	2.50	9.50	50	50
Virginia-----	---	3	---	---	6.50	---	80	20
Southern-----	3	10	3	5.00	3.60	6.67	61	39
Idaho-----	---	8	---	---	5.00	---	100	---
Nevada-----	---	2/	---	---	2.00	---	100	---
Oregon-----	150	2/	2/	8.00	3.00	11.00	80	20
Utah-----	---	2/	---	---	2.00	---	20	80
Washington-----	---	10	---	---	3.00	---	90	10
Western-----	150	18	2/	8.00	3.89	11.00	82	18
United States-----	153	56	3	7.94	3.16	6.67	76	24

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 61.--Grass seed crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of treated acres
Pennsylvania-----	---	Fair	---	Up	Some	No	---
Northeastern-----	---	1-Fair	---	1-Up	1-Some	1-No	---
Kansas-----	---	Good	---	Up	Some	No	---
Minnesota-----	---	Fair	---	Up	Urgent	No	---
North Central-----	---	1-Good 1-Fair	---	2-Up	1-Urgent 1-Some	2-No	---
Florida-----	---	Fair	---	Sta.	Little	No	---
South Carolina-----	---	Good	Good	Sta.	Some	No	---
Tennessee-----	---	Good	---	Up	Some	No	---
Texas-----	Good	Fair	Good	Up	Some	Yes	50
Virginia-----	---	Poor	---	Up	Urgent	No	---
Southern-----	1-Good	2-Good 2-Fair 1-Poor	2-Good	3-Up 2-Sta.	1-Urgent 3-Some 1-Little	1-Yes 4-No	25
Idaho-----	---	Good	---	Up	Some	Yes	2
Nevada-----	---	Good	---	Up	Some	No	---
Oregon-----	Good	Good	Good	Sta.	Little	No	---
Utah-----	---	Good	---	Sta.	Some	No	---
Washington-----	---	Good	---	Sta.	Some	No	---
Western-----	1-Good	5-Good	1-Good	2-Up 3-Sta.	4-Some 1-Little	1-Yes 4-No	---
United States-----	2-Good	8-Good 4-Fair 1-Poor	3-Good	8-Up 5-Sta.	2-Urgent 9-Some 2-Little	2-Yes 11-No	2

1/ Sta., stationary.

Table 62.--Grass seed crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region					Infestation trend					Total area 100 acres
		NE	NC	S	W	No.	Area	No.	Area	No.	Area	
Alyssum, hoary-----	1	--	1	--	--	--	---	1	28	--	---	28
Barley, little-----	2	--	--	2	--	--	---	1	40	1	200	240
Bentgrass, wind-----	1	--	--	--	1	--	---	1	7	--	---	7
Bermudagrass-----	1	--	--	1	--	1	5	--	---	--	---	5
Bindweed, field-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
*Bluegrass, annual---	3	--	--	--	3	1	(1/)	1	12	1	1,060	1,072 1/
*Bromes-----	9 2/	--	3	--	6 2/	5	1,347 1/	3	(1/)	--	---	1,347 1/
Buckwheat, id-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Buttercup-----	1	--	--	1	--	--	---	1	50	--	---	50
Carpetgrass-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)
Carrot, wild-----	1	1	--	--	--	1	25	--	---	--	---	25
Catchfly-----	1	--	1	--	--	1	130	--	---	--	---	130
Cheat-----	1	--	--	1	--	--	---	1	340	--	---	340
Chickweeds-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Chicory-----	1	--	--	1	--	1	17	--	---	--	---	17
Cockle, white-----	2	--	2	--	--	1	530	1	50	--	---	580
Cocklebur-----	1	--	1	--	--	--	---	--	---	1	50	50
*Crabgrass-----	3	--	--	3	--	2	218	--	---	1	(1/)	218 1/
Dallisgrass-----	1	--	--	1	--	1	2	--	---	--	---	2
Docks-----	2	--	--	2	--	1	130	1	6	--	---	136
Dogfennel-----	1	--	--	1	--	1	40	--	---	--	---	40
Fescue, rattail-----	1	--	--	--	1	1	850	--	---	--	---	850
Flabane, red-----	1	--	1	--	--	--	---	1	840	--	---	840
*Flax-----	6	--	4	--	2	4	1,450 1/	2	(1/)	--	---	1,450 1/
*Flax, fl-----	3	--	--	3	--	2	93	1	340	--	---	433
Henbit-----	1	--	--	--	1	1	14	--	---	--	---	14
Horsenettle-----	1	--	--	1	--	1	40	--	---	--	---	40
Horseweed-----	1	--	1	--	--	1	960	--	---	--	---	960
Indigo, hairy-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)
Johnsongrass-----	1	--	--	1	--	--	---	1	30	--	---	30
Kochia-----	3	--	2	--	1	1	(1/)	1	(1/)	1	(1/)	(1/)
*Lambsquarters-----	3	1	1	1	--	3	75	--	---	--	---	75
Morningglories-----	1	--	--	1	--	--	---	1	50	--	---	50
Mustards-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Nightshade, silverleaf	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)
Oat, wild-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
Panicums-----	1	--	1	--	--	1	(1/)	--	---	--	---	(1/)
Paspalums-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)
Pennycress, field---	1	--	1	--	--	--	---	1	11	--	---	11
Pepperweed-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
*Pigweeds-----	4	1	1	2	--	3	61 1/	--	---	1	(1/)	61 1/
*Plantains-----	3	1	--	2	--	3	236	--	---	--	---	236
*Quackgrass-----	7 2/	--	3	1	3 2/	3	585 1/	3	11 1/	--	---	596 1/
Ragweed-----	2	--	--	2	--	2	70 1/	--	---	--	---	70 1/
Rocket, yellow-----	2	1	1	--	--	1	30	1	28	--	---	58
Ryegrasses-----	2	--	--	1	1	2	1,283	--	---	--	---	1,283
Sandburs-----	3	--	1	2	--	--	---	2	7	1	(1/)	7 1/
Signalgrasses-----	1	--	--	1	--	--	---	1	1	--	---	1
Smartweeds-----	1	--	1	--	--	1	50	--	---	--	---	50
Sneezeweed, bitter--	1	--	--	1	--	--	---	1	70	--	---	70

See footnotes at end of table.

Table 62.--Grass seed crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968--continued

Weed or complex	: Number	: Reports by region				: Infestation trend					:	
	: of	: Stationary				: Up		: Down		: Total		
	: reports	: NE	: NC	: S	: W	: No.	: Area	: No.	: Area	: No.	: Area	: area
							<u>100 acres</u>		<u>100 acres</u>		<u>100 acres</u>	<u>100 acres</u>
Sorrel, red-----	1	--	--	--	1	1	320	--	---	--	---	320
Sunflower-----	2	--	1	1	--	--	---	--	---	2	50 1/	50 1/
Thistle, Russian----	1	--	--	--	1	--	---	--	---	1	(1/)	(1/)
Thistles-----	4	--	2	--	2	1	(1/)	2	720 1/	1	(1/)	720 1/
Witchgrass-----	1	--	--	--	1	--	---	1	10	--	---	10

1/ No acreages estimated for weeds reported in Nebraska, North Dakota, Florida, Texas, Idaho, Montana, Utah, Wyoming, and Hawaii.

2/ Weeds reported by Idaho included in total and regional counts but not classified by infestation trend.



Table 63.--Grass seed crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1965

Region and State	Weed	Infestation Acres infested		Weed	Infestation Acres infested		Weed	Infestation Acres infested		Weed	Infestation Acres infested	
		Pct.	(1)		Pct.	(1)		Pct.	(1)		Pct.	(1)
Northeastern:												
Pennsylvania---	Carrot, wild	25	Sta.	Lambsquarters	35	Sta.	Plantain, black	45	Sta.	Rocket, yellow	30	Sta.
North Central:												
Iowa-----	Cocklebur	70	Down	Foxtails	70	Sta.	Sunflower	70	Down	Night-flowering	25	Sta.
Minnesota-----	Brome, downy	50	Sta.	Cockle, white	100	Sta.	Quackgrass	100	Sta.	Thistles	60	Up
Missouri-----	Brome, Japanese	40	Sta.	Pleabane, rough	70	Up	Foxtails	80	Sta.	Sandbur	40	Up
Nebraska-----	Brome, downy	100	Sta.	Foxtails	30	Sta.	Panicum	30	Sta.	Thistle, Canada	15	Up
North Dakota---	Kochia	10	Sta.	Lambsquarters, common	5	Sta.	Quackgrass	15	Up	Rocket, yellow	50	Up
Wisconsin-----	Alyssum, hairy	50	Up	Cockle, white	90	Up	Pennycress, field	20	Up			
Southern:												
Florida-----	Carpetgrass	5	Sta.	Indigo, hairy	5	Sta.	Paspalum	10	Sta.			
Kentucky-----	Barley, little	30	Down	Cheat	50	Up	Dock	20	Sta.	Plantain	30	Sta.
Mississippi-----	Dallisgrass	15	Sta.	Hydrgrass	10	Sta.	Signalgrass	3	Up			
Oklahoma-----	Bermudagrass	15	Sta.	Craygrass	85	Sta.	Johnsongrass	90	Up	Sandbur	20	Up
South Carolina---	Barley, little	30	Up	Dogfennel	25	Sta.	Garlic, wild	40	Sta.	Unweeded, bitter	50	Up
Tennessee-----	Buttercup	20	Up	Crabgrass	90	Sta.	Lambsquarters	15	Sta.	It, weed	30	Sta.
Texas-----	Crabgrass	90	Down	Nightshade, silverleaf	25	Sta.	Pigweed	90	Down	Sunflower	25	Down
Virginia-----	Groundleaf plantain	10	Sta.	Chicory	15	Sta.	Dock, curly	5	Up	Quackgrass	10	Up
Western:												
Idaho-----	Brome, downy	20	Up	Quackgrass	30	Sta.	Foxtail, green	10	Up	Oats, wild	30	Up
Montana-----	Brome, downy	50	Down	Buckwheat, wild	5	Sta.	Fescue, rattail	40	Sta.	Sorrel, red	15	Sta.
Oregon-----	Bluegrass, annual	10	Up	Brome, downy	25	Up	Peppercorn, yellow	30	Sta.	Thistle, Canada	10	Sta.
Utah-----	Timothy	15	Up	Bluegrass, annual	25	Up	Brome, downy	35	Sta.	Thistle, Russian	60	Down
Washington-----	Cent. russ, wind	15	Up	Foxtail, green	50	Up	Kochia	60	Down			
Wyoming-----	Brome, downy	50	Up	Crabgrass	40	Sta.	Quackgrass	20	Sta.			
Alaska-----	Bluegrass, annual	20	Sta.	Cockleweed	40	Sta.						

1/Sta., stationary

2/Up, up; down, down

3/Up, up; down, down

# HORTICULTURAL CROPS

## (See General Limitations)

Although horticultural crop acreages are small compared with many of the agronomic crops, the gross monetary return for these crops is large. These higher crop-unit values are able to support the cost of numerous weed control operations to facilitate production. Efficient herbicidal weed control methods, although costly, are often economically feasible because of the scarcity and high cost of hand labor. This explains the growers' acceptance of high treatment costs for some horticultural crops.

Two or three vegetable crops are often grown in succession on the same land each year. Therefore, growers carefully select and use herbicides and attempt to avoid the accumulation of chemical residues in soils. This practice, which may involve the application of three or more herbicides in succession, provides control over a much larger group of weed species than would be possible with a single herbicide or with a single treatment. As a result, the weeds prevalent in the several crops differ substantially within the same geographic region. Specialized cultural practices and the crop's growth habits are additional factors that influence the prevalence of weed species. These factors should be considered when interpreting the following detailed information.

Herbicides are vitally important in producing horticultural crops. Nevertheless, they do not supplant cultural practices, such as cultivation, crop rotation, fallowing, and similar methods, where these prove effective in controlling weeds.

# HORTICULTURAL CROPS--VEGETABLES

## (See General Limitations)

Every region of the United States has areas devoted to the commercial production of vegetable crops for the fresh market or for the processing industry. Therefore, numerous soils, climatic conditions, cultural practices, weed species, and crop varieties are involved in the discussion of weed control practices in these crops. Each of these factors has a major influence on the effectiveness of weed control methods. The tabular data presented in tables 64 through 111 are best understood if viewed in this light.<sup>10</sup> Approximately 66 percent of the sweet corn acreage and 36 percent of the acreage of other vegetables were treated with herbicides in 1968 (table 1).

Data on the extent, costs, and usage of herbicides in sweet corn and in other vegetables are summarized in tables 1 through 7. The 10 weeds reported most frequently in all vegetable crops (in order of decreasing frequency) were:

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<sup>10</sup>Preemergence and postemergence refer to emergence of weeds in perennial plantings of vegetable crops.

pigweeds and other amaranths, crabgrasses, lambsquarters, nutsedges, foxtails, ragweeds, barnyardgrass, purslane, quackgrass, and chickweed. The most frequently reported weeds in individual crops are designated in the summary weed table for each crop. Tables for the individual vegetable crops are grouped at the end of the discussions (see pages 85 through 130).

## Sweet Corn

Over 700,000 acres of sweet corn were grown in 1968. On-the-farm value of this crop was more than \$128 million. Approximately 461,000 acres, equivalent to 66 percent of the sweet corn acreage, were treated with herbicides. Of this acreage, 67 percent was treated before emergence; 24 percent was treated after emergence; and 9 percent was treated both before and after emergence. The total cost of herbicides and applications was \$2.8 million (tables 64, 65, 66, and 67).

## Potatoes

Approximately 1.4 million acres of potatoes were planted in 1968. On-the-farm value was \$609 million. The acreage treated with herbicides constituted 31 percent of the total, or approximately 432,000 acres. The total cost of herbicides and applications was \$3.7 million. Preemergence treatments were applied on 86 percent of the treated acreage; postemergence on 10 percent; and the combination of preemergence and postemergence treatments on 4 percent (tables 68, 69, 70, and 71).

## Asparagus

The total area of asparagus harvested in 1968 was 125,000 acres. The on-the-farm value of the crop was \$60.8 million. The percentage of the total acreage treated was 89 percent, or approximately 111,100 acres. The total cost of treatment was \$1.2 million. The distribution among various methods of treatment was: preemergence, 55 percent; postemergence, 12 percent; and the preemergence plus postemergence combination, 33 percent (tables 72, 73, 74, and 75).

## Vegetable Legumes

Approximately 2.6 million acres of vegetable legumes, including lima beans, snap beans, peas, and dry edible beans, were harvested during 1968. The on-the-farm value of these crops was approximately \$353.7 million. Herbicides were applied on 903,000 acres, or on about 34 percent of the total acreage. Preemergence treatments were applied on 63 percent of this acreage; postemergence treatments on 27 percent; and combined treatments on 10 percent. The total cost of herbicides and applications was \$7.0 million (tables 76, 77, 78, and 79).

## Root And Bulb Crops

Approximately 334,515 acres of root and bulb crops, including carrots, onions, sweetpotatoes, and garlic, were harvested in 1968. The on-the-farm value was \$264.5 million. Of the total area harvested, about 64 percent, or approximately 226,000 acres, was treated with herbicides. The total cost of

herbicides and applications amounted to \$4.7 million. Preemergence treatments were applied on 32 percent of the total area treated; postemergence treatments on 32 percent; and the combination of both methods on 36 percent (tables 80, 81, 82, and 83).

## Vine Crops

During 1968, a total of approximately 615,000 acres of vine crops, including cucumbers, cantaloupes, and watermelons, was harvested. The on-the-farm value of these crops was \$227 million. Herbicides were applied on 108,000 acres, or on approximately 18 percent of the total acreage. Preemergence treatments were applied on 94 percent of this acreage; postemergence treatments on 3 percent; and combined treatments on 3 percent. The total cost of herbicides and applications was \$1.2 million (tables 84, 85, 86, and 87).

## Solanaceous Fruits

Approximately 568,000 acres of solanaceous vegetable fruit crops, including eggplants, peppers, and tomatoes, were harvested in 1968. The on-the-farm value of these crops was \$568 million. Herbicides were applied on 263,500 acres, or on approximately 46 percent of the total acreage. Preemergence treatments were applied on 84 percent of this acreage; postemergence treatments on 6 percent; and combined treatments on 10 percent. The total cost of herbicides and applications was \$3.7 million (tables 88, 89, 90, and 91).

## Greens

Approximately 40,000 acres of vegetable greens, including kale and spinach, were harvested during 1968. The on-the-farm value of these crops was \$15 million. Herbicides were applied on 15,000 acres, or on approximately 37 percent of the total acreage. Preemergence treatments were applied on 80 percent of this acreage; postemergence treatments on 13 percent; and combined treatments on 7 percent. The total cost of herbicides and applications was \$112,800 (tables 92, 93, 94, and 95).

## Salad Crops

Approximately 264,000 acres of salad crops, including celery, escarole, and lettuce, were harvested during 1968. The on-the-farm value of these crops was \$279.7 million. Herbicides were applied on 138,300 acres, or on approximately 52 percent of the total acreage. Preemergence treatments were applied on 90 percent of this acreage; postemergence treatments on 2 percent; and combined treatments on 8 percent. The total cost of herbicides and applications was \$1.8 million (tables 96, 97, 98, and 99).

## Cole Crops

Approximately 185,000 acres of cole crops, including broccoli, brussels sprouts, cabbage, and cauliflower, were harvested during 1968. The on-the-farm value of these crops was \$125 million. Herbicides were applied on 86,800 acres, or on approximately 47 percent of the total acreage. Preemergence treatments were applied on 87 percent of this acreage; postemergence treatments



on 9 percent; and combined treatments on 4 percent. The total cost of herbicides and applications was \$851,300 (tables 100, 101, 102, and 103).

## Miscellaneous Vegetable Crops

Agricultural Statistics (1969) reported that artichokes, spearmint, and peppermint were harvested on 105,600 acres in 1968. However, Agricultural Statistics does not cover a wide variety of other minor vegetable crops that are harvested from small acreages for local consumption in nearly all sections of the United States. Of all miscellaneous vegetable crop plantings, State specialists reported that approximately 24,000 acres were treated with herbicides during 1968. Preemergence treatments were applied on 81 percent of this acreage; postemergence treatments on 17 percent; and combined treatments on 2 percent. The total cost of herbicides and applications was \$89,200 (tables 104, 105, 106, and 107).

## All Vegetable Seed Crops

Approximately 173,000 acres of 42 different vegetable seed crops were grown during 1968. About 239 million pounds of seed were produced. Herbicides were applied on 5,000 acres, or on about 3 percent of the total acreage. Preemergence treatments were applied on 80 percent of this acreage, while postemergence treatments were made on the remaining 20 percent. The application of combined treatments was limited. The total cost of herbicides was approximately \$70,000 (tables 108, 109, 110, and 111).



Table 64.--Sweet corn: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre 1/			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	3	0.5	0.1	9.00	7.00	15.00	65	35
Delaware-----	2	1	.1	4.00	3.00	6.00	80	20
Maine-----	1	1	.5	7.50	7.50	14.50	75	25
Maryland-----	24	---	---	6.00	---	---	75	25
Massachusetts-----	8	---	---	9.00	---	---	90	10
New Hampshire-----	.3	2/	2/	9.00	10.00	10.00	90	10
New Jersey-----	7	---	---	4.50	---	---	90	10
New York-----	25	5	---	12.00	7.50	---	75	25
Pennsylvania-----	8	1	---	6.50	6.50	---	50	50
Vermont-----	.1	.1	---	9.00	9.00	---	100	---
West Virginia-----	.5	.2	2/	10.00	8.00	12.00	100	---
Northeastern-----	78.9	8.8	.7	8.25	6.88	13.36	75	25
Illinois-----	36	18	6	8.00	1.00	10.00	60	40
Iowa-----	4	2	1	4.00	1.50	6.50	90	10
Kansas-----	.8	---	---	7.00	---	---	100	---
Michigan-----	10	4	12	7.50	3.00	6.00	75	25
Minnesota-----	75	2	---	4.00	3.00	---	80	20
Wisconsin-----	44	48	5	6.65	4.75	10.70	30	70
North Central-----	169.8	74.0	24.0	5.76	3.61	8.00	57	43
Alabama-----	1	.1	---	5.00	2.00	---	80	20
Florida-----	20	10	15	3.00	2.00	4.00	90	10
Kentucky-----	.1	---	---	5.00	---	---	100	---
North Carolina-----	1	1	1	8.00	2.00	10.00	75	25
Oklahoma-----	.8	.2	---	7.00	2.00	---	95	5
South Carolina-----	1	.5	2	10.00	3.00	13.00	90	10
Tennessee-----	.4	---	---	8.50	---	---	90	10
Virginia-----	2	.5	---	4.25	2.25	---	90	10
Southern-----	26.3	12.3	18.0	3.84	2.05	5.33	89	11
California-----	1	2	---	8.00	5.00	---	80	20
Idaho-----	2	5	---	6.00	2.00	---	25	75
Oregon-----	30	5	---	10.00	10.00	---	70	30
Utah-----	---	1	---	---	2.50	---	80	20
Washington-----	1	1	---	5.00	4.00	---	90	10
Hawaii-----	.3	---	2/	30.00	---	35.00	100	---
Western-----	34.3	14.0	2/	9.74	5.46	35.00	65	35
United States-----	309.3	109.1	42.7	6.67	3.94	6.96	65	35

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 65.--Sweet corn: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Good	Fair	Fair	Up	Some	Yes	10
Delaware-----	Fair	Fair	Good	Sta.	Some	No	---
Maine-----	Good	Good	Good	Up	Little	Yes	50
Maryland-----	Good	---	---	Up	Little	Yes	10
Massachusetts-----	Good	Fair	Fair	Up	Some	Yes	10
New Hampshire-----	Good	Fair	Good	Up	Some	No	---
New Jersey-----	Good	---	---	Up	Some	No	---
New York-----	Good	Good	---	Sta.	Little	Yes	10
Pennsylvania-----	Good	Good	---	Up	Some	No	---
Vermont-----	Good	Good	---	Up	Some	No	---
West Virginia-----	Good	Fair	Good	Up	Some	No	---
Northeastern-----	10-Good 1-Fair	4-Good 5-Fair	4-Good 2-Fair	9-Up 2-Sta.	8-Some 3-Little	5-Yes 6-No	9
Illinois-----	Good	Good	Good	Sta.	Some	Yes	30
Iowa-----	Good	Good	Good	Sta.	Some	No	---
Kansas-----	Fair	---	---	Up	Some	Yes	70
Michigan-----	Good	Good	Good	Up	Some	Yes	10
Minnesota-----	Good	Good	---	Up	Urgent	No	---
Wisconsin-----	Good	Fair	Good	Up	Some	Yes	75
North Central-----	5-Good 1-Fair	4-Good 1-Fair	4-Good	4-Up 2-Sta.	1-Urgent 5-Some	4-Yes 2-No	35
Alabama-----	Good	Good	---	Up	Some	No	---
Florida-----	Good	Good	Good	Sta.	Little	No	---
Kentucky-----	Good	---	---	Up	Some	Yes	30
North Carolina-----	Good	Good	Good	Up	Some	Yes	10
Oklahoma-----	Good	Fair	---	Sta.	Some	Yes	75
South Carolina-----	Good	Good	Good	Sta.	Some	No	---
Tennessee-----	Good	---	---	Sta.	Some	No	---
Virginia-----	Good	Good	---	Up	Some	Yes	20
Southern-----	8-Good	5-Good 1-Fair	3-Good	4-Up 4-Sta.	7-Some 1-Little	4-Yes 4-No	3
California-----	Good	Poor	---	Up	Urgent	No	---
Idaho-----	---	Good	Fair	Up	Some	Yes	15
Oregon-----	Good	Fair	---	Sta.	Some	Yes	20
Utah-----	Good	Fair	---	Up	Urgent	Yes	50
Washington-----	Good	Good	---	Sta.	Some	Yes	30
Hawaii-----	Good	---	Good	Sta.	Some	No	---
Western-----	5-Good	2-Good 2-Fair 1-Poor	1-Good 1-Fair	3-Up 3-Sta.	2-Urgent 4-Some	4-Yes 2-No	19
United States-----	28-Good 2-Fair	15-Good 9-Fair 1-Poor	12-Good 3-Fair	20-Up 11-Sta.	3-Urgent 24-Some 4-Little	17-Yes 14-No	24

1/ Sta., stationary.

Table 66.--Sweet corn: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

	Number	Reports by region				Infestation trend						Total		
	of					Stationary	Up	Down						
Weed or complex	reports	NE	NC	S	W	No.	Area	No.	Area	No.	Area	area		
							100 acres		100 acres		100 acres	100 acres		
*Barnyardgrass-----	10	5	--	--	5	6	612	3	186	--	---	804 1/		
Bermudagrass-----	3	--	--	2	1	1	(2/)	1	7	--	---	56 1/		
Bindweeds-----	4	2	1	--	1	2	5	2	30	--	---	35		
Bromes-----	1	--	1	--	--	1	18	--	---	--	---	18		
Cocklebur-----	4	--	1	3	--	4	88	2/	---	--	---	88		
*Crabgrasses-----	18	8	1	9	--	10	278	2/	4	33	1	10	628 1/	
Crowfootgrass-----	1	--	--	1	--	--	---	--	---	--	---	295 1/		
Fleabane, rough-----	1	--	1	--	--	--	---	1	16	--	---	16		
*Foxtails-----	15	4	6	1	4	8	528	2/	4	1,281	3/	3	356 4/	
Goosegrass-----	2	--	--	2	--	1	4	1	2	--	---	---	2,165 3/4/	
Horsenettle-----	1	1	--	--	--	1	12	--	---	--	---	---	12	
Horseweed-----	1	--	1	--	--	1	18	--	---	--	---	---	18	
Jimsonweed-----	1	--	1	--	--	--	---	1	27	--	---	---	27	
*Johnsongrass-----	5	--	--	5	--	2	21	3	12	--	---	---	33	
Junglerice-----	1	--	--	1	--	--	---	1	3	--	---	---	3	
Kochia-----	1	--	--	--	1	1	6	--	---	--	---	---	6	
Ladysthumb-----	1	1	--	--	--	--	---	1	(2/)	--	---	---	(2/)	
*Lambsquarters-----	10	4	1	1	4	8	1,141	--	---	1	(2/)	---	1,142 1/	
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	---	(1/2/)	
Morningglories-----	2	--	--	2	--	2	9	--	---	--	---	---	9	
Nightshades-----	1	--	1	--	--	--	---	--	---	--	---	---	(1/2/)	
*Nutsedges-----	15	7	1	6	1	5	25	2/	7	40	2/	1	2	166 1/
*Panicum, fall-----	8	6	1	1	--	2	15	5	109	2/	--	---	---	130 1/
Peavine-----	1	--	1	--	--	--	---	1	41	--	---	---	41	
*Pigweeds 5/-----	19	5	2	6	6	15	2,627	2/	--	---	2	98	---	2,899 1/
Purslane-----	1	--	--	--	1	1	48	--	---	--	---	---	48	
Pusley, Florida-----	2	--	--	1	1	1	---	2/	1	16	--	---	---	16
*Quackgrass-----	13	7	2	--	4	4	54	3	58	5	1,276	---	1,390 1/	
Ragweeds-----	3	2	--	1	--	2	135	2/	--	---	1	61	---	196
Ryegrass-----	1	--	--	--	1	1	216	--	---	--	---	---	---	216
Sandburs-----	2	--	--	--	2	--	---	2	25	--	---	---	---	25
Sicklepod-----	1	--	--	1	--	1	(2/)	--	---	--	---	---	---	(2/)
*Smartweeds-----	4	--	2	1	1	4	229	--	---	--	---	---	---	229
Sunflower-----	1	--	1	--	--	--	---	1	79	--	---	---	---	79
Thistles-----	2	--	1	--	1	--	---	1	14	1	2	---	---	16
Velvetleaf-----	3	1	2	--	--	2	149	1	573	--	---	---	---	722
Witchgrass-----	1	1	--	--	--	--	---	1	(2/)	--	---	---	---	(2/)

- 1/ Reports and acreage estimates for weeds reported in Rhode Island, Kansas, and Florida are included in regional and total figures but not in figures for infestation trends.
- 2/ Figures do not include estimates of less than 500 acres for certain weeds reported in Vermont, West Virginia, Georgia, Kentucky, Tennessee, and Hawaii.
- 3/ Includes estimates of 127,400 acres of green foxtail but not 38,200 acres of giant foxtail reported in Wisconsin.
- 4/ Includes estimates of 27,100 acres of giant foxtail but not 20,300 acres of yellow foxtail reported in Illinois.
- 5/ Includes all amaranths.

Table 67. Sweet corn: Five most important weeds listed alphabetically by states within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		
		Pct.	Acres Trend		Pct.	Acres Trend		Pct.	Acres Trend		Pct.	Acres Trend		Pct.	Acres Trend	
Northeastern:																
Connecticut	Barnyardgrass	10	Sta.	Crabgrass	30	Up	Nutsedge	10	Sta.	Panicum, fall	10	Sta.	Quackgrass	10	Down	
Delaware	Bindweed, field	10	Sta.	Crabgrass	25	Sta.	Foxtail, green	25	Sta.	Nutsedge	25	Sta.	Panicum, fall	25	Sta.	
Maine	Barnyardgrass	10	Sta.	Crabgrass	60	Up	Lambsquarters	30	Sta.	Pigweed	30	Sta.	Quackgrass	40	Sta.	
Maryland	Crabgrass	40	Sta.	Foxtail	60	Sta.	Lambsquarters	30	Sta.	Pigweed	50	Sta.	Velvetleaf	25	Sta.	
New Hampshire	Barnyardgrass	15	Sta.	Bindweed	5	Sta.	Crabgrass	50	Up	Nutsedge	10	Down	Quackgrass	20	Sta.	
New Jersey	Crabgrass	25	Sta.	Foxtails	25	Sta.	Horsebottle	10	Sta.	Nutsedge	15	Up	Panicum, fall	30	Up	
New York	Barnyardgrass	20	Up	Lambsquarters	90	Sta.	Pigweed, redroot	40	Sta.	Quackgrass	30	Down	Ragweed	40	Sta.	
Pennsylvania	Foxtail, yellow	35	Down	Panicum, fall	10	Up	Pigweed, redroot	20	Down	Ragweed	25	Down	Quackgrass	45	Down	
Rhode Island	Barnyardgrass	60	Down	Crabgrass	95	Down	Nutsedge	10	Down	Panicum, fall	60	Down	Quackgrass	45	Down	
Vermont	Crabgrass	20	Up	Lambsquarters	20	Down	Nutsedge	20	Up	Pigweed, redroot	20	Down	Quackgrass	45	Down	
West Virginia	Ladysthumb	15	Up	Nutsedge	30	Sta.	Panicum, fall	30	Up	Quackgrass	50	Up	Witchgrass	20	Up	
North Central:																
Illinois	Foxtail, giant	40	Down	Foxtail, yellow	30	Down	Smartweed, Pa.	100	Sta.	Sunflower	100	Up	Velvetleaf	100	Sta.	
Iowa	Cocklebur, common	100	Sta.	Foxtails	100	Sta.	Mercury, three-seeded	5	Down	Nightshade	5	Down	Pigweed	15	Down	
Kansas	Crabgrass	15	Down	Lambsquarters	20	Down	Mercury	20	Down	Nightshade	5	Down	Pigweed	15	Down	
Michigan	Nutsedge	5	Up	Quackgrass	20	Down	Foxtails	90	Sta.	Horseweed	80	Sta.	Thistles	20	Up	
Missouri	Brome, Japanese	80	Sta.	Fleabane, rough	70	Up	Panicum, fall	30	Up	Peavine	30	Up	Smartweed	20	Sta.	
Ohio	Bindweed	20	Up	Dimsonweed	20	Up	Quackgrass	100	Sta.	Down	Velvetleaf	45	Up	Smartweed	20	Sta.
Wisconsin	Foxtail, giant	30	Up	Pigweed, redroot	100	Sta.	Quackgrass	90	Down	Velvetleaf	45	Up	Smartweed	20	Sta.	
Southern:																
Alabama	Crabgrass	100	Sta.	Johnsongrass	30	Up	Nutsedge	20	Sta.	Musley, Florida	50	Up	Smartweed	30	Sta.	
Florida	Amaranth, shiny	35	Down	Bermudagrass	10	Down	Crabgrass, large	60	Down	Crowfootgrass	60	Down	Nutsedge, purple	20	Down	
Georgia	Cocklebur	5	Sta.	Crabgrass	90	Sta.	Morning glory	30	Sta.	Pigweed	30	Sta.	Sicklepod	5	Sta.	
Kentucky	Crabgrass	100	Sta.	Foxtail, giant	100	Sta.	Pigweed	30	Sta.	Ragweed	60	Sta.	Sicklepod	5	Sta.	
North Carolina	Crabgrass	40	Sta.	Goosegrass	10	Sta.	Lambsquarters	25	Sta.	Nutsedge	15	Up	Pigweed	10	Sta.	
Oklahoma	Bermudagrass	30	Up	Crabgrass	90	Sta.	Johnsongrass	20	Sta.	Junglerice	15	Up	Pigweed	10	Sta.	
South Carolina	Cocklebur	50	Sta.	Crabgrass	60	Sta.	Johnsongrass	20	Sta.	Nutsedge	30	Sta.	Pigweed	10	Sta.	
Tennessee	Cocklebur	25	Sta.	Crabgrass	40	Down	Johnsongrass	5	Up	Morning glory	40	Sta.	Nutsedge	10	Up	
Virginia	Crabgrass	30	Sta.	Goosegrass	5	Up	Johnsongrass	5	Up	Nutsedge	15	Up	Panicum, fall	15	Up	
Western:																
California	Barnyardgrass	70	Up	Lambsquarters	40	Sta.	Pigweed, redroot	50	Sta.	Purslane	30	Sta.	Smartweed	10	Up	
Idaho	Barnyardgrass	20	Sta.	Foxtail, green	90	Sta.	Lambsquarters	50	Sta.	Pigweed	40	Sta.	Smartweed	10	Up	
Montana	Foxtail, green	50	Up	Kochia	50	Sta.	Pigweed, rough	50	Sta.	Quackgrass	10	Sta.	Smartweed	10	Up	
Oregon	Barnyardgrass	50	Sta.	Lambsquarters	50	Sta.	Pigweed	50	Sta.	Quackgrass	10	Sta.	Smartweed	10	Up	
Utah	Barnyardgrass	50	Up	Bindweed, field	25	Up	Foxtail, green	15	Sta.	Pigweed, redroot	95	Sta.	Smartweed	20	Up	
Washington	Barnyardgrass	60	Sta.	Lambsquarters	60	Sta.	Pigweed, redroot	60	Sta.	Quackgrass	10	Up	Smartweed	20	Up	
Hawaii	Bermudagrass	15	Sta.	Foxtail, bristly	30	Up	Nutsedge, purple	30	Up	Musley, Florida	15	Sta.	Smartweed	20	Up	

1/ Sta., stationary.

Table 68.--Potatoes: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2.4	2.4	0.6	18.00	18.00	21.00	100	--
Delaware-----	4	3	.1	3.00	25.00	28.00	90	10
Maine-----	130	10	5	4.00	4.00	8.00	98	2
Maryland-----	1.5	---	---	10.00	---	---	100	--
Massachusetts-----	2.3	2.3	.5	18.00	18.00	21.00	90	10
New Hampshire-----	2	.5	---	10.00	10.00	---	100	--
New Jersey-----	8	---	---	15.00	---	---	90	10
Pennsylvania-----	29	---	2.5	12.50	---	15.00	85	15
Rhode Island-----	3	1	1	10.00	10.00	20.00	100	--
Vermont-----	.5	1	---	10.00	15.00	---	100	--
West Virginia-----	.3	.1	---	20.00	30.00	---	90	10
Northeastern-----	183.0	20.3	9.7	6.42	11.46	12.72	95	5
Illinois-----	1	---	---	10.00	---	---	80	20
Iowa-----	.5	---	.5	4.00	---	4.00	100	--
Kansas-----	.8	---	---	13.00	---	---	100	--
Michigan-----	40	---	---	8.00	---	---	60	40
Ohio-----	5	1	---	12.00	6.00	---	75	25
South Dakota-----	1	---	---	13.00	---	---	70	30
Wisconsin-----	30	5	2	10.00	6.00	9.00	100	--
North Central-----	78.3	6.0	2.5	9.14	6.00	8.00	79	21
Alabama-----	1	---	---	5.00	---	---	90	10
Florida-----	5	3	4	4.00	4.00	7.00	95	5
Kentucky-----	.1	---	---	7.00	---	---	100	--
Louisiana-----	.8	---	---	10.00	---	---	98	2
Mississippi-----	.8	---	---	7.00	---	---	100	--
North Carolina-----	8	---	---	7.00	---	---	75	25
Oklahoma-----	.3	---	---	7.50	---	---	100	--
South Carolina-----	.5	---	---	8.00	---	---	100	--
Tennessee-----	.2	---	---	20.00	---	---	90	10
Virginia-----	5	10	.5	12.50	12.50	19.00	90	10
Southern-----	21.7	13.0	4.5	7.74	10.54	8.33	90	10
Arizona-----	2	---	---	8.00	---	---	50	50
California-----	50	---	---	15.00	---	---	70	30
Colorado-----	2	---	---	10.00	---	---	90	10
Idaho-----	15	1	---	7.00	3.50	---	40	60
Montana-----	4	1	---	12.00	4.00	---	100	--
Oregon-----	5	1	---	15.00	6.00	---	90	10
Utah-----	1	---	---	6.00	---	---	10	90
Washington-----	10	---	---	5.00	---	---	90	10
Alaska-----	.5	---	---	6.00	---	---	90	10
Hawaii-----	.2	---	---	40.00	---	---	100	--
Western-----	89.7	3.0	---	12.05	4.50	---	69	31
United States-----	372.7	42.3	16.7	8.42	9.91	10.83	86	14

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.



Table 69.--Potatoes: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Good	Good	Good	Sta.	Some	No	---
Delaware-----	Good	Good	Good	Sta.	Some	No	---
Maine-----	Good	Good	Good	Up	Some	No	---
Maryland-----	Good	---	---	Up	Some	No	---
Massachusetts-----	Good	Good	Good	Sta.	Some	No	---
New Hampshire-----	Good	Fair	---	Sta.	Some	No	---
New Jersey-----	Fair	---	---	Sta.	Some	No	---
Pennsylvania-----	Good	---	Good	Up	Some	No	---
Rhode Island-----	Good	Good	Good	Up	Some	No	---
Vermont-----	Good	Fair	---	Sta.	Some	No	---
West Virginia-----	Fair	Fair	---	Up	Some	No	---
Northeastern-----	9-Good 2-Fair	5-Good 3-Fair	6-Good	5-Up 6-Sta.	11-Some	11-No	---
Illinois-----	Fair	Fair	Good	Up	Some	No	---
Iowa-----	Good	---	Good	Sta.	Some	No	---
Kansas-----	Fair	---	---	Up	Some	Yes	40
Michigan-----	Good	---	---	Up	Some	No	---
Ohio-----	Good	Fair	---	Up	Some	No	---
South Dakota-----	Good	---	---	Sta.	Some	No	---
Wisconsin-----	Good	Good	Good	Up	Some	Yes	5
North Central-----	5-Good 2-Fair	1-Good 2-Fair	3-Good	5-Up 2-Sta.	7-Some	2-Yes 5-No	3
Alabama-----	Fair	---	---	Up	Some	No	---
Florida-----	Fair	Fair	Good	Up	Some	No	---
Kentucky-----	Good	---	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Fair	---	---	Up	Some	No	---
North Carolina-----	Fair	---	---	Up	Urgent	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
South Carolina-----	Good	---	---	Up	Some	No	---
Tennessee-----	Fair	---	---	Sta.	Some	No	---
Virginia-----	Fair	Fair	Fair	Up	Some	Yes	1
Southern-----	3-Good 7-Fair	2-Fair	1-Good 1-Fair	9-Up 1-Sta.	1-Urgent 6-Some 1-Little	1-Yes 9-No	---
Arizona-----	Good	---	---	Up	Some	No	---
California-----	Fair	---	---	Sta.	Some	No	---
Colorado-----	Good	---	---	Up	Some	No	---
Idaho-----	Fair	Poor	---	Up	Urgent	No	---
Montana-----	Fair	Fair	---	Sta.	Little	No	---
Oregon-----	Good	Fair	---	Up	Urgent	No	---
Utah-----	Fair	---	---	Up	Urgent	No	---
Washington-----	Fair	---	---	Up	Some	Yes	10
Alaska-----	Good	---	---	Sta.	Some	No	---
Hawaii-----	Poor	---	---	Sta.	Urgent	No	---
Western-----	4-Good 5-Fair 1-Poor	2-Fair 1-Poor	---	6-Up 4-Sta.	4-Urgent 5-Some 1-Little	1-Yes 9-No	1
United States-----	21-Good 16-Fair 1-Poor	6-Good 9-Fair 1-Poor	10-Good 1-Fair	25-Up 13-Sta.	5-Urgent 31-Some 2-Little	4-Yes 34-No	1

1/ Sta., stationary.

Table 70.--Potatoes: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region					Infestation trend					Total area	
		NE	NC	S	W	No.	Stationary		Up		Down		
							No.	Area	No.	Area	No.		Area
							100 acres	100 acres		100 acres		100 acres	
Apple-of-Peru-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)	
Barley, wild-----	1	--	--	1	--	--	---	1	6	--	---	6	
*Barnyardgrass-----	12	4	2	1	5	6	1,109	6	1,210	--	---	2,319	
Bermudagrass-----	3	--	--	2	1	1	(1/)	1	2	--	---	65 2/	
Bindweeds-----	1	--	--	--	1	--	---	1	7	--	---	7	
Bluegrass, annual---	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
Chickweeds-----	3	1	--	1	1	2	19	--	---	1	2	21	
Cocklebur-----	1	--	--	1	--	--	---	1	10	--	---	10	
*Crabgrasses-----	19	5	4	10	--	10	579	2	68	4	36 1/	943 2/	
Crowfootgrass-----	1	--	--	1	--	--	---	--	---	--	---	251 2/	
Docks-----	1	--	--	1	--	--	---	1	43	--	---	43	
Dodder-----	1	1	--	--	--	1	8	--	---	--	---	8	
Fingergrass, feather	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)	
*Foxtails-----	14	3	7	1	3	7	1,770	5	413 1/	1	61	2,264 2/	
Galinsoga-----	1	1	--	--	--	--	---	1	1	--	---	1	
Goosefoots-----	1	--	--	--	1	1	50	--	---	--	---	50	
Goosegrass-----	1	1	--	--	--	--	---	1	8	--	---	8	
Henbit-----	1	--	--	1	--	1	20	--	---	--	---	20	
Jimsonweed-----	1	1	--	--	--	1	32	--	---	--	---	32	
Johnsongrass-----	1	--	--	1	--	1	4	--	---	--	---	4	
Knotweeds-----	1	--	--	--	1	1	20	--	---	--	---	20	
*Kochia-----	5	--	2	--	3	4	1,203	1	27	--	---	1,230	
Ladysthumb-----	3	2	1	--	--	3	295	--	---	--	---	295	
*Lambsquarters-----	22	8	6	2	6	18	6,181	1	6	2	32 1/	6,219 2/	
Mallows-----	1	--	--	--	1	1	20	--	---	--	---	20	
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	1 2/	
Millet-----	1	1	--	--	--	--	---	1	775	--	---	775	
Morningglories-----	3	--	--	3	--	2	13	1	2	--	---	15	
Mustards-----	2	1	1	--	--	1	40	--	---	1	1,162	1,202	
*Nightshades-----	7	--	2	1	4	2	486	4	277	--	---	763 2/	
*Nutsedges-----	15	5	2	6	2	2	401	11	256 1/	--	---	744 2/	
Oat, wild-----	3	--	1	--	2	3	1,140	--	---	--	---	1,140	
Panicum-----	5	3	1	1	--	1	16	3	92	--	---	135 2/	
*Pigweeds 3/-----	26	6	6	7	7	19	6,700	4	123	--	---	7,003 2/	
Purslane-----	2	1	--	--	1	2	300	--	---	--	---	300	
Pusley, Florida-----	1	--	--	1	--	1	82	--	---	--	---	82	
*Quackgrass-----	9	3	2	1	3	5	236	4	46 1/	--	---	282	
Radish, wild-----	1	1	--	--	--	1	34	--	---	--	---	34	
*Ragweeds-----	5	1	2	2	--	4	491	--	---	1 1/	---	491	
Rockets-----	2	1	--	--	1	2	75	--	---	--	---	75	
Shepherdspurse-----	1	--	--	--	1	--	--	1	368	--	---	368	
Signalgrass-----	1	--	--	1	--	--	---	1	13	--	---	13	
Smartweeds-----	3	--	1	1	1	1	5	2	65	--	---	70	
Sowthistle-----	1	--	--	--	1	1	40	--	---	--	---	40	
Spurry, corn-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)	
Thistle, Russian-----	1	--	1	--	--	1	40	--	---	--	---	40	
Thistles-----	4	--	--	--	4	1	8	3	635	--	---	643	

1/ No acreages estimated for weeds reported in Illinois, Alaska, and Hawaii.

2/ Reports and acreage estimates for weeds reported in Indiana, Kansas, and Florida are included in regional and total figures but not in figures for infestation trends.

3/ Includes all amaranths.

Table 11.—Relation: Five most injurious and weeds reported alphabetically by States within regions, acreage infested, and infestation trend, 1927

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
Northeastern:												
Connecticut----	Barnyardgrass----	30	Up	Crabgrass----	60	Up	Lambsquarters----	10	Up	Nutsedge----	10	Up
Delaware----	Doeder----	10	Sta.	Jimsonweed----	40	Sta.	Lambsquarters----	25	Sta.	Purslane----	30	Sta.
Maine----	Barnyardgrass----	50	Up	Lambsquarters----	80	Sta.	Millet----	50	Up	Mustard----	75	Down
Maryland----	Orchardgrass----	30	Sta.	Foxtail----	30	Up	Lambsquarters----	90	Sta.	Nutsedge----	60	Up
New Hampshire----	Chickweed, field----	25	Down	Crabgrass----	80	Down	Gainsog-----	10	Up	Lambsquarters----	60	Sta.
New Jersey----	Barnyardgrass----	15	Sta.	Lambsquarters----	40	Sta.	Nutsedge----	25	Up	Panicum, fall----	25	Up
Pennsylvania----	Foxtail, yellow----	30	Sta.	Lambsquarters----	30	Sta.	Nutsedge----	35	Sta.	Pigweed----	30	Sta.
Rhode Island----	Foxtails----	60	Up	Foxtails----	40	Up	Ladythumb-----	35	Sta.	Panicum, fall----	50	Up
Vermont----	Barnyardgrass----	20	Sta.	Crabgrassquarters----	15	Sta.	Lambsquarters----	15	Sta.	Pigweed, redroot----	15	Sta.
West Virginia----	Goosegrass----	15	Up	Ladythumb-----	10	Sta.	Nutsedge-----	20	Up	Panicum, fall----	30	Sta.
North Central:												
Illinois----	Crabgrass----	--	Down	Lambsquarters----	--	Down	Ragweed-----	--	Down	Panicums-----	--	Down
Indiana----	Crabgrass----	40	Down	Foxtails----	30	Down	Nutsedge-----	5	Down	Panicum----	40	Down
Iowa----	Barnyardgrass----	15	Sta.	Foxtails----	15	Sta.	Lambsquarters----	15	Sta.	Pigweed, redroot----	15	Sta.
Kansas----	Crabgrass----	25	Down	Lambsquarters----	5	Down	Mercury, three-seeded----	10	Down	Nightshade----	2	Down
Nebraska----	Foxtail----	100	Sta.	Kochia----	40	Sta.	Lambsquarters, common----	40	Sta.	Nightshade, black----	15	Up
North Dakota----	Foxtail----	90	Sta.	Lambsquarters, common----	60	Sta.	Oats, wild-----	50	Sta.	Pigweed, redroot----	60	Sta.
Ohio----	Barnyardgrass----	40	Up	Crabgrass----	30	Sta.	Foxtail-----	40	Down	Nutsedge----	15	Up
South Dakota----	Foxtails----	100	Sta.	Kochia----	75	Sta.	Mustard-----	75	Sta.	Thistle, Russian----	75	Sta.
Wisconsin----	Foxtail, green----	100	Sta.	Ladythumb-----	50	Sta.	Lambsquarters, common----	100	Sta.	Pigweed, redroot----	100	Sta.
Southern:												
Alabama----	Crabgrass----	100	Sta.	Nutsedge-----	20	Sta.	Pigweed-----	50	Up	Pusley, Florida----	50	Sta.
Florida----	Amaranth, spiny----	30	Down	Bermudagrass----	15	Down	Crabgrass, large----	55	Down	Crowfootgrass----	60	Down
Kentucky----	Crabgrass----	100	Sta.	Nightshade-----	100	Sta.	Nightshade-----	20	Sta.	Nutsedge, purple----	20	Down
Louisiana----	Chickweed----	85	Sta.	Crabgrass----	80	Sta.	Henbit-----	90	Sta.	Pigweed----	80	Sta.
Mississippi----	Cocklebur-----	40	Up	Crabgrass----	90	Sta.	Morningglory-----	10	Up	Nutsedge----	15	Up
North Carolina----	Crabgrass----	100	Sta.	Dock, curly-----	30	Up	Lambsquarters----	50	Sta.	Panicum, fall----	20	Up
Oklahoma----	Bermudagrass----	50	Up	Crabgrass----	90	Sta.	Johnsongrass-----	85	Sta.	Lambsquarters----	70	Sta.
South Carolina----	Crabgrass----	40	Down	Morningglory-----	30	Sta.	Nutsedge-----	30	Up	Pigweed----	40	Sta.
Tennessee----	Barley, wild-----	15	Up	Crabgrass----	70	Down	Morningglory-----	30	Sta.	Nutsedge----	5	Up
Virginia----	Barnyardgrass----	10	Up	Crabgrass----	40	Sta.	Nutsedge-----	10	Up	Pigweed----	60	Sta.
Western:												
Arizona----	Gooseneeds-----	50	Sta.	Knotweed-----	20	Sta.	Mallow-----	20	Sta.	Rocket, London----	70	Sta.
California----	Barnyardgrass----	60	Sta.	Nightshade-----	20	Up	Nutsedge-----	40	Sta.	Purslane----	30	Sta.
Colorado----	Barnyardgrass----	60	Up	Foxtail-----	75	Up	Kochia-----	50	Sta.	Lambsquarters----	50	Sta.
Idaho----	Lambsquarters----	30	Sta.	Lambsquarters----	90	Sta.	Oats, wild-----	20	Sta.	Pigweed, redroot----	100	Sta.
Montana----	Lambsquarters----	40	Down	Oats, wild-----	15	Sta.	Pigweed, redroot----	50	Sta.	Thistle, Canada----	10	Sta.
Oregon----	Barnyardgrass----	10	Sta.	Lambsquarters----	10	Sta.	Pigweed-----	8	Sta.	Quackgrass----	5	Sta.
Utah----	Barnyardgrass----	50	Up	Bindweed, field-----	10	Up	Kochia-----	40	Up	Nightshade----	90	Up
Washington----	Barnyardgrass----	75	Sta.	Lambsquarters----	75	Sta.	Nightshade, black-----	75	Sta.	Pigweed, redroot----	75	Sta.
Wyoming----	Foxtail, green-----	50	Up	Nightshade, black-----	50	Up	Pigweed, redroot----	50	Up	Smartweed-----	40	Up
Alaska----	Bluegrass, annual-----	20	Up	Chickweed-----	90	Sta.	Lambsquarters----	90	Sta.	Quackgrass-----	25	Up
Hawaii----	Apple-of-Peru-----	75	Sta.	Bermudagrass----	15	Sta.	Fingergrass, feather----	5	Sta.	Foxtail, bristly----	30	Up
1/Sta., stationary.												

1/Sta., stationary.

Table 72.--Asparagus: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	---	---	12.00	----	----	100	--
Delaware-----	3	2.5	---	12.00	15.00	----	95	5
Maryland-----	4.2	---	---	6.50	----	----	95	5
Massachusetts-----	1	---	---	12.00	----	----	75	25
New Hampshire-----	2/	---	---	10.00	----	----	100	--
New Jersey-----	---	8	---	----	12.00	----	90	10
Pennsylvania-----	---	.2	---	----	8.00	----	75	25
West Virginia-----	2/	2/	---	30.00	35.00	----	100	--
Northeastern-----	8.2	10.7	---	9.18	12.63	----	92	8
Illinois-----	9	---	---	11.00	----	----	50	50
Kansas-----	.3	---	---	8.00	----	----	100	--
Michigan-----	10	2	2	10.00	10.00	20.00	75	25
Ohio-----	.2	---	---	8.00	----	----	100	--
North Central-----	19.5	2.0	2.0	10.41	10.00	20.00	66	34
Arkansas-----	.2	---	---	8.00	----	----	100	--
Oklahoma-----	.4	---	---	4.50	----	----	100	--
Virginia-----	.1	---	2/	8.50	----	16.00	100	--
Southern-----	7	---	2/	6.07	----	16.00	100	--
California-----	30	---	35	9.00	----	13.50	90	10
Oregon-----	1	1	---	12.00	3.00	----	80	20
Utah-----	2/	---	---	12.00	----	----	80	20
Washington-----	1	---	---	5.00	----	----	90	10
Western-----	32.0	1.0	35.0	8.97	3.00	13.50	90	10
United States-----	60.4	13.7	37.0	9.43	11.54	13.85	85	15

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 73.--Asparagus: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Good	---	---	Sta.	Some	No	---
Delaware-----	Fair	Fair	---	Sta.	Little	No	---
Maryland-----	Good	---	---	Sta.	Little	No	---
Massachusetts-----	Fair	---	---	Sta.	Some	No	---
New Hampshire-----	Good	---	---	Sta.	Some	No	---
New Jersey-----	---	Good	---	Up	Some	No	---
Pennsylvania-----	---	Good	---	Down	Some	No	---
West Virginia-----	Fair	Fair	---	Up	Some	No	---
Northeastern-----	3-Good 3-Fair	2-Good 2-Fair	---	2-Up 5-Sta. 1-Down	6-Some 2-Little	8-No	---
Illinois-----	Fair	---	---	Up	Urgent	No	---
Kansas-----	Good	---	---	Sta.	Little	No	---
Michigan-----	Good	Good	Good	Up	Some	No	---
Ohio-----	Good	---	---	Sta.	Some	No	---
North Central-----	3-Good 1-Fair	1-Good	1-Good	2-Up 2-Sta.	1-Urgent 2-Some 1-Little	4-No	---
Arkansas-----	Good	---	---	Sta.	Little	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
Virginia-----	Fair	---	Fair	Sta.	Little	No	---
Southern-----	1-Good 2-Fair	---	1-Fair	1-Up 2-Sta.	1-Some 2-Little	3-No	---
California-----	Fair	---	Fair	Up	Urgent	No	---
Oregon-----	Good	Fair	---	Sta.	Some	No	---
Utah-----	Fair	---	---	Sta.	Some	No	---
Washington-----	Good	---	---	Sta.	Some	No	---
Western-----	2-Good 2-Fair	1-Fair	1-Fair	1-Up 3-Sta.	1-Urgent 3-Some	4-No	---
United States-----	9-Good 8-Fair	3-Good 3-Fair	1-Good 2-Fair	6-Up 12-Sta. 1-Down	2-Urgent 12-Some 5-Little	19-No	---

1/ Sta., stationary.



Table 74.--Asparagus: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region					Infestation trend						Total area
	of reports	NE	NC	S	W	Stationary	Up	Down					
						No.	Area	No.	Area	No.	Area		
							100 acres		100 acres		100 acres		
*Barnyardgrass-----	4	--	--	1	3	3	43 1/	1	6	--	---	49 1/	
*Bermudagrass-----	3	--	--	2	1	1	140	2	(1/)	--	---	140 1/	
*Bindweeds-----	9	3	2	--	4	3	191 1/	6	45 1/	--	---	236 1/	
Brome, downy-----	1	--	--	--	1	1	26	--	---	--	---	26	
Chickweeds-----	2	1	--	--	1	2	124	--	---	--	---	124	
*Crabgrasses-----	6 2/	2	1	3	--	5	32 1/	--	---	--	---	32 1/	
Crowfootgrass-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)	
Dogbane-----	1	1	--	--	--	1	4	--	---	--	---	4	
*Foxtails-----	3	--	2	--	1	1	34	--	---	2	(1/)	34 1/	
Grasses, annual-----	1	1	--	--	--	--	---	1	(1/)	--	---	(1/)	
Henbit-----	1	1	--	--	--	1	7	--	---	--	---	7	
Horsenettle-----	2	1	1	--	--	1	4	1	7	--	---	11	
Johnsongrass-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)	
*Lambsquarters-----	4	2	--	2	--	3	19 1/	--	---	1	2	21 1/	
Marestail-----	1	1	--	--	--	1	36	--	---	--	---	36	
*Milkweeds-----	6 2/	2	4	--	--	3	40 1/	2	14	--	---	54	
Morningglories-----	1	--	1	--	--	1	(1/)	--	---	--	---	(1/)	
Mustards-----	2	--	--	--	2	2	26 1/	--	---	--	---	26 1/	
Nightshades-----	1 2/	--	1	--	--	--	---	--	---	--	---	(1/)	
*Nutsedges-----	3	1	1	1	--	--	---	3	7 1/	--	---	7 1/	
Orchardgrass-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
Panicum, fall-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
*Pigweeds 3/-----	6 2/	1	1	3	1	3	2 1/	1	1/	1	1	3 1/	
Purslane-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)	
*Quackgrass-----	5	2	2	--	1	1	26	3	1/	1	1	27 1/	
Ragweeds-----	2	2	--	--	--	--	---	1	14	1	1	15	
Sandburs-----	1 2/	--	1	--	--	--	---	--	---	--	---	(1/)	
Thistles-----	2	1	1	--	--	--	---	2	26	--	---	26	

1/ No acreages estimated for weeds reported in Connecticut, West Virginia, Illinois, Kansas, Florida, Oklahoma, and Utah.

2/ Weeds reported in Kansas not classified by infestation trend; counts included in regional and total reports only; acreages estimated as negligible.

3/ Includes all amaranths.

Table 75.---Lambert: Five most important weeds listed by region, and infestation trend, 1900-1910.

Region and State	Weed	Infestation Acres trend		Weed	Infestation Acres trend		Weed	Infestation Acres trend		Weed	Infestation Acres trend	
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
Northeastern:												
Connecticut	Grasses, annual	25	Up	Crabgrass	--	--	Dogbane	--	--	Horsenettle	--	--
Delaware	Bindweed	10	Sta.	Crabgrass	30	Sta.	Henbit	10	Sta.	Lambsquarters	10	Sta.
Maryland	Chickweed	20	Sta.	Crabgrass	50	Sta.	Milkweed	20	Sta.	Ragweed	50	Sta.
New Jersey	Bindweed	10	Up	Crabgrass	15	Sta.	Milkweed	15	Sta.	Ragweed	10	Up
Pennsylvania	Lambsquarters	25	Down	Pigweed, redroot	20	Down	Crabgrass	18	Down	Ragweed	20	Down
West Virginia	Bindweed, field	15	Sta.	Nutsedge	40	Up	Orchardgrass	25	Sta.	Panicum, fall	30	Sta.
North Central:												
Illinois	Foxtail, giant	--	Down	Foxtail, yellow	--	Down	Milkweed	--	Sta.	Morningglory	--	Sta.
Kansas	Crabgrass	20	Down	Milkweed, climbing	3	Down	Nightshade	5	Down	Pigweed	5	Down
Michigan	Bindweed, field	5	Up	Horsenettle	20	Up	Milkweed, common	10	Up	Nutsedge	5	Up
Ohio	Bindweed	30	Up	Milkweed	--	--	Crabgrass	10	Up	Thistle, Canada	25	Up
Southern:												
Florida	Amaranth, spiny	60	Up	Bermudagrass	20	Up	Crabgrass, large	70	Sta.	Crowfootgrass	70	Sta.
Oklahoma	Crabgrass	95	Sta.	Johnsongrass	80	Sta.	Lambsquarters	60	Sta.	Pigweed	90	Sta.
Virginia	Barnyardgrass	10	Sta.	Bermudagrass	5	Up	Crabgrass	25	Sta.	Lambsquarters	35	Sta.
Western:												
California	Bermudagrass	30	Sta.	Bindweed	40	Sta.	Chickweed, common	25	Sta.	--	--	--
Oregon	Barnyardgrass	50	Up	Bindweed, field	20	Up	--	--	--	--	--	--
Utah	Barnyardgrass	50	Sta.	Bindweed, field	10	Up	Mustard, black	50	Sta.	Pigweed, redroot	90	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.	Bindweed, field	5	Up	Brome, downy	15	Sta.	Foxtail, green	20	Sta.
Washington	Barnyardgrass	25	Sta.									

1/Sta., stationary.

Table 76.--Vegetable legumes: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	0.3	---	---	9.00	----	----	100	---
Delaware-----	12	2	---	8.00	18.00	----	80	20
Maine-----	7	2	---	10.00	3.00	----	90	10
Maryland-----	17.5	2.6	---	8.00	4.00	----	50	50
Massachusetts-----	1.3	---	---	9.00	----	----	100	---
New Hampshire-----	.2	---	---	10.00	----	----	90	10
New Jersey-----	2	---	---	6.00	----	----	90	10
New York-----	115	5	---	12.00	5.00	----	95	5
Pennsylvania-----	8	---	---	6.50	----	----	75	25
West Virginia-----	.2	2/	---	20.00	25.00	----	100	---
Northeast-----	163.5	11.6	---	10.83	6.67	----	87	13
Illinois-----	30	---	---	8.00	----	----	80	20
Kansas-----	13	---	---	10.00	----	----	80	20
Michigan-----	15	3	---	12.00	8.50	----	75	25
Minnesota-----	8	20	---	9.00	3.00	----	80	20
Missouri-----	1	2/	0.1	8.00	5.00	7.00	75	25
Ohio-----	1	---	---	6.00	----	----	75	25
Wisconsin-----	40	50	---	10.00	6.60	----	25	75
North Central-----	108.0	73.0	.1	9.59	5.69	7.00	52	48
Alabama-----	2	---	---	8.00	----	----	80	20
Arkansas-----	.7	---	---	6.00	----	----	100	---
Florida-----	30	5	6	3.00	2.00	4.00	95	5
Georgia-----	1	---	---	10.00	----	----	100	---
Kentucky-----	.5	---	---	9.00	----	----	100	---
Louisiana-----	.3	---	---	10.00	----	----	98	2
Mississippi-----	4	.2	---	5.00	8.00	----	100	---
North Carolina-----	7	---	---	8.00	----	----	90	10
Oklahoma-----	3	---	---	6.00	----	----	100	---
South Carolina-----	5	---	---	12.00	----	----	90	10
Tennessee-----	1	---	---	12.00	----	----	90	10
Texas-----	1	---	---	6.00	----	----	100	---
Virginia-----	2	---	---	8.50	----	----	100	---
Southern-----	57.5	5.2	6.0	5.51	2.23	4.00	95	5
California-----	35	5	---	10.00	5.00	----	90	10
Idaho-----	83	18	34	6.50	5.00	6.00	70	30
Montana-----	.5	1	---	4.00	3.00	----	60	40
Oregon-----	40	10	---	15.00	3.00	----	70	30
Utah-----	1	1	---	12.00	5.00	----	10	90
Washington-----	50	120	50	5.00	4.00	9.00	40	60
Wyoming-----	30	---	---	9.00	----	----	70	30
Hawaii-----	2/	---	---	30.00	----	----	100	---
Western-----	239.5	155.0	84	8.45	4.08	7.79	58	42
United States-----	568.5	244.8	90.1	9.05	4.64	7.54	65	35

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 77.--Vegetable legumes: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	Fair	---	---	Up	Some	No	---
Delaware-----	Fair	Fair	---	Sta.	Some	No	---
Maine-----	Good	Fair	---	Up	Some	No	---
Maryland-----	Good	Good	---	Up	Some	No	---
Massachusetts-----	Fair	---	---	Sta.	Little	No	---
New Hampshire-----	Good	---	---	Sta.	Some	No	---
New Jersey-----	Good	---	---	Sta.	Some	No	---
New York-----	Good	Good	---	Sta.	Little	No	---
Pennsylvania-----	Good	---	---	Up	Some	No	---
West Virginia-----	Good	Fair	---	Up	Some	No	---
Northeastern-----	7-Good 3-Fair	2-Good 3-Fair	---	5-Up 5-Sta.	8-Some 2-Little	10-No	---
Illinois-----	Fair	---	---	Up	Urgent	Yes	40
Kansas-----	Good	---	---	Up	Urgent	No	---
Michigan-----	Good	Good	---	Up	Some	No	---
Minnesota-----	Good	Good	---	Sta.	Some	No	---
Missouri-----	Good	Good	Fair	Up	Some	No	---
Ohio-----	Fair	---	---	Sta.	Some	No	---
Wisconsin-----	Fair	Fair	---	Up	Some	No	---
North Central-----	4-Good 3-Fair	3-Good 1-Fair	1-Fair	5-Up 2-Sta.	2-Urgent 5-Some	1-Yes 6-No	7
Alabama-----	Fair	---	---	Up	Some	No	---
Arkansas-----	Good	---	---	Sta.	Little	Yes	5
Florida-----	Good	Fair	Good	Up	Little	No	---
Georgia-----	Fair	---	---	Up	Some	No	---
Kentucky-----	Good	---	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Fair	Poor	---	Up	Some	No	---
North Carolina-----	Fair	---	---	Up	Some	No	---
Oklahoma-----	Good	---	---	Up	Some	No	---
South Carolina-----	Good	---	---	Up	Some	No	---
Tennessee-----	Fair	---	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	No	---
Virginia-----	Fair	---	---	Up	Some	No	---
Southern-----	7-Good 6-Fair	1-Fair 1-Poor	1-Good	12-Up 1-Sta.	10-Some 3-Little	1-Yes 12-No	---
California-----	Good	Fair	---	Up	Some	Yes	10
Idaho-----	Fair	Fair	Fair	Up	Some	Yes	1
Montana-----	Good	Fair	---	Sta.	Some	No	---
Oregon-----	Good	Fair	---	Up	Some	No	---
Utah-----	Good	---	---	Up	Some	No	---
Washington-----	Good	Good	Good	Up	Some	No	---
Wyoming-----	Good	---	Good	Up	Some	No	---
Hawaii-----	Poor	---	---	Sta.	Some	No	---
Western-----	6-Good 1-Fair 1-Poor	4-Fair 1-Good	2-Good 1-Fair	6-Up 2-Sta.	8-Some	2-Yes 6-No	1
United States-----	24-Good 13-Fair 1-Poor	6-Good 9-Fair 1-Poor	3-Good 2-Fair	28-Up 10-Sta.	2-Urgent 31-Some 5-Little	4-Yes 34-No	2

1/ Sta., stationary.

Table 78.--Vegetable legumes: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region					Infestation trend					Total area
	of						Stationary	Up	Down			
	reports	NE	NC	S	W	No.	Area	No.	Area	No.	Area	
							100 acres		100 acres		100 acres	100 acres
*Barnyardgrass-----	5	1	--	--	4	3	2,053	1	(1/)	1	8	2,061 1/
Bermudagrass-----	2	--	--	2	--	--	--	2	41	--	--	41
Bindweed, field-----	2	--	--	--	2	1	257	1	29	--	--	286
Carpetweed-----	1	--	--	1	--	1	8	--	--	--	--	8
Cocklebur-----	5	--	1	4	--	2	32	3	114	--	--	146
*Crabgrasses-----	13	2	4	12	--	11	1,135	1	29	5	453	2,035 2/
Cranesbill-----	1	1	--	--	--	--	--	1	20	--	--	20
Crowfootgrass-----	1	--	--	1	--	1	117	--	--	--	--	117
Dandelions-----	1	1	--	--	--	--	--	--	--	1	9	9
Fiddleneck, coast---	1	--	--	--	1	1	1,540	--	--	--	--	1,540
*Foxtails-----	8	1	4	1	2	3	2,587	2	64	3	316	2,967
Goosegrass-----	1	--	--	1	--	--	--	--	--	1	92	92
Grasses, annual-----	1	1	--	--	--	--	--	1	3	--	--	3
Groundcherry-----	2	--	1	--	1	--	--	2	673	--	--	673
Groundsels-----	1	--	--	--	1	--	--	1	87	--	--	87
Jimsonweed-----	2	1	1	--	--	2	135	--	--	--	--	135
Johnsongrass-----	3	--	--	2	1	1	19	--	--	1	6	339 2/
*Kochia-----	5	--	2	--	3	3	582	1	2	--	--	618 2/
*Lambsquarters-----	16	5	2	3	6	10	5,055	2	154 1/	4	5,242	10,451 1/
Morningglories-----	5	1	--	4	--	3	34	1	84	1	2	120
Mustards-----	2	1	--	1	--	--	--	2	52	--	--	52
*Nightshades-----	6	--	2	--	4	1	1,540	5	2,223	--	--	3,763
*Nutsedges-----	14	6	1	6	1	5	89	8	821 1/	1	(1/)	910 1/
Oat, wild-----	3	--	--	--	3	2	2,014	--	--	1	6	2,020
Panicum, browntop---	1	--	--	1	--	1	33	--	--	--	--	33
Pennycress-----	1	--	--	--	1	1	1,143	--	--	--	--	1,143
*Pigweeds 3/-----	29	7	5	10	7	18	5,642 1/	3	113	6	5,973	12,050 1/2/
Purslane-----	2	--	1	1	--	1	76	1	17	--	--	93
Pusley, Florida-----	2	--	--	2	--	1	38	--	--	1	30	68
Quackgrass-----	4	4	--	--	--	2	615 1/	1	9	1	10	634 1/
Radish, wild-----	1	1	--	--	--	1	77	--	--	--	--	77
*Ragweeds-----	12	5	3	4	--	8	1,001	3	1,462	1	17	2,480
Sandburs-----	1	--	1	--	--	--	--	--	--	--	--	8 2/
Sicklepod-----	2	--	--	2	--	--	--	2	130	--	--	130
Sida, prickly-----	1	--	--	1	--	--	--	1	9	--	--	9
Signalgrass-----	2	--	--	2	--	1	2	1	27	--	--	29
Smartweeds-----	1	--	--	1	--	1	21	--	--	--	--	21
Thistle, Russian---	1	--	1	--	--	--	--	--	--	--	--	34 2/
*Thistles-----	6	2	2	--	2	3	741	2	101	1	29	871
Velvetleaf-----	3	1	2	--	--	1	116	2	401	--	--	517
Waterhemp-----	1	--	1	--	--	--	--	1	22	--	--	22

1/ No acreages estimated for weeds in West Virginia and less than 50 acres estimated for weeds in Hawaii.

2/ Weeds reported in Kansas and Arkansas not classified by infestation trend; however, counts and acreages are included in regional and total figures.

3/ Includes all amaranths.



Table 79.---Vegetable Injurers: Five most important weeds listed alphabetically by states within various, average infested, and infestation trend, 1968

Region and State	Weed	Infestation Acres Trend 1/1		Weed	Infestation Acres Trend 1/1		Weed	Infestation Acres Trend 1/1	
		Pct.	1/1		Pct.	1/1		Pct.	1/1
Northeastern:									
Connecticut	Grasses, annual	50	Up	Nutsedge	25	Up	Ragweed	25	Up
Delaware	Jimsonweed	30	Sta.	Radiish, wild	15	Sta.	Ragweed	30	Sta.
Maine	Dandelion	15	Down	Quackgrass	15	Up	Ragweed	30	Sta.
Maryland	Crabgrass	60	Sta.	Lambsquarters	10	Sta.	Ragweed	40	Up
New Hampshire	Lambsquarters	25	Down	Morning glory	15	Up	Pigweed	60	Down
New Jersey	Crabgrass	25	Sta.	Nutsedge	40	Sta.	Pigweed	35	Sta.
New York	Lambsquarters	15	Down	Nutsedge, redroot	90	Sta.	Pigweed	40	Sta.
Pennsylvania	Foxtail	50	Up	Pigweed, redroot	22	Down	Ragweed	10	Down
West Virginia	Barriardgrass	50	Up	Lambsquarters	25	Up	Pigweed, redroot	15	Sta.
North Central:									
Illinois	Crabgrass	20	Down	Jimsonweed	40	Down	Lambsquarters	20	Down
Kansas	Kochia	10	Down	Sandbur	5	Down	Thistle, Russian	20	Down
Michigan	Groundcherry	10	Up	Lambsquarters	90	Down	Pigweed, rough	60	Down
Missouri	Cocklebur	50	Up	Foxtail	90	Up	Ragweed	70	Up
Nebraska	Crabgrass	60	Sta.	Kochia	55	Sta.	Nightshade, black	100	Sta.
Ohio	Crabgrass	75	Sta.	Purslane	75	Sta.	Ragweed	40	Up
Wisconsin	Foxtail, green	100	Sta.	Pigweed, redroot	50	Up	Thistle, Canada	25	Sta.
Southern:									
Alabama	Crabgrass	100	Sta.	Mustard, wild	40	Up	Pigweed	50	Sta.
Arkansas	Crabgrass, hairy	100	Down	Johnsongrass	75	Down	Ragweed	20	Sta.
Florida	Amaranth, shiny	60	Up	Bermudagrass	20	Up	Nutsedge, purple	70	Sta.
Georgia	Cocklebur	40	Up	Crabgrass	30	Down	Sicklepod	20	Sta.
Kentucky	Crabgrass	100	Sta.	Foxtail, giant	100	Sta.	Pigweed	30	Sta.
Louisiana	Crabgrass	40	Sta.	Morning glory	70	Sta.	Pigweed	80	Sta.
Mississippi	Cocklebur	75	Sta.	Morning glory	10	Down	Sida, prickly	60	Up
North Carolina	Cocklebur	30	Up	Crabgrass	100	Down	Lambsquarters	20	Sta.
Oklahoma	Bermudagrass	40	Up	Crabgrass	90	Sta.	Pigweed	40	Sta.
South Carolina	Crabgrass	40	Down	Nutsedge	50	Up	Ragweed	60	Sta.
Tennessee	Cocklebur	10	Sta.	Crabgrass	80	Down	Smartweed	30	Sta.
Texas	Crabgrass	10	Sta.	Panicum, brownlop	40	Sta.	Purslane, common	60	Up
Virginia	Crabgrass	50	Sta.	Lambsquarters	40	Sta.	Ragweed	50	Sta.
Western:									
California	Barriardgrass	60	Sta.	Nightshade	20	Up	Pigweed, redroot	10	Sta.
Idaho	Lambsquarters	50	Sta.	Pennyress, field	60	Sta.	Pigweed, redroot	50	Down
Montana	Foxtail, green	30	Up	Kochia	10	Up	Pigweed, redroot	5	Sta.
New Mexico	Barriardgrass	20	Down	Johnsongrass	15	Down	Lambsquarters	20	Down
Oregon	Barriardgrass	20	Sta.	Groundsel	20	Up	Pigweed, redroot	50	Sta.
Utah	Bindweed, field	20	Up	Groundcherry	70	Sta.	Lambsquarters	10	Up
Washington	Bindweed, field	10	Sta.	Pinkflower, coast	60	Sta.	Pigweed, redroot	90	Sta.
Wyoming	Barriardgrass	50	Sta.	Foxtail, green	50	Down	Oat, wild	20	Sta.
Hawaii	Nutsedge, purple	25	Down				Pigweed, redroot	60	Down
2/Sta., stationary.									

1/Sta., stationary.

Table 80.--Root and bulb crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre 1/			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	0.4	---	8.00	15.00	----	100	--
Delaware-----	.2	.8	0.8	5.00	30.00	35.00	10	90
Maryland-----	2.8	---	---	11.00	----	----	100	--
Massachusetts-----	.2	.8	---	8.00	20.00	----	100	--
New Hampshire-----	2/	---	---	18.00	----	----	100	--
New Jersey-----	6	---	---	6.00	----	----	90	10
New York-----	---	---	20	----	----	75.00	95	5
Pennsylvania-----	.8	.4	---	25.00	35.00	----	100	--
West Virginia-----	2/	2/	---	20.00	30.00	----	100	--
Northeastern-----	10.0	2.4	20.8	8.94	25.00	73.46	90	10
Illinois-----	3.3	---	.9	16.00	----	20.00	95	5
Indiana-----	2	1	2	15.00	15.00	30.00	99	1
Iowa-----	2	---	---	8.00	----	----	100	--
Kansas-----	.4	---	---	10.00	----	----	100	--
Michigan-----	11	11	11	12.00	25.00	37.00	60	40
Minnesota-----	.2	.5	---	9.50	9.50	----	100	--
Ohio-----	.1	.1	.2	8.00	12.00	20.00	100	--
Wisconsin-----	6	---	---	15.00	----	----	30	70
North Central-----	25.0	12.6	14.1	13.10	23.49	34.68	66	34
Arkansas-----	.6	---	---	6.00	----	----	100	--
Florida-----	3	1	1	4.00	3.00	5.00	100	--
Georgia-----	.5	---	---	10.00	----	----	100	--
Mississippi-----	---	6	.2	----	8.00	12.00	100	--
North Carolina-----	5	---	---	8.00	----	----	90	10
Oklahoma-----	.3	---	---	6.00	----	----	100	--
South Carolina-----	1	---	1	10.00	----	10.00	90	10
Tennessee-----	1	---	---	18.00	----	----	90	10
Texas-----	13	13	---	5.00	3.00	----	50	50
Virginia-----	---	2	---	----	7.50	----	100	--
Southern-----	24.4	22.0	2.2	6.37	4.77	7.91	72	28
Arizona-----	---	4	---	----	6.00	----	50	50
California-----	---	30	40	----	12.00	24.00	20	80
Nevada-----	---	.5	---	----	5.00	----	100	--
New Mexico-----	2	---	---	3.25	----	----	15	85
Oregon-----	8	1	2	15.00	10.00	25.00	90	10
Utah-----	.6	.1	---	20.00	8.00	----	10	90
Washington-----	1	.8	2	20.00	15.00	35.00	40	60
Alaska-----	2/	2/	2/	28.00	48.00	30.00	100	--
Hawaii-----	.3	---	---	35.00	----	----	100	--
Western-----	11.9	36.4	44.0	14.20	11.24	24.55	31	69
United States-----	71.3	73.4	81.1	10.40	11.85	38.40	57	43

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 81.--Root and bulb crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for : better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of treated acres
Connecticut-----	Fair	Good	---	Sta.	Urgent	No	---
Delaware-----	Fair	Good	Good	Up	Some	No	---
Maryland-----	Good	---	---	Sta.	Some	No	---
Massachusetts-----	Fair	Fair	---	Sta.	Some	No	---
New Hampshire-----	Fair	---	---	Sta.	Some	No	---
New Jersey-----	Good	---	---	Up	Some	No	---
New York-----	---	---	Good	Sta.	Some	No	---
Pennsylvania-----	Fair	Good	---	Up	Some	No	---
West Virginia-----	Good	Fair	---	Up	Some	No	---
Northeastern-----	3-Good 5-Fair	3-Good 2-Fair	2-Good	4-Up 5-Sta.	1-Urgent 8-Some	9-No	---
Illinois-----	Good	---	Good	Sta.	Some	No	---
Indiana-----	Good	Fair	Fair	Up	Urgent	No	---
Iowa-----	Good	---	---	Up	Some	No	---
Kansas-----	Good	---	---	Sta.	Some	No	---
Michigan-----	Fair	Fair	Good	Up	Urgent	No	---
Minnesota-----	Good	Good	---	Sta.	Little	No	---
Ohio-----	Good	Good	Good	Sta.	Little	No	---
Wisconsin-----	Good	---	---	Up	Some	No	---
North Central-----	7-Good 1-Fair	2-Good 2-Fair	3-Good 1-Fair	4-Up 4-Sta.	2-Urgent 4-Some 2-Little	8-No	---
Arkansas-----	Good	---	---	Up	Some	No	---
Florida-----	Fair	Fair	Fair	Up	Some	No	---
Georgia-----	Good	---	---	Sta.	Some	No	---
Mississippi-----	---	Poor	Fair	Sta.	Urgent	No	---
North Carolina-----	Good	---	---	Up	Some	No	---
Oklahoma-----	Fair	---	---	Sta.	Some	No	---
South Carolina-----	Fair	---	Fair	Up	Urgent	No	---
Tennessee-----	Good	---	---	Up	Some	No	---
Texas-----	Good	Good	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	5-Good 3-Fair	1-Good 2-Fair 1-Poor	3-Fair	7-Up 3-Sta.	2-Urgent 8-Some	10-No	---
Arizona-----	---	Good	---	Sta.	Little	No	---
California-----	---	Fair	Good	Up	Urgent	No	---
Nevada-----	---	Poor	---	Up	Urgent	No	---
New Mexico-----	Good	---	---	Up	Urgent	No	---
Oregon-----	Fair	Fair	Good	Up	Some	No	---
Utah-----	---	Fair	---	Up	Urgent	No	---
Washington-----	Good	Good	Good	Sta.	Some	No	---
Alaska-----	Fair	Fair	Fair	Up	Urgent	No	---
Hawaii-----	Fair	---	---	Up	Urgent	No	---
Western-----	2-Good 3-Fair	2-Good 4-Fair 1-Poor	3-Good 1-Fair	7-Up 2-Sta.	6-Urgent 2-Some 1-Little	9-No	---
United States-----	17-Good 12-Fair	8-Good 10-Fair 2-Poor	8-Good 5-Fair	22-Up 14-Sta.	11-Urgent 22-Some 3-Little	36-No	---

1/ Sta., stationary.

Table 82.--Root and bulb crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region				Infestation trend						Total area
	of					Stationary	Up	Down				
	reports	NE	NC	S	W	No.	Area	No.	Area	No.	Area	
							100 acres		100 acres		100 acres	100 acres
*Barnyardgrass-----	7	2	1	--	4	6	99	1	(1/)	--	---	99 1/
Bermudagrass-----	3	--	--	3	--	2	229	1	(1/)	--	---	229 1/
Bindweed, field-----	1	--	--	--	1	--	---	1	2	--	---	2
*Chickweeds-----	5	1	1	2	1	3	20 1/	1	42	1	52	114 1/
Cockburs-----	3	--	--	3	--	2	199	1	52	--	---	251
*Crabgrasses-----	16	1	3	12	--	11	756 1/	1	5	2	196	976 1/2/
Crowfootgrass-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)
Dodd-----	2	2	--	--	--	--	---	2	5	--	---	5
*Foxtails-----	8	2	4	1	1	4	125 1/	3	18	1	1	144 1/
Galinsogas-----	2	1	--	--	1	--	---	2	1 1/	--	---	1 1/
Goosefoot-----	1	--	--	--	1	1	34	--	---	--	---	34
Goosegrass-----	3	1	--	2	--	1	12	--	---	2	87	99
Grasses, annual-----	1	1	--	--	--	--	---	1	1	--	---	1
Groundsel, common---	1	--	--	--	1	--	---	1	190	--	---	190
Hempnettle-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
Johnsongrass-----	3	--	--	3	--	2	27	--	---	--	---	41 2/
Kochia-----	1	--	--	--	1	--	---	1	4	--	---	4
*Lambsquarters-----	20	5	6	3	6	12	855 1/	2	3 1/	5	91	949 1/2/
Lovegrass-----	1	1	--	--	--	--	---	1	18	--	---	18
Mallow, dwarf-----	1	--	--	--	1	1	316	--	---	--	---	316
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	2
*Morningglories-----	4	1	--	3	--	3	51	1	11	--	---	62
Mustards-----	2	--	1	--	1	1	10	1	49	--	---	59
Nettle, burning-----	1	--	--	--	1	1	158	--	---	--	---	158
Nightshades-----	2	--	--	--	2	2	44	--	---	--	---	44
*Nutsedges-----	13	4	--	8	1	2	11	8	130 2/	2	20 1/	175 1/2/
Panicums-----	2	1	1	--	--	--	---	2	29	--	---	29
Pepperweed-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)
*Pigweeds-----	21	4	5	8	4	12	849	4	98 1/	4	106	1,054 1/2/
Pineappleweed-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)
*Purslane-----	9	2	5	1	1	4	211	1	2	4	246	459
Quackgrass-----	4	3	--	--	1	--	---	2	(1/)	2	24	24 1/
*Ragweeds-----	5	2	1	2	--	1	50	1	6	3	4 1/	60 1/
Rockets-----	3	--	--	1	2	2	549	1	253	--	---	802
Sandburs-----	1	--	--	1	--	1	132	--	---	--	---	132
Shepherdspurse-----	2	1	--	--	1	--	---	2	10 1/	--	---	10 1/
Sicklepod-----	2	--	--	2	--	1	51	1	52	--	---	103
Signalgrass-----	1	--	--	1	--	--	---	1	378	--	---	378
Smartweeds-----	4	--	3	1	--	2	21	1	13	1	3	37
Sunflower-----	1	--	--	1	--	1	330	--	---	--	---	330
Swinecress-----	1	--	--	--	1	--	---	1	1	--	---	1
Tansymustard-----	1	--	--	1	--	1	198	--	---	--	---	198
Tasselflower, red---	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Thistle, Canada-----	1	--	--	--	1	--	---	1	7	--	---	7
Velvetleaf-----	1	--	1	--	--	--	---	--	---	--	---	(2/)

1/ Acreages estimated less than 50 acres for some or all weeds reported in Connecticut, Delaware, West Virginia, Florida, Kentucky, Alaska, and Hawaii.

2/ Weeds reported in Kansas and Arkansas not classified by infestation trend; however, counts and acreages are included in regional and total figures.

3/ Includes all amaranths.



Table 83.--Root and bulb crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1908

Region and State	Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/		Weed	Infestation Acres Trend 1/	
		Pct.	Pct.		Pct.	Pct.		Pct.	Pct.			
Northeastern:												
Connecticut-----	Chickweed-----	15	Sta.	Galinsoga-----	10	Up	Grasses, annual-----	20	Up	Pepoerweed-----	10	Sta.
Delaware-----	Dodder, field-----	1	Up	Goosegrass-----	40	Sta.	Lambsquarters-----	50	Sta.	Lovegrass-----	60	Up
Maryland-----	Crabgrass-----	60	Down	Morningglory-----	10	Sta.	Nutsedge-----	10	Sta.	Pigweed-----	60	Up
New Hampshire-----	Lambsquarters-----	30	Down	Nutsedge-----	5	Up	Panicum, fall-----	35	Up	Shepherdspurse-----	25	Down
New Jersey-----	Barnyardgrass-----	90	Sta.	Nutsedge-----	10	Down	Pigweed, redroot-----	50	Sta.	Quackgrass-----	90	Sta.
New York-----	Lambsquarters-----	18	Down	Foxtails-----	15	Sta.	Lambsquarters-----	20	Down	Purslane-----	8	Sta.
Pennsylvania-----	Foxtail, yellow-----	20	Up	Foxtails-----	15	Sta.	Lambsquarters-----	35	Up	Nutsedge-----	25	Down
West Virginia-----	Barnyardgrass-----	20	Up	Foxtails-----	15	Sta.	Lambsquarters-----	35	Up	Nutsedge-----	25	Down
North Central:												
Illinois-----	Lambsquarters-----	25	Down	Purslane-----	30	Down	Ragweed-----	20	Down	Smartweed-----	20	Down
Indiana-----	Crabgrass-----	40	Up	Foxtails-----	30	Up	Panicums-----	40	Up	Pigweed-----	80	Sta.
Iowa-----	Barnyardgrass-----	75	Sta.	Foxtails-----	75	Up	Lambsquarters, common-----	50	Sta.	Pigweed, redroot-----	50	Sta.
Kansas-----	Crabgrass-----	10	Sta.	Lambsquarters-----	5	Down	Mercury, three-seeded-----	20	Down	Pigweed-----	10	Sta.
Michigan-----	Chickweed, common-----	40	Down	Lambsquarters-----	60	Down	Pigweed, rough-----	70	Down	Purslane, common-----	90	Down
Ohio-----	Crabgrass-----	75	Sta.	Foxtail-----	75	Up	Lambsquarters-----	40	Sta.	Purslane-----	75	Sta.
Wisconsin-----	Foxtail, green-----	100	Sta.	Lambsquarters-----	100	Sta.	Mustard, wild-----	40	Up	Pigweed, redroot-----	100	Down
Southern:												
Alabama-----	Crabgrass-----	100	Sta.	Johnsongrass-----	40	Sta.	Nutsedge-----	20	Sta.	Pigweed-----	50	Up
Arkansas-----	Crabgrass-----	100	Sta.	Johnsongrass-----	75	Sta.	Nutsedge-----	75	Sta.	Pigweed-----	60	Sta.
California-----	Amaranth, spiny-----	40	Up	Bermudagrass-----	20	Up	Crabgrass, large-----	60	Sta.	Nutsedge, purple-----	15	Up
Florida-----	Chickweed-----	50	Up	Crabgrass-----	80	Sta.	Morningglory-----	50	Sta.	Sicklepod-----	80	Sta.
Georgia-----	Crabgrass-----	100	Sta.	Foxtail-----	100	Sta.	Nutsedge-----	80	Sta.	Pigweed-----	85	Sta.
Kentucky-----	Bermudagrass-----	40	Sta.	Cocklebur-----	35	Sta.	Crabgrass-----	80	Sta.	Signalgrass-----	70	Up
Louisiana-----	Crabgrass-----	97	Sta.	Morningglory-----	10	Up	Nutsedge-----	5	Up	Ragweed-----	60	Sta.
Mississippi-----	Cocklebur-----	30	Up	Crabgrass-----	100	Down	Goosegrass-----	40	Down	Sicklepod-----	20	Sta.
North Carolina-----	Crabgrass-----	95	Sta.	Johnsongrass-----	85	Sta.	Lambsquarters-----	80	Sta.	Pigweed-----	80	Sta.
Oklahoma-----	Cocklebur-----	40	Sta.	Crabgrass-----	90	Sta.	Nutsedge-----	25	Up	Ragweed-----	25	Up
South Carolina-----	Crabgrass-----	80	Down	Goosegrass-----	60	Down	Morningglory-----	30	Sta.	Pigweed-----	10	Up
Tennessee-----	Lambsquarters-----	30	Sta.	Rocket, London-----	75	Sta.	Sandbur-----	20	Sta.	Tansymustard-----	50	Sta.
Texas-----	Bermudagrass-----	10	Sta.	Chickweed-----	15	Sta.	Crabgrass-----	30	Sta.	Pigweed-----	10	Up
Virginia-----	Goosefoot-----	50	Sta.	Rocket, London-----	80	Sta.	Mallow, dwarf-----	50	Sta.	Pigweed-----	10	Up
Western:												
Arizona-----	Groundsel-----	30	Up	Lambsquarters-----	40	Sta.	Mallow, green-----	50	Sta.	Rocket, London-----	25	Sta.
California-----	Barnyardgrass-----	20	Sta.	Carelessweed-----	20	Down	Foxtail, green-----	5	Sta.	Lambsquarters-----	10	Up
New Mexico-----	Barnyardgrass-----	20	Sta.	Lambsquarters-----	10	Sta.	Nightshade-----	20	Sta.	Purslane-----	10	Sta.
Oregon-----	Barnyardgrass-----	50	Sta.	Bindweed, field-----	20	Up	Lambsquarters-----	30	Up	Pigweed, redroot-----	90	Sta.
Utah-----	Barnyardgrass-----	70	Sta.	Lambsquarters-----	50	Sta.	Nightshade, black-----	30	Up	Pigweed, redroot-----	90	Sta.
Washington-----	Chickweed-----	100	Sta.	Hempnettle-----	80	Up	Pineappleweed-----	90	Up	Shepherdspurse-----	15	Up
Alaska-----	Galinsoga, small fl. 2/	50	Up	Lambsquarters, common-----	30	Sta.	Nutsedge, purple-----	30	Down	Quackgrass-----	75	Up
Hawaii-----	Galinsoga, small fl. 2/	50	Up	Lambsquarters, common-----	30	Sta.	Nutsedge, purple-----	30	Down	Quackgrass-----	75	Up

1/Sta., stationary.

2/Galinsoga, small flower.



Table 84.--Vine crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	0.2	---	---	6.00	---	---	100	---
Delaware-----	1.5	---	0.5	8.00	---	18.00	100	---
Maine-----	.8	---	---	10.00	---	---	100	---
Maryland-----	7.3	---	---	10.00	---	---	100	---
Massachusetts-----	3	---	---	12.00	---	---	100	---
New Hampshire-----	---	2/	---	---	60.00	---	100	---
New Jersey-----	1	---	---	12.00	---	---	90	10
New York-----	3	---	---	20.00	---	---	95	5
Pennsylvania-----	2	---	---	14.00	---	---	100	---
West Virginia-----	2/	2/	---	25.00	35.00	---	100	---
Northeast-----	18.8	2/	.5	12.24	47.50	18.00	99	1
Illinois-----	4	---	---	7.00	---	---	70	30
Indiana-----	3	---	---	10.00	---	---	99	1
Kansas-----	2	---	---	10.00	---	---	80	20
Michigan-----	25	---	---	15.00	---	---	75	25
Minnesota-----	1	---	---	9.00	---	---	50	50
Ohio-----	.5	---	---	12.00	---	---	100	---
Wisconsin-----	15	---	---	7.00	---	---	50	50
North Central-----	50.5	---	---	11.35	---	---	69	31
Arkansas-----	.4	---	---	12.00	---	---	100	---
Florida-----	4	1	2	4.00	3.00	5.00	95	5
Georgia-----	.5	---	---	5.00	---	---	100	---
Kentucky-----	2/	---	---	7.00	---	---	100	---
Louisiana-----	.5	---	---	10.00	---	---	98	2
Mississippi-----	.5	2	---	10.00	7.00	---	100	---
North Carolina-----	10	---	---	12.00	---	---	90	10
Oklahoma-----	2	---	---	7.50	---	---	100	---
South Carolina-----	4	---	---	10.00	---	---	90	10
Tennessee-----	1	---	---	15.00	---	---	90	10
Texas-----	3	---	---	6.00	---	---	90	10
Virginia-----	.5	---	---	10.50	---	---	100	---
Southern-----	26.4	3.0	2.0	9.34	5.67	5.00	93	7
Arizona-----	2	---	---	8.00	---	---	20	80
California-----	2	---	---	15.00	---	---	100	---
Oregon-----	1	---	---	20.00	---	---	80	20
Washington-----	1	---	1	15.00	---	15.00	40	60
Hawaii-----	.5	---	---	35.00	---	---	100	---
Western-----	6.5	---	1.0	15.15	---	15.00	60	40
United States-----	102.2	3.0	3.5	11.24	5.67	9.71	81	19

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 85.--Vine crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Poor	---	---	Sta.	Urgent	No	---
Delaware-----	Poor	---	Poor	Up	Urgent	No	---
Maine-----	Fair	---	---	Up	Urgent	No	---
Maryland-----	Fair	---	---	Up	Urgent	No	---
Massachusetts-----	Poor	---	---	Sta.	Urgent	No	---
New Hampshire-----	---	Fair	---	Sta.	Some	No	---
New Jersey-----	Good	---	---	Up	Urgent	No	---
New York-----	Fair	---	---	Up	Urgent	No	---
Pennsylvania-----	Fair	---	---	Up	Urgent	No	---
West Virginia-----	Fair	Poor	---	Up	Some	No	---
Northeastern-----	1-Good						
	5-Fair	1-Fair	1-Poor	7-Up	8-Urgent	10-No	---
	3-Poor	1-Poor		3-Sta.	2-Some		
Illinois-----	Fair	---	---	Up	Urgent	No	---
Indiana-----	Good	---	---	Up	Urgent	No	---
Kansas-----	Fair	---	---	Sta.	Urgent	No	---
Michigan-----	Poor	---	---	Up	Urgent	No	---
Minnesota-----	Good	---	---	Sta.	Urgent	No	---
Ohio-----	Fair	---	---	Up	Urgent	No	---
Wisconsin-----	Poor	---	---	Sta.	Urgent	No	---
North Central-----	2-Good						
	3-Fair	---	---	4-Up	7-Urgent	7-No	---
	2-Poor			3-Sta.			
Arkansas-----	Poor	---	---	Up	Urgent	No	---
Florida-----	Poor	Poor	Poor	Up	Urgent	No	---
Georgia-----	Fair	---	---	Up	Some	No	---
Kentucky-----	Poor	---	---	Up	Urgent	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Fair	Poor	---	Up	Urgent	Yes	40
North Carolina-----	Fair	---	---	Up	Urgent	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
South Carolina-----	Good	---	---	Up	Some	No	---
Tennessee-----	Fair	---	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Urgent	Yes	90
Virginia-----	Fair	---	---	Up	Urgent	No	---
Southern-----	3-Good						
	6-Fair	2-Poor	1-Poor	12-Up	7-Urgent	2-Yes	
	3-Poor				4-Some	10-No	12
					1-Little		
Arizona-----	Good	---	---	Up	Urgent	No	---
California-----	Poor	---	---	Up	Urgent	No	---
Oregon-----	Fair	---	---	Up	Urgent	No	---
Washington-----	Good	---	Poor	Up	Urgent	No	---
Hawaii-----	Fair	---	---	Sta.	Some	No	---
Western-----	2-Good						
	2-Fair	---	1-Poor	4-Up	4-Urgent	5-No	---
	1-Poor			1-Sta.	1-Some		
United States-----	8-Good						
	16-Fair	1-Fair	3-Poor	27-Up	26-Urgent	2-Yes	
	9-Poor	3-Poor		7-Sta.	7-Some	32-No	3
					1-Little		

<sup>1/</sup> Sta., stationary.

Table 86.--Vine crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region					Infestation trend						Total area
		NE	NC	S	W	No.	Stationary		Up		Down		
							No.	Area	No.	Area	No.	Area	
							100 acres		100 acres		100 acres		100 acres
Barley, wild-----	1	--	--	1	--	--	---	1	(1/)	--	---	---	(1/)
*Barnyardgrass-----	9	2	1	--	6	8	620 1/	1	187	--	---	---	807 1/
Bermudagrass-----	2	--	--	2	--	--	---	2	236	--	---	---	236
Bindweed, field-----	1	--	--	--	1	--	---	1	1	--	---	---	1
*Cocklebur-----	5	--	--	5	--	3	336 1/	2	62	--	---	---	398 1/
*Crabgrasses-----	19	2	4	13	--	11	2,313 1/	3	138 1/	3	610	---	3,153 1/2/
Crowfootgrass-----	1	--	--	1	--	1	464	--	---	--	---	---	464
*Foxtails-----	8	2	4	1	1	5	243 1/	1	38	2	104	---	385 1/
Galinsoga-----	1	--	--	--	1	--	---	1	1	--	--	---	1
Goosegrass-----	2	1	--	1	--	1	31	--	---	1	236	---	267
Grasses, annual-----	2	2	--	--	--	1	1	1	(1/)	--	---	---	1 1/
Horsetail-----	1	--	--	--	1	1	2	--	---	--	---	---	2
Jimsonweed-----	2	--	2	--	--	1	7	1	10	--	---	---	17
Johnsongrass-----	3	--	--	3	--	1	130	1	18	--	---	---	221 2/
Kochia-----	1	--	--	--	1	--	---	1	1	--	---	---	1
*Lambsquarters-----	21	8	5	3	5	13	864 1/	3	77	4	250	---	1,191 1/2/
Mallows-----	2	--	--	--	2	1	1	1	(1/)	--	---	---	1 1/
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	---	1 1/
Morningglories-----	4	1	--	3	--	2	292	2	15 1/	--	---	---	307 1/
Mustards-----	2	1	--	--	1	2	6	--	---	--	---	---	6
Nightshade, black---	1	--	--	--	1	1	16	--	---	--	---	---	16
*Nutsedges-----	7	3	--	3	1	5	242	2	127	--	---	---	369
*Pigweeds 3/-----	29	8	6	10	5	19	1,327 1/	4	393 1/	4	212	---	2,024 1/2/
Poorjoe-----	2	--	--	2	--	--	---	1	57	--	---	---	130 2/
Puncturevine-----	2	--	--	--	2	2	78	--	---	--	---	---	78
*Purslane-----	5	2	2	--	1	4	176	--	---	1	9	---	185
Pusley, Florida-----	4	--	--	3	1	1	76	2	284	1	1	---	361
Quackgrass-----	3	3	--	--	--	1	11	1	2	1	5	---	18
*Ragweeds-----	12	5	2	5	--	6	207	4	100	2	11	---	318 1/
Rocket, London-----	1	--	--	1	--	1	310	--	---	--	---	---	310
*Sandburs-----	5	--	2	2	1	4	407	1	242	--	---	---	649
Sicklepod-----	1	--	--	1	--	--	---	1	340	--	---	---	340
Smartweeds-----	3	2	1	--	--	1	9	2	10 1/	--	---	---	19 1/
Sunflower-----	1	--	--	1	--	1	540	--	---	--	---	---	540
Tasselflower, red---	1	--	--	--	1	--	---	1	1	--	---	---	1
Thistle, Canada-----	1	--	--	--	1	1	5	--	---	--	---	---	5
Velvetleaf-----	3	--	3	--	--	--	---	2	23	--	---	---	23 2/
Watergrasses (complex)	1	--	--	--	1	1	156	--	---	--	---	---	156

1/ Acreages of weeds in Connecticut, West Virginia, and Tennessee not estimated; less than 50 acres estimated for some weeds in Idaho and New Mexico.

2/ Weeds in Kansas and Arkansas not classified by infestation trend; counts and acreages included in regional and total figures.

3/ Includes all amaranths.

Table 87.---Vine crops: Five most important weeds listed alphabetically by states within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend
<b>Northeastern:</b>								
Connecticut	Grasses, annual	Pct.	Lambsquarters	Pct.	Pigweed	Pct.	Ragweed	Pct.
Delaware	Lambsquarters	50 Up	Nutsedge	50 Sta.	Purslane	50 Sta.	Ragweed, redroot	50 Sta.
Maine	Grasses, annual	50 Sta.	Goosegrass	15 Sta.	Pigweed, wild	15 Sta.	Pigweed, redroot	15 Sta.
Maryland	Grasses	20 Sta.	Lambsquarters	85 Sta.	Mustard, wild	30 Sta.	Pigweed	85 Sta.
New Hampshire	Lambsquarters	60 Sta.	Goosegrass	70 Sta.	Lambsquarters	70 Up	Pigweed	60 Sta.
New Jersey	Lambsquarters	60 Down	Morningglory	10 Sta.	Nutsedge	60 Down	Pigweed	60 Down
New York	Barnyardgrass	50 Sta.	Foxtail	60 Sta.	Lambsquarters	40 Sta.	Pigweed	45 Sta.
Pennsylvania	Lambsquarters	50 Sta.	Nutsedge	25 Up	Pigweed, redroot	75 Sta.	Purslane	30 Sta.
West Virginia	Foxtail, yellow	20 Down	Lambsquarters	35 Down	Pigweed, redroot	30 Down	Ragweed	20 Down
	Barnyardgrass	25 Sta.	Crabgrass	60 Up	Pigweed, redroot	50 Up	Ragweed, common	40 Up
<b>North Central:</b>								
Illinois	Crabgrass	25 Down	Jimsonweed	15 Sta.	Purslane	20 Down	Ragweed	20 Down
Indiana	Jimsonweed	10 Up	Lambsquarters	20 Up	Pigweed	30 Up	Smartweed	10 Up
Iowa	Foxtails	150 Sta.	Lambsquarters, common	150 Sta.	Pigweed, redroot	150 Sta.	Sandbur	100 Sta.
Kansas	Crabgrass	10	Lambsquarters	5	Mercury, three-seeded	20	Pigweed	10
Michigan	Crabgrass, large	50 Down	Foxtail, green	40 Down	Lambsquarters	95 Sta.	Pigweed, rough	80 Down
Ohio	Crabgrass	75 Sta.	Foxtail	75 Up	Pigweed	40 Sta.	Ragweed	40 Sta.
Wisconsin	Barnyardgrass	100 Up	Foxtail, green	100 Sta.	Lambsquarters, common	100 Sta.	Pigweed, redroot	100 Sta.
<b>Southern:</b>								
Alabama	Cocklebur	20 Up	Crabgrass	100 Sta.	Nutsedge	20 Sta.	Pigweed	50 Sta.
Arkansas	Crabgrass, large	100	Johnsongrass	80	Pigweed	100	Poor Joe	60
Florida	Anarath, spiny	40 Up	Bermudagrass	20 Up	Crabgrass, large	60 Sta.	Cowfootgrass	60 Sta.
Georgia	Cocklebur	50 Sta.	Crabgrass	90 Sta.	Morningglory	30 Sta.	Sandbur	50 Up
Kentucky	Crabgrass	100 Sta.	Foxtail	100 Sta.	Pigweed	30 Sta.		
Louisiana	Crabgrass	80 Sta.	Pigweed	65 Sta.	Poor Joe	70 Up	Ragweed	60 Up
Mississippi	Cocklebur	20 Up	Crabgrass	75 Up	Johnsongrass	15 Up	Pigweed	45 Up
North Carolina	Cocklebur	20 Sta.	Crabgrass	100 Down	Goosegrass	50 Down	Lambsquarters	20 Sta.
Oklahoma	Bermudagrass	50 Up	Crabgrass	90 Sta.	Johnsongrass	80 Sta.	Pigweed	80 Sta.
South Carolina	Crabgrass	90 Sta.	Nutsedge	50 Sta.	Pigweed	60 Sta.	Pigweed	60 Up
Tennessee	Burley, wild	40 Up	Cocklebur	35 Sta.	Crabgrass	75 Sta.	Morningglory	35 Up
Texas	Crabgrass	50 Sta.	Rocket, London	75 Sta.	Sandbur	50 Sta.	Sunflower	50 Sta.
Virginia	Crabgrass	50 Up	Lambsquarters	40 Sta.	Morningglory	15 Up	Pigweed	45 Sta.
<b>Western:</b>								
Arizona	Puncturevine	40 Sta.	Watergrass	85 Sta.				
California	Barnyardgrass	65 Sta.	Lambsquarters	35 Up	Pigweed, redroot	40 Sta.		
Idaho	Barnyardgrass	10 Sta.	Mallow, low	2 Sta.	Pigweed, redroot	10 Sta.	Puncturevine	70 Sta.
New Mexico	Barnyardgrass	20 Sta.	Carelessweed	20 Down	Foxtail, green	5 Sta.	Lambsquarters	10 In
Oregon	Barnyardgrass	50 Sta.	Lambsquarters	70 Sta.	Pigweed, redroot	30 Sta.	Purslane	30 Sta.
Utah	Barnyardgrass	50 Sta.	Bindweed, field	20 Up	Pigweed, redroot	30 Up	Mustard, black	80 Sta.
Washington	Barnyardgrass	70 Sta.	Horsetail	5 Sta.	Lambsquarters	50 Sta.	Nutsedge, black	50 Sta.
Hawaii	Callitriche, small	35 In	Mallow, little	25 Sta.	Nutsedge, turnip	15 Sta.	Wesley, Florida	20 Down

1/Sta., stationary.

2/Galinsoga, smallflower.



Table 88.—Solanaceous fruits: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and Region	Acres treated			Average cost per acre			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	0.2	1.8	---	10.00	12.00	---	90	10
Delaware-----	2	.6	---	12.00	18.00	---	100	---
Maine-----	2/	---	---	9.00	---	---	100	---
Maryland-----	7.2	---	---	10.00	---	---	100	---
Massachusetts-----	.5	.5	---	12.00	12.00	---	100	---
New Jersey-----	6	---	---	7.00	---	---	90	10
New York-----	5	---	---	20.00	---	---	90	10
West Virginia-----	---	.4	0.1	---	35.00	50.00	100	---
Northeastern-----	20.9	3.3	.1	11.77	15.88	50.00	95	5
Illinois-----	5	---	---	8.00	---	---	90	10
Indiana-----	10	---	---	10.00	---	---	99	1
Kansas-----	.8	---	---	10.00	---	---	100	---
Michigan-----	8	---	---	18.00	---	---	75	25
Ohio-----	12	5	---	6.00	12.00	---	50	50
North Central-----	35.8	5.0	---	10.17	12.00	---	73	27
Alabama-----	5	---	---	8.00	---	---	90	10
Arkansas-----	3	---	---	7.50	---	---	100	---
Florida-----	20	5	20	4.00	4.00	7.00	95	5
Georgia-----	.5	---	---	5.00	---	---	100	---
Kentucky-----	.3	---	---	10.00	---	---	100	---
Louisiana-----	1	---	---	10.00	---	---	95	5
Mississippi-----	2	.5	---	7.00	10.00	---	100	---
North Carolina-----	4	---	---	15.00	---	---	90	10
Oklahoma-----	.3	---	---	4.50	---	---	100	---
South Carolina-----	6	---	---	10.00	---	---	90	10
Texas-----	3	---	---	6.00	---	---	90	10
Virginia-----	3	3	---	10.00	11.50	---	90	10
Southern-----	48.1	8.5	20.0	7.10	7.00	7.00	94	6
California-----	115	---	5	20.00	---	28.00	50	50
Oregon-----	.5	---	---	15.00	---	---	100	---
Utah-----	1	---	---	6.00	---	---	10	90
Hawaii-----	.3	---	---	35.00	---	---	100	---
Western-----	116.8	---	5.0	19.90	---	28.00	50	50
United States-----	221.6	16.8	25.1	14.78	10.23	11.35	71	29

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.



Table 89.--Solanaceous fruits: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Good	Good	---	Up	Some	No	---
Delaware-----	Fair	Fair	Fair	Sta.	Some	No	---
Maine-----	Poor	---	---	Down	Urgent	No	---
Maryland-----	Fair	---	---	Sta.	Some	No	---
Massachusetts-----	Fair	Fair	---	Sta.	Some	No	---
New Jersey-----	Good	---	---	Up	Urgent	No	---
New York-----	Fair	---	---	Sta.	Urgent	No	---
West Virginia-----	---	Good	Fair	Up	Urgent	Yes	15
Northeastern-----	2-Good 4-Fair 1-Poor	2-Good 2-Fair	2-Fair	3-Up 4-Sta. 1-Down	4-Urgent 4-Some	1-Yes 7-No	---
Illinois-----	Fair	---	---	Up	Some	Yes	10
Indiana-----	Fair	---	---	Up	Urgent	No	---
Kansas-----	Good	---	---	Up	Urgent	Yes	35
Michigan-----	Fair	---	---	Up	Some	No	---
Ohio-----	Good	Good	---	Up	Some	Yes	20
North Central-----	2-Good 3-Fair	1-Good	---	5-Up	2-Urgent 3-Some	3-Yes 2-No	10
Alabama-----	Fair	---	---	Up	Some	No	---
Arkansas-----	Good	---	---	Up	Little	No	---
Florida-----	Good	Fair	Good	Up	Some	No	---
Georgia-----	Fair	---	---	Up	Some	No	---
Kentucky-----	Good	---	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Good	Fair	---	Up	Some	No	---
North Carolina-----	Fair	---	---	Up	Urgent	No	---
Oklahoma-----	Fair	---	---	Up	Little	No	---
South Carolina-----	Good	---	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	Yes	10
Virginia-----	Fair	Fair	---	Up	Some	Yes	20
Southern-----	7-Good 5-Fair	3-Fair	1-Good	12-Up	1-Urgent 8-Some 3-Little	2-Yes 10-No	2
California-----	Fair	---	Good	Sta.	Some	No	---
Oregon-----	Good	---	---	Sta.	Little	No	---
Utah-----	Good	---	---	Up	Some	No	---
Hawaii-----	Fair	---	---	Sta.	Urgent	No	---
Western-----	2-Good 2-Fair	---	1-Good	1-Up 3-Sta.	1-Urgent 2-Some 1-Little	4-No	---
United States-----	13-Good 14-Fair 1-Poor	3-Good 5-Fair	2-Good 2-Fair	21-Up 7-Sta. 1-Down	8-Urgent 17-Some 4-Little	6-Yes 23-No	2

1/ Sta., stationary.

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

- 1/ Acreages of weeds reported in Maine and New Hampshire not estimated; less than 50 acres estimated for some weeds in New Mexico, Washington, and Hawaii.
- 2/ Weeds reported in Kansas and Arkansas not classified by infestation trend; counts and acreage estimates included in regional and total figures.
- 3/ Includes all amaranths.

Table 97. --Solanaceous fruits: Five most important weeds listed alphabetically by states within regions, acreage infested, and infestation trend, 1941

Region and State	Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Weed	Infestation Acres Trend	
		Pct.	1/2		Pct.	1/2		Pct.	1/2		Pct.	1/2
Northeastern:												
Connecticut	Galinsoga	5	Up	Grasses, annual	15	Down	Lambsquarters	10	Down	Peppercweed	5	Up
Delaware	Jimsonweed	40	Sta.	Nutsedge	15	Sta.	Purslane	20	Sta.	Ragweed	40	Sta.
Maine	Grasses, annual	20	Sta.	Lambsquarters	30	Sta.	Mustard, wild	30	Sta.	Pigweed, redroot	30	Sta.
Maryland	Foxtail	70	Sta.	Jimsonweed	50	Up	Nutsedge	20	Up	Pigweed	60	Up
New Hampshire	Lambsquarters	60	Down	Morningglory	10	Sta.	Nutsedge	10	Sta.	Pigweed	60	Down
New Jersey	Barnyardgrass	60	Sta.	Foxtail	50	Sta.	Nutsedge	45	Up	Panicum, fall	40	Up
New York	Lambsquarters	90	Sta.	Nutsedge	35	Up	Pigweed, redroot	75	Sta.	Purslane	30	Sta.
Pennsylvania	Foxtail, yellow	30	Down	Galinsoga	8	--	Lambsquarters	20	Down	Pigweed, redroot	25	Down
Rhode Island	Purslane	75	Sta.	Grasses	40	Up	Nightshade, black	80	Up	Nutsedge	25	Up
West Virginia	Barnyardgrass	60	Up	Crabgrass	40	Up	Nightshade, black	80	Up	Nutsedge	25	Up
North Central:												
Illinois	Foxtail, giant	40	Down	Pigweed	30	Down	Purslane	20	Down	Ragweed	20	Down
Indiana	Jimsonweed	40	Up	Morningglory, ivyleaf	10	Up	Ragweed	20	Up	Smartweeds	40	Up
Iowa	Barnyardgrass	67	Sta.	Foxtails	67	Sta.	Smartweed, Pa.	67	Sta.	Velvetleaf	67	Sta.
Kansas	Crabgrass	10	--	Lambsquarters	5	--	Mercury, three-seeded	20	--	Pigweed	10	--
Michigan	Groundcherry	20	Up	Nightshade, black	20	Up	Nutsedge	5	Up	Pigweed, rough	85	Down
Ohio	Mallow, Venice	30	Up	Pigweed	75	Down	Ragweed	40	Up	Thistle, Canada	30	Up
Southern:												
Alabama	Crabgrass	100	Sta.	Nutsedge	20	Sta.	Pigweed	50	Sta.	Ragweed	30	Up
Arkansas	Crabgrass, large	100	--	Johnsongrass	90	--	Pigweed	90	--	Nightshade, black	70	Up
Florida	Amaranth, soiny	40	Up	Bermudagrass	10	Up	Crabgrass, large	70	Sta.	Nightshade, purple	20	Up
Georgia	Cocklebur	50	Up	Crabgrass	50	Sta.	Morningglory	80	Up	Sicklepod	80	Up
Kentucky	Crabgrass	100	Sta.	Foxtail, giant	100	Sta.	Nightshade	10	Sta.	Pigweed	20	Sta.
Louisiana	Crabgrass	80	Sta.	Goosegrass	60	Sta.	Morningglory	40	Sta.	Pigweed	75	Sta.
Mississippi	Cocklebur	75	Sta.	Crabgrass	95	Up	Nutsedge	15	Up	Sida, prickly	25	Up
North Carolina	Cocklebur	20	Sta.	Crabgrass	80	Up	Galinsoga	80	Up	Lambsquarters	30	Sta.
Oklahoma	Bermudagrass	40	Up	Crabgrass	90	Sta.	Johnsongrass	90	Sta.	Morningglory	20	Up
South Carolina	Cocklebur	40	Up	Crabgrass	50	Down	Morningglory	20	Sta.	Pigweed	40	Sta.
Tennessee	Crabgrass	40	Down	Crabgrass	30	Down	Nutsedge	15	Up	Ragweed	30	Sta.
Texas	Crabgrass	50	Sta.	Purslane, common	30	Sta.	Ragweed, common	75	Sta.	Sunflower	35	Sta.
Virginia	Crabgrass	40	Sta.	Lambsquarters	30	Sta.	Morningglory	25	Sta.	Nutsedge	5	Up
Western:												
California	Barnyardgrass	70	Sta.	Lambsquarters	40	Sta.	Nightshade	20	Up	Pigweed, redroot	40	Sta.
New Mexico	Barnyardgrass	5	Down	Carelessweed	5	Down	Foxtail, green	3	Down	Johnsongrass	12	Sta.
Oregon	Groundsel	50	Sta.	Nightshade	30	Sta.	Nightshade	30	Sta.	Pigweed, redroot	30	Sta.
Utah	Barnyardgrass	50	Sta.	Bindweed, field	20	Up	Lambsquarters, common	50	Sta.	Nightshade	25	Up
Washington	Barnyardgrass	80	Up	Lambsquarters	75	Sta.	Nightshade, black	75	Sta.	Pigweed, redroot	75	Sta.
Hawaii	Amole-of-Peru	25	Sta.	Mallow, little	15	Down	Nightshade, black	30	Sta.	Nutsedge, purple	35	Up
1/2, stationary.												

Table 92.--Greens: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Connecticut-----	0.1	---	---	10.00	----	----	100	--
Massachusetts-----	.3	---	---	12.00	----	----	100	--
New Hampshire-----	.1	---	---	20.00	----	----	100	--
New Jersey-----	---	1	---	----	8.00	----	90	10
West Virginia-----	2/	---	---	20.00	----	----	100	--
Northeastern-----	.5	1.0	---	13.20	8.00	----	99	1
Ohio-----	1	---	---	10.00	----	----	100	--
North Central-----	1.0	---	---	10.00	----	----	100	--
Arkansas-----	2	---	---	6.00	----	----	100	--
Florida-----	2	1	1	4.00	3.00	5.00	100	--
Georgia-----	1	---	---	5.00	----	----	100	--
Kentucky-----	2/	---	---	9.00	----	----	100	--
Mississippi-----	1	---	---	10.00	----	----	100	--
North Carolina-----	.5	---	---	12.00	----	----	100	--
Oklahoma-----	.5	---	---	7.50	----	----	100	--
Texas-----	2	---	---	6.00	----	----	90	10
Virginia-----	1.2	---	---	12.50	----	----	100	--
Southern-----	10.2	1.0	1.0	7.03	3.00	5.00	98	2
Oregon-----	.1	---	---	15.00	----	----	100	--
Hawaii-----	.2	---	---	35.00	----	----	100	--
Western-----	.3	---	---	28.33	----	----	100	--
United States-----	12.0	2.0	1.0	8.07	5.50	5.00	98	2

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 93.--Greens: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1</u> /	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Poor	---	---	Sta.	Urgent	No	---
Massachusetts-----	Fair	---	---	Sta.	Some	No	---
New Hampshire-----	Fair	---	---	Sta.	Some	No	---
New Jersey-----	---	Good	---	Up	Some	No	---
Northeastern-----	2-Fair	1-Good	---	1-Up	1-Urgent	4-No	---
	1-Poor			3-Sta.	3-Some		
Ohio-----	Fair	---	---	Up	Urgent	No	---
North Central-----	1-Fair	---	---	1-Up	1-Urgent	1-No	---
Arkansas-----	Good	---	---	Sta.	Some	No	---
Florida-----	Poor	Poor	Poor	Up	Urgent	No	---
Georgia-----	Fair	---	---	Up	Some	No	---
Kentucky-----	Fair	---	---	Up	Urgent	No	---
Mississippi-----	Fair	---	---	Sta.	Some	No	---
North Carolina-----	Fair	---	---	Up	Urgent	No	---
Oklahoma-----	Fair	---	---	Sta.	Little	No	---
Texas-----	Good	---	---	Up	Some	No	---
Virginia-----	Fair	---	---	Up	Some	No	---
Southern-----	2-Good	1-Poor	1-Poor	6-Up	3-Urgent	9-No	---
	6-Fair			3-Sta.	5-Some		
	1-Poor				1-Little		
Oregon-----	Fair	---	---	Up	Some	No	---
Hawaii-----	Fair	---	---	Sta.	Urgent	No	---
Western-----	2-Fair	---	---	1-Up	1-Urgent	2-No	---
				1-Sta.	1-Some		
United States-----	2-Good	1-Good	1-Poor	9-Up	6-Urgent	16-No	---
	11-Fair			7-Sta.	9-Some		
	2-Poor				1-Little		

1/ Sta., stationary.



Table 94.--Greens: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region					Infestation trend						Total area
	of						Stationary	Up	Down				
	reports	NE	NC	S	W	No.	Area	No.	Area	No.	Area		
							100 acres		100 acres		100 acres	100 acres	
Barnyardgrass-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
Bermudagrass-----	1	--	--	1	--	--	---	1	4	--	---	4	
Bittercress-----	1	--	--	1	--	--	---	1	3	--	---	3	
*Bluegrass, annual----	3	--	--	1	2	2	52	1	1	--	---	53	
Chamomile, corn-----	1	1	--	--	--	--	---	1	8	--	---	8	
*Chickweeds-----	10	2.	--	6	2	9	77	1	2	--	---	79	
*Crabgrasses-----	12	2	2	8	--	8	83	2	5	1	(1/)	88 2/	
Crowfootgrass-----	1	--	--	1	--	1	13	--	---	--	---	13	
Dock, curly-----	1	--	--	1	--	1	1	--	---	--	---	1	
*Foxtails-----	3	1	1	1	--	1	(1/)	2	6	--	---	6	
Galinsogas-----	2	1	--	--	1	--	---	2	(1/)	--	---	(1/)	
Garlic, wild-----	1	--	--	1	--	--	---	1	1	--	---	1	
Grasses, annual-----	2	2	--	--	--	1	12	1	(1/)	--	---	12	
Groundsels-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)	
*Henbit-----	8	3	--	5	--	5	26	2	2	--	---	59 2/	
Johnsongrass-----	2	--	--	2	--	2	24	--	---	--	---	24	
Ladysthumb-----	1	1	--	--	--	--	---	1	(1/)	--	---	(1/)	
*Lambsquarters-----	9	5	2	1	1	6	33	1	12	1	(1/)	45 2/	
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	(2/)	
Morningglories-----	1	--	--	1	--	--	---	1	(1/)	--	---	(1/)	
Mustard, wild-----	2	2	--	--	--	1	6	1	(1/)	--	---	6	
*Nutsedges-----	4	--	--	3	1	1	(1/)	3	4	--	---	4	
Pepperweed-----	1	--	--	1	--	1	1	--	---	--	---	1	
*Pigweeds 3/-----	9	3	2	4	--	4	43	4	11	--	---	54 2/	
*Purslane-----	6	2	1	3	--	4	40	2	5	--	---	45	
Pusley, Florida-----	2	--	--	2	--	2	(1/)	--	---	--	---	(1/)	
Quackgrass-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
*Ragweeds-----	5	1	--	4	--	3	5	2	(1/)	--	---	5	
Rockets-----	2	1	--	1	--	2	37	--	---	--	---	37	
Sandburs-----	1	--	--	1	--	1	10	--	---	--	---	10	
Shepherdspurse-----	1	1	--	--	--	--	---	1	6	--	---	6	
Sicklepod-----	1	--	--	1	--	--	---	1	(1/)	--	---	(1/)	
Sorrels-----	1	--	--	1	--	--	---	1	1	--	---	1	
Sunflower-----	1	--	--	1	--	1	37	--	---	--	---	37	
Swinecress-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
Tasselflower, red----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)	
Velvetleaf-----	1	--	1	--	--	--	---	--	---	--	---	(2/)	

1/ U.S. production statistics for kale and spinach do not include acreages for Connecticut, New Hampshire, Alabama, Georgia, Kentucky, North Carolina, South Carolina, Oregon, and Hawaii. Weeds reported in these States are included in frequency counts but acreages are not estimated.

2/ Weeds reported in Kansas and Arkansas not classified by infestation trends; counts and acreage estimates included in regional and total figures.

3/ Includes all amaranths.

Table 9. Insects: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
<b>Northeastern:</b>															
Connecticut	Galinsoga	15	Up	Grasses, annual	40	Up	Lambquarters	20	Sta.	Pigweed	10	Sta.	Purslane	15	Sta.
Maryland	Chickweed	40	Sta.	Crabgrass	50	Sta.	Henbit	25	Down	Lambquarters	60	Up	Shepherdspurse	30	Up
New Hampshire	Chickweed	60	Down	Henbit	50	Up	Lambquarters	50	Sta.	Quackgrass	20	Sta.	Rocket, yellow	40	Sta.
New Jersey	Chamomile, com	35	Up	Chickweed	60	Sta.	Grasses, annual	50	Sta.	Henbit	30	Sta.	Mustard, wild	25	Sta.
Pennsylvania	Foxtail, yellow	12	Up	Lambquarters	25	Sta.	Pigweed, redroot	40	Sta.	Purslane	6	Up	Ragweed	30	Sta.
West Virginia	Barnyardgrass	30	Sta.	Ladythumb	20	Up	Lambquarters	30	Sta.	Mustard, wild	50	Up	Pigweed, redroot	25	Up
<b>North Central:</b>															
Kansas	Crabgrass	5	--	Lambquarters	5	--	Mercury, three-scoded	3	--	Pigweed	10	--	Velvetleaf	1	--
Ohio	Crabgrass	75	Up	Foxtail	50	Up	Lambquarters	30	Sta.	Pigweed	75	Sta.	Purslane	75	Sta.
<b>Southern:</b>															
Alabama	Crabgrass	100	Sta.	Johnsongrass	40	Sta.	Morningglory	50	Up	Pigweed	50	Up	Ragweed	50	Up
Arkansas	Henbit	100	--	--	--	--	--	--	--	--	--	--	--	--	--
Florida	Amaranth, shiny	60	Up	Bermudagrass	20	Up	Crabgrass, large	70	Sta.	Crowfootgrass	70	Sta.	Nutsedge, purple	20	Up
Georgia	Chickweed	30	Sta.	Crabgrass	90	Up	Nutsedge	70	Up	Pursley, Florida	40	Sta.	Sicklenod	50	Up
Kentucky	Chickweed	80	Sta.	Crabgrass	100	Sta.	Foxtail	100	Sta.	Henbit	80	Sta.	Ragweed	10	Sta.
Mississippi	Chickweed	40	Sta.	Crabgrass	80	Sta.	Sorrel	60	Up	--	--	--	--	--	--
North Carolina	Chickweed	30	Sta.	Henbit	30	Sta.	Ragweed	20	Sta.	Pigweed	9	Sta.	Purslane	60	Sta.
Oklahoma	Crabgrass	100	Sta.	Johnsongrass	70	Sta.	Lambquarters	80	Sta.	Pigweed	9	Sta.	Ragweed	30	Up
South Carolina	Crabgrass	80	Sta.	Nutsedge	30	Up	Pigweed	30	Up	Pursley, Florida	40	Up	Peppercweed	15	Sta.
Tennessee	Chickweed	40	Up	Dock, curly	15	Sta.	Garlic, wild	20	Up	Henbit	20	Up	Sunflower	75	Sta.
Texas	Crabgrass	50	Sta.	Purslane, common	30	Sta.	Rocket, London	75	Sta.	Sandbar	20	Sta.	Purslane	15	Up
Virginia	Bitlcrress	10	Up	Bluegrass, annual	5	Up	Chickweed	50	Sta.	Henbit	50	Sta.	--	--	--
<b>Western:</b>															
California	Bluegrass, annual	50	Sta.	Chickweed, common	40	Sta.	--	--	--	--	--	--	--	--	--
Oregon	Bluegrass, annual	60	Sta.	Chickweed	80	Sta.	Groundsel	60	Sta.	--	--	--	--	--	--
Hawaii	Galinsoga, small fl.	60	Up	Lambquarters, common	40	Sta.	Nutsedge, purple	10	Sta.	Swinecress	40	Up	Tas:elflower, red	10	Sta.

1/Sta., stationary

2/Galinsoga, smallflower.

Table 96.--Salad crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	0.8	---	---	10.00	----	----	100	--
Maine-----	.4	---	---	11.00	----	----	100	--
Massachusetts-----	1	---	---	12.00	----	----	100	--
New Jersey-----	2	---	---	12.00	----	----	85	15
West Virginia-----	2/	---	---	20.00	----	----	100	--
Northeastern-----	4.2	---	---	11.52	----	----	93	7
Illinois-----	.1	---	---	5.00	----	----	80	20
Michigan-----	2	0.5	---	15.00	12.00	----	60	40
Ohio-----	.5	---	---	10.00	----	----	100	--
Wisconsin-----	3	---	---	9.00	----	----	100	--
North Central-----	5.6	.5	---	11.16	12.00	----	83	17
Florida-----	7	2	11	5.00	4.00	8.00	95	5
Oklahoma-----	2	---	---	7.00	----	----	100	--
Texas-----	5	---	---	6.00	----	----	90	10
Virginia-----	.1	---	---	8.50	----	----	100	--
Southern-----	14.1	2.0	11.0	5.66	4.00	8.00	94	6
Arizona-----	20	---	---	12.00	----	----	50	50
California-----	80	---	---	15.00	----	----	20	80
Oregon-----	.3	---	---	12.00	----	----	100	--
Hawaii-----	.6	---	---	35.00	----	----	100	--
Western-----	100.9	---	---	14.52	----	----	27	73
United States-----	124.8	2.5	11.0	13.27	5.60	8.00	45	55

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied pesticides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 97.--Salad crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides:	Persistence problem	
	Pre- : emergence :	Post- : emergence :	Pre- + post- : emergence :			Indication : of : problem :	Percent of : treated : acres
Connecticut-----	Fair	---	---	Sta.	Urgent	No	---
Maine-----	Poor	---	---	Sta.	Urgent	No	---
Massachusetts-----	Fair	---	---	Sta.	Some	No	---
New Jersey-----	Good	---	---	Up	Some	No	---
West Virginia-----	Fair	---	---	Up	Some	No	---
Northeastern-----	1-Good	---	---	2-Up	2-Urgent	5-No	---
	3-Fair	---	---	3-Sta.	3-Some		---
	1-Poor						
Illinois-----	Fair	---	---	Up	Some	No	---
Michigan-----	Fair	Fair	---	Up	Urgent	No	---
Ohio-----	Good	---	---	Up	Some	No	---
Wisconsin-----	Fair	---	---	Sta.	Urgent	No	---
North Central-----	1-Good	1-Fair	---	3-Up	2-Urgent	4-No	---
	3-Fair			1-Sta.	2-Some		
Florida-----	Good	Good	Good	Sta.	Little	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	Yes	20
Virginia-----	Fair	---	---	Up	Some	No	---
Southern-----	2-Good	1-Good	1-Good	3-Up	3-Some	1-Yes	
	2-Fair			1-Sta.	1-Little	3-No	4
Arizona-----	Good	---	---	Sta.	Some	Yes	10
California-----	Good	---	---	Sta.	Some	No	---
Oregon-----	Fair	---	---	Up	Some	No	---
Hawaii-----	Fair	---	---	Sta.	Some	No	---
Western-----	2-Good	---	---	1-Up	4-Some	1-Yes	
	2-Fair			3-Sta.		3-No	2
United States-----	6-Good	1-Good	1-Good	9-Up	4-Urgent	2-Yes	
	10-Fair			8-Sta.	12-Some	15-No	2
	1-Poor				1-Little		

1/ Sta., stationary.

Table 98.--Salad crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region				Infestation trend						Total area	
	of	Stationary				Up		Down		Total area			
	reports	NE	NC	S	W	No.	Area	No.	Area		No.		Area
							100 acres		100 acres		100 acres	100 acres	
*Barnyardgrass-----	5	1	2	--	2	4	28	--	---	--	---	28 <u>2/</u>	
Bermudagrass-----	1	--	--	1	--	--	---	1	44	--	---	44	
Bindweed-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
Bittercress-----	1	--	--	1	--	--	---	1	(1/)	--	---	(1/)	
Chickweeds-----	4	1	1	2	--	3	19	--	---	1	20	39	
*Crabgrasses-----	9	2	3	4	--	5	170	2	18	1	(1/)	188 <u>3/</u>	
Crowfootgrass-----	1	--	--	1	--	1	153	--	---	--	---	153	
Dogfennel-----	1	--	--	--	1	1	2	--	---	--	---	2	
Foxtails-----	2	1	1	--	--	1	(1/)	1	12	--	---	12	
*Galinsogas-----	3	2	--	--	1	--	---	3	10	--	---	10	
Grasses, annual-----	1	1	--	--	--	--	---	--	---	1	1	1	
Groundsels-----	1	--	--	--	1	1	3	--	---	--	---	3	
*Henbit-----	4	2	--	2	--	3	19	1	(1/)	--	---	19	
Johnsongrass-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)	
Ladysthumb-----	1	--	1	--	--	1	17	--	---	--	---	17	
*Lambsquarters-----	14	5	4	1	4	9	33	1	(1/)	2	21	54 <u>2/3/</u>	
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	(3/)	
*Mustards-----	3	2	--	--	1	3	3	--	---	--	---	3	
Nettle, stinging----	1	--	--	--	1	--	---	--	---	--	---	(2/)	
Nightshades-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
*Nutsedges-----	3	--	--	2	1	2	1	1	44	--	---	45	
Panicum, fall-----	1	1	--	--	--	--	---	1	(1/)	--	---	(1/)	
*Pigweeds <u>4/</u> -----	12	3	3	3	3	8	23	1	131	1	28	182 <u>2/3/</u>	
*Purslane-----	11	3	3	3	2	6	237	3	2	1	26	265 <u>2/</u>	
Pusley, Florida-----	1	--	--	1	--	1	(1/)	--	---	--	---	(1/)	
Quackgrass-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
*Ragweeds-----	4	2	--	2	--	3	12	1	(1/)	--	---	12	
Rockets-----	2	1	--	1	--	2	46	--	---	--	---	46	
Sandburs-----	1	--	--	1	--	1	19	--	---	--	---	19	
Shepherdspurse-----	1	1	--	--	--	--	---	1	8	--	---	8	
Sunflower-----	1	--	--	1	--	1	46	--	---	--	---	46	
Swinecress-----	1	--	--	--	1	--	---	1	2	--	---	2	
Tasselflower, red---	1	--	--	--	1	1	1	--	---	--	---	1	
Velvetleaf-----	1	--	1	--	--	--	---	--	---	--	---	(3/)	
Watercress (complex)	1	--	--	--	1	1	136	--	---	--	---	136	

1/ U.S. production statistics for celery, escarole, and lettuce do not include acreages for New Hampshire, West Virginia, Kentucky, Oklahoma, South Carolina, Virginia, and Utah; infestations of less than 50 acres were estimated for some weeds in Pennsylvania. Weeds reported are included in frequency counts, but acreages were not estimated.

2/ Weeds listed by California not classified by extent of infestations or trend.

3/ Weeds reported in Kansas not classified by infestation trend; counts and acreage estimates included in regional and total figures.

4/ Includes all amaranths.



Table 99.---Weeded crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>												
Connecticut	Galinisoga	15	Up	Grasses, annual	25	Down	Lambsquarters	10	Sta.	Pigweed	5	Sta.
Maine	Barleygrass	35	Sta.	Lambsquarters	60	Sta.	Mustard, wild	20	Sta.	Pigweed, redroot	50	Sta.
New Hampshire	Crabgrass	60	Down	Henbit	20	Up	Lambsquarters	60	Down	Quackgrass	20	Sta.
New Jersey	Crabgrass	35	Sta.	Galinisoga	10	Up	Henbit	35	Sta.	Shepherdspurse	15	Up
Pennsylvania	Foxtail, yellow	15	Sta.	Lambsquarters	20	Sta.	Pigweed, redroot	25	Sta.	Purslane	5	Up
West Virginia	Crabgrass	50	Up	Lambsquarters	40	Up	Mustard, wild	30	Sta.	Panicum, fall	20	Up
<b>North Central:</b>												
Kansas	Crabgrass	5	---	Lambsquarters	5	---	Mercury, three-seeded	5	---	Pigweed	5	---
Michigan	Barleygrass	30	Sta.	Chickweed, common	60	Down	Lambsquarters	65	Down	Pigweed, rough	85	Down
Ohio	Crabgrass	75	Up	Foxtail	50	Up	Lambsquarters	40	Sta.	Pigweed	75	Sta.
Wisconsin	Barleygrass	100	Sta.	Crabgrass, large	100	Sta.	Ladythumb	100	Sta.	Lambsquarters, common	100	Sta.
<b>Southern:</b>												
Florida	Amaranth, spiny	60	Up	Bermudagrass	20	Up	Crabgrass, large	70	Sta.	Crowfootgrass	70	Sta.
Kentucky	Chickweed	10	Sta.	Henbit	10	Sta.	Lambsquarters	80	Sta.	Pigweed	90	Sta.
Oklahoma	Crabgrass	95	Sta.	Johnsongrass	65	Sta.	Lambsquarters	80	Sta.	Pigweed	90	Sta.
South Carolina	Crabgrass	80	Sta.	Nutsedge	30	Sta.	Pigweed, Florida	30	Sta.	Purslane	50	Sta.
Texas	Purslane, common	30	Sta.	Ragweed, common	20	Sta.	Rocket, London	75	Sta.	Sandbur	30	Sta.
Virginia	Bittercress	10	Up	Chickweed	50	Sta.	Crabgrass	25	Sta.	Henbit	50	Sta.
<b>Western:</b>												
Arizona	Purslane	40	Sta.	Watergrass	30	Sta.	Nettle, stinging	---	---	Pigweed, redroot	---	---
California	Barleygrass	---	---	Lambsquarters	---	---	Lambsquarters	20	Sta.	Mustard	30	Sta.
Oregon	Dogfennel	30	Sta.	Groundsel	50	Sta.	Lambsquarters	50	Sta.	Nightshade	25	Up
Utah	Barleygrass	60	Sta.	Bindweed, field	10	Up	Lambsquarters	50	Sta.	Pigweed, redroot	90	Sta.
Hawaii	Galinisoga, small fl.	60	Up	Lambsquarters, common	40	Sta.	Nutsedge, purple	10	Sta.	Tasselgrass, red	10	Sta.

1/Sta., stationary

2/Galinisoga, smallflower

Table 100.--Cole crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	1.2	---	---	12.00	---	100	--
Maine-----	2/	---	---	9.00	---	---	100	--
Massachusetts-----	---	1.0	---	---	14.00	---	100	--
New Hampshire-----	---	.3	---	---	30.00	---	85	15
New Jersey-----	1	---	---	6.00	---	---	90	10
West Virginia-----	2/	---	---	25.00	---	---	100	--
Northeastern-----	1.0	2.5	---	6.00	14.96	---	96	4
Illinois-----	2	---	.3	12.00	---	20.00	80	20
Michigan-----	5	---	---	10.00	---	---	75	25
Ohio-----	2	1	---	8.00	8.00	---	50	50
Wisconsin-----	5	---	---	12.00	---	---	60	40
North Central-----	14.0	1.0	.3	10.71	8.00	20.00	66	34
Alabama-----	.2	---	---	7.00	---	---	100	--
Arkansas-----	.2	---	---	6.00	---	---	100	--
Florida-----	4	2	2	3.00	3.00	5.00	95	5
Georgia-----	.5	---	---	5.00	---	---	100	--
Kentucky-----	2/	---	---	10.00	---	---	100	--
Louisiana-----	.3	---	---	10.00	---	---	98	2
Mississippi-----	.2	---	---	7.00	---	---	100	--
North Carolina-----	3	---	---	8.00	---	---	90	10
Oklahoma-----	.3	---	---	3.50	---	---	100	--
South Carolina-----	1	---	---	8.00	---	---	100	--
Texas-----	15	---	---	5.50	---	---	90	10
Virginia-----	.5	---	---	9.50	---	---	100	--
Southern-----	25.2	2.0	2.0	5.63	3.00	5.00	92	8
Arizona-----	2	---	---	10.00	---	---	50	50
California-----	30	2	---	12.50	8.00	---	20	80
Oregon-----	3	---	1	12.00	---	20.00	60	40
Utah-----	.3	---	---	6.00	---	---	10	90
Hawaii-----	.5	---	---	35.00	---	---	100	--
Western-----	35.8	2.0	1.0	12.58	8.00	20.00	27	73
United States-----	76.0	7.5	3.3	9.84	8.99	10.91	59	41

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 101.--Cole crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	---	Good	---	Up	Some	No	---
Maine-----	Good	---	---	Down	Some	No	---
Massachusetts-----	Fair	Fair	---	Up	Some	No	---
New Hampshire-----	---	Good	---	Up	Some	No	---
New Jersey-----	Fair	---	---	Sta.	Urgent	No	---
West Virginia-----	Fair	---	---	Up	Urgent	No	---
Northeastern-----	1-Good 3-Fair	2-Good 1-Fair	---	4-Up 1-Sta. 1-Down	2-Urgent 4-Some	6-No	---
Illinois-----	Fair	---	Fair	Up	Some	No	---
Michigan-----	Fair	---	---	Up	Some	No	---
Ohio-----	Good	Good	---	Up	Some	No	---
Wisconsin-----	Fair	---	---	Sta.	Urgent	No	---
North Central-----	1-Good 3-Fair	1-Good	1-Fair	3-Up 1-Sta.	1-Urgent 3-Some	4-No	---
Alabama-----	Fair	---	---	Up	Urgent	No	---
Arkansas-----	Good	---	---	Sta.	Little	No	---
Florida-----	Good	Good	Good	Up	Some	No	---
Georgia-----	Fair	---	---	Up	Some	No	---
Kentucky-----	Good	---	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Good	---	---	Sta.	Little	No	---
North Carolina-----	Fair	---	---	Up	Some	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
South Carolina-----	Fair	---	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	Yes	10
Virginia-----	Fair	---	---	Up	Some	No	---
Southern-----	6-Good 6-Fair	1-Good	1-Good	10-Up 2-Sta.	1-Urgent 8-Some 3-Little	1-Yes 11-No	5
Arizona-----	Good	---	---	Sta.	Little	Yes	10
California-----	Good	Good	---	Up	Some	No	---
Oregon-----	Fair	---	Good	Up	Some	No	---
Utah-----	Good	---	---	Up	Some	No	---
Hawaii-----	Fair	---	---	Sta.	Some	No	---
Western-----	3-Good 2-Fair	1-Good	1-Good	3-Up 2-Sta.	4-Some 1-Little	1-Yes 4-No	1
United States-----	11-Good 14-Fair	5-Good 1-Fair	2-Good 1-Fair	20-Up 6-Sta. 1-Down	4-Urgent 19-Some 4-Little	2-Yes 25-No	2

1/ Sta., stationary.

Table 102.--Cole crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region					Infestation trend					Total area	
		NE	NC	S	W	No.	Stationary		Up		Down		
							Area	No.	Area	No.	Area		No.
							100 acres		100 acres		100 acres	100 acres	
*Barnyardgrass-----	5	1	2	1	1	3	15	--	---	2	14	29	
Bermudagrass-----	1	--	--	1	--	--	---	1	34	--	---	34	
Bindweed, field-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
Bluegrass, annual----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
*Chickweeds-----	8	--	--	7	1	6	38	1	3	--	---	41 2/	
Cocklebur-----	1	--	--	1	--	--	---	1	3	--	---	3	
*Crabgrasses-----	16	2	2	12	--	11	229	--	---	2	12	241 2/3/	
Crowfootgrass-----	1	--	--	1	--	1	119	--	---	--	---	119	
Eveningprimrose-----	1	--	--	1	--	1	12	--	---	--	---	12	
*Foxtails-----	5	1	3	1	--	3	59	--	---	2	20	79	
Galinsogas-----	3	1	--	1	1	1	(1/)	2	23	--	---	23	
Goosegrass-----	2	1	--	1	--	2	10	--	---	--	---	10	
Grasses, annual-----	2	2	--	--	--	1	24	--	---	1	1	25	
Groundsels-----	1	--	--	--	1	--	---	1	31	--	---	31	
Henbit-----	3	--	--	3	--	3	25	--	---	--	---	25	
Johnsongrass-----	3	--	--	3	--	1	(1/)	1	(1/)	--	---	(3/)	
Ladysthumb-----	1	--	1	--	--	1	57	--	---	--	---	57	
*Lambsquarters-----	17	6	5	3	3	10	139	1	(1/)	5	51	190 3/	
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	(3/)	
Morningglories-----	1	--	--	1	--	1	3	--	---	--	---	3	
*Mustards-----	4	2	--	--	2	2	12	2	(1/)	--	---	12	
Nettle, stinging-----	1	--	--	--	1	--	---	--	---	--	---	(2/)	
Nightshades-----	1	--	--	--	1	--	---	--	---	--	---	(2/)	
*Nutsedges-----	6	1	1	3	1	2	1	3	40	--	---	41 2/	
Panicum, fall-----	1	1	--	--	--	1	(1/)	--	---	--	---	(1/)	
Pepperweeds-----	1	1	--	--	--	1	9	--	---	--	---	9	
*Pigweeds 4/-----	21	6	5	8	2	12	115	2	107	5	85	307 3/	
*Purslane-----	9	1	3	3	2	5	66	--	---	3	73	139 2/	
Quackgrass-----	2	--	1	--	1	2	57	--	---	--	---	57	
*Ragweeds-----	7	2	1	4	--	3	17	2	23	2	11	51	
Rockets-----	2	1	--	1	--	2	110	--	---	--	---	110	
Sandburs-----	1	--	--	1	--	1	44	--	---	--	---	44	
Shepherdspurse-----	1	--	--	--	1	--	---	--	---	--	---	(2/)	
Signalgrass-----	1	--	--	1	--	--	---	1	12	--	---	12	
Spurry, corn-----	1	--	--	--	1	--	---	1	(1/)	--	---	(1/)	
Sunflower-----	1	--	--	1	--	1	110	--	---	--	---	110	
Swinecress-----	1	--	--	--	1	--	---	1	2	--	---	2	
Tasselflower, red----	1	--	--	--	1	1	1	--	---	--	---	1	
Velvetleaf-----	1	--	1	--	--	--	---	--	---	--	---	(3/)	
Watergrass (complex)	1	--	--	--	1	1	26	--	---	--	---	26	

- 1/ U.S. production statistics for cole crops do not include acreages for Maine, West Virginia, Kentucky, Oklahoma, and Utah; infestations of less than 50 acres were estimated for some weeds in Connecticut, New Hampshire, Mississippi, and Alaska. Weeds reported are included in frequency counts, but acreages were not estimated.
- 2/ Weeds listed by South Carolina and California not classified by extent of infestation or trend.
- 3/ Weeds reported in Kansas and Arkansas not classified by infestation trend; counts and acreages included in regional and total figures.
- 4/ Includes all amaranths.

Table 13.---Color cross: five most important weeds listed alphabetically by states within regions, acreage in study, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Pct.	1/1		Pct.	1/1		Pct.	1/1		Pct.	1/1
Northeastern:												
Connecticut	Grasses, annual	10	Down	Lambquarters	10	Down	Pigweed	5	Down			
Maine	Lambquarters	40	Sta.	Mustard, wild	50	Up	Pigweed, redroot	40	Sta.			
Maryland	Crabgrass	60	Sta.	Goosegrass	30	Sta.	Lambquarters	60	Sta.	Pigweed	50	Sta.
New Hampshire	Barnyardgrass	60	Down	Crabgrass	70	Down	Lambquarters	50	Down	Nutsedge	10	Sta.
New Jersey	Grasses, annual	40	Sta.	Pepperweed	15	Sta.	Pigweed	25	Sta.			
Pennsylvania	Foxtails, yellow	30	Down	Lambquarters	35	Down	Pigweed, redroot	25	Down	Purslane	9	Sta.
West Virginia	Galinsoga	30	Sta.	Lambquarters	40	Up	Mustard, wild	40	Up	Panicum, Fall	45	Sta.
North Central:												
Illinois	Lambquarters	25	Down	Purslane	20	Down	Rugweed	20	Down			
Iowa	Barnyardgrass	50	Sta.	Foxtails	50	Sta.	Pigweed, redroot	50	Sta.			
Kansas	Crabgrass	5	Down	Lambquarters	75	Down	Mercury, three-seeded	5	Up	Pigweed	5	Down
Michigan	Barnyardgrass	30	Down	Foxtails	30	Down	Nutsedge	40	Sta.	Pigweed, rough	85	Down
Ohio	Crabgrass	30	Sta.	Lambquarters	100	Sta.	Lambquarters	100	Sta.	Purslane	75	Down
Wisconsin	Foxtail, green	100	Sta.	Lady's thumb	100	Sta.	Lambquarters, common	100	Sta.	Quackgrass	100	Sta.
Southern:												
Alabama	Chickweed	20	Sta.	Crabgrass	100	Sta.	Lambquarters	30	Sta.	Pigweed	40	Sta.
Arkansas	Crabgrass	100	Down	Johnsongrass	100	Down	Pigweed	100	Down			
Florida	Amaranth, spiny	60	Up	Bermudagrass	20	Up	Crabgrass, large	70	Sta.	Crowfootgrass	70	Sta.
Georgia	Chickweed	30	Sta.	Crabgrass	20	Sta.	Evening primrose	40	Sta.	Hornbit	30	Sta.
Kentucky	Chickweed	70	Sta.	Crabgrass	100	Sta.	Foxtail, giant	100	Sta.	Pigweed	50	Sta.
Louisiana	Chickweed	75	Sta.	Crabgrass	80	Sta.	Henbit	80	Sta.	Pigweed	70	Sta.
Mississippi	Cocklebur	40	Up	Crabgrass	70	Sta.	Johnsongrass	5	Up	Pigweed	75	Up
North Carolina	Barnyardgrass	20	Sta.	Chickweed	20	Sta.	Crabgrass	70	Sta.	Gallinsoga	30	Up
Oklahoma	Crabgrass	95	Sta.	Crabgrass	80	Sta.	Lambquarters	50	Sta.	Pigweed	90	Sta.
South Carolina	Chickweed	40	Sta.	Crabgrass	60	Sta.	Nutsedge	30	Up	Pigweed	60	Sta.
Tennessee	Lambquarters	40	Sta.	Purslane, common	30	Sta.	Crabgrass, large	75	Sta.	Sundbur	30	Sta.
Texas	Chickweed	10	Up	Crabgrass	40	Sta.	Pigweed	40	Sta.	Purslane	20	Sta.
Virginia												
Western:												
Arizona	Purslane	40	Sta.	Watergrass	40	Sta.						
California	Nettle, stinging	50	Up	Mightshade, hairy	20	Down	Purslane	20	Down	Shepherdspurse		
Oregon	Groundsel	80	Sta.	Mustard	10	Up	Pigweed, redroot	50	Sta.	Mustard, black	90	Sta.
Utah	Barnyardgrass	30	Up	Bindweed, field	90	Sta.	Lambquarters	90	Sta.	Quackgrass	30	Up
Alaska	Bluegrass, annual	60	Up	Chickweed	40	Sta.	Nutsedge, purple	10	Sta.	Swinecress	10	Sta.
Hawaii	Galinsoga, smallflower			Lambquarters, common								

1/ Sta., stationary.



Table 104.--Miscellaneous vegetable crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Maryland-----	2	---	---	6.50	----	----	100	--
West Virginia-----	---	2 <sup>1/</sup>	---	----	50.00	----	100	--
Northeastern-----	2.0	2 <sup>1/</sup>	---	6.50	50.00	----	100	--
Kansas-----	1.2	---	---	6.50	----	----	100	--
North Central-----	1.2	---	---	6.50	----	----	100	--
Florida-----	15	4	0.4	3.00	2.00	4.00	95	5
Louisiana-----	.5	---	---	10.00	----	----	98	2
Oklahoma-----	.3	---	---	4.50	----	----	100	--
Tennessee-----	.5	---	---	15.00	----	----	90	10
Southern-----	16.3	4.0	.4	3.61	2.00	4.00	95	5
United States-----	19.5	4.0	.4	4.08	2.00	4.00	96	4

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 105.--Miscellaneous vegetable crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Maryland-----	Fair	---	---	Up	Some	No	---
West Virginia-----	---	Poor	---	Up	Some	No	---
Northeastern-----	1-Fair	1-Poor	---	2-Up	2-Some	2-No	---
Kansas-----	Fair	---	---	Up	Some	Yes	70
North Central-----	1-Fair	---	---	1-Up	1-Some	1-Yes	70
Florida-----	Fair	Fair	Fair	Up	Urgent	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
Tennessee-----	Fair	---	---	Up	Some	No	---
Southern-----	1-Good 3-Fair	1-Fair	1-Fair	4-Up	1-Urgent 2-Some 1-Little	4-No	---
United States-----	1-Good 5-Fair	1-Fair 1-Poor	1-Fair	7-Up	1-Urgent 5-Some 1-Little	1-Yes 6-No	3

<sup>1/</sup> Sta., stationary.

Table 106.--Miscellaneous vegetable crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the five weeds reported most frequently in the crop]

Weed or complex	Number	Reports by region				Infestation trend						Total area
	of	: NE : NC : S : W				Stationary	Up	Down		Percent		
	reports	No.:	Area	No.:	Area	No.:	Area	Percent				
	Percent	Percent	Percent	Percent								
Barnyardgrass-----	1	--	--	--	1	1	60	--	---	--	---	60
Bentgrass-----	1	--	--	--	1	1	40	--	---	--	---	40
Bermudagrass-----	1	--	--	1	--	--	---	1	20	--	---	20
Bindweed, field-----	1	1	--	--	--	--	---	1	20	--	---	20
Bluegrass, annual----	1	--	--	--	1	1	50	--	---	--	---	50
Chickweeds-----	1	--	--	--	1	1	50	--	---	--	---	50
Cockleburs-----	2	--	--	2	--	2	52	--	---	--	---	52
*Crabgrasses-----	9	--	1	8	--	6	87	1	95	1	90	80 2/
Crowfootgrass-----	1	--	--	1	--	1	70	--	---	--	---	70
Foxtails-----	1	--	--	1	--	1	100	--	---	--	---	100
Goosegrass-----	1	--	--	1	--	--	---	--	---	1	60	60
Groundsels-----	1	--	--	--	1	1	30	--	---	--	---	30
*Johnsongrass-----	3	--	--	3	--	3	55	--	---	--	---	55
*Lambsquarters-----	4	--	1	2	1	3	63	--	---	--	---	49 2/
Mercury, three-seeded	1	--	1	--	--	--	---	--	---	--	---	2 2/
Mustards-----	2	1	--	--	1	2	55	--	---	--	---	55
*Nutsedges-----	3	1	--	2	--	1	40	2	18	--	---	25
*Pigweeds 3/-----	8	--	1	6	1	5	71	2	50	--	---	58 2/
Purslane-----	1	--	--	1	--	1	55	--	---	--	---	55
Pusley, Florida-----	1	--	--	1	--	1	50	--	---	--	---	50
Quackgrass-----	2	1	--	--	1	--	---	2	35	--	---	35
Ragweeds-----	1	--	--	1	--	1	40	--	---	--	---	40
Ryegrass-----	1	--	--	--	1	1	50	--	---	--	---	50
Sida, prickly-----	1	--	--	1	--	--	---	1	25	--	---	25
Signalgrass-----	1	--	--	1	--	--	---	1	60	--	---	60
Sorrel, red-----	1	1	--	--	--	--	---	1	30	--	---	30
Teaweed-----	1	--	--	1	--	--	---	1	50	--	---	50
Velvetleaf-----	1	--	1	--	--	--	---	--	---	--	---	5 2/

<sup>1/</sup> Of reporting States, production acreages were available for peppermint in Oregon. Figures in Area columns are averages of percentage estimates given in the reports.

<sup>2/</sup> Weeds reported in Kansas not classified by trends, but area estimates included in overall averages.

<sup>3/</sup> Includes all amaranths.

Table 107.--Miscellaneous vegetable crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1960

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
<b>Northeastern:</b>												
West Virginia	Bindweed, field	20	Up	Mustard, wild	20	Sta.	Nutsedge	40	Sta.	Quackgrass	60	Up
<b>North Central:</b>												
Kansas	Crabgrass	15	---	Lambsquarters	5	---	Mercury, three-seeded	5	---	Pigweed	10	---
<b>Southern:</b>												
Alabama	Cocklebur	30	Sta.	Crabgrass	100	Sta.	Johnsongrass	40	Sta.	Pigweed	50	Sta.
Florida	Amaranth, spiny	60	Up	Bermudagrass	20	Up	Crabgrass, large	70	Sta.	Crowfootgrass	70	Sta.
Kentucky	Crabgrass	100	Sta.	Foxtail, giant	100	Sta.	Pigweed	65	Up	Signalgrass	60	Up
Louisiana	Crabgrass	80	Sta.	Johnsongrass	45	Sta.	Nutsedge	15	Up	Pigweed	40	Up
Mississippi	Cocklebur	75	Sta.	Crabgrass	95	Up	Crabgrass	80	Sta.	Lambsquarters	90	Sta.
North Carolina	Crabgrass	75	Sta.	Johnsongrass	80	Sta.	Lambsquarters	60	Down	Goosegrass	90	Down
Oklahoma	Crabgrass	95	Sta.	Crabgrass	60	Down	Crabgrass	60	Down	Crabgrass	60	Down
Tennessee	Crabgrass	90	Down	Crabgrass	60	Down	Crabgrass	60	Down	Crabgrass	60	Down
<b>Western:</b>												
Oregon	Bentgrass	40	Sta.	Bluegrass, annual	50	Sta.	Chickweed	50	Sta.	Groundsel	30	Sta.
Utah	Barnyardgrass	60	Sta.	Lambsquarters	50	Sta.	Mustard, black	90	Sta.	Pigweed, redroot	90	Sta.

1/Sta., stationary.

Table 108.--All vegetable seed crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Mississippi-----	1	---	---	7.00	----	----	100	--
Southern-----	1	---	---	7.00	----	----	100	--
Idaho-----	1	1	---	13.00	20.00	----	100	--
Oregon-----	2	---	---	15.00	----	----	80	20
Hawaii-----	2/	---	2/	25.00	----	50.00	100	--
Western-----	3	1	2/	14.33	20.00	50.00	90	10
United States-----	4	1	2/	12.50	20.00	50.00	92	8

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 500 acres.

Table 109.--All vegetable seed crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides :	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication : of : problem	Percent of : treated : acres
Mississippi-----	Fair	---	---	Sta.	Some	No	---
Southern-----	1-Fair	---	---	1-Sta.	1-Some	1-No	---
Idaho-----	Good	Good	---	Up	Some	No	---
Oregon-----	Fair	---	---	Up	Some	No	---
Hawaii-----	Fair	---	Good	Up	Urgent	No	---
Western-----	1-Good 2-Fair	1-Good	1-Good	3-Up	1-Urgent 2-Some	3-No	---
United States-----	1-Good 3-Fair	1-Good	1-Good	3-Up 1-Sta.	1-Urgent 3-Some	4-No	---

1/ Sta., stationary.

Table 110.--All vegetable seed crops: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

Weed or complex	: Number	:	: Reports by region				: Infestation trend						Total area	
	: of	:	: NE : NC : S : W				: Stationary		: Up		: Down			Percent
	: reports	:	No.:	Area	No.:	Area	No.:	Area	No.:	Area				
			Percent	Percent	Percent	Percent								
Barnyardgrass-----	3	--	--	--	3	2	30	1	60	--	---	40		
Bermudagrass-----	1	--	--	--	1	--	---	1	20	--	---	20		
Buckwheat, wild-----	1	--	--	--	1	1	100	--	---	--	---	100		
Chickweeds-----	1	--	--	--	1	1	100	--	---	--	---	100		
Cocklebur-----	1	--	--	--	1	1	75	--	---	--	---	75		
Foxtail, bristly----	1	--	--	--	1	1	40	--	---	--	---	40		
Groundsels-----	1	--	--	--	1	1	30	--	---	--	---	30		
Guineagrasses-----	1	--	--	--	1	1	20	--	---	--	---	20		
Knotweed, prostrate-	2	--	--	--	2	1	100	1	25	--	---	62		
Ladysthumb-----	1	--	--	--	1	1	100	--	---	--	---	100		
Lambsquarters-----	3	--	--	--	3	3	67	--	---	--	---	67		
Morningglories-----	1	--	--	--	1	--	---	--	---	1	10	10		
Mustard, black-----	1	--	--	--	1	1	90	--	---	--	---	90		
Nightshades-----	1	--	--	--	1	--	---	1	30	--	---	30		
Panicums-----	1	--	--	--	1	--	---	1	50	--	---	50		
Pigweeds-----	4	--	--	--	1	3	60	1	75	--	---	64		
Purslane-----	1	--	--	--	1	1	30	--	---	--	---	30		
Rhodesgrass-----	1	--	--	--	1	1	20	--	---	--	---	20		
Sida, prickly-----	1	--	--	--	1	--	---	1	60	--	---	60		
Signalgrass-----	1	--	--	--	1	--	15	--	---	--	---	15		

1/ Commercial operations; State acreages not available. Figures in Area columns are averages of percentage estimates reported.



Table III.---All reportable seed crops: Five most important weeds listed alphabetically by states within regions, average infested, and infestation trend, 1963

Region and State	Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Weed	Infestation Acres Trend		Pct.
		1/1			1/1			1/1			1/1			1/1		
<b>Southern:</b>																
Mississippi-----	Cocklebur-----	75 Sta.		Morningglory-----	10 Down		Pigweed-----	75 Up		Sida, prickly-----	60 Up		Signalgrass-----	15 Sta.		
<b>Western:</b>																
California-----	Barnyardgrass-----	30 Sta.		Knotweed, prostrate-----	25 Up		Pigweed, redroot-----	40 Sta.		Purslane-----	30 Sta.			--		
Oregon-----	Barnyardgrass-----	30 Sta.		Groundsel-----	30 Sta.		Lambsquarters-----	40 Sta.		Pigweed, redroot-----	50 Sta.			--		
Utah-----	Barnyardgrass-----	60 Up		Lambsquarters-----	60 Sta.		Mustard, black-----	90 Sta.		Nightshade-----	30 Up		Pigweed, redroot-----	90 Sta.		
Washington-----	Buckwheat, wild-----	100 Sta.		Chickweed-----	100 Sta.		Knotweed, prostrate-----	100 Sta.		Ladysthumb-----	100 Sta.		Lambsquarters-----	100 Sta.		
Hawaii-----	Bermudagrass-----	20 Up		Foxtail, bristly-----	40 Sta.		Guineagrasses-----	20 Sta.		Panicum-----	50 Up		Rhodes grass-----	20 Sta.		

1/ Sta., stationary.

# HORTICULTURAL CROPS--FRUITS AND NUTS

## (See General Limitations)

Fruit and nut crops include citrus fruits, pome fruits, stone fruits, tropical and subtropical fruits and nuts, deciduous tree nuts, and small fruits, such as cane fruits, blueberries, strawberries, and cranberries.

Fruit and nut crops are exclusively perennial in habit, and as a result, their weed problems are specialized in character. For example, perennial weeds are particularly common and constitute a severe problem. When the only available weed control methods with these crops are mowing and limited cultivation, annual and perennial weeds become unmanageable. Therefore, herbicides have been a great boon to growers.<sup>11</sup> During 1968, approximately 96 percent of the acreage of fruit and nut crops was treated with herbicides. Data on the extent, cost, and use of herbicides in fruit and nut crops, as well as data on related weed problems, are summarized in tables 1 through 7 and in tables 112 through 129.

The 10 weeds that were reported most frequently in fruit and nut crops (in order of decreasing frequency) were: quackgrass, crabgrasses, pigweeds, johnsongrass, bermudagrass, bindweed, poison ivy, chickweeds, barnyardgrass, and lambsquarters.

Tables for the individual fruit and nut crops are grouped at the end of the discussions (see pages 133 through 148).

### Citrus Fruits

Approximately 1 million acres of citrus fruits, including oranges, grapefruit, lemons, limes, tangerines, and tangelos, were grown during 1968. Approximately 768,000 acres, or about 77 percent of the total acreage, were treated with herbicides. The total cost of herbicides and applications was \$10.2 million. Preemergence treatments were applied on 63 percent of this acreage; postemergence treatments on 20 percent; and combination treatments on 17 percent (tables 112, 113, and 114).

### Pome Fruits

Approximately 1.4 million acres of pome fruit plantings, including apples and pears, were treated with herbicides during 1968. The total cost of herbicides and applications was \$9 million. Preemergence treatments were applied on 91 percent of this acreage; postemergence treatments on 7 percent; and combination treatments on 2 percent (tables 115, 116, and 117).

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<sup>11</sup>Preemergence and postemergence as used in discussions of weed problems in these perennial crops refer to the emergence of weeds.

## Stone Fruits

During 1968, approximately 333,300 acres of stone fruit plantings, including apricots, cherries, peaches, plums, and prunes, were treated with herbicides. The total cost of herbicides and applications was \$4 million. Pre-emergence treatments were applied on 41 percent of this acreage; postemergence treatments on 33 percent; and combination treatments on 26 percent (tables 118, 119, and 120).

## Tropical And Subtropical Fruits And Nuts

Approximately 57,000 acres of tropical and subtropical fruit and nut plantings were treated with herbicides during 1968. The total cost of herbicides and applications was \$1.3 million. Preemergence treatments were applied on 72 percent of this acreage; postemergence treatments on 23 percent; and combination treatments on 5 percent (tables 121, 122, and 123).

## Deciduous Tree Nuts

During 1968, approximately 244,000 acres of deciduous tree nut plantings, including almonds, filberts, pecans, and walnuts, were treated with herbicides. The total cost of herbicides and applications was \$3.2 million. Preemergence treatments were applied on 60 percent of this acreage; postemergence treatments on 27 percent; and combination treatments on 13 percent (tables 124, 125, and 126).

## Small Fruits

Approximately 124,200 acres of small fruit plantings, including blueberries, cranberries, cane fruit, and grapes, were treated with herbicides during 1968. The cost of herbicides and applications was \$2.1 million. Pre-emergence treatments were applied on 56 percent of this acreage; postemergence treatments on 32 percent; and combination treatments on 12 percent (tables 127, 128, and 129).

Table 112.--Citrus fruits: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Florida-----	225	50	25	20.00	10.00	30.00	40	60
Louisiana-----	1	---	---	12.00	----	----	98	2
Texas-----	50	60	20	6.00	3.00	9.00	90	10
Southern-----	276	110	45	17.45	6.18	20.67	55	45
Arizona-----	5	10	---	8.00	10.00	----	80	20
California-----	200	32	90	9.00	8.00	17.00	80	20
Hawaii-----	---	2/	---	----	15.00	----	100	--
Western-----	205	42	90	8.98	8.49	17.00	80	20
United States-----	481	152	135	13.84	6.82	18.22	66	34

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 113.--Citrus fruits: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <sup>1/</sup>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Florida-----	Good	Fair	Good	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Texas-----	Good	Fair	Good	Up	Some	No	---
Southern-----	3-Good	2-Fair	2-Good	3-Up	2-Some 1-Little	3-No	---
Arizona-----	Good	Fair	---	Up	Urgent	No	---
California-----	Good	Fair	Good	Sta.	Some	No	---
Hawaii-----	---	Good	---	Sta.	Little	No	---
Western-----	2-Good	1-Good 2-Fair	1-Good	1-Up 2-Sta.	1-Urgent 1-Some 1-Little	3-No	---
United States-----	5-Good	1-Good 4-Fair	3-Good	4-Up 2-Sta.	1-Urgent 3-Some 2-Little	6-No	---

<sup>1/</sup> Sta., stationary.

Table 111.--Citrus fruits: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1948

Region and State	1/			1/			1/			1/			
	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	Weed	Infestation Acres	Trend	
Southern:													
Florida-----	Balsamapple, pear-----	--	Up	Guineagrass-----	--	Sta.	Milkvine-----	--	Up	Paragrass-----	--	Sta.	Rosarypea-----
Louisiana-----	Bermudagrass-----	80	Sta.	Crabgrass-----	85	Sta.	Johnsongrass-----	85	Up	Nutsedge-----	75	Up	Pigweed-----
Texas-----	Johnsongrass-----	25	Sta.	Nightshade, silv. 2/-----	20	Up	Nutsedge-----	25	Sta.	Pigweed-----	95	Down	Sunflower-----
Western:													
Arizona-----	Bermudagrass-----	35	Up	Johnsongrass-----	10	Sta.	Rocket, London-----	70	Sta.	Sandbur-----	20	Sta.	Watergrass-----
California-----	Barryardgrass-----	20	Sta.	Bermudagrass-----	30	Up	Binsweed-----	40	Sta.	Nutsedge-----	30	Up	Spurge, prostrate-----
Hawaii-----	Bermudagrass-----	10	Sta.	Foxtail, bristly-----	20	Sta.	Junglerice-----	15	Sta.	Nutsedge-----	50	Sta.	Paspalum-----
1/Sta., stationary.													
2/Nightshade, silverleaf.													



Table 115.--Pome fruits: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	2/	2/	15.00	20.00	30.00	100	--
Delaware-----	---	---	0.5	---	---	5.00	100	--
Maryland-----	55	---	---	7.00	---	---	100	--
Massachusetts-----	0.5	0.5	---	15.00	15.00	---	100	--
New Hampshire-----	---	2	---	---	15.00	---	100	--
Vermont-----	---	4	---	---	10.00	---	100	--
West Virginia-----	5	10	---	15.00	20.00	---	100	--
Northeastern-----	60.5	16.5	.5	7.73	16.82	5.00	100	--
Illinois-----	---	1	5	---	3.40	4.80	100	--
Indiana-----	5	2	5	20.00	12.00	32.00	100	--
Iowa-----	---	.5	.5	---	1.50	1.50	100	--
Kansas-----	2/	1.2	---	12.00	8.00	---	95	5
Michigan-----	---	50	---	---	15.00	---	85	15
Minnesota-----	3	---	2	10.00	---	15.00	90	10
Wisconsin-----	---	3.3	---	---	10.00	---	100	--
North Central-----	8.0	58.0	12.5	16.25	14.15	17.18	90	10
Alabama-----	---	.2	.1	---	10.00	12.00	100	--
Arkansas-----	.1	---	---	6.00	---	---	100	--
Georgia-----	1	1	.5	10.00	10.00	15.00	100	--
Kentucky-----	---	.8	---	---	7.50	---	100	--
North Carolina-----	2	1	---	15.00	10.00	---	90	10
Oklahoma-----	1,200	---	---	5.50	---	---	95	5
Tennessee-----	---	.1	---	---	15.00	---	95	5
Texas-----	1	---	---	6.50	---	---	100	--
Virginia-----	---	6	---	---	4.50	---	100	--
Southern-----	1,204.1	9.1	.6	5.52	6.21	14.50	95	5
California-----	10	3	5	9.00	14.00	23.00	85	15
Idaho-----	---	.1	---	---	3.00	---	100	--
Oregon-----	6	4	---	10.00	6.00	---	80	20
Utah-----	.9	.3	---	5.00	6.00	---	80	20
Washington-----	---	15	---	---	20.00	---	90	10
Western-----	16.9	22.4	5.0	9.14	1.64	23.00	85	15
United States-----	1,289.5	106.0	18.6	5.74	11.24	18.33	95	5

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 116.--Pome fruits: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Fair	Fair	Fair	Sta.	Some	No	---
Delaware-----	---	---	Good	Up	Some	Yes	10
Maryland-----	Good	---	---	Sta.	Some	No	---
Massachusetts-----	Fair	Fair	Fair	Up	Urgent	Yes	---
New Hampshire-----	---	Good	---	Up	Little	No	---
Vermont-----	---	Good	---	Up	Some	No	---
West Virginia-----	Good	Fair	---	Up	Urgent	No	---
Northeastern-----	2-Good 2-Fair	2-Good 3-Fair	1-Good 2-Fair	5-Up 2-Sta.	2-Urgent 4-Some 1-Little	2-Yes 5-No	---
Illinois-----	---	Good	Good	Up	Urgent	No	---
Indiana-----	Good	Fair	Good	Up	Urgent	No	---
Iowa-----	---	Good	Good	Sta.	Some	No	---
Kansas-----	Fair	Good	---	Up	Some	No	---
Michigan-----	---	Good	---	Up	Some	No	---
Minnesota-----	Good	---	Good	Up	Some	No	---
Wisconsin-----	---	Good	---	Sta.	Little	No	---
North Central-----	2-Good 1-Fair	5-Good 1-Fair	4-Good	5-Up 2-Sta.	2-Urgent 4-Some 1-Little	7-No	---
Alabama-----	---	Good	Good	Up	Some	No	---
Arkansas-----	Good	---	---	Up	Little	No	---
Georgia-----	Good	Good	Good	Up	Some	No	---
Kentucky-----	---	Fair	---	Up	Some	No	---
North Carolina-----	Good	Good	---	Up	Some	No	---
Oklahoma-----	Good	---	---	Up	Little	No	---
Tennessee-----	---	Fair	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	Yes	10
Virginia-----	---	Good	---	Up	Some	No	---
Southern-----	5-Good	4-Good 2-Fair	2-Good	9-Up	7-Some 2-Little	1-Yes 8-No	---
California-----	Good	Fair	Good	Up	Some	No	---
Idaho-----	---	Good	---	Up	Little	No	---
Oregon-----	Good	Fair	---	Up	Some	No	---
Utah-----	Good	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	Yes	10
Western-----	3-Good	3-Good 2-Fair	1-Good	5-Up	4-Some 1-Little	1-Yes 4-No	3
United States-----	12-Good 3-Fair	14-Good 8-Fair	8-Good 2-Fair	24-Up 4-Sta.	4-Urgent 19-Some 5-Little	4-Yes 24-No	---

1/ Sta., stationary.

Table 117.---Some fruits: Five most important weeds listed alphabetically by States within regions, forage infested, and infestation trend. 1935

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>												
Connecticut----	Dandelion-----	--	Sta.	Ivy, poison-----	--	Sta.	Morningglory-----	--	Up	Quackgrass-----	--	Sta.
Maryland-----	Dockberries-----	5	Up	Dogbane, hemp-----	25	Up	Horsenettle-----	--	Up	Ivy, poison-----	--	Sta.
New Hampshire----	Ivy, poison-----	30	Down	Milkweed-----	10	Down	Nutsedge-----	--	Up	Quackgrass-----	20	Down
New Jersey-----	Promote, downy-----	30	Sta.	Creepers, Virginia-----	30	Sta.	Dandelion-----	75	Up	Orchardgrass-----	60	Sta.
Pennsylvania-----	Foxtail, yellow-----	30	Down	Lambsquarters-----	30	Down	Pigweed, redroot-----	35	Down	Dock, curly-----	65	Up
Vermont-----	Burdock-----	10	Sta.	Dandelion-----	50	Up	Lambsquarters-----	20	Sta.	Quackgrass-----	15	Down
West Virginia----	Bindweed, field-----	5	Up	Brambles-----	30	Up	Horsenettle-----	50	Up	Pigweed-----	20	Sta.
<b>North Central:</b>												
Illinois-----	Bindweed, field-----	5	Up	Bindweed, hedge-----	5	Up	Foxtail, giant-----	--	Up	Milkweed, climbing-----	--	Sta.
Indiana-----	Bindweed-----	30	Up	Ivy, poison-----	20	Sta.	Milkweed-----	40	Up	Morningglory-----	30	Up
Iowa-----	Foxtails-----	8	Sta.	Ivy, poison-----	2	Sta.	Nettle, stinging-----	20	Up	Sandbur-----	15	Sta.
Kansas-----	Bindweed-----	15	Down	Crabgrass-----	25	Down	Ivy, poison-----	5	Sta.	Johnsongrass-----	10	Sta.
Michigan-----	Bindweed, field-----	5	Up	Ivy, poison-----	5	Up	Milkweed, common-----	10	Up	Quackgrass-----	70	Down
Minnesota-----	Bluegrass-----	100	Sta.	Ivy, poison-----	5	Sta.	Quackgrass-----	100	Down	Southistle, perennial-----	2	Sta.
Ohio-----	Grasses, perennial-----	40	Down	Ivy, poison-----	30	Up	Plantain-----	30	Up	Thistle, Canada-----	30	Sta.
Wisconsin-----	Dandelion, common-----	100	Up	Ivy, poison-----	30	Up	Nightshade, black-----	75	Sta.	Quackgrass-----	100	Sta.
<b>Southern:</b>												
Alabama-----	Bermudagrass-----	80	Sta.	Crabgrass-----	75	Sta.	Johnsongrass-----	40	Sta.	Lambsquarters-----	20	Sta.
Arkansas-----	Bermudagrass-----	30	--	Crabgrass-----	100	--	Johnsongrass-----	40	--	Nutsedge-----	30	--
Georgia-----	Bermudagrass-----	75	Up	Brambles-----	30	Up	Crabgrass-----	90	Sta.	Johnsongrass-----	50	Up
Kentucky-----	Bindweed-----	15	Up	Fescue-----	60	Down	Ivy, poison-----	--	Up	Foxtail-----	--	--
North Carolina----	Brambles-----	50	Up	Crabgrass-----	90	Sta.	Johnsongrass-----	80	Sta.	Pigweed-----	85	Sta.
Oklahoma-----	Bermudagrass-----	50	Up	Crabgrass-----	85	Sta.	Flabane-----	60	Up	Horseweed-----	40	Sta.
Tennessee-----	Bromsedge-----	10	Sta.	Crabgrass-----	60	Down	Johnsongrass-----	60	Sta.	Pigweed-----	90	Down
Texas-----	Bermudagrass-----	5	Up	Honeysuckle-----	5	Sta.	Horsenettle-----	10	Up	Ivy, poison-----	10	Sta.
Virginia-----	Greenbriers-----	5	Up	Crabgrass-----	75	Sta.	Johnsongrass-----	40	Sta.	Lambsquarters-----	20	Sta.
<b>Western:</b>												
California-----	Barnyardgrass-----	40	Up	Bermudagrass-----	20	Sta.	Bindweed-----	30	Up	Johnsongrass-----	20	Down
Idaho-----	Bindweed, field-----	40	Sta.	Goldenrod-----	20	Sta.	Ivy, poison-----	50	Sta.	Quackgrass-----	20	Sta.
New Mexico-----	Barnyardgrass-----	35	Sta.	Carelessweed-----	25	Sta.	Foxtail, green-----	35	Sta.	Lambsquarters-----	30	Sta.
Oregon-----	Barnyardgrass-----	20	Sta.	Bindweed, field-----	20	Sta.	Horsetail-----	10	Down	Kochia-----	40	Down
Utah-----	Bindweed, field-----	20	Up	Cocklebur-----	30	Up	Pigweed, redroot-----	30	Sta.	Quackgrass-----	30	Up
Washington-----	Cocklebur-----	20	Sta.	Dandelions-----	40	Up	Quackgrass-----	60	Up	Ragweed-----	20	Sta.

1/Sta., stationary.

Table 118.--Stone fruits: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	2/	---	---	10.00	---	100	--
Delaware-----	2/	2/	0.1	5.00	5.00	10.00	100	--
Maryland-----	2.3	---	---	8.00	---	---	100	--
Massachusetts-----	.1	---	---	15.00	---	---	100	--
New Hampshire-----	---	0.2	---	---	15.00	---	100	--
West Virginia-----	1	1	---	15.00	20.00	---	100	--
Northeastern-----	3.4	1.2	.1	10.26	19.17	10.00	100	--
Illinois-----	---	.5	1	---	3.40	4.80	100	--
Indiana-----	.7	.3	.7	20.00	12.00	32.00	100	--
Kansas-----	2/	.8	---	12.00	8.00	---	95	5
Michigan-----	---	40	---	---	12.00	---	85	15
Wisconsin-----	---	.8	---	---	10.00	---	100	--
North Central-----	.7	42.4	1.7	20.00	11.79	16.00	87	13
Alabama-----	---	.1	.4	---	10.00	12.00	100	--
Arkansas-----	.1	---	---	6.00	---	---	100	--
Georgia-----	4	1	---	15.00	15.00	---	100	--
Kentucky-----	---	.8	---	---	7.50	---	100	--
Louisiana-----	.3	---	---	7.00	---	---	99	1
Mississippi-----	.2	.2	---	7.00	5.00	---	100	--
North Carolina-----	2	.2	---	15.00	10.00	---	90	10
Oklahoma-----	.7	---	---	5.00	---	---	98	2
South Carolina-----	---	25	---	---	12.00	---	100	--
Tennessee-----	---	.1	---	---	15.00	---	95	5
Texas-----	10	---	---	6.50	---	---	100	--
Virginia-----	---	1.2	---	---	4.50	---	100	--
Southern-----	17.3	28.6	.4	9.40	11.60	12.00	99	1
California-----	110	30	84	9.00	14.00	16.00	90	10
Idaho-----	---	.1	---	---	3.00	---	100	--
Oregon-----	5	2	---	10.00	10.00	---	100	--
Utah-----	1	.4	---	5.00	6.00	---	80	20
Washington-----	---	5	---	---	20.00	---	90	10
Western-----	116.0	37.5	84.0	9.01	14.47	16.00	90	10
United States-----	137.4	109.7	86.2	9.15	12.74	15.97	91	9

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 119.--Stone fruits: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for : better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of treated acres
Connecticut-----	---	Fair	---	Sta.	Some	No	---
Delaware-----	Good	Good	Good	Up	Some	Yes	20
Maryland-----	Good	---	---	Sta.	Some	No	---
Massachusetts-----	Fair	Fair	---	Up	Some	Yes	---
New Hampshire-----	---	Good	---	Up	Little	No	---
West Virginia-----	Good	Good	---	Up	Some	No	---
Northeastern-----	3-Good 1-Fair	3-Good 2-Fair	1-Good	4-Up 2-Sta.	5-Some 1-Little	2-Yes 4-No	---
Illinois-----	---	Good	Good	Up	Urgent	No	---
Indiana-----	Good	Good	Good	Up	Urgent	No	---
Kansas-----	Fair	Good	---	Up	Some	No	---
Michigan-----	---	Fair	---	Up	Urgent	No	---
Wisconsin-----	---	Good	---	Sta.	Little	No	---
North Central-----	1-Good 1-Fair	4-Good 1-Fair	2-Good	4-Up 1-Sta.	3-Urgent 1-Some 1-Little	5-No	---
Alabama-----	---	Good	Good	Up	Some	No	---
Arkansas-----	Good	---	---	Up	Little	No	---
Georgia-----	Good	Good	---	Up	Some	No	---
Kentucky-----	---	Fair	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Fair	Good	---	Up	Some	No	---
North Carolina-----	Good	Good	---	Up	Some	No	---
Oklahoma-----	Good	---	---	Up	Little	No	---
South Carolina-----	---	Good	---	Up	Some	No	---
Tennessee-----	---	Fair	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	Yes	10
Virginia-----	---	Good	---	Up	Some	No	---
Southern-----	6-Good 1-Fair	6-Good 2-Fair	1-Good	12-Up	9-Some 3-Little	1-Yes 11-No	2
California-----	Good	Fair	Good	Up	Urgent	No	---
Idaho-----	---	Good	---	Up	Little	No	---
Oregon-----	Good	Fair	---	Up	Some	No	---
Utah-----	Good	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	Yes	10
Western-----	3-Good	3-Good 2-Fair	1-Good	5-Up	1-Urgent 3-Some 1-Little	1-Yes 4-No	---
United States-----	13-Good 3-Fair	16-Good 7-Fair	5-Good	25-Up 3-Sta.	4-Urgent 18-Some 6-Little	4-Yes 24-No	---

1/ Sta., stationary.





Table 121.--Tropical and subtropical fruits and nuts: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
California-----	16	4	2	9.00	14.00	16.00	90	10
Hawaii-----	25	9	1	28.00	40.00	55.00	100	--
Western-----	41	13	3	20.58	32.00	29.00	96	4
United States-----	41	13	3	20.58	32.00	29.00	96	4

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 122.--Tropical and subtropical fruits and nuts: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
California-----	Good	Fair	Fair	Sta.	Some	No	---
Hawaii-----	Good	Good	Good	Sta.	Some	No	---
Western-----	2-Good	1-Good 1-Fair	1-Good 1-Fair	2-Sta.	2-Some	2-No	---
United States-----	2-Good	1-Good 1-Fair	1-Good 1-Fair	2-Sta.	2-Some	2-No	---

1/ Sta., stationary.



Table 124.--Deciduous tree nuts: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
West Virginia-----	---	2/	---	----	20.00	----	100	--
Northeastern-----	---	2/	---	----	20.00	----	100	--
Kansas-----	---	1	---	----	7.00	----	100	--
North Central-----	---	1	---	----	7.00	----	100	--
Arkansas-----	2/	---	---	6.00	----	----	100	--
Oklahoma-----	45	---	---	5.50	----	----	80	20
Texas-----	10	---	---	7.00	----	----	100	--
Southern-----	55	---	---	5.77	----	----	84	16
Arizona-----	5	5	---	12.00	20.00	----	100	--
California-----	85	60	30	9.00	24.00	15.00	80	20
Oregon-----	2	1	---	10.00	3.00	----	100	--
Utah-----	2/	2/	---	3.00	1.00	----	80	20
Western-----	92	66	30	9.18	23.38	15.00	81	19
United States-----	147	67	30	7.90	23.14	15.00	82	18

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 125.--Deciduous tree nuts: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
West Virginia-----	---	Good	---	Up	Some	No	---
Northeastern-----	---	1-Good	---	1-Up	1-Some	1-No	---
Kansas-----	---	Fair	---	Up	Urgent	No	---
North Central-----	---	1-Fair	---	1-Up	1-Urgent	1-No	---
Arkansas-----	Good	---	---	Up	Little	No	---
Oklahoma-----	Good	---	---	Up	Some	No	---
Texas-----	Fair	---	---	Up	Urgent	No	---
Southern-----	2-Good 1-Fair	---	---	3-Up	1-Urgent 1-Some 1-Little	3-No	---
Arizona-----	Fair	Fair	---	Up	Urgent	No	---
California-----	Good	Fair	Good	Up	Urgent	No	---
Oregon-----	Good	Good	---	Up	Some	No	---
Utah-----	Good	Good	---	Up	Some	No	---
Western-----	3-Good 1-Fair	2-Good 2-Fair	1-Good	4-Up	2-Urgent 2-Some	4-No	---
United States-----	5-Good 2-Fair	3-Good 3-Fair	1-Good	9-Up	4-Urgent 4-Some 1-Little	9-No	---

1/ Sta., stationary.



Table 126.--Deciduous tree nuts: Five most important weeds listed alphabetically by States within regions, average infested, and infestation trend, 1963

Region and State	Weed	Infestation 1/ Acres trend		Weed	Infestation 1/ Acres trend		Weed	Infestation 1/ Acres trend		Weed	Infestation 1/ Acres trend		Infestation Acres trend 1/ Pct.
		Pct.	Up		Pct.	Up		Pct.	Up		Pct.	Up	Pct.
Northeastern:													
West Virginia---	Brambles-----	40	Up	Horsenettle-----	50	Up	Ivy, poison-----	60	Sta.	Nutsedge-----	20	Sta.	Quackgrass----- 60 Sta.
North Central:													
Kansas-----	Barnyardgrass-----	--	--	Bedstraw-----	--	--	Johnsongrass-----	--	--	Nutsedge-----	--	--	Ragweed----- --
Southern:													
Alabama-----	Honeysuckle-----	20	Sta.	Horsenettle-----	40	Sta.	Ivy, poison-----	25	Sta.	Pigweed-----	65	Sta.	Sheepweed, bitter-- 50 Sta.
Arkansas-----	Bermudagrass-----	70	--	Crabgrass-----	60	Up	Johnsongrass-----	40	--	Pigweed-----	50	--	Pepperweed----- --
Georgia-----	Bermudagrass-----	60	Sta.	Chickweed-----	90	Up	Crabgrass-----	90	Sta.	Eveningprimrose-----	50	Up	Pepperweed----- 50 Up
Louisiana-----	Bermudagrass-----	80	Up	Crabgrass-----	75	Sta.	Johnsongrass-----	80	Up	Morningglory-----	65	Up	Pigweed----- 70 Sta.
Oklahoma-----	Bermudagrass-----	70	Sta.	Crabgrass-----	95	Sta.	Ivy, poison-----	20	Up	Johnsongrass-----	90	Sta.	Pigweed----- 80 Sta.
Texas-----	Johnsongrass-----	40	Sta.	Kochia-----	20	Sta.	Pigweed-----	65	Sta.	Sandbur-----	20	Sta.	Sunflower----- 30 Sta.
Western:													
Arizona-----	Bermudagrass-----	15	Up	Johnsongrass-----	30	Sta.	Mustards-----	60	Sta.	Pigweed-----	50	Sta.	Matergrass----- 50 Sta.
California-----	Barnyardgrass-----	90	Sta.	Bermudagrass-----	30	Up	Bindweed-----	30	Up	Johnsongrass-----	30	Sta.	Pepperweed----- --
New Mexico-----	Barnyardgrass-----	20	Sta.	Carelessweed-----	15	Sta.	Johnsongrass-----	15	Sta.	Kochia-----	10	Up	Lambsquarters----- 15 Sta.
Oregon-----	Bindweed, field-----	20	Up	Bluegrass, annual-----	90	Sta.	Chickweed-----	90	Sta.	Ryegrass-----	70	Sta.	Pigweed----- --
Utah-----	Barnyardgrass-----	80	Sta.	Bindweed, field-----	20	Up	Johnsongrass-----	10	Up	Milkweed, western 2/	20	Up	Pigweed, redroot---- 80 Sta.

1/Sta., stationary.  
2/Milkweed, western whorled.

Table 127.--Small fruits: Estimated extent and cost of chemical weed control,  
by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre 1/			Acreage treated by--	
	Pre- emergence	Post- emergence	Pre- + post- emergence	Pre- emergence	Post- emergence	Pre- + post- emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	---	---	15.00	---	---	100	---
Delaware-----	---	0.3	---	---	25.00	30.00	100	---
Maine-----	10	10	---	3.50	3.50	---	90	10
Maryland-----	.4	4	---	25.00	25.00	---	100	---
Massachusetts-----	.7	---	---	18.00	---	---	100	---
New Hampshire-----	.1	.1	2/	18.00	18.00	27.00	100	---
New Jersey-----	---	4	---	---	10.00	---	80	20
Pennsylvania-----	---	---	2	---	---	60.00	100	---
West Virginia-----	---	.5	---	---	45.00	---	100	---
Northeastern-----	11.2	15.3	2.0	5.30	7.63	60.00	90	10
Illinois-----	.8	---	---	25.00	---	---	95	5
Kansas-----	.1	2/	---	15.00	10.00	---	100	---
Michigan-----	20	5	5	18.00	16.00	27.00	60	40
Minnesota-----	.3	---	2/	15.00	---	20.00	90	10
Ohio-----	---	2	---	---	30.00	---	100	---
Wisconsin-----	.3	7.2	1.5	25.00	46.50	50.00	100	---
North Central-----	21.5	14.2	6.5	18.30	33.44	32.31	71	29
Alabama-----	2/	---	---	10.00	---	---	100	---
Arkansas-----	3	---	---	7.50	---	---	100	---
Georgia-----	.5	---	---	10.00	---	---	100	---
Kentucky-----	1	2/	---	10.00	5.00	---	100	---
Louisiana-----	1.5	---	---	15.00	---	---	95	5
Mississippi-----	2/	---	---	9.00	---	---	100	---
North Carolina-----	4	3	---	20.00	8.00	---	75	25
Oklahoma-----	.8	.2	---	8.00	2.00	---	90	10
Tennessee-----	1	.8	---	15.00	5.00	---	80	20
Texas-----	.5	---	---	7.00	---	---	100	---
Virginia-----	---	1	---	---	12.00	---	90	10
Southern-----	12.3	5.0	---	13.41	8.08	---	95	5
California-----	5	---	1	7.00	---	14.00	90	10
Oregon-----	20	---	5	15.00	---	20.00	70	30
Utah-----	.2	2/	---	20.00	12.00	---	80	20
Washington-----	---	5	---	---	12.00	---	95	5
Western-----	25.2	5.0	6.0	13.45	12.00	19.00	77	23
United States-----	70.2	39.5	14.5	13.63	17.52	30.62	80	20

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 128.--Small fruits: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for : better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	Fair	---	---	Sta.	Some	No	---
Delaware-----	---	Good	Good	Up	Some	No	---
Maine-----	Fair	Fair	---	Up	Urgent	No	---
Maryland-----	Good	Good	---	Sta.	Little	No	---
Massachusetts-----	Fair	Fair	---	Up	Urgent	Yes	---
New Hampshire-----	Good	Good	Good	Up	Some	No	---
New Jersey-----	---	Fair	---	Up	Some	No	---
Pennsylvania-----	---	---	Good	Up	Urgent	No	---
West Virginia-----	---	Good	---	Up	Some	Yes	15
Northeastern-----	2-Good 3-Fair	4-Good 3-Fair	3-Good	7-Up 2-Sta.	3-Urgent 5-Some 1-Little	2-Yes 7-No	---
Illinois-----	Fair	---	---	Up	Urgent	No	---
Kansas-----	Fair	Fair	---	Up	Urgent	No	---
Michigan-----	Fair	Fair	Good	Up	Urgent	No	---
Minnesota-----	Good	---	Good	Up	Some	No	---
Ohio-----	---	Good	---	Up	Some	No	---
Wisconsin-----	Good	Good	Good	Sta.	Some	No	---
North Central-----	2-Good 3-Fair	2-Good 2-Fair	3-Good	5-Up 1-Sta.	3-Urgent 3-Some	6-No	---
Alabama-----	Fair	---	---	Sta.	Some	No	---
Arkansas-----	Good	---	---	Sta.	Little	No	---
Georgia-----	Good	---	---	Up	Some	No	---
Kentucky-----	Fair	Fair	---	Up	Some	No	---
Louisiana-----	Fair	---	---	Up	Some	No	---
Mississippi-----	Poor	---	---	Sta.	Urgent	No	---
North Carolina-----	Fair	Fair	---	Up	Urgent	No	---
Oklahoma-----	Fair	Fair	---	Sta.	Some	No	---
Tennessee-----	Fair	Fair	---	Up	Some	No	---
Texas-----	Good	---	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Urgent	No	---
Southern-----	3-Good 6-Fair 1-Poor	5-Fair	---	7-Up 4-Sta.	3-Urgent 7-Some 1-Little	11-No	---
California-----	Fair	---	Fair	Sta.	Little	No	---
Oregon-----	Good	---	Good	Sta.	Some	Yes	20
Utah-----	Good	Good	---	Up	Some	No	---
Washington-----	---	Fair	---	Sta.	Some	Yes	10
Western-----	2-Good 1-Fair	1-Good 1-Fair	1-Good 1-Fair	1-Up 3-Sta.	3-Some 1-Little	2-Yes 2-No	15
United States-----	9-Good 13-No 1-Poor	7-Good 11-Fair	7-Good 1-Fair	20-Up 10-Sta.	9-Urgent 18-Some 3-Little	4-Yes 26-No	4

1/ Sta., stationary.

Table 129.--Small fruits: Five most important weeds listed alphabetically by States within regions, average infested, and in-estation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
<b>Northeastern:</b>												
Connecticut	Bluegrass	50	Sta.	Cinquefoil	20	Sta.	Crabgrass	25	Down	Dandelions	50	Up
Maine	Aspen, bigtooth	60	Down	Chokeberry, black	50	Down	Hardhack	50	Down	Laurel, sheep	50	Down
New Hampshire	Crabgrass	40	Down	Lambquarters	60	Up	Nutsedge	10	Sta.	Pigweed	60	Down
New Jersey	Bracken	10	Sta.	Buckheat, wild	20	Up	Ivy, poison	30	Sta.	Pigweed	60	Down
Pennsylvania	Foxtail, yellow	15	Sta.	Lambquarters	18	Sta.	Pigweed, redroot	18	Sta.	Shagbark	35	Up
West Virginia	Bindweed, field	25	Up	Chickweed, common	60	Up	Nutsedge	30	Up	Quackgrass	10	Sta.
<b>North Central:</b>												
Illinois	Bindweed	---	Down	Bluegrass, annual	---	Sta.	Chickweed	---	Down	Johnsongrass	---	Sta.
Indiana	Chickweed	25	---	Crabgrass	20	Down	Foxtail	20	---	Morningglory	---	---
Kansas	Barnyardgrass	10	Sta.	Crabgrass	30	Down	Garlic, wild	2	Sta.	Ragweed	10	---
Michigan	Chest	80	Down	Chickweed, common	25	Down	Crabgrass	40	Down	Panicum, fall	5	Down
Minnesota	Chickweed	70	Sta.	Dandelion	25	Sta.	Foxtails	90	Sta.	Quackgrass	30	Sta.
Ohio	Bindweed, field	30	Up	Chickweed, common	10	Sta.	Purslane	50	Sta.	Quackgrass	75	Sta.
Wisconsin	Clover, white	30	Sta.	Dandelions	30	Sta.	Quackgrass	70	Sta.	Sorrel, red	30	Up
<b>Southern:</b>												
Alabama	Bermudagrass	75	Sta.	Chickweed	50	Sta.	Crabgrass	70	Sta.	Lambquarters	30	Sta.
Arkansas	Bermudagrass	30	---	Crabgrass	100	Sta.	Johnsongrass	10	---	Pigweed	50	Sta.
Georgia	Bermudagrass	75	Up	Crabgrass	90	Sta.	Johnsongrass	50	Up	Nutsedge	50	Up
Kentucky	Chickweed	---	---	Crabgrass	---	---	Foxtail	---	---	Henbit	---	---
Louisiana	Bluegrass, annual	85	Sta.	Dandelion	55	Up	Eveningprimrose	75	Up	Smartweed	55	Sta.
North Carolina	Bermudagrass	15	Up	Chickweed	40	Sta.	Crabgrass	80	Sta.	Ragweed	10	Sta.
Oklahoma	Bermudagrass	65	Up	Crabgrass	95	Sta.	Johnsongrass	80	Sta.	Lambquarters	50	Sta.
Tennessee	Bermudagrass	10	Sta.	Chickweed	95	Sta.	Crabgrass	95	Sta.	Henbit	95	Sta.
Texas	Crabgrass	40	Sta.	Johnsongrass	15	Sta.	Junglerice	20	Sta.	Panicum, browntop	20	Sta.
Virginia	Barnyardgrass	5	Sta.	Chickweed	20	Up	Crabgrass	30	Up	Henbit	1	Up
<b>Western:</b>												
California	Barnyardgrass	50	Up	Bermudagrass	40	Up	Bindweed	30	Up	Johnsongrass	30	Sta.
Idaho	Kochia	10	Up	Lambquarters	20	Sta.	Lettuce, prickly	10	Up	Pigweed, redroot	25	Sta.
Oregon	Pigweed, redroot	20	Down	Crabgrass	20	Sta.	Ryegrass	20	Down	Sorrel, red	10	Sta.
Utah	Barnyardgrass	50	Sta.	Bindweed, field	10	Up	Mallow	50	Sta.	Pigweed, redroot	90	Sta.
Washington	Chickweed	90	Sta.	Groundsel, common	90	Sta.	Ladythumb	100	Sta.	Lambquarters	100	Sta.
<b>1/Sta., stationary.</b>												

2/See 3. Listed for Wisconsin are those reported specifically for strawberries. Wisconsin also reported the following weeds in cranberry plantings: barnyardgrass, 5 percent up; dewberry, 2 percent sta.; fern, feathery, 5 percent sta.; firm, sensitive, 5 percent sta.; sedge, 50 percent up.

# HORTICULTURAL CROPS--ORNAMENTALS

## (See General Limitations)

Ornamental crops include annual species as well as herbaceous and woody perennial species. Weed control in nursery plantings is very complex, because the species and varieties of plants involved number in the hundreds. Most of these types have very specific requirements with respect to light, soil, nutrients, temperature, moisture, and cultural practices. Weed control requirements range from a few weeks with some species to several years with others. Methods of herbicide application include preplanting, preemergence, and postemergence treatments.<sup>12</sup> During 1968, approximately 43 percent of the total acreage of ornamentals was treated with herbicides.

Data on the extent, costs, and use of herbicides on ornamental plantings have been summarized in tables 130 through 144.

The 10 weeds reported most frequently in ornamental crops (in order of decreasing frequency) were: crabgrasses, chickweeds, quackgrass, pigweeds, nutsedges, lambsquarters, foxtails, bermudagrass, purslane, and bluegrass.

Tables for the individual categories of ornamental plants are grouped at the end of the discussions (see pages 151 through 164).

### Herbaceous Ornamental Plants

During 1968, approximately 5,100 acres of herbaceous ornamental plantings were treated with herbicides. The total cost of herbicides and applications was \$159,000. Preemergence treatments were applied on 88 percent of this acreage, while postemergence treatments were applied on the remaining 12 percent. Combined treatments were not used (tables 130, 131, and 132).

### Bulb And Corm Crops

During 1968, approximately 13,000 acres of ornamental bulb and corm crop plantings were treated with herbicides. The total cost of herbicides and applications was \$255,000. Preemergence treatments were applied on 91 percent of this acreage; postemergence treatments on 8 percent, and combination treatments on 1 percent (tables 133, 134, and 135).

### Ornamental Seed Crops

Approximately 6,000 acres of ornamental seed crop plantings were treated with herbicides during 1968. The total cost of herbicides and applications was \$71,000. Preemergence treatments were applied on 83 percent of this acreage, and postemergence treatments were applied on 17 percent. No combined treatments were reported (tables 136, 137, and 138).

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<sup>12</sup>Preemergence and postemergence refer to the emergence of weeds in perennial woody species.



## Woody Ornamentals

Approximately 36,100 acres of woody ornamental plantings were treated with herbicides during 1968. The total cost of herbicides and applications was \$560,000. Preemergence treatments were applied on 64 percent of this acreage; postemergence treatments on 24 percent; and combination treatments on 12 percent (tables 139, 140, and 141).

## Nursery Stock

During 1968, approximately 29,100 acres of ornamental nursery plantings were treated with herbicides. The total cost of herbicides and applications was \$766,000. Preemergence treatments were applied on 46 percent of this acreage; postemergence treatments on 49 percent; and combination treatments on 5 percent (tables 142, 143, and 144).

Table 130.--Herbaceous materials: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
West Virginia-----	<u>2/</u>	<u>2/</u>	---	30.00	5.00	----	100	--
Northeastern-----	<u>2/</u>	<u>2/</u>	---	30.00	5.00	----	100	--
Kansas-----	<u>2/</u>	0.2	---	25.00	9.00	----	20	80
Michigan-----	0.5	---	---	20.00	----	----	60	40
Ohio-----	---	.2	---	----	20.00	----	100	--
North Central-----	.5	.4	---	20.00	14.50	----	60	40
Florida-----	<u>2/</u>	---	---	28.00	----	----	100	--
Virginia-----	---	<u>2/</u>	---	----	15.00	----	100	--
Southern-----	<u>2/</u>	<u>2/</u>	---	28.00	15.00	----	100	--
California-----	4	---	---	35.00	----	----	70	30
Hawaii-----	---	.2	---	----	15.00	----	100	--
Western-----	4.0	.2	---	35.00	15.00	----	71	29
United States-----	4.5	.6	---	33.33	14.67	----	69	31

1/ Includes herbicide equipment and labor for treatment made by farmers, Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 131.--Herbaceous materials: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
West Virginia-----	Fair	Fair	---	Up	Some	No	---
Northeastern-----	1-Fair	1-Fair	---	1-Up	1-Some	1-No	---
Kansas-----	Good	Poor	---	Up	Urgent	No	---
Michigan-----	Fair	---	---	Up	Some	No	---
Ohio-----	---	Fair	---	Up	Some	No	---
North Central-----	1-Good 1-Fair	1-Fair 1-Poor	---	3-Up	1-Urgent 2-Some	3-No	---
Florida-----	Fair	---	---	Sta.	Urgent	No	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	1-Fair	1-Fair	---	1-Up 1-Sta.	1-Urgent 1-Some	2-No	---
California-----	Fair	---	---	Up	Urgent	Yes	20
Hawaii-----	---	Fair	---	Up	Urgent	No	---
Western-----	1-Fair	1-Fair	---	2-Up	2-Urgent	1-Yes 1-No	19
United States-----	1-Good 4-Fair	4-Fair 1-Poor	---	7-Up 1-Sta.	4-Urgent 4-Some	1-Yes 7-No	16

1/ Sta., stationary.



Table 133.--Bulb and corm crops: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
West Virginia-----	2/	2/	---	20.00	40.00	---	100	---
Northeastern-----	2/	2/	---	20.00	40.00	---	100	---
Illinois-----	1	---	---	15.00	---	---	75	25
Kansas-----	.1	2/	---	15.00	9.00	---	100	---
Michigan-----	.3	---	---	10.00	---	---	60	40
North Central-----	1.4	2/	---	13.93	9.00	---	74	26
Alabama-----	.2	2/	---	9.60	2.40	---	80	20
Arkansas-----	2/	---	---	10.00	---	---	100	---
Florida-----	2	1	---	28.00	36.00	---	100	---
North Carolina-----	1	---	---	7.00	---	---	75	25
Virginia-----	---	2/	---	---	12.00	---	100	---
Southern-----	3.2	1.0	---	20.29	36.00	---	93	7
California-----	5	---	---	15.00	---	---	70	30
Oregon-----	.3	---	0.1	20.00	---	30.00	100	---
Washington-----	2	---	---	25.00	---	---	40	60
Western-----	7.3	---	.1	17.95	---	30.00	64	36
United States-----	11.9	1.0	.1	18.11	36.00	30.00	74	26

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.



Table 134.--Bulb and corm crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for : better : herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
West Virginia-----	Fair	Fair	---	Up	Some	No	---
Northeastern-----	1-Fair	1-Fair	---	1-Up	1-Some	1-No	---
Illinois-----	Fair	---	---	Up	Some	No	---
Kansas-----	Good	Good	---	Up	Urgent	No	---
Michigan-----	Fair	---	---	Up	Some	No	---
North Central-----	1-Good 2-Fair	1-Good	---	3-Up	1-Urgent 2-Some	3-No	---
Alabama-----	Good	Good	---	Up	Some	No	---
Arkansas-----	Good	---	---	Up	Some	No	---
Florida-----	Good	Good	---	Sta.	Some	No	---
North Carolina-----	Fair	---	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Urgent	No	---
Southern-----	3-Good 1-Fair	2-Good 1-Fair	---	4-Up 1-Sta.	1-Urgent 4-Some	5-No	---
California-----	Good	---	---	Up	Urgent	Yes	50
Oregon-----	Good	---	Good	Sta.	Some	No	---
Washington-----	Good	---	---	Sta.	Some	No	---
Western-----	3-Good	---	1-Good	1-Up 2-Sta.	1-Urgent 2-Some	1-Yes 2-No	34
United States-----	7-Good 4-Fair	3-Good 2-Fair	1-Good	9-Up 3-Sta.	3-Urgent 9-Some	1-Yes 11-No	19

1/ Sta., stationary.

Table 135.--Hubb and corn crops: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>												
New Jersey-----	Crabgrass-----	25	Sta.	Foxtails-----	60	Sta.	Lambsquarters-----	55	Sta.	Nutsedge-----	10	Up
Pennsylvania-----	Foxtail, yellow-----	15	Down	Lambsquarters-----	35	Down	Pigweed, redroot-----	40	Down	Purslane-----	10	Sta.
West Virginia-----	Chickweed, common-----	70	Up	Nutsedge-----	40	Sta.	Panicum, Fall-----	60	Sta.	Quackgrass-----	50	Up
<b>North Central:</b>												
Illinois-----	Crabgrass-----	100	Down	Lambsquarters-----	50	Up	Pigweed-----	50	Up	Purslane-----	90	Up
Kansas-----	Chickweed-----	60	--	Crabgrass-----	90	Sta.	Foxtails-----	90	Sta.	Henbit-----	60	--
Michigan-----	Bluegrass, annual-----	20	Up	Chickweed-----	20	Down	Nutsedge-----	5	Up	Quackgrass-----	25	Sta.
Minnesota-----	Foxtails-----	70	Sta.	Lambsquarters-----	60	Sta.	Mustard-----	50	Sta.	Pigweed-----	30	Sta.
<b>Southern:</b>												
Alabama-----	Setaria, Florida-----	15	Up	Cockspur-----	40	Sta.	Crabgrass-----	80	Down	Johnsongrass-----	35	Down
Arkansas-----	Barnyardgrass-----	10	Sta.	Bermudagrass-----	20	Sta.	Crabgrass-----	98	Sta.	Pigweed-----	25	Down
Florida-----	Bermudagrass-----	--	--	Crabgrass-----	--	--	Goosegrass-----	--	--	Pursley, Florida-----	--	--
North Carolina-----	Crabgrass-----	90	Sta.	Goosegrass-----	40	Sta.	Ragweed-----	15	Sta.	--	--	--
Oklahoma-----	Bermudagrass-----	70	Sta.	Crabgrass-----	100	Sta.	Johnsongrass-----	50	Sta.	Sandbur-----	90	Sta.
Virginia-----	Bermudagrass-----	5	Sta.	Crabgrass-----	80	Sta.	Galinsoga-----	15	Up	Purslane-----	30	Sta.
<b>Western:</b>												
California-----	Chenopodium-----	40	Up	Chickweed, common-----	40	Sta.	Lambsquarters-----	60	Sta.	Nightshade-----	30	Up
Oregon-----	Bluegrass, annual-----	20	Down	Chickweed-----	20	Down	Groundsel-----	20	Down	Rye-----	40	Sta.
Washington-----	Buckwheat, wild-----	100	Sta.	Chickweed-----	100	Sta.	Knotweed, prostrate-----	100	Sta.	Lambsquarters-----	100	Sta.
Wyoming-----	Bindweed, field-----	30	Up	Brome-----	60	Up	Pigweed, redroot-----	50	Up	Thistle, Russian-----	40	Up

1/Sta., stationary.

Table 136.--Ornamental seed crops: Estimated extent and cost of chemical weed control by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Kansas-----	2/	---	---	30.00	----	----	100	--
North Central-----	2/	2/	---	30.00	----	----	100	--
California-----	2	0.5	---	8.00	5.00	----	90	10
Washington-----	3	.5	---	15.00	15.00	----	30	70
Western-----	5.0	1.0	---	12.20	10.00	----	55	45
United States-----	5.0	1.0	---	12.20	10.00	----	55	45

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 137.--Ornamental seed crops: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Kansas-----	Fair	---	---	Up	Urgent	No	---
North Central-----	1-Fair	---	---	1-Up	1-Urgent	1-No	---
California-----	Fair	Fair	---	Up	Urgent	Yes	60
Washington-----	Good	Good	---	Up	Some	No	---
Western-----	1-Good	1-Good	---	2-Up	1-Urgent	1-Yes	25
	1-Fair	1-Fair			1-Some	1-No	
United States-----	1-Good	1-Good	---	3-Up	2-Urgent	1-Yes	25
	2-Fair	1-Fair			1-Some	2-No	

1/ Sta., stationary.

Table 130.--Ornamental seed crops: Five most important weeds listed alphabetically by status within regions, acreage infested, and infestation trend, 1962

Region and State	1/		1/		1/		1/		1/	
	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend	Weed	Infestation Acres Trend
		Pct.		Pct.		Pct.		Pct.		Pct.
Northeastern:										
Pennsylvania-----	Chickweed-----	30 Up	Lambsquarters-----	18 Sta.	Pigweed, redroot-----	20 Sta.	Quackgrass-----	12 Up	Ragweed-----	15 Sta.
North Central:										
Kansas-----	Chickweed-----	90 Sta.	Crabgrass-----	90 Sta.	Foxtails-----	90 Sta.	Henbit-----	90 Sta.	Pigweed-----	90 Sta.
Western:										
California-----	Cheeseweed-----	20 Up	Chickweed, common-----	30 Sta.	Knotweed-----	30 Sta.	Lambsquarters-----	60 Sta.	Spurry, corn-----	20 Sta.
	1/ Sta., stationary.									

Table 139.--Woody ornamentals: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
New Hampshire-----	0.1	0.3	---	30.00	60.00	----	70	30
West Virginia-----	<u>2/</u>	.1	---	20.00	50.00	----	100	--
Northeastern-----	.1	.4	---	30.00	57.50	----	76	24
Illinois-----	3	---	---	10.75	----	----	100	--
Kansas-----	.2	<u>2/</u>	---	20.00	8.00	----	95	5
Michigan-----	.5	---	0.5	10.00	----	20.00	60	40
Ohio-----	---	2	---	----	20.00	----	100	--
North Central-----	3.7	2.0	.5	11.15	20.00	20.00	93	7
Alabama-----	2	1	---	6.00	4.00	----	60	40
Arkansas-----	<u>2/</u>	---	---	10.00	----	----	100	--
Florida-----	1	.5	---	56.00	25.00	----	100	--
Georgia-----	.5	---	---	15.00	----	----	100	--
Kentucky-----	.5	---	---	13.00	----	----	25	75
Louisiana-----	1	---	---	25.00	----	----	95	5
North Carolina-----	1	1	---	10.00	8.00	----	75	25
Tennessee-----	1	.2	---	15.00	5.00	----	80	20
Virginia-----	---	.3	---	----	15.00	----	60	40
Southern-----	7.0	3.0	---	18.86	10.00	----	75	25
California-----	11	3	4	15.00	5.00	20.00	50	50
Oregon-----	.5	---	---	25.00	----	----	20	80
Washington-----	.7	---	---	10.00	----	----	90	10
Hawaii-----	---	.2	---	----	5.00	----	100	--
Western-----	12.2	3.2	4.0	15.12	5.00	20.00	51	49
United States-----	23.0	8.6	4.5	15.68	12.67	20.00	65	35

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.



Table 140.--Woody ornamentals: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
New Hampshire-----	Good	Good	---	Up	Some	No	---
West Virginia-----	Fair	Fair	---	Up	Urgent	Yes	10
Northeastern-----	1-Good 1-Fair	1-Good 1-Fair	---	2-Up	1-Urgent 1-Some	1-Yes 1-No	2
Illinois-----	Good	---	---	Up	Urgent	Yes	50
Kansas-----	Good	Good	---	Up	Urgent	No	---
Michigan-----	Good	---	Good	Up	Some	No	---
Ohio-----	---	Good	---	Up	Some	No	---
North Central-----	3-Good	2-Good	1-Good	4-Up	2-Urgent 2-Some	1-Yes 3-No	24
Alabama-----	Good	Good	---	Up	Some	No	---
Arkansas-----	Good	---	---	Up	Little	No	---
Florida-----	Good	Good	---	Up	Some	No	---
Georgia-----	Good	---	---	Up	Some	No	---
Kentucky-----	Fair	---	---	Up	Some	No	---
Louisiana-----	Fair	---	---	Up	Little	No	---
North Carolina-----	Fair	Good	---	Up	Urgent	No	---
Tennessee-----	Good	Fair	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	5-Good 3-Fair	3-Good 2-Fair	---	9-Up	1-Urgent 6-Some 2-Little	9-No	---
California-----	Good	Fair	Good	Up	Urgent	Yes	20
Oregon-----	Fair	---	---	Up	Some	No	---
Washington-----	Good	---	---	Up	Urgent	No	---
Hawaii-----	---	Good	---	Sta.	Some	No	---
Western-----	2-Good 1-Fair	1-Good 1-Fair	1-Good	3-Up 1-Sta.	2-Urgent 2-Some	1-Yes 3-No	19
United States-----	11-Good 5-Fair	7-Good 4-Fair	2-Good	18-Up 1-Sta.	6-Urgent 11-Some 2-Little	3-Yes 16-No	14

1/ Sta., stationary.

Table 111.--Woody ornamentals: Five most important weeds listed alphabetically by states within regions, areas infested, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
<b>Northeastern:</b>												
Connecticut <sup>2/</sup>	Bindweed	95	Up	Crabgrass	100	Up	Dandelion	100	Up	Galinsoga	85	Up
Maryland	Chickweed	40	Sta.	Crabgrass	80	Sta.	Pigweed	60	Sta.	Ragweed	50	Up
New Hampshire	Chickweed	70	Up	Crabgrass	60	Down	Lambsquarters	50	Down	Mutsedge	10	Up
New Jersey	Bindweed, hedge	35	Up	Chickweed	75	Up	Poxtail, meadow	25	Up	Marestail	10	Up
Pennsylvania	Foxtails	70	Down	Goldenrod	25	Up	Lambsquarters	20	Down	Pigweed, redroot	50	Down
Vermont	Chickweed	70	Sta.	Grasses, annual	25	Up	Mutsedge	20	Up	Purslane	50	Up
West Virginia	Bindweed, field	40	Up	Dandelion	60	Up	Mutsedge	40	Sta.	Crabgrass	90	Up
<b>North Central:</b>												
Illinois	Bindweed, field	10	Up	Crabgrass	100	Down	Lambsquarters	50	Down	Crabgrass	30	Down
Indiana	Bindweed	50	Up	Garlic, wild	10	Sta.	Mugwort	10	Sta.	Crabgrass	30	Sta.
Iowa	Bluegrass	100	Sta.	Foxtails	100	Sta.	Crabgrass	90	Sta.	Foxtails	75	Sta.
Kansas	Bermudagrass	20	Up	Bindweed	10	Down	Crabgrass	30	Sta.	Crabgrass	40	Sta.
Michigan	Bindweed, field	10	Up	Bluegrass, annual	20	Sta.	Panicum, fall	60	Sta.	Crabgrass	50	Sta.
Minnesota	Dandelion	60	Sta.	Foxtails	80	Sta.	Purslane	60	Sta.	Crabgrass	20	Up
Ohio	Barnyardgrass	35	Up	Bindweed, field	25	Up	Chickweed, common	100	Sta.	Crabgrass	50	Sta.
Wisconsin	Dandelion, common	50	Sta.	Poxtail, green	100	Sta.	Pigweed, redroot	100	Sta.	Pigweed, broadleaf	50	Sta.
<b>Southern:</b>												
Alabama	Betony, fl.	10	Up	Beggarweed	20	Sta.	Henbit	40	Up	Mutsedge	25	Down
Arkansas	Bermudagrass	20	Sta.	Crabgrass	98	Sta.	Henbit	85	Sta.	Johnsongrass	25	Sta.
Florida	Betony, fl.	35	Up	Crabgrass	90	Sta.	Mutsedge, purple	30	Up	Pusley, Florida	65	Up
Georgia	Chickweed	45	Sta.	Crabgrass	85	Sta.	Crabgrass	90	Sta.	Henbit	80	Sta.
Kentucky	Bermudagrass	20	Up	Crabgrass	30	Sta.	Crabgrass	95	Sta.	Poor-joe	10	Sta.
Louisiana	Bermudagrass	70	Sta.	Crabgrass	90	Sta.	Crabgrass	20	Up	Mutsedge	50	Sta.
Mississippi	Bermudagrass	10	Up	Crabgrass	25	Up	Crabgrass	75	Sta.	Johnsongrass	5	Up
North Carolina	Bermudagrass	100	Sta.	Crabgrass	100	Sta.	Crabgrass	30	Sta.	Mugwort	5	Up
Oklahoma	Bermudagrass	100	Sta.	Crabgrass	100	Sta.	Crabgrass	100	Sta.	Crabgrass	100	Sta.
Virginia	Bermudagrass	100	Sta.	Crabgrass	100	Sta.	Crabgrass	100	Sta.	Crabgrass	100	Sta.
<b>Western:</b>												
Arizona	Bermudagrass	100	Sta.	Crabgrass	100	Sta.	Mutsedge	30	Sta.	Spurge, prostrate	50	Sta.
California	Bluegrass, annual	50	Up	Groundsel	20	Up	Spurge	20	Up	Spurge	70	Up
Oregon	Bluegrass, annual	50	Down	Groundsel	20	Up	Horseail	10	Down	Crabgrass	10	Down
Utah	Barnyardgrass	50	Up	Bindweed, field	50	Up	Kochia	50	Up	Pigweed, redroot	80	Sta.
Washington	Bluegrass, annual	100	Sta.	Chickweed	100	Sta.	Lodystumb	100	Sta.	Lambsquarters	100	Sta.
Hawaii	Crabgrass, large	15	Sta.	Galinsoga, smallflower	30	Sta.	Mutsedge, purple	45	Sta.	Pusley, Florida	30	Sta.

1/Sta., stationary.

2/Connecticut also reported: Vetch 90 Up.

Table 142.--Nursery stock: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	5	0.5	0.4	15.00	12.00	10.00	50	50
Delaware-----	.3	.7	.1	40.00	100.00	160.00	100	--
Maryland-----	.5	---	---	20.00	---	---	100	--
Massachusetts-----	.2	1	2/	20.00	30.00	---	90	10
New Hampshire-----	.2	2/	2/	30.00	60.00	80.00	75	25
Pennsylvania-----	---	6	---	---	9.50	---	90	10
West Virginia-----	---	2/	---	---	70.00	---	100	--
Northeastern-----	6.2	8.2	.5	17.26	19.88	36.00	75	25
Illinois-----	.1	---	---	50.00	---	---	100	--
Iowa-----	.5	---	.5	4.00	---	4.00	100	--
Kansas-----	.1	2/	2/	20.00	8.00	28.00	95	5
Michigan-----	.5	---	.5	10.00	---	20.00	60	40
Ohio-----	---	4	---	---	20.00	---	100	--
North Central-----	1.2	4.0	1.0	11.67	20.00	12.00	93	7
Arkansas-----	2/	---	---	10.00	---	---	100	--
Oklahoma-----	2	---	---	12.00	---	---	75	25
Tennessee-----	1	---	---	15.00	---	---	90	10
Virginia-----	.5	2	---	200.00	30.00	---	90	10
Southern-----	3.5	2.0	---	29.71	30.00	---	85	15
California-----	2	---	---	80.00	---	---	90	10
Oregon-----	.5	---	---	25.00	---	---	80	20
Utah-----	2/	---	---	10.00	---	---	100	--
Western-----	2.5	---	---	69.00	---	---	88	12
United States-----	13.4	14.2	1.5	32.28	21.34	20.00	82	18

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom application and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 143.--Nursery stock: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Fair	Fair	Fair	Up	Urgent	No	---
Delaware-----	Good	Good	Good	Up	Urgent	No	---
Maryland-----	Fair	---	---	Up	Some	Yes	10
Massachusetts-----	Good	Good	Good	Up	Urgent	Yes	10
New Hampshire-----	Fair	Good	Fair	Up	Some	No	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Vermont-----	---	Good	---	Up	Some	No	---
West Virginia-----	---	Fair	---	Up	Urgent	No	---
Northeastern-----	2-Good 3-Fair	5-Good 2-Fair	2-Good 2-Fair	8-Up	4-Urgent 4-Some	2-Yes 6-No	1
Illinois-----	Good	---	---	Up	Urgent	Yes	100
Iowa-----	Good	---	Good	Sta.	Some	No	---
Kansas-----	Good	Good	Good	Up	Urgent	No	---
Michigan-----	Good	---	Good	Up	Some	No	---
Ohio-----	---	Good	---	Up	Some	No	---
North Central-----	4-Good	2-Good	3-Good	4-Up 1-Sta.	2-Urgent 3-Some	1-Yes 4-No	2
Arkansas-----	Good	---	---	Up	Little	No	---
Oklahoma-----	Fair	---	---	Up	Some	No	---
Tennessee-----	Fair	---	---	Up	Some	No	---
Virginia-----	Fair	Fair	---	Up	Some	No	---
Southern-----	1-Good 3-Fair	1-Fair	---	4-Up	3-Some 1-Little	4-No	---
California-----	Fair	---	---	Up	Urgent	No	---
Oregon-----	Fair	---	---	Sta.	Some	No	---
Utah-----	Good	---	---	Up	Some	No	---
Western-----	1-Good 2-Fair	---	---	2-Up 1-Sta.	1-Urgent 2-Some	3-No	---
United States-----	8-Good 8-Fair	7-Good 3-Fair	5-Good 2-Fair	18-Up 2-Sta.	7-Urgent 12-Some 1-Little	3-Yes 17-No	1

1/ Sta., stationary.

Table 1111.--Nursery stock: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	1/		1/		1/		1/		1/	
		Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend	Pct.	Weed	Infestation Acres Trend
Southern: Arkansas----- Oklahoma-----	Bermudagrass-----	20 Sta.	98	Crabgrass-----	98 Sta.	95	Henbit	25 Sta.	85	Nutsedge-----	50 Sta.
	Bermudagrass-----	70 Sta.	85	Crabgrass-----	85 Sta.	60	Johnsongrass-----	85 Sta.	85	Purslane-----	60 Sta.
Western: California----- Oregon-----	Bluegrass, annual--	30 Sta.	50	Chickweed, common--	50 Sta.	30	Mustard, wild-----	30 Sta.	30	Oats, wild-----	30 Sta.
	Bluegrass, annual--	50 Sta.	20	Chickweed-----	20 Down	30	Groundsel-----	30 Sta.	10	Ryegrass-----	20 Sta.
1/Sta., stationary.											



# LAWNS AND OTHER TURF AREAS

## (See General Limitations)

About 20 million acres of turf are distributed nationwide in home lawns, school installations, industrial grounds, military reservations, cemeteries, parks, and golf courses.

Weeds rank as one of the major problems in turf, as judged by consumer interest and demand for tools and chemicals for weed control (tables 145 through 150).

Thirty-nine States have estimated that over 3.8 million acres of turf were treated with herbicides during 1968 at a total cost of almost \$113 million. Custom operators treated 21 percent of this acreage. Twenty-four States reported good effectiveness for preemergence treatments, while 27 States revealed an upward trend in herbicide usage (tables 1-7, 145, 146, 148, and 149).

As indicated by their frequency of listing, the most important weeds in lawns and other turf areas, respectively, were: crabgrasses (32 and 27 States), dandelions (30 and 24), chickweed (27 and 17), annual bluegrass (13 and 22), and plantain species (16 and 12). Satisfactory control methods are available for all of these species except annual bluegrass.

Other species mentioned almost as frequently included: quackgrass (11 and 8 States), knotweed (10 and 8), nutsedge (8 and 6), henbit (8 and 4), and ground ivy (6 and 5). Other species mentioned represented a significant amount of infested acreage; otherwise, they would not have been listed as one of the five most important weeds in even one State (tables 147 and 150).

Perennial grasses are particularly difficult to control selectively in turf situations. The more frequently mentioned perennial grasses in lawns and in other turf areas, respectively, were listed as follows: quackgrass (10 and 8 States), tall fescue and other fescues (9 and 3), dallisgrass and other Paspalum species (4 and 6), and bentgrass (5 and 2). Other perennial grass species mentioned by more than one State included: smooth brome grass, bahia-grass, bermudagrass, nimblewill, velvetgrass, and johnsongrass.

It is noteworthy that many of the species listed infest a high percentage of the lawns. This indicates a sizable acreage where control methods are needed. Also, even though there may now be a useful control method for many species, this does not preclude wide acceptance of a more effective method, should it become available. More effective and efficient herbicides are needed to cope with lawn weed problems.

Table 145.--Home lawns: Estimated extent and cost of chemical weed control, By States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	40	5	30.00	30.00	60.00	95	5
Delaware-----	4	4	2	10.00	6.00	15.00	75	25
Massachusetts-----	5	5	---	30.00	15.00	---	90	10
New Hampshire-----	1	8	---	40.00	20.00	---	50	50
New Jersey-----	12	20	---	75.00	20.00	---	85	15
Pennsylvania-----	6	301	1	50.00	18.00	68.00	75	25
Rhode Island-----	3	1	3	35.00	20.00	50.00	80	20
Vermont-----	---	2	---	---	15.00	---	50	50
West Virginia-----	---	5	---	---	8.00	---	80	20
Northeastern-----	31	386	11	49.52	19.09	49.82	78	22
Illinois-----	10	20	15	100.00	10.00	110.00	80	20
Iowa-----	10	200	30	10.00	2.00	12.00	95	5
Kansas-----	4	6	1	30.00	10.00	40.00	90	10
Minnesota-----	30	30	30	180.00	80.00	260.00	90	10
North Dakota-----	1	20	---	5.00	3.00	---	75	25
Ohio-----	50	166	30	60.00	20.00	80.00	60	40
South Dakota-----	1	2	---	30.00	10.00	---	95	5
North Central-----	106	444	106	91.08	14.55	115.57	79	21
Arkansas-----	1	15	18	220.00	25.00	245.00	80	20
Florida-----	40	20	10	175.00	250.00	200.00	50	50
Georgia-----	50	100	---	12.00	4.00	---	90	10
Kentucky-----	10	15	---	50.00	10.00	---	75	25
Louisiana-----	5	---	---	25.00	---	---	90	10
Mississippi-----	10	75	80	40.00	6.00	45.00	80	20
North Carolina-----	10	70	5	40.00	15.00	45.00	80	20
Oklahoma-----	15	25	5	14.00	9.00	17.50	50	50
South Carolina-----	5	5	10	10.00	5.00	15.00	85	15
Tennessee-----	5	15	---	20.00	2.50	---	90	10
Texas-----	100	50	10	25.00	12.00	37.00	90	10
Virginia-----	---	55	---	---	35.00	---	70	30
Southern-----	251	445	138	48.23	23.01	78.57	79	21
Arizona-----	5	10	---	40.00	10.00	---	90	10
California-----	25	30	10	65.00	25.00	75.00	80	20
Idaho-----	---	15	---	---	5.00	---	75	25
Montana-----	2	15	2	7.00	3.00	9.00	80	20
Nevada-----	2/	2/	---	20.00	8.00	---	90	10
Utah-----	2	6	---	15.00	4.00	---	70	30
Washington-----	6	6	---	7.00	5.00	---	90	10
Wyoming-----	---	2	---	---	5.00	---	75	25
Hawaii-----	2/	1	2/	20.00	25.00	35.00	50	50
Western-----	40	85	12	47.78	12.46	64.00	81	19
United States-----	428	1,360	267	58.89	18.48	91.42	79	21

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 146.--Home lawns: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of treated acres
Connecticut-----	Good	Good	Good	Up	Some	No	---
Delaware-----	Good	Fair	Good	Up	Some	Yes	10
Massachusetts-----	Good	Good	---	Up	Some	No	---
New Hampshire-----	Fair	Good	---	Up	Some	No	---
New Jersey-----	Good	Good	---	Up	Some	No	---
Pennsylvania-----	Good	Good	Good	Up	Some	No	---
Rhode Island-----	Good	Good	Good	Up	Some	No	---
Vermont-----	---	Good	---	Up	Some	No	---
West Virginia-----	---	Fair	---	Up	Some	No	---
Northeastern-----	6-Good 1-Fair	7-Good 2-Fair	4-Good	9-Up	9-Some	1-Yes 8-No	---
Illinois-----	Fair	Fair	Fair	Up	Some	No	---
Iowa-----	Good	Good	Good	Up	Some	No	---
Kansas-----	Good	Fair	Fair	Up	Some	No	---
Minnesota-----	Good	Fair	Fair	Up	Urgent	No	---
North Dakota-----	Good	Good	---	Up	Some	No	---
Ohio-----	Good	Good	Good	Up	Some	No	---
South Dakota-----	Good	Good	---	Sta.	Some	No	---
North Central-----	6-Good 1-Fair	4-Good 3-Fair	2-Good 3-Fair	6-Up 1-Sta.	1-Urgent 6-Some	7-No	---
Arkansas-----	Good	Good	Good	Up	Some	No	---
Florida-----	Good	Good	Good	Up	Urgent	No	---
Georgia-----	Good	Good	---	Up	Some	No	---
Kentucky-----	Good	Good	---	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Good	Fair	Good	Up	Some	No	---
North Carolina-----	Good	Good	Good	Up	Some	No	---
Oklahoma-----	Fair	Fair	Good	Up	Some	No	---
South Carolina-----	Fair	Fair	Fair	Up	Some	No	---
Tennessee-----	Fair	Good	---	Up	Some	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	8-Good 3-Fair	7-Good 4-Fair	6-Good 1-Fair	12-Up	1-Urgent 10-Some 1-Little	12-No	---
Arizona-----	Good	Good	---	Up	Little	Yes	5
California-----	Good	Fair	Good	Up	Urgent	Yes	20
Idaho-----	---	Good	---	Up	Little	No	---
Montana-----	Fair	Good	Good	Up	Little	No	---
Nevada-----	Fair	Good	---	Up	Some	No	---
Utah-----	Fair	Fair	---	Up	Urgent	Yes	5
Washington-----	Good	Good	---	Up	Some	Yes	10
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	Good	Good	Good	Up	Urgent	No	---
Western-----	4-Good 3-Fair	7-Good 2-Fair	3-Good	9-Up	3-Urgent 3-Some 3-Little	4-Yes 5-No	11
United States-----	24-Good 8-Fair	25-Good 11-Fair	15-Good 4-Fair	36-Up 1-Sta.	5-Urgent 28-Some 4-Little	5-Yes 32-No	1

1/ Sta., stationary.

Table 111.--Home towns: Five most important weeds listed alphabetically by States within regions, average infested, and infestation trend, 1961

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
<b>Northeastern:</b>												
Connecticut	Chickweed	50	Sta.	Crabgrass	75	Down	Dandelion	50	Down	Plantain	50	Sta.
Delaware	Bluegrass, annual	25	Sta.	Fescue, tall	15	Up	Ivy, ground	10	Sta.	Starwort, little	40	Up
Maryland	Bluegrass, annual	40	Sta.	Crabgrass	40	Sta.	Dandelion	60	Sta.	Sorrel, red	10	Up
Massachusetts	Chickweed	65	Sta.	Clover, white	40	Sta.	Crabgrass	85	Sta.	Plantain	30	Sta.
New Hampshire	Crabgrass	60	Down	Dandelions	80	Down	Ironweed	10	Sta.	Plantain, buckhorn	90	Sta.
New Jersey	Cinquefoil	20	Sta.	Crabgrass	75	Up	Grasses, perennial	60	Up	Medic, black	30	Up
Pennsylvania	Chickweed	35	Sta.	Dandelion	45	Up	Dandelion	40	Sta.	Rocket, yellow	25	Sta.
Rhode Island	Chickweed	98	Down	Crabgrass	98	Down	Dandelion	98	Down	Plantain	98	Down
Vermont	Crabgrass	25	Sta.	Dandelion	70	Down	Ivy, ground	25	Sta.	Plantain	45	Down
West Virginia	Crabgrass	75	Up	Ivy, ground	80	Sta.	Mallow, common	40	Sta.	Plantain, buckhorn	60	Down
<b>North Central:</b>												
Illinois	Bentgrass	25	Up	Crabgrass	100	Down	Dandelions	100	Down	Fescue, tall	40	Sta.
Indiana	Bluegrass	100	Sta.	Fescue, tall	100	Sta.	Knotweed, prostrate	100	Sta.	Sorrel, red	25	Up
Iowa	Chickweed	70	Sta.	Crabgrass	90	Sta.	Dandelion	60	Sta.	Nutsedge, yellow	10	Up
Kansas	Chickweed	20	Up	Fescue, tall	15	Up	Nutsedge	10	Up	Sorrel	15	Sta.
Michigan	Bentgrass	40	Up	Chickweed	30	Sta.	Crabgrass	50	Sta.	Quackgrass	15	Sta.
Minnesota	Crabgrass	90	Sta.	Dandelion, large	90	Sta.	Foxtail	100	Sta.	Henbit	90	Sta.
Missouri	Chickweed, common	35	Sta.	Dandelion	85	Sta.	Chickweed	60	Down	Spurge, prostrate	50	Sta.
Nebraska	Crabgrass	35	Sta.	Chickweed, common	35	Up	Dandelion, common	90	Sta.	Quackgrass	50	Sta.
North Dakota	Brome, smooth	20	Down	Fescue, tall	75	Sta.	Mimblewill	25	Sta.	Quackgrass	10	Up
Ohio	Crabgrass	50	Sta.	Crabgrass	75	Sta.	Dandelion	100	Sta.	Quackgrass	50	Sta.
South Dakota	Brome grasses, weedy	20	Up	Chickweed, common	80	Down	Chickweed, mouseear	80	Down	Quackgrass	95	Sta.
Wisconsin	Bentgrass	20	Up	Bluegrass, annual	95	Sta.	Chickweed	95	Sta.	Henbit	20	Up
<b>Southern:</b>												
Alabama	Bahiagrass	90	Sta.	Bluegrass, annual	60	Down	Limnia	90	Sta.	Dandelion	70	Up
Arkansas	Chickweed	60	Up	Kyllinga, green	85	Sta.	Crabgrass	85	Sta.	Sorrel, red	70	Up
Florida	Bluegrass, annual	90	Up	Chickweed	40	Sta.	Crabgrass	75	Down	Dallisgrass	60	Sta.
Georgia	Chickweed	35	Up	Clovers, white	90	Up	Dandelion	70	Sta.	Garlic, wild	75	Sta.
Kentucky	Chickweed	60	Sta.	Crabgrass	40	Sta.	Dandelion	95	Sta.	Garlic, wild	30	Sta.
Louisiana	Chickweed	85	Sta.	Chickweed	40	Sta.	Crabgrass	75	Up	Paspalum	40	Sta.
Mississippi	Chickweed	35	Up	Crabgrass	40	Sta.	Crabgrass	10	Sta.	Ivy, ground	20	Sta.
North Carolina	Chickweed	60	Sta.	Crabgrass	65	Sta.	Orchardgrass	5	Up	Quackgrass	10	Up
Oklahoma	Chickweed	85	Sta.	Chickweed	40	Sta.	Crabgrass	40	Sta.	Plantain	40	Sta.
Tennessee	Bluegrass, annual	50	Sta.	Chickweed	40	Sta.	Crabgrass	40	Sta.	Ivy, ground	20	Sta.
Texas	Bluegrass, annual	10	Up	Bucklover	40	Sta.	Dallisgrass	10	Sta.	Sorrel, red	10	Up
Virginia	Bermudagrass	15	Up	Crabgrass	65	Sta.	Orchardgrass	5	Up	Quackgrass	10	Up
<b>Western:</b>												
Arizona	Bermudagrass	50	Sta.	Bluegrass, annual	50	Sta.	Mustards	50	Sta.	Nutsedge	25	Up
California	Bermudagrass	20	Sta.	Crabgrass	40	Up	Chickweed	30	Sta.	Crabgrass	40	Sta.
Colorado	Chickweed	30	Sta.	Crabgrass	40	Sta.	Dandelions	95	Sta.	Fescues	25	Up
Idaho	Chickweed	50	Sta.	Crabgrass	10	Down	Dandelion	70	Sta.	Plantain, broadleaf	30	Sta.
Montana	Bellflower	15	Up	Chickweed	35	Up	Dandelion	85	Down	Medic, black	30	Sta.
Nevada	Bluegrass, annual	50	Sta.	Fescue, tall	30	Sta.	Nimblewill	20	Sta.	Velvetgrass, German	10	Sta.
New Mexico	Barnyardgrass	2	Sta.	Crabgrass	2	Sta.	Dandelions	20	Sta.	Rescuegrass	5	Sta.
Oregon	Bluegrass, annual	50	Sta.	Dandelion	60	Sta.	Dock	60	Sta.	Velvetgrass	30	Sta.
Utah	Bluegrass, rough	5	Up	Chickweed, mouseear	10	Up	Crabgrass, large	30	Up	Plantain, buckhorn	80	Up
Washington	Bluegrass, annual	25	Sta.	Dandelion	80	Sta.	Medic, black	40	Sta.	Plantain	50	Down
Wyoming	Bellflower, creeping	25	Sta.	Dandelion	60	Down	Dandelion	80	Down	Knotted, prostrate	25	Sta.
Alaska	Bluegrass, annual	3	Up	Chickweed	30	Sta.	Dandelion	30	Sta.	Plantain	15	Sta.
Hawaii	Beggarweed, threefl.	25	Up	Crabgrass, Henry	30	Sta.	Nutsedge, purple	30	Sta.	Stargrass, Australian	30	Up

1/ Sta., stationary.  
2/ Reported as onion, wild; and Garlic, wild.  
3/ Beggarweed, three flower.



Table 148.--Other turf areas: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	2/	35	---	60.00	50.00	----	95	5
Delaware-----	4	5	2	8.00	6.00	12.00	75	25
Maryland-----	---	21	---	----	1.50	----	100	--
Massachusetts-----	5	5	---	40.00	20.00	----	75	25
New Hampshire-----	1	2	---	30.00	20.00	----	50	50
Pennsylvania-----	3	103	2	50.00	16.00	66.00	65	35
West Virginia-----	---	10	---	----	7.00	----	50	50
Northeastern-----	13	181	4	31.69	20.27	39.00	74	26
Illinois-----	10	30	5	40.00	3.00	43.00	95	5
Iowa-----	50	100	15	10.00	2.00	12.00	95	5
Kansas-----	5	7	2	25.00	8.00	32.00	80	20
Minnesota-----	10	70	80	15.00	20.00	35.00	90	10
Ohio-----	30	200	20	60.00	15.00	75.00	20	80
South Dakota-----	1	2	---	20.00	4.00	----	80	20
North Central-----	106	409	122	28.25	11.62	39.01	64	36
Arkansas-----	2/	10	10	160.00	10.00	170.00	100	--
Florida-----	5	30	---	50.00	50.00	----	100	--
Georgia-----	50	100	---	10.00	3.00	----	90	10
Kentucky-----	5	10	---	50.00	10.00	----	90	10
Louisiana-----	4	---	---	30.00	----	----	90	10
Mississippi-----	5	8	12	40.00	20.00	35.00	90	10
North Carolina-----	5	5	2	40.00	15.00	45.00	80	20
Oklahoma-----	---	5	---	----	6.00	----	90	10
Tennessee-----	---	5	---	----	2.50	----	95	5
Texas-----	250	200	50	25.00	12.00	37.00	95	5
Virginia-----	---	90	---	----	35.00	----	70	30
Southern-----	324	463	74	23.98	16.91	54.86	91	9
California-----	14	16	5	45.00	18.00	53.00	70	30
Idaho-----	---	4	---	----	5.00	----	100	--
Montana-----	2	7	5	5.50	2.50	6.00	90	10
Nevada-----	2/	2/	---	20.00	8.00	----	5	95
New Mexico-----	---	1	---	----	5.50	----	90	10
Utah-----	1	3	---	10.00	3.00	----	80	20
Washington-----	4	4	---	7.00	5.00	----	10	90
Wyoming-----	---	2	---	----	5.00	----	75	25
Hawaii-----	1	5	1	20.00	30.00	40.00	50	50
Western-----	22	42	11	31.77	12.38	30.45	68	32
United States-----	465	1,095	211	25.54	15.32	44.12	78	22

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 500 acres.



Table 149.--Other turf areas: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides :	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication : of problem	Percent of : treated acres
Connecticut-----	Good	Good	---	Up	Some	No	---
Delaware-----	Good	Fair	Good	Up	Some	Yes	10
Maryland-----	---	Fair	---	Up	Some	No	---
Massachusetts-----	Good	Good	---	Up	Some	No	---
New Hampshire-----	Fair	Good	---	Up	Some	No	---
Pennsylvania-----	Good	Good	Good	Up	Some	No	---
West Virginia-----	---	Good	---	Up	Some	No	---
Northeastern-----	4-Good 1-Fair	5-Good 2-Fair	2-Good	7-Up	7-Some	1-Yes 6-No	1
Illinois-----	Fair	Fair	Fair	Up	Some	No	---
Iowa-----	Good	Good	Good	Up	Some	No	---
Kansas-----	Good	Fair	Fair	Up	Some	No	---
Minnesota-----	Good	Fair	Fair	Up	Urgent	No	---
Ohio-----	Good	Good	Good	Up	Some	No	---
South Dakota-----	Good	Good	---	Sta.	Some	No	---
North Central-----	5-Good 1-Fair	3-Good 3-Fair	2-Good 3-Fair	5-Up 1-Sta.	1-Urgent 5-Some	6-No	---
Arkansas-----	Good	Good	Good	Up	Some	No	---
Florida-----	Fair	Good	---	Up	Urgent	No	---
Georgia-----	Good	Good	---	Up	Some	No	---
Kentucky-----	Good	Good	--	Up	Some	No	---
Louisiana-----	Good	---	---	Up	Little	No	---
Mississippi-----	Good	Good	Good	Up	Some	No	---
North Carolina-----	Good	Good	Good	Up	Some	No	---
Oklahoma-----	---	Fair	---	Up	Some	No	---
Tennessee-----	---	Good	---	Up	Some	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	7-Good 1-Fair	8-Good 2-Fair	4-Good	11-Up	1-Urgent 9-Some 1-Little	11-No	---
California-----	Fair	Fair	Fair	Up	Urgent	Yes	30
Idaho-----	---	Fair	---	Up	Some	No	---
Montana-----	Fair	Good	-Good	Up	Little	No	---
Nevada-----	Fair	Good	---	Up	Some	No	---
Utah-----	Poor	Fair	---	Up	Urgent	Yes	10
Washington-----	Good	Good	---	Up	Some	Yes	10
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	Good	Good	Good	Up	Urgent	No	---
Western-----	2-Good 3-Fair 1-Poor	5-Good 3-Fair	2-Good 1-Fair	8-Up	3-Urgent 4-Some 1-Little	3-Yes 5-No	16
United States-----	18-Good 6-Fair 1-Poor	21-Good 10-Fair	10-Good 4-Fair	31-Up 1-Sta.	5-Urgent 25-Some 2-Little	4-Yes 28-No	1

1/ Sta., stationary.

Table 150.--Other turf areas: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
			1/			1/			1/			1/
<b>Northeastern:</b>												
Connecticut---	Crabgrass, annual---	60	Down	Grasses, hay-----	30	Up	Hawweed-----	25	Down	Quackgrass-----	75	Sta.
Delaware---	Bluegrass, annual---	50	Up	Crabgrass, annual---	25	Sta.	Goosegrass-----	15	Sta.	Star-of-bethlehem---	15	Down
Maine---	Bluegrass, annual---	20	Up	Chickweed, annual---	5	Sta.	Dandelion-----	75	Sta.	Plantain, European---	3	Sta.
Maryland---	Bluegrass, annual---	40	Up	Crabgrass, annual---	50	Sta.	Crabgrass, annual---	60	Down	Plantain, white-----	30	Up
New Hampshire---	Crabgrass, annual---	60	Sta.	Dandelion-----	75	Up	Ivy, Poison-----	10	Sta.	Quackgrass-----	90	Down
New Jersey---	Cinquefoil-----	20	Sta.	Dandelion-----	75	Up	Grasses, perennial---	60	Up	Rocket, white-----	30	Up
New York---	Bluegrass, annual---	35	Up	Chickweed, annual---	40	Sta.	Crabgrass, annual---	98	Down	Medic, black-----	65	Sta.
Pennsylvania---	Chickweed, annual---	98	Down	Crabgrass, annual---	60	Sta.	Dandelion-----	98	Down	Plantain-----	50	Down
Rhode Island---	Bluegrass, annual---	50	Sta.	Crabgrass, annual---	60	Sta.	Ivy, ground-----	30	Down	Plantain-----	98	Down
West Virginia---	Bluegrass, annual---	50	Sta.	Crabgrass, annual---	60	Sta.	Ivy, ground-----	30	Down	Spurge, spotted-----	20	Up
<b>North Central:</b>												
Illinois---	Bluegrass, annual---	25	Up	Clover, white-----	75	Down	Crabgrass-----	70	Down	Knotted, prostrate---	40	Down
Iowa---	Brone, smooth---	100	Sta.	Chickweed, annual---	100	Sta.	Dandelion, common---	100	Sta.	Quackgrass-----	100	Sta.
Kansas---	Sinewed, field---	40	Down	Crabgrass, annual---	40	Sta.	Foxtails-----	5	Sta.	Ivy, ground-----	10	Down
Minnesota---	Bluegrass, annual---	30	Sta.	Bluegrass, annual---	40	Sta.	Crabgrass, annual---	30	Sta.	Mueselgrass-----	50	Sta.
Nebraska---	Bluegrass, annual---	70	Sta.	Chickweed, common---	70	Sta.	Foxtails-----	85	Sta.	Dandelion-----	70	Sta.
North Dakota---	Brone, smooth---	35	Sta.	Chickweed, common---	40	Sta.	Dandelion, common---	90	Sta.	Spurge, prostrate---	20	Sta.
Ohio---	Crabgrass, annual---	40	Sta.	Foxtails-----	50	Sta.	Quackgrass-----	20	Sta.	Quackgrass-----	50	Sta.
South Dakota---	Bronegrasses-----	50	Sta.	Crabgrass, annual---	75	Sta.	Dandelion-----	100	Sta.	Mistle, Canada-----	25	Sta.
Wisconsin---	Chickweed, common---	80	Sta.	Chickweed, mouseear---	80	Sta.	Dandelion, common---	100	Down	Quackgrass-----	50	Sta.
<b>Southern:</b>												
Alabama---	Sahiagrass-----	--	Up	Bl regass, annual---	--	Up	Chickweed-----	--	Up	Garlic, wild-----	--	Up
Arkansas---	Crabgrass, large---	95	Sta.	Goosegrass, common---	50	Sta.	Henbit-----	80	Sta.	Johnsongrass-----	20	Sta.
Florida---	Bluegrass, annual---	80	Up	Goosegrass-----	85	Down	Kyllinga, green-----	70	Down	Spurge, spotted-----	95	Up
Georgia---	Bahiagrass-----	40	Up	Crabgrass, annual---	50	Sta.	Dandelion-----	30	Sta.	Doek-----	60	Up
Kentucky---	Bluegrass, annual---	85	Sta.	Chickweed-----	40	Up	Crabgrass-----	85	Up	Goosegrass-----	--	Up
Louisiana---	Bluegrass, annual---	35	Up	Clovers-----	40	Sta.	Crabgrass-----	75	Down	Dallisgrass-----	70	Up
Mississippi---	Chickweed-----	50	Sta.	Crabgrass, annual---	40	Sta.	Dandelion-----	70	Up	Docks-----	60	Sta.
North Carolina---	Chickweed-----	50	Sta.	Crabgrass, annual---	40	Sta.	Dandelion-----	95	Down	Dallisgrass-----	30	Up
Oklahoma---	Chickweed-----	50	Sta.	Chickweed-----	40	Sta.	Crabgrass-----	95	Down	Henbit-----	--	Up
South Carolina---	Bluegrass, annual---	85	Up	Dandelion-----	30	Sta.	Garlic, wild-----	60	Sta.	Sandburs-----	50	Down
Tennessee---	Bluegrass, annual---	20	Sta.	Burclover-----	40	Up	Goosegrass-----	60	Sta.	Paspalum-----	50	Up
Texas---	Bluegrass, annual---	5	Up	Goosegrass-----	5	Up	Ivy, ground-----	5	Up	Ivy, ground-----	20	Up
Virginia---	Bluegrass, annual---	5	Up	Goosegrass-----	5	Up	Ivy, ground-----	5	Up	Speedwell-----	5	Up
<b>Western:</b>												
Arizona---	Bermudagrass-----	80	Sta.	Mustards-----	50	Sta.	Mutsedge-----	25	Up	Puncturevine-----	50	Sta.
California---	Bluegrass, annual---	50	Up	Crabgrass-----	50	Down	Daisy, English-----	20	Up	Dallisgrass-----	20	Up
Colorado---	Bluegrass, annual---	25	Up	Dandelion-----	30	Sta.	Fescue-----	5	Up	Plantain, broadleaf---	40	Sta.
Idaho---	Bluegrass, annual---	15	Up	Chickweed, annual---	25	Up	Flare-----	75	Down	Medic, black-----	20	Up
Montana---	Bluegrass, annual---	50	Sta.	Fescue, tall-----	40	Sta.	Nimblewill-----	30	Sta.	Velvetgrass, downy---	15	Sta.
Nevada---	Bluegrass, annual---	10	Sta.	Dandelion-----	40	Sta.	Johnsongrass-----	15	Sta.	Velvetgrass-----	30	Sta.
New Mexico---	Bluegrass, annual---	60	Sta.	Dandelion-----	40	Sta.	Plantain, European---	40	Sta.	Velvetgrass-----	30	Sta.
Oregon---	Bluegrass, annual---	20	Sta.	Chickweed, mouseear---	15	Sta.	Crabgrass-----	15	Up	Plantain-----	80	Sta.
Utah---	Bluegrass, annual---	25	Up	Dandelion-----	80	Sta.	Medic, black-----	40	Sta.	Plantain-----	50	Down
Washington---	Crabgrass, annual---	10	Down	Dandelion-----	40	Sta.	Fingergrass, swollen---	25	Up	Stargrass, Australian---	30	Up
Wyoming---	Crabgrass, annual---	30	Up	Dandelion-----	30	Sta.	Fingergrass, swollen---	25	Up	Stargrass, Australian---	30	Up
Hawaii---	Crabgrass, annual---	30	Up	Dandelion-----	30	Sta.	Fingergrass, swollen---	25	Up	Stargrass, Australian---	30	Up

1/ Sta., stationary.

# HAY

## (See General Limitations)

Thirty-seven States reported that about 1.3 million acres were sprayed for weed control during 1968. This was a slight increase over the acreage that had been reported sprayed during 1965. Of the total acreage sprayed during 1968, 76 percent was treated by farmers, while the remaining 24 percent was treated by custom operators. Nineteen States reported the effectiveness of postemergence herbicides to be fair or poor. Sixteen reported good effectiveness. Thirty-two States indicated a need for better herbicides with hay crops (tables 1 through 7, 151, and 152).

A wide range of weeds were serious problems to hay crops. Although some weeds were found to be widely scattered (tables 153 and 154), weeds in general tended to be regional in distribution. Some of the species of weeds that had a wide distribution were: quackgrass, 13 States; thistles, 12; chickweed, 11; dandelions, 8; and weed bromes, 8. Pigweeds and other amaranths, sandburs, rockets, and ragweeds were each reported by 7 States, while docks were reported by 6 States.

There is a need for much more research on the control of weeds in hay crops than is currently underway. Methods for the control of many of the weeds listed here are inadequate.

Table 151.--Hay: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Connecticut-----	1	5	1	11.00	7.00	18.00	80	20
Delaware-----	1	2	1	8.00	5.00	13.00	75	25
Maine-----	---	10	---	---	8.00	---	75	25
Maryland-----	5	70	5	9.00	2.35	11.35	90	10
Massachusetts-----	2	5	1	12.00	4.00	15.00	75	25
New Jersey-----	---	15	---	---	10.00	---	90	10
New York-----	---	90	---	---	6.00	---	80	20
Pennsylvania-----	---	81	---	---	4.75	---	75	25
Rhode Island-----	2/	1	---	12.00	6.00	---	75	25
Vermont-----	---	1	---	---	4.00	---	50	50
West Virginia-----	20	15	30	9.00	3.00	12.00	90	10
Northeastern-----	29	295	38	9.24	4.88	12.18	83	17
Iowa-----	---	50	---	---	5.00	---	80	40
Minnesota-----	5	10	5	8.00	6.00	14.00	90	10
Ohio-----	---	6	---	---	2.50	---	90	10
South Dakota-----	---	85	---	---	1.50	---	50	50
Wisconsin-----	---	4	---	---	1.45	---	80	20
North Central-----	5	155	5	8.00	2.96	14.00	60	40
Alabama-----	5	5	---	7.00	3.00	---	95	5
Kentucky-----	16	20	---	13.00	2.00	---	75	25
Mississippi-----	50	15	60	5.00	3.00	7.00	90	10
North Carolina-----	5	5	---	7.00	2.50	---	80	20
Oklahoma-----	15	60	---	6.50	2.50	---	85	15
South Carolina-----	3	10	13	10.00	2.50	12.50	65	35
Tennessee-----	---	2	30	---	2.50	10.00	50	50
Texas-----	50	40	---	7.00	3.00	---	50	50
Virginia-----	1	90	---	12.50	4.80	---	70	30
Southern-----	145	247	103	7.02	3.43	8.57	73	27
Arizona-----	1	---	---	8.00	---	---	80	20
California-----	10	60	10	9.00	17.50	23.00	75	25
Idaho-----	2/	10	---	6.50	5.00	---	25	75
Montana-----	2	1	---	4.00	3.00	---	100	---
Nevada-----	1	7	---	8.00	4.00	---	20	80
New Mexico-----	2	2	---	8.50	3.80	---	100	---
Oregon-----	5	20	---	4.00	10.00	---	90	10
Utah-----	2	---	---	6.00	---	---	50	50
Washington-----	---	120	---	---	4.00	---	90	10
Wyoming-----	---	1	---	---	2.00	---	100	---
Alaska-----	---	2/	---	---	4.00	---	100	---
Hawaii-----	2/	2/	---	---	20.00	---	100	---
Western-----	23	221	10	7.09	8.24	23.00	80	20
United States-----	202	918	156	7.37	4.97	10.55	76	24

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.



Table 152.--Hay: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend 1/	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	Good	Good	Good	Sta.	Some	No	---
Delaware-----	Good	Good	Good	Sta.	Some	No	---
Maine-----	---	Fair	---	Sta.	Some	No	---
Maryland-----	Good	Fair	Good	Up	Some	No	---
New Jersey-----	---	Fair	---	Sta.	Little	No	---
New York-----	---	Fair	---	Up	Urgent	Yes	---
Pennsylvania-----	---	Good	---	Up	Urgent	No	---
Rhode Island-----	Good	Fair	---	Sta.	Some	No	---
Vermont-----	---	Fair	---	Sta.	Urgent	No	---
West Virginia-----	Fair	Fair	Fair	Up	Urgent	Yes	10
Northeastern-----	4-Good 1-Fair	3-Good 7-Fair	3-Good 1-Fair	4-Up 6-Sta.	4-Urgent 5-Some 1-Little	2-Yes 8-No	2
Iowa-----	---	Good	---	Up	Little	No	---
Minnesota-----	Fair	Fair	Fair	Up	Urgent	Yes	1
Ohio-----	---	Good	---	Sta.	Some	No	---
South Dakota-----	---	Fair	---	Up	Some	No	---
Wisconsin-----	---	Poor	---	Sta.	Urgent	No	---
North Central-----	1-Fair	2-Good 2-Fair 1-Poor	1-Fair	3-Up 2-Sta.	2-Urgent 2-Some 1-Little	1-Yes 4-No	---
Alabama-----	Good	Good	---	Up	Some	No	---
Kentucky-----	Good	Good	---	Up	Some	No	---
Mississippi-----	Good	Good	Good	Up	Little	No	---
North Carolina-----	Good	Good	---	Up	Some	No	---
Oklahoma-----	Good	Fair	---	Up	Some	No	---
South Carolina-----	Good	Good	Good	Down	Some	No	---
Tennessee-----	---	Fair	---	Sta.	Some	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	Fair	Fair	---	Up	Some	No	---
Southern-----	7-Good 1-Fair	6-Good 3-Fair	3-Good	7-Up 1-Sta. 1-Down	8-Some 1-Little	9-No	---
Arizona-----	Good	Fair	---	Sta.	Some	No	---
California-----	Fair	Good	Fair	Up	Urgent	No	---
Idaho-----	Fair	Fair	---	Up	Some	No	---
Montana-----	Fair	Fair	---	Up	Some	No	---
Nevada-----	Fair	Good	---	Up	Some	No	---
New Mexico-----	Good	Good	---	Sta.	Some	No	---
Oregon-----	Fair	Fair	---	Up	Little	No	---
Utah-----	Good	---	---	Up	Urgent	Yes	100
Washington-----	---	Good	---	Up	Some	Yes	60
Wyoming-----	---	Good	---	Sta.	Urgent	No	---
Alaska-----	---	Fair	---	Sta.	Some	No	---
Hawaii-----	---	Poor	---	Down	Urgent	No	---
Western-----	3-Good 5-Fair	5-Good 5-Fair 1-Poor	1-Fair	7-Up 4-Sta. 1-Down	4-Urgent 7-Some 1-Little	2-Yes 10-No	29
United States-----	14-Good 8-Fair	16-Good 17-Fair 2-Poor	6-Good 3-Fair	21-Up 13-Sta. 2-Down	10-Urgent 22-Some 4-Little	5-Yes 31-No	6

1/ Sta., stationary.



Table 153.--Hay: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in the crop]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area 1,000 acres
		NE	NC	S	W	Stationary		Up		Down		
						No.	Area 1,000 acres	No.	Area 1,000 acres	No.	Area 1,000 acres	
Alyssum, hoary-----	2	--	2	--	--	1	398	1	2,024	--	---	2,422
Arrowgrass-----	1	--	--	--	1	--	---	1	118	--	---	118
Bahiagrass-----	1	--	--	1	--	--	---	1	73	--	---	73
*Barley-----	6	--	--	1	5	4	1,077	2	662	--	---	1,739
Barnyardgrass-----	2	--	1	--	1	--	---	1	196	1	14	210
Bedstraw-----	1	1	--	--	--	--	---	1	(1/)	--	---	(1/)
Bermudagrass-----	1	--	--	--	1	--	---	1	(2/)	--	---	(2/)
Bindweeds-----	2	1	1	--	--	1	88	--	---	1	13	101
Blackberry-----	1	--	--	1	--	--	---	--	---	1	73	73
*Bromes 3/-----	8	--	3	--	5	6	2,860	1	290	1	155	3,305
Caraway-----	2	--	--	--	2	--	---	1	118	1	110	228
Carrot, wild-----	1	1	--	--	--	--	---	--	---	1	40	40
*Chickweeds-----	11	6	1	3	1	9	1,879	2	316 1/	--	---	2,195 1/
Chicory-----	1	--	--	1	--	1	53	--	---	--	---	53
Cockle-----	5	2	3	--	--	1	87	4	4,956	--	---	5,043
Cocklebur-----	1	--	--	1	--	1	64	--	---	--	---	64
Crabgrasses-----	4 4/	--	1	3	--	1	1,005	--	---	2	1,532	2,537
Crotalaris-----	1	--	--	1	--	1	3	--	---	--	---	3
Croton-----	1	--	--	1	--	--	---	1	91	--	---	91
Daisies-----	2	2	--	--	--	--	---	1	12	1	13	25
*Dandelions-----	9	4	--	--	5	2	262	6	1,786	1	353	2,401
Docks-----	6	1	1	4	--	5	347	1	45	--	---	392
Dodder-----	3	--	--	1	2	3	190	--	---	--	---	190
Dogfennel-----	1	--	--	1	--	1	8	--	---	--	---	8
Fescue, rattail-----	1	--	--	--	1	1	102	--	---	--	---	102
Fiddleneck, Douglas-----	1	--	--	--	1	1	559	--	---	--	---	559
Fingergrass, feather-----	1	--	--	--	1	1	(2/)	--	---	--	---	(2/)
Fleabanes-----	2	--	--	2	--	2	698	--	---	--	---	698
Flixweed-----	1	--	--	--	1	--	---	1	174	--	---	174
Foxtails-----	5	--	4	1	--	3	1,824	2	2,924	--	---	4,748
Gromwell, corn-----	1	--	--	1	--	--	---	1	53	--	---	53
Henbit-----	5	1	--	4	--	3	637	1	316	1	475	1,428
Horsenettle-----	2	--	--	2	--	--	---	2	229	--	---	229
Horsetail-----	1	--	--	--	1	--	---	1	3	--	---	3
*Johnsongrass-----	6 4/	--	--	4	2	1	36	2	289	2	727	1,052
Kikuyugrass-----	1	--	--	--	1	1	(2/)	--	---	--	---	(2/)
Knapweed, Russian-----	1	--	--	--	1	1	53	--	---	--	---	53
Knawel-----	1	1	--	--	--	1	7	--	---	--	---	7
Kochia-----	2	--	1	--	1	--	---	2	1,174	--	---	1,174
Lambsquarters-----	1	--	1	--	--	1	828	--	---	--	---	828
Milkweed-----	1	--	1	--	--	--	---	1	221	--	---	221
Mustards-----	4	2	1	--	1	4	2,074	--	---	--	---	2,074
Nightshade, apple-of-Sodom-----	1	1	--	--	--	1	7	--	---	--	---	7
Oat, wild-----	1	--	--	--	1	1	72	--	---	--	---	72
Panicums-----	2	1	1	--	--	--	---	2	135	--	---	135

See footnotes at end of table.

Table 153.--Hay: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968--continued

Weed or complex	Number of reports	Reports by region					Infestation trend						Total area 1,000 acres
		NE	NC	S	W	No.	Stationary		Up		Down		
							No.	Area 1,000 acres	No.	Area 1,000 acres	No.	Area 1,000 acres	
Pennycress-----	1	--	1	--	--	--	---	1	810	--	---	---	810
Pepperweeds-----	2	2	--	--	--	1	58	1	296	--	---	---	354
*Pigweeds-----	7 4/	1	1	3	2	5	1,389 2/	--	---	1	1,188	---	2,577 2/
Plantains-----	3	1	--	1	1	2	659	--	---	1	(1/)	---	659 1/
Poorjoe-----	1	--	--	1	--	1	47	--	---	--	---	---	47
Puncturevine-----	1 4/	--	--	1	--	--	---	--	---	--	---	---	---
*Quackgrass-----	13	3	6	--	4	9	7,800	3	273	1	54	---	8,127
Radish, wild-----	1	1	--	--	--	1	4	--	---	--	---	---	4
*Ragweeds-----	7 4/	--	2	5	--	5	2,215	--	---	--	---	---	2,215
Rocket-----	7	5	2	--	--	2	1,326	4	2,150 1/	1	80	---	3,556 1/
Ryegrass-----	1	--	--	--	1	1	305	--	---	--	---	---	305
*Sandburs-----	7 4/	--	--	5	2	2	95	3	137 2/	1	475	---	707 2/
Shepherdspurse-----	4	1	--	--	3	2	1,040	2	684	--	---	---	1,724
Sicklepod-----	1	--	--	1	--	1	5	--	---	--	---	---	5
Signalgrass-----	1 4/	--	--	1	--	--	---	--	---	--	---	---	---
Smartweeds-----	2	--	2	--	--	1	802	--	---	1	172	---	974
Smutgrass-----	1	--	--	1	--	--	---	1	130	--	---	---	130
Sneezeweed, bitter--	2	--	--	2	--	--	---	2	444	--	---	---	444
Speedwells-----	1	1	--	--	--	--	---	1	51	--	---	---	51
Starthistles-----	1	--	--	--	1	1	746	--	---	--	---	---	746
Tansymustard-----	3	--	--	--	3	2	638	--	---	1	22	---	660
Tarweed, common-----	1	--	--	--	1	1	559	--	---	--	---	---	559
*Thistles-----	12	1	6	3	2	6	581	6	2,379	--	---	---	2,960
Turnip, wild-----	1	1	--	--	--	1	102	--	---	--	---	---	102
Watergrass (complex)	1	--	--	--	1	1	143	--	---	--	---	---	143
Whitetop-----	2	--	--	--	2	2	163	--	---	--	---	---	163
Yankeeeweed-----	1	--	--	1	--	--	---	1	159	--	---	---	159

1/ No acreages estimated for weeds reported in West Virginia.

2/ Less than 500 acres estimated for weeds reported in Hawaii.

3/ Includes cheat and chess.

4/ Weeds reported in Mississippi and Oklahoma not classified by trend or area of infestation; included in total and regional frequency counts only.

Table 151.---May: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation Acres Trend 1/	Weed	Infestation Acres Trend 1/	Weed	Infestation Acres Trend 1/	Weed	Infestation Acres Trend 1/	Pct.	Infestation Acres Trend 1/	Weed	Infestation Acres Trend 1/	Pct.
<b>Northeastern:</b>													
Connecticut	Chickweed	50 Sta.	Mustards	60 Sta.	Pennycress	50 Sta.	Pigweeds	80 Sta.	Quackgrass	80 Sta.	Quackgrass	80 Sta.	80 Sta.
Delaware	Knave	20 Sta.	Nightshade, apple-of-	20 Sta.	Panicum, fall	15 Up	Radish, wild	10 Sta.					--
Maryland	Dandelion	30 Up	Rocket, yellow	15 Up	Henbit	30 Sta.							--
Maryland	Chickweed	30 Sta.	Dandelion	60 Sta.	Daisy	10 Down	Mustard, wild	60 Sta.	Rocket, yellow	60 Sta.	Rocket, yellow	25 Up	25 Up
New Hampshire	Bindweed	10 Down	Carrot, wild	30 Down	Dandelion	75 Up	Speedwell	40 Down	Rocket, yellow	40 Down	Rocket, yellow	60 Down	60 Down
New Jersey	Chickweed	40 Sta.	Carrot, corn	60 Sta.	Dandelion	30 Up	Pennycress, field	15 Up	Rocket, yellow	35 Sta.	Turnip, wild	70 Sta.	70 Sta.
Pennsylvania	Chickweed	40 Sta.	Dandelion	30 Up	Pennycress, field	15 Up	Rocket, yellow	35 Sta.	Shepherdspurse	35 Sta.	Shepherdspurse	20 Up	20 Up
Rhode Island	Chickweed	40 Sta.	Dandelion	90 Up	Dock, curly	50 Sta.	Quackgrass	75 Sta.	Thistle	75 Sta.	Thistle	75 Up	75 Up
West Virginia	Bedstraws	-- Up	Chickweed	-- Up	Cockle, white	-- Up	Plantains	-- Down	Rocket, yellow	-- Down	Rocket, yellow	-- Down	-- Down
<b>North Central:</b>													
Illinois	Barnyardgrass	15 Up	Chickweed	3 Sta.	Panicum, fall	10 Up	Quackgrass	10 Sta.	Thistle, Canada	10 Sta.	Thistle, Canada	10 Sta.	10 Sta.
Indiana	Brome, downy	16 Down	Dock, curly	4 Sta.	Foxtail, giant	20 Sta.	Quackgrass	5 Sta.	Thistle, Canada	5 Sta.	Thistle, Canada	10 Sta.	10 Sta.
Iowa	Foxtails	30 Sta.	Ragweed, common	30 Sta.	Smartweed, Pa.	10 Sta.							--
Michigan	Alyssum, hoary	25 Up	Cockle, white	20 Up	Rocket, yellow	10 Sta.	Thistle, Canada	10 Sta.					--
Minnesota	Cockle, white	25 Up	Foxtails	40 Up	Mustard	50 Sta.	Quackgrass	75 Sta.	Thistle, Canada	75 Sta.	Thistle, Canada	50 Up	50 Up
North Dakota	Foxtails	25 Sta.	Kochia	35 Up	Lambsquarters, common	50 Sta.	Figweed, redroot	35 Sta.	Quackgrass	35 Sta.	Quackgrass	20 Sta.	20 Sta.
Ohio	Crabgrass	30 Down	Quackgrass	15 Sta.	Ragweed	50 Sta.	Smartweed	15 Down	Thistle, Canada	15 Down	Thistle, Canada	30 Up	30 Up
South Dakota	Brome, downy	2 Sta.	Brome, downy	10 Sta.	Brome, downy	10 Sta.	Milkweed	5 Up	Thistle, Canada	5 Up	Thistle, Canada	1 Sta.	1 Sta.
Wisconsin	Alyssum, hoary	50 Up	Cockle, white	90 Up	Pennycress, field	20 Up	Quackgrass	100 Sta.	Rocket, yellow	100 Sta.	Rocket, yellow	50 Up	50 Up
<b>Southern:</b>													
Alabama	Barnyardgrass	15 Up	Barley, little	15 Up	Blackberry	15 Down	Horse-nettle	20 Up	Sandbur	20 Up	Sandbur	15 Up	15 Up
Arkansas	Chickweed	60 Sta.	Croton	12 Up	Dock	6 Up	Henbit	60 Sta.	Sneezeweed, bitter	60 Sta.	Sneezeweed, bitter	30 Up	30 Up
Florida	Crotalaria	2 Sta.	Dorfenel	5 Sta.	Ragweed	10 Sta.	Sicklepod	3 Sta.	Thistle, bull	3 Sta.	Thistle, bull	6 Up	6 Up
Georgia	Dock	20 Sta.	Johnsongrass	30 Up	Sandbur	20 Sta.	Sandgrass	20 Up	Sneezeweed, bitter	20 Up	Sneezeweed, bitter	50 Up	50 Up
Louisiana	Cocklebur	20 Sta.	Johnsongrass	50 Up	Figweed	20 Sta.	Sandbur	20 Up	Yankeweed	20 Up	Yankeweed	50 Up	50 Up
Mississippi	Crabgrass	10 Sta.	Ragweed	25 Sta.	Signalgrass	20 Sta.	Horse-nettle	30 Up		30 Up		5 Sta.	5 Sta.
North Carolina	Chickweed	--	Dock	--	Henbit	--	Ragweed	--	Thistle	--	Thistle	--	--
Oklahoma	Johnsongrass	40 Sta.	Figweed	30 Sta.	Plantain	30 Sta.	Portulaca	20 Sta.	Sandbur	20 Sta.	Sandbur	30 Sta.	30 Sta.
South Carolina	Dodder	40 Sta.	Fleabane	50 Sta.	Foxtails	20 Up	Ragweed	60 Sta.	Thistles	60 Sta.	Thistles	10 Up	10 Up
Tennessee	Crabgrass	50 Down	Henbit	20 Down	Johnsongrass	30 Down	Pigweed	50 Down	Sandbur	50 Down	Sandbur	20 Down	20 Down
Texas	Crabgrass	30 Up	Chicory	5 Sta.	Dock, curly	10 Sta.	Cromwell, corn	5 Up	Henbit	5 Up	Henbit	30 Up	30 Up
Virginia	Chickweed	--		--		--		--		--		--	--
<b>Western:</b>													
Arizona	Johnsongrass	15 Sta.	Mustards	60 Sta.	Oat, wild	30 Sta.	Pigweed	30 Sta.	Watergrass	30 Sta.	Watergrass	60 Sta.	60 Sta.
California	Chess, soft	50 Sta.	Fiddleneck, Douglas	30 Sta.	Starthistle, yellow	40 Sta.	Thistles	20 Sta.	Turnip, common	20 Sta.	Turnip, common	30 Sta.	30 Sta.
Idaho	Brome, downy	20 Sta.	Dandelion	20 Sta.	Quackgrass	30 Sta.	Shepherdspurse	60 Sta.	Thistle, Canada	60 Sta.	Thistle, Canada	10 Sta.	10 Sta.
Montana	Harley, wild	5 Sta.	Caraway	5 Down	Dandelion	30 Up	Thistle, Canada	10 Up	Whitelo	10 Up	Whitelo	5 Sta.	5 Sta.
Nevada	Dodder	5 Sta.	Kanawood, Russian	15 Sta.	Whitelo	35 Sta.		--		--		--	--
New Mexico	Barnyardgrass	5 Down	Johnsongrass	5 Down	Chickweed	5 Up	Sandbur	3 Sta.	Yankeweed	3 Sta.	Yankeweed	8 Down	8 Down
Oregon	Barley, foxtail	60 Sta.	Chest	60 Sta.	Dodder	10 Sta.	Priscus, rattail	10 Sta.	Yankeweed	10 Sta.	Yankeweed	30 Sta.	30 Sta.
Utah	Brome, downy	50 Up	Dandelion	25 Up	Flaxweed	40 Up	Quackgrass	25 Up	Shepherdspurse	25 Up	Shepherdspurse	50 Up	50 Up
Washington	Barley, wild	40 Sta.	Brome, downy	20 Sta.	Dandelion	30 Down	Shepherdspurse	30 Sta.	Yankeweed	30 Sta.	Yankeweed	30 Sta.	30 Sta.
Wyoming	Arrowgrass	10 Up	Barley, foxtail	50 Up	Caraway	10 Up	Plantain	50 Sta.	Quackgrass	50 Sta.	Quackgrass	10 Up	10 Up
Alaska	Barley, foxtail	30 Sta.	Chickweed	100 Sta.	Dandelion	30 Sta.	Horse-tail	20 Up	Quackgrass	20 Up	Quackgrass	80 Up	80 Up
Hawaii	Amaranth, spiny	10 Sta.	Bermudagrass	10 Up	Fingergrass, feather	15 Sta.	Kikuyagrass	5 Sta.	Sandbur, southern	5 Sta.	Sandbur, southern	40 Up	40 Up

1/ Sta., stationary.  
2/ Nightshade, apple-of-Sodom.

# GRAZING LAND

## (See General Limitations)

Approximately 940 million acres of land are grazed in the United States --about 310 million acres of pastures and 630 million acres of rangelands. Weeds and brush are found in almost all of this area, but constitute a problem in only about one-half to three-fourths of it.

Over 9 million acres of grazing land were sprayed by herbicides during 1968 at a cost of \$36.4 million. Farmers or ranchers sprayed only 17 percent of this acreage of rangelands with their own equipment, but treated 74 percent of the pasture acreage. Custom sprayers treated the remainder in each case.

The cost of spraying rangeland is higher than the cost for pastures, mainly because relatively more brush species on rangelands were sprayed with 2,4,5-T. Less expensive 2,4-D is effective on many pasture species and is more commonly used on pastures. Also, the rate of herbicide required for the control of brush is usually higher than that needed for the control of herbaceous weeds (tables 1 through 7 and 155 through 175).

To provide more meaningful information on weed and brush species, the grazing land areas have been classified as follows: annual pastures, perennial improved pastures, perennial unimproved pastures, mountain rangeland, foothill or prairie rangeland, arid rangeland, and rainbelt rangeland. Tables for the individual grazing land areas are grouped at the end of the discussion (see pages 181 through 199).

## GRAZING LAND--PASTURES

### (See General Limitations)

The 10 weeds or weed complexes that were reported most frequently in pasture areas (in order of decreasing frequency) were: thistles (excluding Russian thistle), ragweeds, docks, pigweeds and other amaranths, horsenettle, wild barley species, crabgrasses, dandelions, buttercups, and wild garlic (tables 157, 160, and 163).

### Annual Pastures

Although 18 States submitted reports on annual pastures, most of the acreage that was treated with herbicides was in Iowa (table 155). A very limited amount of herbicides was applied preemergence for annual pastures. Over 97 percent of this acreage was treated postemergence. Only seven out of 17 States considered postemergence treatments good, while 14 States reported some need or urgent need for better herbicides (table 156). The species of weeds listed among the five most important by the various States are shown in table 157. Only a few perennial and biennial species were listed as being serious problems for annual pastures.



## Perennial Improved Pastures

Data on the extent, costs, and use of herbicides in perennial improved pastures are given in tables 158 and 159. The perennial improved pastures are characterized as having a high proportion of perennial weed species listed as most important problems (table 160). Those species that were mentioned most frequently were: Canada thistle (15 States); other thistles, mostly biennial (17); quackgrass (11); ragweeds (11); horsenettle (10); docks (10); and dandelions (9).

## Perennial Unimproved Pastures

Data on the extent, costs, and use of herbicides in perennial unimproved pastures are given in tables 161 and 162. Perennial unimproved pastures are also characterized by having a preponderance of perennial weeds listed as the most important (table 163). A number of annual weeds are notably important also. Species listed most frequently were: Canada thistle (6 States); other thistles (10); broomsedge (5); ragweeds and goldenrods (4 each); and dock, ironweed, and weed bromes (3 each).

The high percentage of pasture acreage infested by many of the species listed in table 163 indicated a high potential acreage for use of any improved method of control that may be developed.

## GRAZING LAND--RANGELANDS

### (See General Limitations)

The 10 weeds or weed complexes that were reported most frequently for all rangelands (in order of decreasing frequency) were: sagebrushes, weed bromes, larkspurs, thistles, pricklypear, rabbitbrush, spurges, juniper species, medusahead, and mesquite (tables 166, 169, 172, and 175).

### Mountain Rangeland

Fourteen States submitted reports on the extent, costs, and use of herbicides and weed problems on mountain rangeland. Some of the more serious weed problems mentioned were: larkspur species (7 States), sagebrush species (6), Canada thistle (6), hellebore, mulesears, leafy spurge, and junipers (3 each). Woody plants, other than the sagebrush species, were listed among the five most important weeds on rangelands in 11 States (tables 164, 165, and 166).

### Foothill (Prairie) Rangeland

Sixteen States submitted reports on the extent, costs, and use of herbicides and weed problems on the foothill and prairie ranges. Species of sagebrush were mentioned most often among the five most important weeds within the States reporting. The next most frequently mentioned were the weed bromes. Other species mentioned by many States included juniper species, larkspurs,



spotted knapweed, and rabbitbrush. Other brush species were mentioned by 13 States.

Because of the extensive acreages involved and the high percentage of infestation, many of the difficult-to-kill species warrant increased attention in research. On the other hand, species such as sagebrushes, which are found on extensive acreage, probably should command only low priority in research because efficient and effective methods for their control have been developed (tables 167, 168, and 169).

## Arid Rangeland

Ten States submitted reports on the extent, costs, and use of herbicides on arid rangeland. Twelve States reported on their weed problems. Vast acreages are included in the arid rangeland class. The vegetation on these rangelands consists mostly of species of low grazing value, whose replacement by more useful forage on the more favorable sites would improve carrying capacity. Weeds listed most frequently in the 12 States reporting included: pricklypear and other cacti (5 States), downy brome and rabbitbrush (4 each), and sagebrush, mesquite, juniper, and halogeton (3 each) (tables 170, 171, and 172).

## Rainbelt Rangeland

Two Southern and three Western States submitted reports on herbicide useage and the most important weed and brush problems in rainbelt rangelands. Sixteen of the species listed were woody plants, while eight were herbaceous. Many species were not efficiently controlled by herbicides now registered for use on grazing lands (tables 173, 174, and 175).

Table 155.--Annual pastures: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	2/	---	---	8.00	---	100	--
Massachusetts-----	1	1	---	10.00	4.00	---	75	25
New Hampshire-----	2/	---	---	6.00	---	---	80	20
Pennsylvania-----	---	8	---	---	6.00	---	90	10
Vermont-----	---	2/	---	---	4.00	---	25	75
Northeastern-----	1	2	---	10.00	5.78	---	87	13
Iowa-----	---	500	---	---	2.50	---	75	25
Minnesota-----	---	5	---	---	2.00	---	100	--
South Dakota-----	---	15	---	---	1.35	---	50	50
North Central-----	---	520	---	---	2.46	---	75	25
Alabama-----	---	2	---	---	3.00	---	100	--
Florida-----	---	2	---	---	4.00	---	100	--
Louisiana-----	15	10	---	6.00	4.00	---	90	10
Mississippi-----	---	25	---	---	2.00	---	100	--
North Carolina-----	---	10	---	---	2.50	---	100	--
South Carolina-----	---	1	---	---	1.00	---	65	35
Tennessee-----	---	2	---	---	2.50	---	95	5
Texas-----	---	2/	---	---	2.50	---	40	60
Virginia-----	---	2/	---	---	3.25	---	100	--
Southern-----	15	52	---	6.00	2.60	---	95	5
California-----	1	10	---	6.00	3.50	---	70	30
Western-----	1	10	---	6.00	3.50	---	70	30
United States-----	17	591	---	6.24	2.54	---	77	23

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.

Table 156.--Annual pastures: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides: usage trend <u>1</u> :	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	---	Good	---	Sta.	Little	No	---
New Hampshire-----	Good	---	---	Sta.	Some	No	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Vermont-----	---	Good	---	Up	Some	No	---
Northeastern-----	1-Good	3-Good	---	2-Up 2-Sta.	3-Some 1-Little	4-No	---
Iowa-----	---	Good	---	Sta.	Little	No	---
Minnesota-----	Fair	---	---	Up	Some	No	---
South Dakota-----	---	Fair	---	Up	Some	No	---
North Central-----	1-Fair	1-Good 1-Fair	---	2-Up 1-Sta.	2-Some 1-Little	3-No	---
Alabama-----	---	Fair	---	Up	Some	No	---
Florida-----	---	Fair	---	Sta.	Some	No	---
Louisiana-----	Fair	Fair	---	Up	Urgent	No	---
Mississippi-----	---	Fair	---	Sta.	Some	No	---
North Carolina-----	---	Good	---	Sta.	Some	No	---
South Carolina-----	---	Good	Good	Sta.	Some	No	---
Tennessee-----	---	Fair	---	Up	Some	No	---
Texas-----	---	Good	---	Up	Some	No	---
Virginia-----	---	Fair	---	Sta.	Little	No	---
Southern-----	1-Fair	3-Good 6-Fair	1-Good	4-Up 5-Sta.	1-Urgent 7-Some 1-Little	9-No	---
California-----	Fair	Fair	---	Sta.	Some	No	---
Western-----	1-Fair	1-Fair	---	1-Sta.	1-Some	1-No	---
United States-----	1-Good 3-Fair	7-Good 8-Fair	1-Good	8-Up 9-Sta.	1-Urgent 13-Some 3-Little	17-No	---

1/ Sta., stationary.



Table 158.--Perennial improved pastures: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	1	---	---	8.00	---	90	10
Delaware-----	---	5	---	---	3.00	---	90	10
Maine-----	---	2	---	---	8.00	---	90	10
Maryland-----	---	20	---	---	2.00	---	100	--
Massachusetts-----	1	4	---	10.00	4.00	---	75	25
New Hampshire-----	1	---	---	5.50	---	---	70	30
New Jersey-----	---	12	---	---	2.00	---	85	15
New York-----	---	20	---	---	3.00	---	90	10
Pennsylvania-----	---	45	---	---	4.25	---	95	5
Rhode Island-----	2/	2/	---	9.00	8.00	---	75	25
Vermont-----	---	2/	---	---	8.00	---	50	50
West Virginia-----	---	20	---	---	6.00	---	80	20
Northeastern-----	2	129	---	7.75	3.80	---	91	9
Illinois-----	---	50	---	---	3.00	---	98	2
Iowa-----	---	500	---	---	1.50	---	95	5
Kansas-----	---	500	---	---	2.00	---	30	70
Minnesota-----	---	100	---	---	2.00	---	95	5
Ohio-----	---	45	---	---	1.75	---	90	10
South Dakota-----	---	25	---	---	1.50	---	50	50
North Central-----	---	1,220	---	---	1.82	---	67	33
Alabama-----	---	150	---	---	2.50	---	95	5
Arkansas-----	10	60	80	3.00	2.00	5.00	90	10
Florida-----	---	8	---	---	1.50	---	60	40
Georgia-----	---	343	---	---	3.00	---	80	20
Kentucky-----	---	100	---	---	2.00	---	95	5
Louisiana-----	---	100	---	---	3.00	---	90	10
Mississippi-----	100	100	20	5.00	2.00	6.50	80	20
North Carolina-----	10	100	---	7.50	2.50	---	100	--
Oklahoma-----	35	150	10	5.50	1.75	7.25	60	40
South Carolina-----	---	215	---	---	2.50	---	65	35
Tennessee-----	---	10	---	---	2.50	---	95	5
Texas-----	20	15	5	7.00	2.50	9.50	50	50
Virginia-----	---	100	---	---	4.50	---	100	---
Southern-----	175	1,451	115	5.36	2.62	5.65	81	19
California-----	---	50	---	---	3.50	---	70	30
Idaho-----	---	45	---	---	3.00	---	50	50
Montana-----	---	3	---	---	2.00	---	40	60
Nevada-----	---	1	---	---	1.00	---	50	50
Oregon-----	---	1	---	---	4.00	---	70	30
Utah-----	---	4	---	---	2.50	---	80	20
Washington-----	---	20	---	---	5.00	---	90	10
Wyoming-----	---	2	---	---	2.00	---	50	50
Hawaii-----	---	5	---	---	15.00	---	50	50
Western-----	---	131	---	---	3.89	---	65	35
United States-----	177	2,931	115	5.39	2.40	5.65	75	25

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 500 acres.



Table 159.--Perennial improved pastures: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides	Persistence problem	
	Pre- : emergence	Post- : emergence	Pre- + post- : emergence			Indication : of : problem	Percent of : treated : acres
Connecticut-----	---	Good	---	Sta.	Little	No	---
Delaware-----	---	Good	---	Sta.	Some	No	---
Maine-----	---	Good	---	Sta.	Some	No	---
Maryland-----	---	Good	---	Sta.	Some	No	---
New Hampshire-----	Good	---	---	Sta.	Some	No	---
New Jersey-----	---	Good	---	Sta.	Some	No	---
New York _/-----	---	Good	---	Up	Some	No	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Rhode Island-----	Good	Good	---	Up	Some	No	---
Vermont-----	---	Fair	---	Up	Some	No	---
West Virginia-----	---	Fair	---	Up	Urgent	No	---
Northeastern-----	2-Good	8-Good 2-Fair	---	5-Up 6-Sta.	1-Urgent 9-Some 1-Little	11-No	---
Illinois-----	---	Fair	---	Up	Some	No	---
Iowa-----	---	Good	Good	Up	Some	No	---
Kansas-----	---	Fair	---	Up	Some	No	---
Minnesota-----	---	Fair	---	Up	Some	No	---
Ohio-----	---	Fair	---	Sta.	Some	No	---
South Dakota-----	---	Fair	---	Up	Urgent	No	---
North Central-----	---	1-Good 5-Fair	1-Good	5-Up 1-Sta.	1-Urgent 5-Some	6-No	---
Alabama-----	---	Poor	---	Up	Urgent	No	---
Arkansas-----	Good	Good	Good	Up	Some	No	---
Florida-----	---	Fair	---	Sta.	Some	No	---
Georgia-----	---	Good	---	Up	Some	No	---
Kentucky-----	---	Fair	---	Up	Urgent	No	---
Louisiana-----	---	Good	---	Up	Some	No	---
Mississippi-----	Good	Good	Good	Up	Some	No	---
North Carolina-----	Good	Good	---	Sta.	Some	No	---
Oklahoma-----	Fair	Fair	Good	Up	Some	No	---
South Carolina-----	Good	Good	---	Sta.	Little	No	---
Tennessee-----	---	Fair	---	Sta.	Some	No	---
Texas-----	Good	Good	Good	Up	Some	No	---
Virginia-----	---	Fair	---	Sta.	Little	No	---
Southern-----	5-Good 1-Fair	7-Good 5-Fair 1-Poor	4-Good	8-Up 5-Sta.	2-Urgent 9-Some 2-Little	13-No	---
California-----	---	Fair	---	Up	Some	No	---
Idaho-----	---	Good	---	Up	Some	No	---
Montana-----	---	Fair	---	Up	Some	No	---
Nevada-----	---	Fair	---	Sta.	Some	No	---
Oregon-----	---	Good	---	Sta.	Some	No	---
Utah-----	---	Good	---	Sta.	Urgent	No	---
Washington-----	---	Good	---	Up	Some	No	---
Wyoming-----	---	Fair	---	Up	Some	No	---
Hawaii-----	---	Fair	---	Up	Urgent	No	---
Western-----	---	4-Good 5-Fair	---	6-Up 3-Sta.	2-Urgent 7-Some	9-No	---
United States-----	7-Good 1-Fair	26-Good 17-Fair 1-Poor	5-Good	24-Up 15-Sta.	6-Urgent 30-Some 3-Little	39-No	---

1/ Sta., stationary.

Table 160.--Perennial improved pastures: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
Northeastern:												
Connecticut	Cockle, white	30	Sta.	Crabgrass	50	Sta.	Dandelion	50	Sta.	Quackgrass	50	Sta.
Delaware	Bermudagrass	5	Sta.	Nightshade, apple- <sup>2/</sup>	50	Sta.						
Maine	Thistle	20	Sta.	Thistle	10	Sta.						
Maryland	Buttercup	15	Sta.	Garlic, wild	25	Sta.	Horsenettle	10	Sta.	Milkweed	10	Sta.
New Hampshire	Milkweed	5	Sta.	Mullein	10	Sta.	Nutsedge	20	Sta.	Quackgrass	60	Down
New Jersey	Horsenettle	15	Sta.	Johnsonweed	25	Up	Nightshade	20	Up	Poisonivy	10	Sta.
Pennsylvania	Buttercup	15	Sta.	Dandelion	25	Up	Garlic, wild	20	Sta.	Rocket, yellow	20	Sta.
Rhode Island	Bromegrass, weedy	60	Up	Chickweed	50	Sta.	Dock, curly	80	Sta.	Quackgrass	75	Sta.
Vermont	Carrot, wild	20	Sta.	Chicory	20	Up	Dandelion	50	Up	Quackgrass	50	Sta.
West Virginia	Ironweed	60	Up	Onion, wild <sup>3/</sup>	40	Up	Thistle, Canada	35	Up	Thistle, musk	40	Up
North Central:												
Illinois	Barnyardgrass	10	Sta.	Crabgrass	10	Sta.	Panicum, fall	10	Sta.	Quackgrass	10	Sta.
Indiana	Dogfennel	3	Sta.	Horsenettle	5	Sta.	Ironweed	15	Sta.	Thistle, bull	15	Sta.
Iowa	Foxtail	30	Sta.	Rapeseed, common	30	Sta.	Smartweed, Pa.	30	Sta.	Thistle, Canada	10	Down
Kansas	Ironweed	5	Sta.	Rapeseed	70	Sta.	Redroot, eastern	40	In	Thistle	40	Sta.
Minnesota	Bromegrass, weedy	75	Sta.	Quackgrass	70	Sta.	Thistle, Canada	75	Sta.	Vervain	50	Sta.
Missouri	Brome, downy	90	Up	Flabianca	80	Sta.	Rapeseed, common	80	Up	Thistle	80	Up
Nebraska	Bromegrass, weedy	65	Sta.	Dandelion	75	Up	Kochia	40	Sta.	Ragweed, prairie	35	Sta.
Ohio	Crabgrass	40	Sta.	Quackgrass	20	Up	Rapeseed	15	Sta.	Thistle, Canada	20	Sta.
South Dakota	Cocklebur	8	Sta.	Goldenrod	80	Sta.	Gumweed	75	Sta.	Snurge, leafy	2	Up
Wisconsin	Alyssum, hoary	50	Up	Cockle, white	90	Up	Pennycress, field	20	Up	Quackgrass	100	Sta.
Southern:												
Alabama	Dogfennel	45	Up	Dropsed	30	Up	Foxtail	30	Up	Horsenettle	15	Up
Arkansas	Croton	20	Up	Dock	10	Sta.	Rapeseed	10	Sta.	Smartweed	5	Up
Florida	Dock, curly	6	Up	Granum, Carolina	20	Sta.	Hatched	40	Up	Smartweed, bitter	60	Sta.
Georgia	Bahia	30	Up	Dallisgrass	30	Up	Rapeseed, bitter	30	Sta.	Smartweed	30	Up
Kentucky	Garlic, wild	50	Sta.	Horsenettle	20	Up	Mustard, wild	30	Sta.	Smartweed	30	Up
Louisiana	Dock	80	Sta.	Dogfennel	60	Up	Goatshead	30	Up	Smartweed	30	Up
Mississippi	Dock	75	Up	Dogfennel	20	Sta.	Garlic, wild	30	Sta.	Smartweed, bitter	80	Up
North Carolina	Buttercup	10	Up	Dock, curly	35	Up	Oak, blackjack	30	Sta.	Smartweed	40	Sta.
Oklahoma	Broomsedge	60	Sta.	Dogfennel	35	Up	Garlic, wild	35	Sta.	Smartweed, bitter	40	Sta.
South Carolina	Barley, littl	25	Sta.	Dogfennel	20	Sta.	Horsenettle	30	Up	Smartweed, bitter	45	Sta.
Tennessee	Broomsedge	80	Up	Buttercup	30	Sta.	Horsenettle	30	Up	Smartweed, bitter	20	Down
Texas	Croton	20	Down	Dock	20	Down	Horsenettle	30	Down	Smartweed	40	Down
Virginia	Buttercup, bulbous	10	Up	Garlic, wild	10	Sta.	Horsenettle	15	Up	Thistle, plumelless	15	Up
Western:												
California	Bermudagrass	35	Up	Dock, curly	60	Up	Foxtail, yellow	25	Sta.	Umbrellaplant, tall	30	Up
Idaho	Barley, squirreltail	5	Sta.	Dandelion	10	Sta.	Quackgrass	40	Sta.	Thistle, Canada	50	Up
Montana	Barley, wild	5	Sta.	Spurge, leafy	3	Up	Thistle, bull	1	Sta.	Thistle, musk	2	Up
Nevada	Arrowgrass	10	Sta.	Knapsack, Russian	10	Up	Thistle, Canada	15	Up	Thistle	10	Up
New Mexico	Barnyardgrass	20	Down	Carrot, wild	20	Up	Cocklebur	2	Down	Sunflowers	5	Down
Oregon	Barley, wild	10	Sta.	Carrot, wild	20	Up	Chest	40	Sta.	Thistle, Canada	10	Up
Utah	Brome, field	50	Up	Dandelion	50	Sta.	Gumweed	25	Up	Thistle, bull	25	Up
Washington	Buttercup	10	Up	Dandelion	25	Sta.	Quackgrass	25	Up	Thistle, Canada	20	Up
Wyoming	Barley, foxtail	50	Up	Dandelion	50	Up	Pigweed, redroot	30	Sta.	Thistle, Russian	30	Sta.
Hawaii	Eupatorium, river	20	Sta.	Guava	15	Up	Senna	10	Up	Sourgrass	5	Sta.

1/ Sta., stationary  
2/Nightshade, apple-of-Sodom  
3/Reported as Onion, wild and Garlic, wild

1/Sta., stationary

2/Nightshade, apple-of-Sodom

3/Reported as Onion, wild and Garlic, wild

Table 161.--Perennial unimproved pastures: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Connecticut-----	---	1	---	----	5.00	----	100	--
Maryland-----	---	10	---	----	1.00	----	100	--
Pennsylvania-----	---	15	---	----	4.25	----	90	10
Vermont-----	---	2/	---	----	5.00	----	75	25
Northeastern-----	---	26	---	----	3.03	----	94	6
Illinois-----	---	25	---	----	3.00	----	98	2
Minnesota-----	---	75	---	----	2.00	----	95	5
Missouri-----	---	84	---	----	3.00	----	50	50
South Dakota-----	---	55	---	----	2.50	----	40	60
North Central-----	---	239	---	----	2.57	----	67	33
Arkansas-----	20	125	40	1.50	2.00	2.00	90	10
Louisiana-----	---	20	---	----	4.00	----	90	10
Mississippi-----	10	15	5	5.00	2.00	6.50	90	10
Virginia-----	---	330	---	----	5.70	----	50	50
Southern-----	30	490	45	2.67	4.57	2.50	67	33
Montana-----	---	3	---	----	2.00	----	40	60
Hawaii-----	1	20	---	25.00	15.00	----	50	50
Western-----	1	23	---	25.00	13.30	----	49	51
United States-----	31	778	45	3.39	4.16	2.50	67	33

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 500 acres.

Table 162.--Perennial unimproved pastures: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for : better : herbicides :	Persistence problem	
	Pre- : emergence :	Post- : emergence :	Pre- + post- : emergence :			Indication : of :	Percent of : treated : acres
Connecticut-----	---	Fair	---	Sta.	Little	No	---
Maryland-----	---	Good	---	Sta.	Little	No	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Vermont-----	---	Fair	---	Sta.	Little	No	---
Northeastern-----	---	2-Good 2-Fair	---	1-Up 3-Sta.	1-Some 3-Little	4-No	---
Minnesota-----	---	Fair	---	Up	Some	No	---
Missouri-----	---	Good	---	Up	Little	No	---
South Dakota-----	---	Fair	---	Up	Urgent	No	---
North Central-----	---	1-Good 2-Fair	---	3-Up	1-Urgent 1-Some 1-Little	3-No	---
Arkansas-----	Fair	Good	Good	Up	Some	No	---
Louisiana-----	---	Good	---	Up	Some	No	---
Mississippi-----	Fair	Good	Good	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Urgent	No	---
Southern-----	2-Fair	3-Good 1-Fair	2-Good	4-Up	1-Urgent 3-Some	4-No	---
Montana-----	---	Fair	---	Up	Some	No	---
Hawaii-----	Fair	Fair	---	Up	Urgent	No	---
Western-----	1-Fair	2-Fair	---	2-Up	1-Urgent 1-Some	2-No	---
United States-----	3-Fair	6-Good 7-Fair	2-Good	10-Up 3-Sta.	3-Urgent 6-Some 4-Little	13-No	---

1/ Sta., stationary.





Table 164.--Mountain rangeland: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
New Hampshire-----	---	2	---	---	50.00	---	100	---
Northeastern-----	---	2	---	---	50.00	---	100	---
South Dakota-----	---	25	---	---	5.00	---	25	75
North Central-----	---	25	---	---	5.00	---	25	75
Texas-----	---	600	---	---	6.00	---	10	90
Southern-----	---	600	---	---	6.00	---	10	90
California-----	---	80	---	---	6.50	---	10	90
Colorado-----	---	10	---	---	5.00	---	60	40
Idaho-----	---	6	---	---	5.00	---	75	25
Montana-----	---	20	---	---	3.00	---	5	95
New Mexico-----	---	1	---	---	3.90	---	---	100
Oregon-----	---	2	---	---	2.50	---	---	100
Utah-----	---	5	---	---	3.00	---	10	90
Washington-----	---	2	---	---	2.00	---	10	90
Wyoming-----	---	100	---	---	3.00	---	---	100
Hawaii-----	---	10	---	---	7.00	---	50	50
Western-----	---	236	---	---	4.48	---	11	89
United States-----	---	863	---	---	5.66	---	11	89

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 165.--Mountain rangeland: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage : trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
New Hampshire-----	---	Fair	---	Sta.	Some	No	---
Northeastern-----	---	1-Fair	---	1-Sta.	1-Some	1-No	---
South Dakota-----	---	Good	---	Up	Some	No	---
North Central-----	---	1-Good	---	1-Up	1-Some	1-No	---
Texas-----	---	Good	---	Up	Some	No	---
Southern-----	---	1-Good	---	1-Up	1-Some	1-No	---
California-----	---	Good	---	Sta.	Some	No	---
Colorado-----	---	Fair	---	Up	Urgent	No	---
Idaho-----	---	Good	---	Sta.	Some	No	---
Montana-----	---	Good	---	Up	Little	No	---
New Mexico-----	---	Good	---	Sta.	Some	No	---
Oregon-----	---	Good	---	Up	Some	No	---
Utah-----	---	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	No	---
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	---	Fair	---	Up	Urgent	No	---
Western-----	---	8-Good	---	7-Up	2-Urgent	10-No	---
		2-Fair		3-Sta.	7-Some 1-Little		
United States-----	---	10-Good	---	9-Up	2-Urgent	13-No	---
		3-Fair		4-Sta.	10-Some 1-Little		

1/ Sta., stationary.



Table 167.--Foothill (prairie) rangeland: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Kansas-----	---	500	---	---	2.00	---	50	50
North Dakota-----	---	147	---	---	2.00	---	30	70
South Dakota-----	---	100	---	---	3.00	---	20	80
North Central-----	---	747	---	---	2.13	---	42	58
Oklahoma-----	---	300	---	---	4.00	---	20	80
Texas-----	---	1,500	---	---	6.00	---	10	90
Southern-----	---	1,800	---	---	5.67	---	12	88
California-----	---	30	---	---	6.50	---	10	90
Colorado-----	---	20	---	---	3.00	---	20	80
Idaho-----	---	45	---	---	3.00	---	5	95
Montana-----	---	30	---	---	3.00	---	5	95
Nevada-----	---	25	---	---	3.00	---	10	90
New Mexico-----	---	3	---	---	3.90	---	---	100
Utah-----	---	5	---	---	3.00	---	10	90
Washington-----	---	8	---	---	2.00	---	10	90
Wyoming-----	---	20	---	---	3.50	---	20	80
Hawaii-----	---	15	---	---	15.00	---	50	50
Western-----	---	201	---	---	4.44	---	13	87
United States-----	---	2,748	---	---	4.62	---	20	80

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 168.--Foothill (prairie) rangeland: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Kansas-----	---	Fair	---	Up	Some	No	---
North Dakota-----	---	Good	---	Up	Some	No	---
South Dakota-----	---	Good	---	Up	Some	No	---
North Central-----	---	2-Good 1-Fair	---	3-Up	3-Some	3-No	---
Oklahoma-----	---	Fair	---	Up	Some	No	---
Texas-----	---	Good	---	Up	Some	No	---
Southern-----	---	1-Good 1-Fair	---	2-Up	2-Some	2-No	---
California-----	---	Good	---	Sta.	Some	No	---
Colorado-----	---	Good	---	Up	Urgent	No	---
Idaho-----	---	Good	---	Up	Some	No	---
Montana-----	---	Good	---	Up	Little	No	---
Nevada-----	---	Fair	---	Up	Some	No	---
New Mexico-----	---	Good	---	Sta.	Some	No	---
Utah-----	---	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	No	---
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	---	Fair	---	Up	Urgent	No	---
Western-----	---	8-Good 2-Fair	---	8-Up 2-Sta.	2-Urgent 7-Some 1-Little	10-No	---
United States-----	---	11-Good 4-Fair	---	13-Up 2-Sta.	2-Urgent 12-Some 1-Little	15-No	---

1/ Sta., stationary.



Table 169.---Toothill rangeland: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
			1/			1/			1/			1/			1/
<b>North Central:</b>															
Kansas-----	Ironweed	15	Sta.	Gallin	10	Up	Redwood, western	30	Sta.	Redcedar, eastern	15	Up	Thistle, musk-----	25	Sta.
North Dakota-----	Goldenrods	40	Sta.	Gumweed	40	Sta.	Sagebrush, fringed	85	Sta.	Snowberry, western	60	Sta.	Spurge, leafy-----	50	Up
South Dakota-----	Bindweed, field	15	Sta.	Bromegrasses, weedy	80	Sta.	Goldenrod	2	Sta.	Gumweed	60	Sta.	Sagebrushes-----	70	Sta.
<b>Southern:</b>															
Oklahoma-----	Broomweed	70	Sta.	Bullnettle	15	Up	Ragweed	80	Sta.	Sagebrush	40	Sta.	Sandbur-----	25	Up
Texas-----	Mesquite	52	Up	Oak, live	32	Up	Pricklypear	72	Up	Sagebrush	25	Sta.	Whitebrush-----	15	Up
<b>Western:</b>															
California-----	Goatgrass, barb	5	Up	Medusahead	35	Up	Oak, blue	35	Up	Starthistle, yellow	30	Up	Thistle, Italian---	10	Up
Colorado-----	Larkspurs	2	Sta.	Loco	5	Up	Pricklypear	20	Up	Rabbitbrush	15	Up	Sagebrush	25	Sta.
Idaho-----	Brome, downy	30	Sta.	Peucedan	1	Sta.	Knapweed, spotted	1	Up	Medusahead	5	Up	Sagebrush	70	Down
Montana-----	Brome, downy	7	Up	Clubmoss	10	Sta.	Knapweed, spotted	5	Sta.	Sagebrush, fringed	5	Up	Spurge, leafy-----	5	Sta.
Nevada-----	Halogeton	20	Up	Larkspur, tall	20	Up	Juniper	15	Up	Rabbitbrush, rubber	6	Sta.	-----	20	Sta.
New Mexico-----	Dalea, broom	8	Up	Greaseweed	3	Sta.	Juniper	15	Up	Medusahead	5	Up	Ragwort, tansy---	4	Up
Oregon-----	Blackberries	2	Up	Dogtail, crested	5	Up	Rabbitbrush	30	Up	Sagebrush, big	70	Sta.	Thistle, Russian---	60	Sta.
Utah-----	Brome, downy	60	Sta.	Mullein	18	Up	Knapweed	15	Up	Medusahead	3	Up	Thistle, Canada---	1	Up
Washington-----	Balsamroot, arrowleaf	3	Up	Brush	18	Up	Pricklypear	1	Down	Sagebrush	50	Sta.	Sagebrush, fringed	30	Up
Wyoming-----	Brome, downy	40	Up	Larkspur, Geyer's	20	Sta.	Pricklypear	20	Sta.	Sagebrush	15	Sta.	Peperitree, Brazil--	20	Up
Hawaii-----	Broomsedge	20	Up	Foxtail, yellow	20	Sta.	Guava	15	Sta.	Melastoma, banks	15	Sta.	-----	20	Up

1/Sta., stationary.

Table 170.--Arid rangeland: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Texas-----	---	260	---	---	5.00	---	10	90
Southern-----	---	260	---	---	5.00	---	10	90
California-----	---	5	---	---	5.00	---	30	70
Idaho-----	---	14	---	---	3.00	---	95	5
Montana-----	---	2	---	---	3.00	---	5	95
New Mexico-----	---	5	---	---	3.00	---	100	---
Oregon-----	---	100	---	---	3.00	---	10	90
Utah-----	---	2	---	---	3.00	---	10	90
Washington-----	---	15	---	---	2.00	---	10	90
Wyoming-----	---	8	---	---	8.00	---	---	100
Hawaii-----	---	25	---	---	15.00	---	25	75
Western-----	---	176	---	---	4.90	---	22	78
United States-----	---	436	---	---	4.96	---	15	85

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 171.--Arid rangeland: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Texas-----	---	Good	---	Up	Urgent	No	---
Southern-----	---	1-Good	---	1-Up	1-Urgent	1-No	---
California-----	---	Fair	---	Sta.	Urgent	No	---
Idaho-----	---	Fair	---	Sta.	Some	No	---
Montana-----	---	Good	---	Up	Little	No	---
New Mexico-----	---	Good	---	Up	Some	No	---
Oregon-----	---	Good	---	Up	Some	No	---
Utah-----	---	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	No	---
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	---	Good	---	Up	Urgent	No	---
Western-----	---	7-Good 2-Fair	---	7-Up 2-Sta.	2-Urgent 6-Some 1-Little	9-No	---
United States-----	---	8-Good 2-Fair	---	8-Up 2-Sta.	3-Urgent 6-Some 1-Little	10-No	---

1/ Sta., stationary.

Table 172.---Arid rangeland: Five most important weeds listed alphabetically by States within regions, average infested, and infestation trend, 1968

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
North Central:	Cactus	5	Sta.									
South Dakota												
Southern:	Blackbush	15	Up	Cresotebush	72	Up	Mesquite	76	Up	Salcedar	3	Up
Texas												
Western:												
Arizona	Cactus	10	Sta.	Juniper	15	Sta.	Mesquite	30	Sta.	Oak	20	Sta.
California	Pescue	25	Sta.	Juniper, California	75	Up	Startistle, yellow	50	Sta.	Tansymustard	30	Sta.
Idaho	Brome, rattail	80	Sta.	Halopton	5	Sta.	Mustard	30	Sta.	Rabbitbrush	15	Sta.
Idaho	Brome, downy	5	Sta.	Knapweed, spotted	2	Up	Pricklypear	1	Down	Sagebrush, big	20	Up
Montana	Cholla	10	Up	Cresotebush	12	Sta.	Junipers	5	Up	Mesquite	20	Up
New Mexico	Larkspur	10	Up	Medusahead	5	Up	Rabbitbrush	5	Up	Sagebrush	10	Up
Oregon	Brome, low	15	Up	Loco	20	Sta.	Milkweed, western	10	Up	Rabbitbrush	30	Up
Utah	Brome, downy	70	Down	Halopton	1	Sta.	Rabbitbrush, green	15	Up	Sagebrush, big	20	Up
Washington	Brome, downy	30	Up	Greasweed	15	Sta.	Halo, cotton	20	Up	Pricklypear	20	Sta.
Wyoming	Brome, downy	10	Up	Huisache	10	Sta.	Lantana	25	Down	Nightshade	5	Sta.
Hawaii												

1/Sta., stationary.

2/Milkweed, western whorled.

3/Nightshade, apple-of-Sodom.

Table 173.--Rainbelt rangeland: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom Operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Florida-----	---	1	---	---	2.00	---	25	75
Texas-----	---	300	---	---	9.00	---	10	90
Southern-----	---	301	---	---	8.98	---	10	90
California-----	---	10	---	---	6.50	---	30	70
Hawaii-----	---	15	---	---	15.00	---	50	50
Western-----	---	25	---	---	11.60	---	42	58
United States-----	---	326	---	---	9.18	---	12	88

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 174.--Rainbelt rangeland: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State, and region	Effectiveness of herbicides			Herbicides usage trend <u>1/</u>	Need for better herbicides	Persistent problem	
	Pre-emergence	Post-emergence	Pre- + post-emergence			Indication of problem	Percent of treated acres
Florida-----	---	Poor	---	Down	Little	No	---
Texas-----	---	Good	---	Up	Urgent	No	---
Southern-----	---	1-Good 1-Poor	---	1-Up 1-Down	1-Urgent 1-Little	2-No	---
California-----	---	Good	---	Sta.	Urgent	No	---
Hawaii-----	---	Fair	---	Up	Urgent	No	---
Western-----	---	1-Good 1-Fair	---	1-Up 1-Sta.	2-Urgent	2-No	---
United States-----	---	2-Good 1-Fair 1-Poor	---	2-Up 1-Sta. 1-Down	3-Urgent 1-Little	4-No	---

1/ Sta., stationary.

Table 175.--Rainbelt rangeland: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1900-1909

Region and State	Weed	1/			Weed	1/			Weed	1/			Weed	1/		
		Pct.	Infestation Acres	Trend		Pct.	Infestation Acres	Trend		Pct.	Infestation Acres	Trend		Pct.	Infestation Acres	Trend
Southern:																
Florida-----	Dogfennel-----	10	Sta.		Galberry-----	20	Sta.		Palmetto, saw-----	70	Sta.		Smutgrass-----	10	Up	
Texas-----	Flm-----	12	Up		Huisache-----	12	Up		Oak, posi-----	52	Up		Rose, Macartney-----	3	Up	
Western:																
California-----	Blackberry, Himalaya	20	Up		Broom, Scotch-----	12	Up		Corse-----	5	Up		Ragwort, tansy-----	5	Up	
Oregon-----	Berries, wild-----	2	Up		Buttercup-----	3	Up		Iris-----	1	Up		Oak, poison-----	5	Up	
Hawaii-----	Eupatorium, river---	50	Up		Fern-----	35	Up		Guava-----	40	Sta.		Melastoma, bark-----	30	Sta.	
													Sourbush-----	20	Sta.	

1/Sta., stationary.



# FOREST PLANTINGS

## (See General Limitations)

The control of competing vegetation increases the chance of success in forest plantings and assures the more rapid development of forest species. Almost 500,000 acres were reported as receiving herbicidal weed control. The cost was approximately \$6 million (tables 1 through 7, 176, and 177). The most important weeds mentioned by States in forest plantings were herbaceous. These outnumbered undesirable woody plants by over two to one (table 178).

Some of the more important weeds and complexes mentioned were: quackgrass, oak species, blackberries and brambles, bracken and other ferns, perennial grasses, pigweeds, broomsedge, and bindweeds. Research, so far, has shown a high potential for improvement of weed control in forest plantings. More research in this area is badly needed.

Table 176.--Forest plantings: Estimated extent and cost of chemical weed control,  
by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <u>1/</u>			Acreage treated by--	
	Pre- emergence	Post- emergence	Pre- + post- emergence	Pre- emergence	Post- emergence	Pre- + post- emergence	Farmers	Custom operators
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>	<u>Percent</u>
Connecticut-----	2	1	---	10.00	15.00	----	90	10
New Jersey-----	---	29	---	----	15.00	----	95	5
Pennsylvania-----	5	12	---	9.50	10.50	----	90	10
Vermont-----	.1	.2	---	7.50	7.50	----	100	---
Northeastern-----	7.1	42.2	---	9.61	13.68	----	93	7
Illinois-----	29	.3	0.3	8.00	9.50	11.00	95	5
Iowa-----	.3	---	---	4.00	----	----	100	---
Kansas-----	.9	.1	---	13.00	10.00	----	90	10
North Dakota-----	11	.6	---	5.00	2.00	----	60	40
North Central-----	41.2	1.0	.3	7.28	5.05	11.00	85	15
Alabama-----	---	100	---	----	15.00	----	10	90
Arkansas-----	---	10	---	----	10.00	----	1	99
Florida-----	---	---	10	----	----	15.00	5	95
Louisiana-----	---	131	---	----	15.00	----	91	9
Mississippi-----	---	100	---	----	13.00	----	50	50
North Carolina-----	---	2	---	----	10.00	----	100	---
Tennessee-----	---	1	---	----	8.00	----	5	95
Virginia-----	---	2	---	----	10.00	----	50	50
Southern-----	---	346.0	10.0	----	14.20	15.00	51	49
California-----	5	7	---	10.00	12.00	----	35	65
Idaho-----	---	<u>2/</u>	---	----	3.75	----	100	---
Montana-----	---	.5	---	----	7.00	----	100	---
Oregon-----	---	1	---	----	10.00	----	100	---
Washington-----	---	1	---	----	5.00	----	10	90
Hawaii-----	---	.2	.2	----	10.00	15.00	100	---
Western-----	5.0	9.7	.2	10.00	10.77	15.00	42	58
United States-----	53.3	398.9	10.5	7.85	14.04	14.89	58	42

1/ Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farm-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

2/ Less than 50 acres.

Table 177.--Forest plantings: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	Good	Fair	---	Up	Some	No	---
New Jersey-----	---	Good	---	Up	Urgent	No	---
Pennsylvania-----	Good	Good	---	Up	Some	No	---
Vermont-----	Good	Good	---	Up	Little	No	---
Northeastern-----	3-Good	3-Good 1-Fair	---	4-Up	1-Urgent 2-Some 1-Little	4-No	---
Illinois-----	Good	Good	Good	Up	Some	Yes	10
Iowa-----	Fair	---	---	Up	Some	No	---
Kansas-----	Fair	Fair	---	Up	Some	No	---
North Dakota-----	Good	Fair	---	Up	Some	No	---
North Central-----	2-Good 2-Fair	1-Good 2-Fair	1-Good	4-Up	4-Some	1-Yes 3-No	7
Alabama-----	---	Good	---	Down	Urgent	No	---
Arkansas-----	---	Fair	---	Down	Little	No	---
Florida-----	---	---	Fair	Up	Some	No	---
Louisiana-----	---	Good	---	Up	Some	No	---
Mississippi-----	---	Fair	---	Up	Some	No	---
North Carolina-----	---	Good	---	Up	Some	No	---
Tennessee-----	---	Fair	---	Up	Some	No	---
Virginia-----	---	Fair	---	Up	Urgent	No	---
Southern-----	---	3-Good 4-Fair	1-Fair	6-Up 2-Down	2-Urgent 5-Some 1-Little	8-No	---
California-----	Fair	Fair	---	Up	Urgent	No	---
Idaho-----	---	Good	---	Up	Little	No	---
Montana-----	---	Good	---	Sta.	Little	No	---
Oregon-----	---	Good	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	No	---
Hawaii-----	---	Fair	Good	Up	Urgent	No	---
Western-----	1-Fair	4-Good 2-Fair	1-Good	5-Up 1-Sta.	2-Urgent 2-Some 2-Little	6-No	---
United States-----	5-Good 3-Fair	11-Good 9-Fair	2-Good 1-Fair	19-Up 1-Sta. 2-Down	5-Urgent 13-Some 4-Little	1-Yes 21-No	1

1/ Sta., stationary.

Table 174. Forest plantings: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1921

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend		Acres	Trend
		Pct.			Pct.			Pct.			Pct.			Pct.			Pct.	
<b>Northeastern:</b>																		
Connecticut---	Crabgrass---	100	Sta.	Nutsedge---	100	Up	Purslane---	100	Sta.	Quackgrass---	100	Sta.	Toadflax---	100	Up			
New Hampshire---	Rackoon---	10	Down	Cottonwood---	20	Sta.	Quackgrass---	60	Down	Spirea---	20	Sta.	Sweetfern---	30	Sta.			
New Jersey---	Rambles---	25	Sta.	Bromsedge---	30	Up	Creepcr, Virginia---	35	Up	Foxtails---	25	Sta.	Ivy, poison---	20	Sta.			
Pennsylvania---	Bluegrass---	25	Sta.	Foxtail, yellow---	30	Up	Goldenrod---	25	Sta.	Plums, woody---	10	Sta.	Quackgrass---	10	Up			
Vermont---	Rambles---	30	Sta.	Brush---	50	Sta.	Goldenrod---	25	Sta.	Grasses, annual---	80	Down	Quackgrass---	90	Down			
<b>North Central:</b>																		
Illinois---	Bindweed, field---	--	Up	Flkweed, climbing---	--	--	Persimmon---	--	Sta.	Quackgrass---	--	Sta.	Sassafras---	--	Sta.			
Iowa---	Burny redgrass---	100	Sta.	Bluegrass, Kentucky---	100	Sta.	Stam, quack---	100	Sta.	Foxtails---	100	Sta.	Hayweed---	100	Sta.			
Kansas---	Bindweed---	20	Up	Grasses, perennial---	60	Sta.	Sindoor---	20	Sta.	Thistle, Russian---	10	Sta.	Quackgrass---	--	Sta.			
Minnesota---	Bluegrass---	60	Sta.	Brush, mixed---	20	Sta.	Foxtails---	10	Sta.	Virgweed---	10	Sta.	Quackgrass---	100	Sta.			
North Dakota---	Kochia---	60	Sta.	Mustard, wild---	60	Sta.	Pigweed, reir-mol---	50	Sta.	Shirley, leafy---	10	Up	Thistle, Russian---	25	Sta.			
<b>Southern:</b>																		
Alabama---	Blackgum---	75	Sta.	Hardwood (all other)---	75	Sta.	Hickory---	75	Sta.	Oaks---	--	Sta.	Sweetgum---	75	Sta.			
Arkansas---	Oak, blackjack---	20	Sta.	Oak, post---	20	Sta.	--	--	--	--	--	--	--	--	--			
Florida---	Galberry---	10	Down	Greenbrier---	1	Sta.	Oak, scrub---	21	Down	Palmetto, saw---	15	Down	Flu---	25	Down			
Georgia---	Hickory---	60	Sta.	Oak, blackjack---	1	Sta.	Oak, post---	25	Sta.	Oak, Southern red---	30	Sta.	Sweetgum---	40	Sta.			
Louisiana---	Blackberry---	60	Up	Bromsedge---	16	Up	Bromweed---	10	Sta.	Johnson grass---	30	Sta.	Hayweed---	70	Sta.			
Oklahoma---	Bermudagrass---	50	Sta.	Crabgrass---	40	Sta.	Ironweed---	10	Sta.	Pigweed---	50	Up	Hayweed---	10	Up			
South Carolina---	Blackberry---	10	Sta.	Fescue---	70	Sta.	Ironweed---	35	Sta.	Ragweed---	30	Sta.	Flu---	25	Up			
Tennessee---	Bromsedge---	40	Sta.	Bermudagrass---	10	Sta.	Ironweed---	20	Sta.	Red and blackberry---	20	Sta.	Grasses, annual---	20	Sta.			
Virginia---	Annuals, winter---	20	Sta.	--	--	--	--	--	--	--	--	--	--	--	--			
<b>Western:</b>																		
California---	Broom-	50	Sta.	Bracken---	20	Up	Grass, Sod---	50	Sta.	Kanawita---	20	Sta.	Sorrel, red---	20	Up			
Idaho---	Pesone, tall---	90	Up	Knotted, prostrate---	60	Sta.	Yellow, common---	70	Sta.	Pigweed, redroot---	10	Sta.	Quackgrass---	40	Up			
Montana---	Brome, downy---	30	Sta.	Knotted---	50	Sta.	Pigweed---	50	Sta.	Thistle, bull---	5	Down	Thistle, Canada---	5	Sta.			
Oregon---	Alder---	10	--	Knotted---	10	--	Berries, wild---	3	--	Gorse---	3	--	Velvetgrass---	1	--			
Utah---	Bindweed, field---	25	Up	Mallow---	50	Sta.	Burselung---	25	Up	Quackgrass---	25	Up	Thistle, Russian---	50	Up			
Washington---	Bracken---	10	Up	Thistle, Canada---	10	Up	--	--	--	--	--	--	Thistle, Russian---	50	Up			
Idaho---	Poplarium, river---	40	Sta.	corn---	30	Up	Fireweed---	10	Sta.	Medicinal, banks---	30	Sta.	Poplarium, river---	10	Up			

1/ Sta., stationary.

# NONCROPLAND

## (See General Limitations)

Noncropland consists of ditchbanks and fencerows; feedlots; highway, railroad, and utility rights of way; areas surrounding buildings; and industrial and defense installations. Weed growth on noncropland is a serious problem for agriculture. Uncontrolled weeds in these areas provide a continuous source of weed seed that infests adjacent farmlands. They also constitute sources of inoculum for many diseases of crops, havens for destructive rodents and other animals, and widespread fire hazards.

Thirty-seven States responded to the survey on weed control on noncroplands. However, only 27 of these provided full or partial estimates of the acres of noncropland that had been treated with herbicides. These States reported the treatment of 1.7 million acres of noncropland. This represents a 53-percent reduction from the acreage reported treated for weed control during the year 1965. The use of herbicides on noncropland has declined since 1962, when 10 percent more noncropland was treated for weed control than was reported in 1965. The significance of the decline in herbicide use is not obvious, although it may be due in part to the present need for maintenance programs only on the large areas previously treated.

Farmers and other landowners applied herbicides on 48 percent of the treated area in 1968, as compared with 39 percent in 1965. The decrease in spraying by custom operators is apparently related to the sizable reduction in the total area of noncropland treated. Of the total noncropland area treated during 1968, only 1,000 acres were treated both preemergence and postemergence. The area treated preemergence only in 1968 was 138,000 acres, while 1.5 million acres were treated postemergence only.

These figures for 1968 represent reductions from 1965 of approximately 88 and 25 percent for preemergence and postemergence treatments, respectively. The average cost of preemergence treatments reported for 1968 was \$20.33 per acre--a reduction of \$12.07 per acre from the average cost reported for 1965. The average cost for postemergence treatments, \$15.74, was up \$2.84 from the average cost of \$12.90 per acre reported for 1965 (tables 1 through 7 and 179).

Almost 75 percent of the States responding to the survey estimated an upward trend in the use of herbicides on noncropland. However, the consistent reduction in the treated area since 1962 makes this estimate questionable. Most of the States reported the effectiveness of preemergence herbicides as good. Slightly more than half reported the postemergence herbicides to be fair in effectiveness. Twenty-three of the 27 States indicated that persistence of herbicides on noncropland was no problem. Six States reported an urgent need for better herbicides, while 20 States believed that there was some need for improvement (table 180).

The geographic regions that reported the greatest use of herbicides on noncropland were the north central region (694,000 acres) and the southern region (631,000 acres). States with the greatest areas treated were Nebraska,



Kansas, and Texas. California, which reported a total area treated of 1.3 million acres in 1965, indicated a treated area of only 124,000 acres in 1968.

Regionally, from east to west, the percent of herbicides applied by farmers or other landowners decreased from a high of 75 percent in the Northeast to a low of 34 percent in the western region. Custom operators probably play a larger role in the control of noncropland weeds where population densities are least and where individual areas to be treated are larger (table 179).

The 37 States reporting listed a total of 75 weeds or weed complexes of importance in noncropland. The weeds included herbaceous annual and perennial weeds, and woody plants. The 10 reported most frequently (in decreasing order of frequency) were: thistles, johnsongrass, ragweeds, Russian thistle, quackgrass, brush species, bindweeds, bermudagrass, sunflowers, and poison ivy.

Many infestations of weeds were stationary; however, for infestations of many of the more difficult to control weeds, such as bindweeds, greenbriers and other vines, bermudagrass, and Russian thistle, the infestation intensity was up. Infestations of quackgrass and johnsongrass were down in several States. The many reports of stationary trends in infestations and the several instances of reports of decreasing intensity trends are evidence that herbicides are capable of controlling weeds on noncroplands (tables 181 and 182).

Table 179.--Noncropland: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	5	---	---	20.00	---	100	---
Delaware-----	1	10	1	50.00	5.00	55.00	20	80
New Jersey-----	---	20	---	---	4.00	---	85	15
Pennsylvania-----	---	21	---	---	16.00	---	90	10
Northeastern-----	1	56	1	50.00	10.11	55.00	75	25
Illinois-----	---	50	---	---	10.00	---	10	90
Iowa-----	1	---	---	10.00	---	---	100	---
Kansas-----	---	230	---	---	2.50	---	80	20
Missouri-----	---	20	---	---	4.00	---	10	90
Nebraska-----	---	250	---	---	4.00	---	15	85
North Dakota-----	1	10	---	20.00	2.50	---	10	90
Ohio-----	---	25	---	---	3.50	---	30	70
South Dakota-----	7	100	---	50.00	50.00	---	75	25
North Central-----	9	685	---	42.22	10.61	---	46	54
Arkansas-----	1	5	---	100.00	5.00	---	100	---
Georgia-----	50	150	---	25.00	15.00	---	50	50
Mississippi-----	---	20	---	---	5.00	---	25	75
Tennessee-----	---	5	---	---	6.00	---	20	80
Texas-----	50	200	---	10.00	8.00	---	90	10
Virginia-----	---	150	---	---	50.00	---	5	95
Southern-----	101	530	---	18.32	21.71	---	55	45
Arizona-----	25	25	---	20.00	15.00	---	50	50
California-----	---	124	---	---	24.00	---	25	75
Colorado-----	---	20	---	---	25.00	---	70	30
Idaho-----	---	7	---	---	16.00	---	10	90
Montana-----	1	3	---	10.00	4.50	---	90	10
Utah-----	1	10	---	15.00	3.00	---	80	20
Washington-----	---	50	---	---	8.00	---	10	90
Wyoming-----	---	2	---	---	30.00	---	80	20
Hawaii-----	---	8	---	---	15.00	---	50	50
Western-----	27	249	---	19.44	18.42	---	34	66
United States-----	138	1,520	1	20.33	15.74	55.00	48	52

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

Table 180.--Noncropland: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication: of problem	Percent of treated acres
Connecticut-----	---	Fair	---	Up	Some	No	---
Delaware-----	Good	Good	Good	Up	Some	No	---
New Jersey-----	---	Good	---	Sta.	Some	No	---
Pennsylvania-----	---	Good	---	Up	Some	No	---
Northeastern-----	1-Good	3-Good 1-Fair	1-Good	3-Up 1-Sta.	4-Some	4-No	---
Illinois-----	---	Fair	---	Sta.	Some	No	---
Iowa-----	Fair	---	---	Up	Some	No	---
Kansas-----	---	Good	---	Sta.	Little	No	---
Missouri-----	---	Good	---	Up	Urgent	No	---
Nebraska-----	---	Fair	---	Up	Urgent	No	---
North Dakota-----	Good	Fair	---	Up	Some	No	---
Ohio-----	---	Good	---	Sta.	Some	No	---
South Dakota-----	---	Good	---	Sta.	Some	No	---
North Central-----	1-Good 1-Fair	4-Good 3-Fair	---	4-Up 4-Sta.	2-Urgent 5-Some 1-Little	8-No	---
Arkansas-----	Good	Fair	Good	Up	Some	No	---
Georgia-----	Good	Good	Good	Up	Some	No	---
Mississippi-----	---	Fair	---	Up	Urgent	No	5
Tennessee-----	---	Fair	---	Up	Some	No	---
Texas-----	Good	Good	---	Up	Some	Yes	---
Virginia-----	---	Fair	---	Up	Some	No	---
Southern-----	3-Good	2-Good 4-Fair	2-Good	6-Up	1-Urgent 5-Some	1-Yes 5-No	---
Arizona-----	Good	Fair	---	Up	Some	Yes	5
California-----	---	Good	---	Up	Some	No	---
Colorado-----	---	Fair	---	Up	Urgent	Yes	80
Idaho-----	---	Fair	---	Sta.	Some	No	---
Montana-----	Fair	Fair	---	Up	Some	No	---
Utah-----	Good	Fair	---	Up	Some	No	---
Washington-----	---	Good	---	Up	Some	No	---
Wyoming-----	---	Good	---	Up	Urgent	Yes	80
Hawaii-----	---	Fair	---	Sta.	Urgent	No	---
Western-----	2-Good 1-Fair	3-Good 6-Fair	---	7-Up 2-Sta.	3-Urgent 6-Some	3-Yes 6-No	7
United States-----	7-Good 2-Fair	12-Good 14-Fair	3-Good	20-Up 7-Sta.	6-Urgent 20-Some 1-Little	4-Yes 23-No	1

1/ Sta., stationary.

Table 181.--Noncropland: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in noncropland]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area
		NE	NC	S	W	Stationary		Up		Down		
						No.	Area	No.	Area	No.	Area	
							Percent		Percent		Percent	Percent
Alder-----	1	--	--	--	1	--	---	1	5	--	---	5
Ash-----	1	1	--	--	--	1	30	--	---	--	---	30
Barnyardgrass-----	1	--	--	--	1	1	20	--	---	--	---	20
*Bermudagrass-----	5	--	--	3	2	3	57	2	55	--	---	56
Berries, wild-----	1	--	--	--	1	--	---	1	5	--	---	5
*Bindweeds-----	5	1	3	--	1	2	18	3	60 <u>2/</u>	--	---	32 <u>2/</u>
Blackberries-----	2	--	--	1	1	--	---	2	20	--	---	20
Bouncingbet-----	1	--	1	--	--	--	---	1	(2/)	--	---	(2/)
Bracken-----	1	1	--	--	--	1	30	--	---	--	---	30
Brambles and briars--	3	1	--	2	--	2	52	1	30	--	---	45
Bromes-----	2	--	--	--	2	2	32	--	---	--	---	32
Broomsedge-----	2	--	--	2	--	2	85	--	---	--	---	85
*Brush-----	6 <u>3/</u>	3	1	1	1	3	35	1	(2/)	1	(2/)	35 <u>2/</u>
Burdock-----	1	--	--	--	1	--	---	1	20	--	---	20
Cocklebur-----	1	--	--	--	1	--	---	1	25	--	---	25
Crabgrasses-----	1	--	1	--	--	1	40	--	---	--	---	40
Cress, hoary-----	1	--	--	--	1	1	15	--	---	--	---	15
Dock, curly-----	1	--	--	1	--	--	---	--	---	1	10	10
Dogbane, hemp-----	1	1	--	--	--	--	---	1	5	--	---	5
Elm-----	1	--	--	1	--	--	---	1	15	--	---	15
Ferns-----	1	--	--	--	1	--	---	1	20	--	---	20
Foxtails-----	1	--	1	--	--	1	50	--	---	--	---	50
Goldenrods-----	2	1	1	--	--	2	15	--	---	--	---	15
Grasses, annual-----	1	--	--	1	--	1	50	--	---	--	---	50
Greenbriers-----	1	1	--	--	--	--	---	1	65	--	---	65
Guava-----	1	--	--	--	1	1	25	--	---	--	---	25
Hemp-----	2	--	2	--	--	2	(2/)	--	---	--	---	(2/)
Honeysuckle-----	2	--	--	2	--	1	20	1	60	--	---	40
Horseweed-----	1	--	1	--	--	1	(2/)	--	---	--	---	(2/)
Ironweed-----	1	1	--	--	--	1	50	--	---	--	---	---
*Johnsongrass-----	12 <u>3/</u>	1	3	5	3	4	32	5	27 <u>2/</u>	2	30	30 <u>2/</u>
Knapweeds-----	3	--	--	--	3	1	15	2	11	--	---	12
Knotweeds-----	1	1	--	--	--	--	---	1	20	--	---	20
Kochia-----	2	--	1	--	1	1	25	1	20	--	---	22
Kudzu-----	1	--	--	1	--	--	---	1	30	--	---	30
Lambsquarters-----	1	--	1	--	--	1	25	--	---	--	---	25
Leadtree-----	1	--	--	--	1	1	20	--	---	--	---	20
Lettuce, prickly-----	1	--	--	--	1	1	60	--	---	--	---	60
Locust, black-----	1	--	--	1	--	1	10	--	---	--	---	10
Maples-----	2	1	--	1	--	2	20	--	---	--	---	20
Mesquite-----	1	--	--	1	--	--	---	1	(2/)	--	---	(2/)
*Milkweeds-----	4	1	2	--	1	1	10	3	5 <u>2/</u>	--	---	8 <u>2/</u>
Mullein-----	1	--	--	--	1	--	---	1	(2/)	--	---	(2/)
Mustards-----	2	--	--	--	2	2	65	--	---	--	---	65
Oaks-----	2	--	1	1	--	1	5	1	10	--	---	8
Oat, wild-----	1	--	--	--	1	1	80	--	---	--	---	80
Panicum-----	1	--	--	--	1	--	---	1	30	--	---	30
Parsnip, wild-----	1 <u>3/</u>	--	1	--	--	--	---	--	---	--	---	---
Paspalums-----	1	--	--	--	1	--	---	1	30	--	---	30
Pigweeds-----	2	--	--	1	1	2	55	--	---	--	---	55

See footnotes at end of table.

Table 181.--Noncropland: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968--continued

Weed or complex	Number	Reports by region				Infestation trend						Total area
	of					Stationary	Up	Down				
	reports	NE	NC	S	W	No.:	Area	No.:	Area	No.:	Area	
							Percent		Percent		Percent	
Pines-----	1	--	--	1	--	1	5	--	---	--	---	5
Poison ivy-----	3	2	1	--	--	2	45 <u>2/</u>	1	30	--	---	38 <u>2/</u>
Popular-----	1	1	--	--	--	--	---	1	40	--	---	40
*Quackgrass-----	7	3	3	--	1	5	32	1	35	1	60	37
*Ragweeds-----	8 <u>3/</u>	1	5	2	--	6	60 <u>2/</u>	1	( <u>2/</u> )	--	---	60 <u>2/</u>
Reed-----	1	1	--	--	--	1	35	--	---	--	---	35
Rose-----	3	1	--	--	2	1	25	2	18	--	---	20
Saltcedar-----	1	--	--	--	1	--	---	--	---	1	2	2
Sassafras-----	1	--	--	1	--	1	10	--	---	--	---	10
Spurge, leafy-----	3	--	1	--	2	1	15	2	16	--	---	16
Sumac-----	3	1	--	2	--	3	45	--	---	--	---	45
*Sunflowers-----	4 <u>3/</u>	--	3	--	1	3	20 <u>2/</u>	--	---	--	---	20 <u>2/</u>
Sweetfern-----	1	1	--	--	--	1	30	--	---	--	---	30
Sweetgum-----	1	--	--	1	--	1	30	--	---	--	---	30
*Thistle, Russian-----	8	--	2	2	4	5	37	2	40 <u>2/</u>	1	( <u>2/</u> )	38 <u>2/</u>
*Thistles-----	18	3	7	1	7	8	22 <u>2/</u>	9	16 <u>2/</u>	1	( <u>2/</u> )	19 <u>2/</u>
Toadflax, yellow-----	1	--	--	--	1	--	---	1	( <u>2/</u> )	--	---	ne <u>2/</u>
Tree-of-heaven-----	1	1	--	--	--	1	25	--	---	--	---	25
Trumpetcreeper-----	1	--	--	1	--	--	---	1	30	--	---	30
Vines-----	1	--	--	1	--	--	---	1	60	--	---	60
Waterhemp-----	1	--	1	--	--	1	( <u>2/</u> )	--	---	--	---	( <u>2/</u> )
Whitehorn-----	1	1	--	--	--	1	30	--	---	--	---	---
Whitetop-----	2	--	--	--	2	--	---	1	20	1	3	12
Willows-----	2	--	--	1	1	1	1	1	40	--	---	20
Woody plants-----	2	--	--	2	--	1	50	1	60	--	---	55

1/ Percentage figures for each trend are averages of those reports for which estimates were given for extent of area infested; other reports included in the number of reports.

2/ No estimates reported for weeds listed in Illinois, Iowa, Kansas, Nebraska, Texas, and Idaho.

3/ Weeds reported in Pennsylvania and Missouri not classified by trend and no estimate given of extent; included in regional and total frequency counts only.



Table 192.--Nonironland: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1968

Region and State	Weed	Infestation acres Trend	Weed	Infestation acres Trend	Weed	Infestation acres Trend	Weed	Infestation acres Trend	Weed	Infestation acres Trend		
Northeastern:												
Connecticut-----	Ash-----	30	Sta.	brambles-----	30	Up	Ivy, poison-----	30	Up	Knave, red-----	30	Sta.
Delaware-----	Dogbane hemp-----	5	Up	Milkweed, broadleaf-----	5	Up	Thistle, Canada-----	10	Up	-----	-----	-----
Maryland-----	Johnsongrass-----	10	Up	Quackgrass-----	5	Sta.	Thistle, Canada-----	10	Up	Quackgrass-----	60	Down
New Hampshire-----	Blindweed-----	20	Sta.	Bracken, fern-----	30	Sta.	Poplar-----	10	Up	Tree-of-heaven-----	35	Sta.
New Jersey-----	Brush, mixed-----	60	Sta.	Ivy, poison-----	15	Sta.	Knotted, Japanese-----	20	Up	-----	-----	-----
Pennsylvania-----	Brush-----	5	Sta.	Goldenrod-----	10	Sta.	Quackgrass-----	50	Sta.	Thistles-----	50	Sta.
West Virginia-----	Greenbrier-----	65	Up	Rose, multiflora-----	50	Sta.	Thistles-----	35	Up	Whitehorn-----	30	Sta.
North Central:												
Illinois-----	Blindweed, field-----	5	Up	Sourclover-----	5	Up	Milkweed, climbing-----	6	Up	Quackgrass-----	6	Sta.
Indiana-----	Horseweed-----	5	Sta.	Ivy, poison-----	5	Sta.	Johnsongrass-----	5	Sta.	Thistle, Canada-----	5	Sta.
Iowa-----	Brush, mixed-----	5	Sta.	Hemp-----	5	Up	Regweed, giant-----	5	Sta.	Thistle, Canada-----	5	Sta.
Kansas-----	Blindweed, field-----	5	Sta.	Johnsongrass-----	40	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
Minnesota-----	Oak, brush-----	5	Sta.	Parula, wild-----	5	Up	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
Missouri-----	Johnsongrass-----	5	Sta.	Milkweed, common-----	30	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
Nebraska-----	Hemp-----	5	Sta.	Spurge, leafy-----	30	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
North Dakota-----	Goldenrod-----	40	Sta.	Spurge, leafy-----	30	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
Ohio-----	Crabgrass-----	40	Sta.	Spurge, leafy-----	30	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
South Dakota-----	Blindweed, field-----	15	Sta.	Kochia-----	25	Sta.	Regweed, giant-----	50	Sta.	Thistle, Canada-----	50	Sta.
Southern:												
Arkansas-----	Broomsedge-----	90	Sta.	Dock, curly-----	10	Down	Johnsongrass-----	30	Down	Regweed-----	60	Sta.
Georgia-----	Bermudagrass-----	70	Up	Blackberry-----	20	Up	Honeyuckle-----	60	Up	Johnsongrass-----	40	Up
North Carolina-----	Bermudagrass-----	70	Sta.	Blackberry-----	20	Up	Honeyuckle-----	60	Up	Johnsongrass-----	40	Up
Oklahoma-----	Bermudagrass-----	80	Sta.	Blackberry-----	20	Up	Honeyuckle-----	60	Up	Johnsongrass-----	40	Up
South Carolina-----	Grasses, annual-----	50	Sta.	Blackberry-----	20	Up	Honeyuckle-----	60	Up	Johnsongrass-----	40	Up
Tennessee-----	Grasses, annual-----	95	Sta.	Sweetgum-----	30	Sta.	Vines-----	60	Up	Willow-----	10	Up
Texas-----	Brush, mixed-----	5	Up	Johnsongrass-----	30	Sta.	Johnsongrass-----	30	Up	Willow-----	10	Up
Virginia-----	Brush, mixed-----	10	Sta.	Johnsongrass-----	30	Sta.	Willow-----	10	Up	Willow-----	10	Up
-----	Locust, black-----	10	Sta.	Naples-----	10	Sta.	Willow-----	10	Up	Willow-----	10	Up
Western:												
Arizona-----	Bermudagrass-----	20	Sta.	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
California-----	Bermudagrass-----	20	Sta.	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Idaho-----	Brush-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Montana-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Nevada-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
New Mexico-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Oregon-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Utah-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Washington-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Wyoming-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.
Hawaii-----	Crane, downy-----	5	Down	Johnson grass-----	10	Sta.	Mustards-----	70	Sta.	Regweed-----	50	Sta.

1/ Sta., stationary.

# AQUATIC AREAS

## (See General Limitations)

The aquatic areas reported include farm ponds, lakes, reservoirs, earth tanks, and irrigation and drainage waterways. All of these areas are subject to varying degrees of weed infestation. Twenty States reported aquatic-weed infestations totaling 216,000 acres--an area almost 2.6 times that reported for 1965. This greater area is explained in part by the greater number of States now reporting treatment in aquatic areas (13 States in 1965). However, it also reflects actual increases in weed-infested areas and the greater attention devoted to aquatic weeds and water resources.

Of the total acres treated for control of aquatic weeds during 1968, only 17,000 were treated preemergence. The remaining acreage was treated postemergence. The average treatment cost per acre for 1968 was \$20.50, as compared with \$22.88 for 1965. The estimated costs varied widely from State to State and from region to region. Seven Southern States reported that 57 percent of the total weed-infested acreage had been treated. The more moderate climate and the rapid spreading of introduced species of aquatic weeds serve to make these States special problem areas.

Farmers treated 25 percent of the infested areas, while custom operators treated the remaining 75 percent. Slightly more than half of the States reporting believed that the effectiveness of the herbicides used was good. Most of the remainder reported the effectiveness as fair, although one State reported the effectiveness of postemergence herbicides as poor.

The need for improved herbicides was listed as urgent by seven States, while the remaining States reported some need for improvement. This response was very similar to that obtained in 1965. Herbicide users apparently felt that, although present herbicides were effective, there was much room for improvement. Treatment costs are certain to be a factor in the user's judgment. Only five of 20 States reported persistence problems associated with the use of herbicides in aquatic sites. This is in contrast to seven of 13 States reporting persistence problems in 1965, and may reflect increased experience and confidence in the use of herbicides (tables 1 through 7, 183, and 184).

Thirty-three States reported a total of 35 different aquatic species or groups of species as being problems in aquatic sites. Algae and pondweeds were cited most often as problem weeds, being listed 44 times in a total of 150 citations. Cattail was third in importance with 17 citations. Seventy-two instances were listed in which the intensity trend of weed infestations was up, nine in which the weed infestations were down, and 67 in which the areas infested remained static (tables 185 and 186).

Table 183.--Aquatic areas: Estimated extent and cost of chemical weed control, by States and geographic regions, 1968

State and region	Acres treated			Average cost per acre <sup>1/</sup>			Acreage treated by--	
	Pre-emergence	Post-emergence	Pre- + post-emergence	Pre-emergence	Post-emergence	Pre- + post-emergence	Farmers	Custom operators
	1,000 acres	1,000 acres	1,000 acres	Dollars	Dollars	Dollars	Percent	Percent
Connecticut-----	---	0.4	---	---	6.00	---	70	30
New Jersey-----	---	.5	---	---	6.00	---	85	15
Pennsylvania-----	1	6	---	6.00	25.00	---	70	30
Northeastern-----	1.0	6.9	---	6.00	22.52	---	71	29
Illinois-----	10	8	---	150.00	10.00	---	10	90
Iowa-----	2	.5	---	20.00	2.50	---	80	20
Minnesota-----	---	50	---	---	15.00	---	25	75
Wisconsin-----	2	---	---	50.00	---	---	25	75
North Central-----	14.0	58.5	---	117.14	14.21	---	23	77
Arkansas-----	---	3	---	---	15.00	---	100	---
Florida-----	---	5	---	---	9.00	---	10	90
Georgia-----	---	5	---	---	25.00	---	90	10
Mississippi-----	---	5	---	---	10.00	---	100	---
Tennessee-----	---	.1	---	---	15.00	---	---	100
Texas-----	---	100	---	---	10.00	---	10	90
Virginia-----	2	3	---	40.00	40.00	---	30	70
Southern-----	2.0	121.1	---	40.00	11.45	---	20	80
California-----	.2	3	---	80.00	35.00	---	80	20
Montana-----	---	2	---	---	15.00	---	50	50
Utah-----	---	2/	---	---	20.00	---	20	80
Washington-----	---	2	---	---	20.00	---	10	90
Wyoming-----	---	3	---	---	30.00	---	20	80
Hawaii-----	---	2	---	---	20.00	---	100	---
Western-----	.2	12.0	---	80.00	25.42	---	52	48
United States-----	17.2	198.5	---	101.28	13.50	---	25	75

<sup>1/</sup> Includes herbicide equipment and labor for treatment made by farmers. Represents cost of herbicide custom applications and/or cost of farmer-applied herbicides. Regional and United States averages are for acreages on which costs were reported.

<sup>2/</sup> Less than 50 acres.

Table 184.--Aquatic areas: Estimated usage trend of chemical weed control, need for better herbicides, and residue problems, by States and geographic regions, 1968

State and region	Effectiveness of herbicides			Herbicides : usage trend <u>1/</u>	Need for better herbicides	Persistence Problem	
	Pre- emergence	Post- emergence	Pre- + post- emergence			Indication of problem	Percent of treated acres
Connecticut-----	---	Good	---	Sta.	Urgent	Yes	15
New Jersey-----	---	Good	---	Up	Some	No	---
Pennsylvania-----	Good	Good	---	Up	Some	No	---
Northeastern-----	1-Good	3-Good	---	2-Up 1-Sta.	1-Urgent 2-Some	1-Yes 2-No	1
Illinois-----	Good	Good	---	Up	Some	No	---
Iowa-----	Fair	Fair	---	Up	Some	No	---
Minnesota-----	---	Fair	---	Up	Some	Yes	10
Wisconsin-----	Good	---	---	Up	Some	No	---
North Central-----	2-Good 1-Fair	1-Good 2-Fair	---	4-Up	4-Some	1-Yes 3-No	7
Arkansas-----	---	Good	---	Up	Some	No	---
Florida-----	---	Fair	---	Down	Some	Yes	---
Georgia-----	---	Good	---	Up	Some	No	---
Mississippi-----	---	Fair	---	Up	Urgent	No	---
Tennessee-----	---	Poor	---	Up	Some	No	---
Texas-----	---	Good	---	Up	Some	No	---
Virginia-----	Fair	Fair	---	Up	Urgent	No	---
Southern-----	1-Fair	3-Good 3-Fair 1-Poor	---	6-Up 1-Down	2-Urgent 5-Some	1-Yes 6-No	---
California-----	Good	Fair	---	Up	Urgent	Yes	12
Montana-----	---	Fair	---	Up	Some	No	---
Utah-----	---	Fair	---	Up	Urgent	No	---
Washington-----	---	Good	---	Up	Urgent	Yes	---
Wyoming-----	---	Good	---	Up	Some	No	---
Hawaii-----	---	Fair	---	Sta.	Urgent	No	---
Western-----	1-Good	2-Good 4-Fair	---	5-Up 1-Sta.	4-Urgent 2-Some	2-Yes 4-No	3
United States-----	4-Good 2-Fair	9-Good 9-Fair 1-Poor	---	17-Up 2-Sta. 1-Down	7-Urgent 13-Some	5-Yes 15-No	3

1/ Sta., stationary.

Table 185.--Aquatic areas: Weeds listed among the five most important in reporting States, reporting frequencies by regions and infestation trends, and estimates of infested acreages, 1968

[Asterisks (\*) designate the 10 weeds reported most frequently in aquatic areas]

Weed or complex	Number of reports	Reports by region				Infestation trend						Total area
		NE	NC	S	W	Stationary		Up		Down		
						No.	Area	No.	Area	No.	Area	
						Percent	Percent	Percent	Percent	Percent		
*Algae-----	21	4	2	8	7	10	41	9	44	2	1	39
*Alligatorweed-----	5	--	--	5	--	1	20	4	36	--	---	33
Barnyardgrass-----	1	1	--	--	--	--	---	1	20	--	---	20
Bladderwort-----	2	1	--	1	--	--	---	2	52	--	---	52
*Bulrushes-----	4	--	--	--	4	3	28	--	---	1	1	19
Burred, water-----	1	1	--	--	--	1	10	--	---	--	---	10
Buttercup, water----	1	--	--	--	1	1	25	--	---	--	---	25
Cabomba-----	2	1	1	--	--	2	13	--	---	--	---	18
Canarygrass, reed---	3	--	--	--	3	--	---	3	6	--	---	6
*Cattails-----	17	2	1	5	9	10	18	3	1	4	14	15
Chara-----	4	--	1	1	2	2	10	2	16	--	---	13
*Coontail-----	6	--	2	4	--	4	38	2	(1/)	--	---	38
*Duckweed-----	10	4	1	5	--	2	22	8	38	--	---	34
*Elodea-----	8	2	3	2	1	2	30	6	31	--	---	31
Horsetail-----	1	1	--	--	--	--	---	--	---	--	20	20
Hydrilla-----	1	--	--	1	--	--	---	1	10	--	---	10
Naiads-----	2	--	1	1	--	--	---	2	20	--	---	20
Paragrass-----	1	--	--	--	1	--	---	1	25	--	---	25
Parrotfeather-----	2	--	--	1	1	--	---	2	22	--	---	22
*Pondweeds-----	23	4	6	3	10	11	52	12	33	--	---	42
Rushes-----	1	--	--	1	--	1	15	--	---	--	---	15
Saltcedar-----	1	--	--	--	1	--	---	1	20	--	---	20
Sedges-----	1	--	--	--	1	1	20	--	---	--	---	20
Smartweed, water----	1	1	--	--	--	1	5	--	---	--	---	5
Spanishneedles-----	1	1	--	--	--	--	---	1	10	--	---	10
Spatterdock-----	3	1	1	1	--	2	15	1	50	--	---	27
Vallisneria-----	2	2	--	--	--	2	22	--	---	--	---	22
Watercress-----	1	--	--	--	1	1	(1/)	--	---	--	---	(1/)
Waterhyacinth-----	3	--	--	2	1	2	30	1	70	--	---	43
*Waterlilies-----	7	1	1	5	--	4	25	2	30	1	(1/)	27
*Watermilfoils-----	10	3	4	2	1	3	60	7	28	--	---	33
Waterprimrose-----	1	--	--	1	--	1	20	--	---	--	---	20
Watershield-----	1	--	--	1	--	--	---	1	(1/)	--	---	(1/)
Waterstargrass-----	1	--	--	--	1	1	20	--	---	--	---	20
Willows-----	1	--	--	--	1	--	---	--	---	1	(1/)	(1/)

1/ Percentage figures for each trend are averages of the individual estimates reported for the extent of area infested; where estimates were not reported, weeds are included in frequency counts only.



Table 186.--Aquatic areas: Five most important weeds listed alphabetically by States within regions, acreage infested, and infestation trend, 1963

Region and State	Weed	Infestation		Weed	Infestation		Weed	Infestation		Weed	Infestation	
		Pct.	1/		Pct.	1/		Pct.	1/		Pct.	1/
Northeastern:												
Connecticut---	Algae---	65	Up	Duckweed---	30	Up	Elodea---	45	Up	Pondweed---	45	Up
New Hampshire---	Algae---	40	Sta.	Cattail---	20	Down	Horsetail---	20	Down	Pondweed---	30	Up
New Jersey---	Burreed, water---	10	Sta.	Cabomba---	30	Sta.	Spatterdock---	50	Jo	Vallisneria---	15	Sta.
Pennsylvania---	Algae---	50	Up	Duckweed---	35	Up	Elodea---	40	Up	Pondweed---	45	Up
Rhode Island---	Bladderwort---	98	Up	Cattail---	20	Sta.	Duckweed---	20	Sta.	Pondweed---	40	Sta.
Vermont---	Algae---	60	Up	Cattail---	100	Up	Smartweed, water---	5	Sta.	Scamishneedles---	10	Jo
West Virginia---	Barryardgrass---	20	Up	Duckweed, common---	100	Up						
North Central:												
Illinois---	Cabomba---	5	Sta.	Chara---	30	Up	Naiad, southern---	20	Up	Pondweed, bushy---	20	Up
Indiana---	Algae---	40	Sta.	Coontail---	55	Sta.	Duckweed---	50	Up	Pondweed---	50	Up
Iowa---	Elodea---	100	Up	Pondweed---	100	Up	Watermillfoil---	100	Jo	Pondweed---	100	Jo
Minnesota <sup>2/</sup> ---	Algae, bluegreen---	--	Up	Cattail---	--	Sta.	Coontail---	--	Sta.	Elodea---	--	Sta.
Wisconsin---	Elodea---	--	Jo	Pondweed, curlyleaf---	--	Up	Pondweed, sago---	--	Up	Waterlily, white---	--	Up
Southern:												
Arkansas---	Algae---	--	Down	Cattail---	--	Down	Coontail---	--	Up	Waterlily---	--	Sta.
Florida---	Alligatorweed---	50	Up	Bladderwort <sup>3/</sup> ---	5	Up	Elodea---	10	Up	Waterhyacinth---	10	Up
Georgia---	Algae---	20	Sta.	Cattail---	20	Sta.	Duckweed---	20	Up	Waterlily---	30	Jo
Kentucky---	Algae---	30	Up	Coontail---	--	Up	Duckweed---	--	Up	Waterlily---	--	Down
Louisiana---	Alligatorweed---	30	Up	Coontail---	20	Sta.	Spatterdock---	25	Sta.	Waterlily---	40	Sta.
North Carolina---	Algae---	40	Sta.	Alligatorweed---	30	Up	Naiads---	25	Up	Watermillfoil---	20	Jo
Oklahoma---	Algae---	--	Sta.	Cattail---	--	Sta.	Coontail---	--	Sta.	Waterlily---	--	Sta.
South Carolina---	Algae---	30	Up	Alligatorweed---	35	Up	Cattail---	30	Sta.	Elodea---	25	Sta.
Texas---	Algae---	30	Sta.	Alligatorweed---	20	Sta.	Cattail---	15	Sta.	Waterprimrose---	20	Sta.
Virginia---	Algae---	30	Up	Chara---	2	Jo	Duckweed---	5	Up	Pondweed---	10	Jo
Western:												
Arizona---	Algae---	90	Sta.	Cattail---	15	Sta.	Chara---	10	Sta.	Pondweed, sago---	70	Sta.
California---	Bulrush, hardstem---	15	Sta.	Cattail---	20	Sta.	Pondweed, American---	60	Sta.	Pondweed, sago---	75	Jo
Idaho---	Algae---	--	Sta.	Canarygrass, reed---	--	Up	Cattail---	--	Up	Watercress---	--	Sta.
Montana <sup>4/</sup> ---	Algae---	--	Sta.	Bulrushes---	--	Sta.	Cattail---	--	Sta.	Pondweed---	--	Sta.
Nevada---	Salcedar---	20	Up		--			--		Pondweed, sago---	--	
New Mexico---	Algae, green---	1	Down	Bulrush, softstem---	1	Down	Cattail---	1	Down		--	
Oregon---	Canarygrass, reed---	3	Up	Cattail---	1	Up	Pondweed, American---	1	Up		--	
Utah---	Algae---	25	Sta.	Bulrush---	40	Sta.	Buttercup, water---	25	Sta.	Cattails---	10	Sta.
Washington---	Algae---	--	Up	Cattail---	--	Up	Pondweed---	--	Up	Pondweed---	--	
Wyoming---	Canarygrass, reed---	10	Up	Cattail---	20	Down	Chara---	10	Sta.	Pondweed, sago---	50	Sta.
Hawaii---	Algae---	30	Up	Elodea---	30	Up	Paragrass---	25	Up	Parrotfeather---	15	Jo
										Waterhyacinth---	20	Sta.

1/Sta., stationary

2/Minnesota also reported: Watermillfoil -- Sta.

3/Bladderwort, coontail, naiad.

4/Montana also reported: Willow -- Down.

# APPENDIX

## Weeds Listed Among the Five Most Important in the Various Crop and Land-use Areas Surveyed

Most weeds listed in the 1968 Survey were reported by standardized common names that had been approved by the Terminology Committee, Weed Science Society of America. Colloquial names were changed to standardized common names in some instances. Each weed has been listed alphabetically by common or colloquial name and is identified by the scientific name or nomenclature judged most accurate by botanists and weed specialists of the U.S. Department of Agriculture.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
A'alii-----	<u>Dodonaea eriocarpa</u> Sm.
Alder-----	<u>Alnus</u> spp.
Alexandergrass-----	<u>Brachiaria plantaginea</u> (Link) A. Hitchc.
Alfalfa (crop)-----	<u>Medicago sativa</u> L.
Algae-----	a complex
Algae, bluegreen-----	a complex
Algae, green-----	a complex
Alligatorweed-----	<u>Alternanthera philoxeroides</u> (Mart.) Griseb.
Alyssum, hoary-----	<u>Berteroa incana</u> (L.) DC.
Amaranth(s)-----	<u>Amaranthus</u> spp.
Amaranth, spiny-----	<u>Amaranthus spinosus</u> L.
Annuals, winter-----	a complex
Anoda, spurred-----	<u>Anoda cristata</u> (L.) Schlecht.
Apple-of-Peru-----	<u>Nicandra physalodes</u> (L.) Pers.
Arrowgrass-----	<u>Triglochin</u> spp.
Ash-----	<u>Fraxinus</u> spp.
Aspen, bigtooth-----	<u>Populus grandidentata</u> Michx.
Aster, white heath-----	<u>Aster pilosus</u> Willd.
Bahiagrass-----	<u>Paspalum notatum</u> Flügge
Balsamapple, pear-----	<u>Momordica charantia</u> L.
Balsamroot, arrowleaf---	<u>Balsamorhiza sagittata</u> Nutt.
Barley (crop)-----	<u>Hordeum vulgare</u> L.
Barley, foxtail-----	<u>Hordeum jubatum</u> L.
Barley, little-----	<u>Hordeum pusillum</u> Nutt.
Barley, squirreltail----	see foxtail barley
Barley, wild-----	<u>Hordeum leporinum</u> Link
Barnyardgrass-----	<u>Echinochloa crus-galli</u> (L.) Beauv.
Baronetgrass-----	<u>Echinochloa</u> sp.
Bearmat-----	<u>Chamaebatia foliolosa</u> Benth.
Bedstraw(s)-----	<u>Galium</u> spp.
Beggarweed-----	<u>Desmodium</u> spp.
Beggarweed, Florida-----	<u>Desmodium tortuosum</u> (Sw.) DC.
Beggarweed, threeflower-	<u>Desmodium triflorum</u> (L.) DC.

COMMON NAMESCIENTIFIC NAME

Bellflower-----	<u>Campanula</u> spp.
Bellflower, creeping----	<u>Campanula</u> <u>rapunculoides</u> L.
Bentgrass-----	<u>Agrostis</u> spp.
Bentgrass, creeping----	<u>Agrostis</u> <u>stolonifera</u> L.
Bentgrass, rough-----	<u>Agrostis</u> <u>scabra</u> Willd.
Bentgrass, wind-----	<u>Agrostis</u> <u>spica-venti</u> L.
Bermudagrass-----	<u>Cynodon</u> <u>dactylon</u> (L.) Pers.
Berries, wild-----	a complex
Betony, Florida-----	<u>Stachys</u> <u>floridana</u> Shuttlew.
Bindweed-----	<u>Convolvulus</u> spp.
Bindweed, field-----	<u>Convolvulus</u> <u>arvensis</u> L.
Bindweed, hedge-----	<u>Convolvulus</u> <u>sepium</u> L.
Bittercress-----	<u>Cardamine</u> spp.
Blackberry-----	<u>Rubus</u> spp.
Blackberry, Himalaya----	<u>Rubus</u> <u>procerus</u> P. J. Muell.
Blackbush-----	<u>Coleogyne</u> <u>ramosissima</u> Torr.
Blackgum-----	<u>Nyssa</u> <u>sylvatica</u> Marsh.
Bladderwort-----	<u>Utricularia</u> spp.
Bluegrass-----	<u>Poa</u> spp.
Bluegrass, annual-----	<u>Poa</u> <u>annua</u> L.
Bluegrass, Kentucky----	<u>Poa</u> <u>pratensis</u> L.
Bouncingbet-----	<u>Saponaria</u> <u>officinalis</u> L.
Bracken-----	<u>Pteridium</u> <u>aquilinum</u> (L.) Kuhn
Brambles-----	a complex
Briars-----	a complex
Brome(s)-----	<u>Bromus</u> spp.
Brome, downy-----	<u>Bromus</u> <u>tectorum</u> L.
Brome, Japanese-----	<u>Bromus</u> <u>japonicus</u> Thunb.
Brome, ripgut-----	<u>Bromus</u> <u>rigidus</u> Roth
Brome, smooth-----	<u>Bromus</u> <u>inermis</u> Leyss.
Broom, Scotch-----	<u>Cytisus</u> <u>scoparius</u> (L.) Link
Broomsedge-----	<u>Andropogon</u> <u>virginicus</u> L.
Broomweed-----	<u>Gutierrezia</u> spp.
Brush-----	a complex
Brush, mixed-----	a complex
Buckbrush-----	<u>Symphoricarpos</u> <u>orbiculatus</u> Moench
Buckwheat, wild-----	<u>Polygonum</u> <u>convolvulus</u> L.
Bullnettle-----	<u>Cnidoscolus</u> <u>stimulosus</u> (Michx.) Gray
Bulrush(es)-----	<u>Scirpus</u> spp.
Bulrush, hardstem-----	<u>Scirpus</u> <u>acutus</u> Muhl.
Bulrush, roughseed-----	<u>Scirpus</u> <u>mucronatus</u> L.
Bulrush, softstem-----	<u>Scirpus</u> <u>validus</u> Vahl
Burclover-----	<u>Medicago</u> spp.
Burcucumber-----	<u>Sicyos</u> <u>angulatus</u> L.
Burdock-----	<u>Arctium</u> spp.
Burreed, water-----	<u>Sparganium</u> <u>fluctuans</u> (Morong) Robinson
Buttercup-----	<u>Ranunculus</u> spp.
Buttercup, bulbous-----	<u>Ranunculus</u> <u>bulbosus</u> L.
Buttercup, tall-----	<u>Ranunculus</u> <u>acris</u> L.
Buttercup, testiculate--	<u>Ranunculus</u> <u>testiculatus</u> Crantz

COMMON NAMESCIENTIFIC NAME

Cabomba-----	<u>Cabomba caroliniana</u> Gray
Cactus-----	a complex
Camphorweed-----	<u>Heterotheca subaxillaris</u> (Lam.) Britt. & Rusby
Canarygrass, reed-----	<u>Phalaris arundinacea</u> L.
Caraway-----	<u>Carum carvi</u> L.
Carpetgrass-----	<u>Axonopus affinis</u> Chase
Carpetweed-----	<u>Mollugo verticillata</u> L.
Carrot, wild-----	<u>Daucus carota</u> L.
Catchfly, nightflowering	<u>Silene noctiflora</u> L.
Cattail(s)-----	<u>Typha</u> spp.
Cattail, common-----	<u>Typha latifolia</u> L.
Ceanothus, wedgeleaf----	<u>Ceanothus cuneatus</u> (Hook.) Nutt.
Chamise-----	<u>Adenostoma fasciculatum</u> Hook. & Arn.
Chamomile, corn-----	<u>Anthemis arvensis</u> L.
Chara-----	<u>Chara</u> spp.
Cheat-----	<u>Bromus seculinus</u> L.
Cheeseweed-----	see little mallow ( <u>Malva parviflora</u> )
Chess, soft-----	<u>Bromus mollis</u> L.
Chickweed(s)-----	<u>Stellaria-Cerastium-Holosteum</u> spp.
Chickweed, common-----	<u>Stellaria media</u> (L.) Cyrillo
Chickweed, field-----	<u>Cerastium arvense</u> L.
Chickweed, mouseear-----	<u>Cerastium vulgatum</u> L.
Chicory-----	<u>Cichorium intybus</u> L.
Chokeberry, black-----	<u>Pyrus melonocarpa</u> (Michx.) Willd.
Cholla-----	<u>Opuntia</u> spp.
Cinquefoil-----	<u>Potentilla</u> spp.
Clover(s)-----	<u>Trifolium</u> spp.
Clover, white-----	<u>Trifolium repens</u> L.
Clubmoss-----	Lycopodiaceae (Pteridophytes)
Cockle-----	<u>Agrostemma-Vaccaria-Lychnis</u> spp.
Cockle, corn-----	<u>Agrostemma githago</u> L.
Cockle, cow-----	<u>Vaccaria segetalis</u> (Neck.) Garcke
Cockle, white-----	<u>Lychnis alba</u> Mill.
Cocklebur-----	<u>Xanthium</u> spp.
Cocklebur, common-----	<u>Xanthium pensylvanicum</u> Wallr.
Cocklebur, spiny-----	<u>Xanthium spinosum</u> L.
Coontail-----	<u>Ceratophyllum</u> spp.
Copperleaf-----	<u>Acalypha</u> spp.
Copperleaf, Virginia----	<u>Acalypha virginica</u> L.
Cottonwood-----	<u>Populus</u> spp.
Crabgrass-----	<u>Digitaria</u> spp.
Crabgrass, Henry-----	<u>Digitaria adscendens</u> (H.B.K.) Henr.
Crabgrass, large-----	<u>Digitaria sanguinalis</u> (L.) Scop.
Cranesbill-----	<u>Geranium</u> spp.
Creeper, Virginia-----	<u>Parthenocissus quinquefolia</u> (L.) Planch
Creosotebush-----	<u>Larrea tridentata</u> (DC.) Coville
Cress, hoary-----	<u>Cardaria draba</u> (L.) Desv.
Crotalaria-----	<u>Crotalaria</u> spp.
Croton-----	<u>Croton</u> spp.
Crowfootgrass-----	<u>Dactyloctenium aegyptium</u> (L.) Richter



COMMON NAMESCIENTIFIC NAME

Cypressweed-----	see dogfennel ( <u>Eupatorium capillifolium</u> )
Daisy-----	<u>Chrysanthemum</u> spp.
Daisy, English-----	<u>Bellis perennis</u> L.
Daisy, oxeye-----	<u>Chrysanthemum leucanthemum</u> L.
Dalea, broom-----	<u>Dalea scoparia</u> A. Gray
Dallisgrass-----	<u>Paspalum dilatatum</u> Poir.
Dandelion(s)-----	<u>Taraxacum</u> spp.
Dandelion, common-----	<u>Taraxacum officinale</u> Weber
Darnel-----	<u>Lolium temulentum</u> L.
Dayflower-----	<u>Commelina</u> sp.
Deathcamas-----	<u>Zigadenus</u> spp.
Dewberries-----	<u>Rubus</u> spp.
Dock-----	<u>Rumex</u> spp.
Dock, curly-----	<u>Rumex crispus</u> L.
Dodder-----	<u>Cuscuta</u> spp.
Dodder, field-----	<u>Cuscuta campestris</u> Yunck.
Dogbane-----	<u>Apocynum</u> spp.
Dogbane, hemp-----	<u>Apocynum cannabinum</u> L.
Dogfennel-----	<u>Eupatorium capillifolium</u> (Lam.) Small
Dogtail, crested-----	<u>Cynosurus cristatus</u> L.
Dropseed-----	<u>Sporobolus</u> spp.
Dropseed, Indian-----	<u>Sporobolus diander</u> (Retz.) Beauv.
Ducksalad-----	<u>Heteranthera limosa</u> (Sw.) Willd.
Duckweed-----	<u>Lemna</u> spp.
Duckweed, common-----	<u>Lemna minor</u> L.
Elm-----	<u>Ulmus</u> spp.
Elodea-----	<u>Elodea canadensis</u> Michx.
Eupatorium, late-----	<u>Eupatorium serotinum</u> Michx.
Eupatorium, river-----	<u>Eupatorium riparium</u> Regel.
Eveningprimrose-----	<u>Oenothera</u> spp.
Eveningprimrose, cutleaf	<u>Oenothera laciniata</u> Hill
Fern(s)-----	a complex
Fern, feathery-----	<u>Dryopteris</u> sp.
Fern, sensitive-----	<u>Onoclea sensibilis</u> L.
Fescue(s)-----	<u>Festuca</u> spp.
Fescue, rattail-----	<u>Festuca myuros</u> L.
Fescue, tall-----	<u>Festuca elatior</u> L.
Fiddleneck-----	<u>Amsinckia</u> spp.
Fiddleneck, coast-----	<u>Amsinckia intermedia</u> Fisch. & Mey.
Fiddleneck, Douglas-----	<u>Amsinckia douglasiana</u> A. DC.
Filaree-----	<u>Erodium</u> spp.
Fingergrass, feather----	<u>Chloris virgata</u> Swartz
Fingergrass, swollen----	<u>Chloris barbata</u> Swartz
Firebush-----	<u>Myrica faya</u> Ait.
Flatsedge(s)-----	<u>Cyperus</u> spp.
Flaveria-----	<u>Flaveria repanda</u> Lag.



## COMMON NAME

## SCIENTIFIC NAME

Fleabane(s)-----	<u>Erigeron</u> spp.
Fleabane, daisy-----	see horseweed ( <u>Conyza canadensis</u> )
Fleabane, rough-----	<u>Erigeron strigosus</u> Muhl.
Flixweed-----	<u>Descurainia sophia</u> (L.) Webb.
Fountaingrass-----	<u>Pennisetum setaceum</u> (Forsk.) Chiov.
Foxtail(s)-----	<u>Setaria</u> spp.
Foxtail, bristly-----	<u>Setaria verticillata</u> (L.) Beauv.
Foxtail, giant-----	<u>Setaria faberi</u> Herrm.
Foxtail, green-----	<u>Setaria viridis</u> (L.) Beauv.
Foxtail, meadow-----	<u>Alopecurus pratensis</u> L.
Foxtail, yellow-----	<u>Setaria lutescens</u> (Weigel) Hubb.
Foxtailgrass, West Indian	<u>Andropogon bicornis</u> L.
Galinsoga-----	<u>Galinsoga</u> spp.
Galinsoga, smallflower---	<u>Galinsoga parviflora</u> Cav.
Gallberry-----	<u>Ilex glabra</u> (L.) Gray
Garlic, wild-----	<u>Allium vineale</u> L.
Geranium, Carolina-----	<u>Geranium carolinianum</u> L.
Goatgrass-----	<u>Aegilops</u> spp.
Goatgrass, barb-----	<u>Aegilops triuncialis</u> L.
Goatweed-----	<u>Croton</u> sp.
Goldenrod(s)-----	<u>Solidago</u> spp.
Goosefoot(s)-----	<u>Chenopodium</u> spp.
Goosefoot, nettleleaf----	<u>Chenopodium murale</u> L.
Goosegrass-----	<u>Eleusine indica</u> (L.) Gaertn.
Gorse-----	<u>Ulex europaeus</u> L.
Grasses (sod)-----	a complex
Grasses, annual-----	a complex
Grasses, hay-----	a complex
Grasses, perennial-----	a complex
Greasewood-----	<u>Sarcobatus vermiculatus</u> (Hook.) Torr.
Greenbrier(s)-----	<u>Smilax</u> spp.
Gromwell-----	<u>Lithospermum</u> spp.
Gromwell, corn-----	<u>Lithospermum arvense</u> L.
Groundcherry-----	<u>Physalis</u> spp.
Groundcherry, Wright-----	<u>Physalis wrightii</u> Gray
Groundsel-----	<u>Senecio</u> spp.
Groundsel, common-----	<u>Senecio vulgaris</u> L.
Guava-----	<u>Psidium</u> spp.
Guineagrass-----	<u>Panicum maximum</u> Jacq.
Gumweed-----	<u>Grindelia squarrosa</u> (Pursh) Dunal
Halogeton-----	<u>Halogeton glomeratus</u> (M. Bieb.) C. A. Mey.
Hardhack-----	<u>Spiraea tomentosa</u> L.
Hardwoods-----	a complex
Hawkweed-----	<u>Hieracium</u> spp.
Hellebore-----	<u>Veratrum</u> spp.
Hellebore, western false-	<u>Veratrum californicum</u> Durand
Hemp-----	<u>Cannabis sativa</u> L.

COMMON NAMESCIENTIFIC NAME

Hempnettle-----	<u>Galeopsis tetrahit</u> L.
Henbit-----	<u>Lamium amplexicaule</u> L.
Hickory-----	<u>Carya</u> spp.
Honeysuckle-----	<u>Lonicera</u> spp.
Horsebrush, smooth-----	<u>Tetradymia</u> sp.
Horsenettle-----	<u>Solanum carolinense</u> L.
Horsetail-----	<u>Equisetum</u> spp.
Horseweed-----	<u>Conyza canadensis</u> (L.) Cronq.
Huisache-----	<u>Acacia farnesiana</u> (L.) Willd.
Hydrilla-----	<u>Hydrilla verticillata</u> Casp.
Indigo, hairy-----	<u>Indigofera hirsuta</u> L.
Iris-----	<u>Iris</u> spp.
Ironweed-----	<u>Vernonia</u> spp.
Ivy, ground-----	<u>Glechoma hederacea</u> L.
Ivy, poison-----	see poison ivy
Jimsonweed-----	<u>Datura stramonium</u> L.
Johnsongrass-----	<u>Sorghum halepense</u> (L.) Pers.
Jointvetch, northern-----	<u>Aeschynomene virginica</u> (L.) B.S.P.
Junglerice-----	<u>Echinochloa colonum</u> (L.) Link
Juniper(s)-----	<u>Juniperus</u> spp.
Juniper, California-----	<u>Juniperus californica</u> Carr.
Juniper, Utah-----	<u>Juniperus osteosperma</u> (Torr.) Little
Kikuyugrass-----	<u>Pennisetum clandestinum</u> Hochst.
Knapweed-----	<u>Centaurea</u> spp.
Knapweed, Russian-----	<u>Centaurea repens</u> L.
Knapweed, spotted-----	<u>Centaurea maculosa</u> Lam.
Knawel-----	<u>Scleranthus annuus</u> L.
Knotweed-----	<u>Polygonum</u> spp.
Knotweed, Japanese-----	<u>Polygonum cuspidatum</u> Sieb. & Zucc.
Knotweed, prostrate-----	<u>Polygonum aviculare</u> L.
Knotweed, silversheath--	<u>Polygonum argyrocoleon</u> Steud.
Kochia-----	<u>Kochia scoparia</u> (L.) Schrad.
Kudzu-----	<u>Pueraria lobata</u> (Willd.) Ohwi
Kyllinga, green-----	<u>Cyperus brevifolius</u> (Rottb.) Hassk.
Ladysthumb-----	<u>Polygonum persicaria</u> L.
Lambsquarters-----	<u>Chenopodium</u> spp. (probably all <u>C. album</u> )
Lambsquarters, common---	<u>Chenopodium album</u> L.
Lantana-----	<u>Lantana camara</u> L.
Larkspur(s)-----	<u>Delphinium</u> spp.
Larkspur, Geyer's-----	<u>Delphinium geyeri</u> Greene
Larkspur, low-----	<u>Delphinium nelsonii</u> Greene
Larkspur, tall-----	<u>Delphinium barbeyi</u> Huth
Laurel, sheep-----	<u>Kalmia angustifolia</u> L.
Leadtree-----	<u>Leucaena leucocephala</u> (Lam.) de Wit

## COMMON NAME

## SCIENTIFIC NAME

Lettuce, China-----	see prickly lettuce ( <u>Lactuca serriola</u> )
Lettuce, prickly-----	<u>Lactuca serriola</u> L.
Lippia-----	<u>Lippia</u> spp.
Lippia, mat-----	<u>Lippia nodiflora</u> (L.) Michx.
Loco(s)-----	<u>Astragalus</u> spp.
Locust, black-----	<u>Robinia pseudoacacia</u> L.
Lovegrass-----	<u>Eragrostis</u> spp.
Lupine-----	<u>Lupinus</u> spp.
Mallow-----	<u>Malva</u> spp.
Mallow, common-----	<u>Malva neglecta</u> Wallr.
Mallow, dwarf-----	<u>Malva rotundiflora</u> L.
Mallow, little-----	<u>Malva parviflora</u> L.
Mallow, Venice-----	<u>Hibiscus trionum</u> L.
Manzanita-----	<u>Arctostaphylos</u> spp.
Maple(s)-----	<u>Acer</u> spp.
Maple, red-----	<u>Acer rubrum</u> L.
Marestail-----	<u>Hippuris vulgaris</u> L.
Mayweed-----	<u>Anthemis cotula</u> L.
Medic, black-----	<u>Medicago lupulina</u> L.
Medusahead-----	<u>Taeniatherum asperum</u> (Sim.) Nevski
Melastoma, Banks-----	<u>Melastoma malabathricum</u> L.
Mercury, three-seeded---	see copperleaf ( <u>Acalypha</u> spp.)
Mesquite-----	<u>Prosopis</u> spp.
Milkvine-----	<u>Gonolobus</u> spp.
Milkweed-----	<u>Asclepias</u> spp.
Milkweed, broadleaf-----	<u>Asclepias latifolia</u> (Torr.) Raf.
Milkweed, climbing-----	<u>Sarcostemma cyanchoides</u> Dcne.
Milkweed, common-----	<u>Asclepias syriaca</u> L.
Milkweed, showy-----	<u>Asclepias speciosa</u> Torr.
Milkweed, western whorled	<u>Asclepias subverticillata</u> (Gray) Vail
Millet-----	<u>Pennisetum-Setaria-Panicum</u> spp.
Millet, Texas-----	see Texas panicum ( <u>Panicum texanum</u> )
Morningglory-----	<u>Ipomoea</u> spp.
Morningglory, cypressvine	<u>Ipomoea quamoclit</u> L.
Morningglory, ivyleaf---	<u>Ipomoea hederacea</u> (L.) Jacq.
Morningglory, threelobe--	<u>Ipomoea triloba</u> L.
Mugwort-----	<u>Artemisia vulgaris</u> L.
Mulesears-----	<u>Wyethia amplexicaulis</u> Nutt.
Mullein-----	<u>Verbascum</u> spp.
Mullein, common-----	<u>Verbascum thapsus</u> L.
Mustard(s)-----	a complex
Mustard, black-----	<u>Brassica nigra</u> (L.) Koch
Mustard, blue-----	<u>Chorispora tenella</u> DC.
Mustard, tumble-----	<u>Sisymbrium altissimum</u> L.
Mustard, wild-----	<u>Brassica kaber</u> (DC.) L. C. Wheeler var. <u>pinnatifida</u> (Stokes) L. C. Wheeler

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Naiad-----	<u>Najas</u> spp.
Naiad, southern-----	<u>Najas guadalupensis</u> (Spreng.) Magnus
Napiergrass-----	<u>Pennisetum purpureum</u> Schumach.
Nettle, burning-----	<u>Urtica urens</u> L.
Nettle, stinging-----	<u>Urtica dioica</u> L.
Nightshade-----	<u>Solanum</u> spp.
Nightshade, apple-of-sodom	<u>Solanum sodomium</u> L.
Nightshade, black-----	<u>Solanum nigrum</u> L.
Nightshade, hairy-----	<u>Solanum sarachoides</u> Sendt.
Nightshade, silverleaf---	<u>Solanum elaeagnifolium</u> Cav.
Nimblewill-----	<u>Muhlenbergia schreberi</u> J. F. Gmel.
Nutsedge-----	<u>Cyperus</u> spp.
Nutsedge, purple-----	<u>Cyperus rotundus</u> L.
Nutsedge, yellow-----	<u>Cyperus esculentus</u> L.
Oak(s)-----	<u>Quercus</u> spp.
Oak (brush and scrub)----	<u>Quercus</u> spp.
Oak, blackjack-----	<u>Quercus marilandica</u> Muenchh.
Oak, blue-----	<u>Quercus douglasii</u> Hook. & Arn.
Oak, live-----	<u>Quercus</u> spp.
Oak, poison-----	see poison oak
Oak, post-----	<u>Quercus stellata</u> Wangenh.
Oak, southern red-----	<u>Quercus falcata</u> Michx.
Oat, wild-----	<u>Avena fatua</u> L.
Onion, wild-----	<u>Allium canadense</u> L.
Orchardgrass-----	<u>Dactylis glomerata</u> L.
Palmetto, saw-----	<u>Serenoa repens</u> (Bartr.) Small
Panicum(s)-----	<u>Panicum</u> spp.
Panicum, browntop-----	<u>Panicum fasciculatum</u> Swartz var. <u>reticulatum</u> (Torr.) Beal
Panicum, fall-----	<u>Panicum dichotomiflorum</u> Michx.
Panicum, Texas-----	<u>Panicum texanum</u> Buckl.
Paragrass-----	<u>Brachiaria mutica</u> (Forsk.) Stapf
Parrotfeather-----	<u>Myriophyllum brasiliense</u> Camb.
Parsnip, wild-----	<u>Pastinoca sativa</u> L.
Partridgepea-----	<u>Cassia fasciculata</u> Michx.
Paspalum(s)-----	<u>Paspalum</u> spp.
Paspalum, sour-----	<u>Paspalum conjugatum</u> Bergius
Passionflower, wingleaf--	<u>Passiflora pulchella</u> H.B.K.
Passionfruit, banana-----	<u>Passiflora mollissima</u> (H.B.K.) Bailey
Peas, wild winter-----	a complex
Peavine-----	<u>Lathyrus</u> spp.
Pennycress, field-----	<u>Thlaspi arvense</u> L.
Peppertree, Brazil-----	<u>Schinus terebinthifolius</u> Raddi
Pepperweed-----	<u>Lepidium</u> spp.
Pepperweed, field-----	<u>Lepidium campestre</u> (L.) R. Br.
Pepperweed, yellowflower-	<u>Lepidium</u> sp.
Persimmon-----	<u>Diospyros</u> spp.



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Pigweed(s)-----	<u>Amaranthus</u> spp.
Pigweed, redroot-----	<u>Amaranthus retroflexus</u> L.
Pigweed, rough-----	see redroot pigweed
Pine(s)-----	<u>Pinus</u> spp.
Pine, pinon-----	<u>Pinus edulis</u> Engelm.
Pineappleweed-----	<u>Matricaria matricarioides</u> (Less.) Porter
Pingue-----	<u>Hymenoxys richardsoni</u> (Hook.) Cockl. var. <u>floribunda</u> (Gray) Parker
Plantain(s)	<u>Plantago</u> spp.
Plantain, blackseed-----	<u>Plantago rugelii</u> Dcne.
Plantain, broadleaf-----	<u>Plantago major</u> L.
Plantain, buckhorn-----	<u>Plantago lanceolata</u> L.
Poison ivy-----	<u>Rhus radicans</u> L.
Poison oak-----	<u>Rhus toxicodendron</u> L.
Pokeweed-----	<u>Phytolacca</u> spp.
Pondweed(s)-----	<u>Potamogeton</u> spp.
Pondweed, American-----	<u>Potamogeton nodosus</u> Poir.
Pondweed, bushy-----	<u>Potamogeton</u> sp.
Pondweed, curlyleaf-----	<u>Potamogeton crispus</u> L.
Pondweed, leafy-----	<u>Potamogeton foliosus</u> Raf.
Pondweed, sago-----	<u>Potamogeton pectinatus</u> L.
Poorjoe-----	<u>Diodia teres</u> Walt.
Poplar-----	<u>Populus</u> spp.
Pricklypear-----	<u>Opuntia</u> spp.
Pukiawe-----	<u>Styphelia tameiameia</u> (Cham.) F. Muell.
Puncturevine-----	<u>Tribulus terrestris</u> L.
Purslane-----	<u>Portulaca</u> spp. (probably all <u>P. oleracea</u> )
Purslane, common-----	<u>Portulaca oleracea</u> L.
Pusley, Florida-----	<u>Richardia scabra</u> L.
Quackgrass-----	<u>Agropyron repens</u> (L.) Beauv.
Rabbitbrush-----	<u>Chrysothamnus</u> spp.
Rabbitbrush, Greene-----	<u>Chrysothamnus greenei</u> (A. Gray) Greene
Rabbitbrush, rubber-----	<u>Chrysothamnus nauseosus</u> (Pall.) Britt.
Radish, wild-----	<u>Raphanus raphanistrum</u> L.
Ragweed-----	<u>Ambrosia</u> spp.
Ragweed, common-----	<u>Ambrosia artemisiifolia</u> L.
Ragweed, giant-----	<u>Ambrosia trifida</u> L.
Ragweed, lanceleaf-----	<u>Ambrosia bidentata</u> Michx.
Ragweed, perennial-----	<u>Ambrosia psilostachya</u> DC. var. <u>coronopifolia</u> (T. & F.) Farw.
Ragweed, western-----	<u>Ambrosia psilostachya</u> DC.
Ragwort, tansy-----	<u>Senecio jacobaea</u> L.
Redcedar, eastern-----	<u>Juniperus virginiana</u> L.
Redvine-----	<u>Brunnichia cirrhosa</u> Gaertn.
Reed-----	<u>Phragmites</u> sp.
Rescuegrass-----	<u>Bromus willdenowii</u> Kunth
Rhodesgrass-----	<u>Chloris gayana</u> Kunth



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Rice, red-----	<u>Oryza sativa</u> L.
Rocket-----	<u>Eruca-Sisymbrium-Barbarea</u> spp.
Rocket, London-----	<u>Sisymbrium irio</u> L.
Rocket, yellow-----	<u>Barbarea vulgaris</u> R. Br.
Rosarypea-----	<u>Abrus</u> sp.
Rose-----	<u>Rosa</u> spp.
Rose, Macartney-----	<u>Rosa bracteata</u> Wendl.
Rose, multiflora-----	<u>Rosa multiflora</u> Thunb.
Rush(es)-----	<u>Juncus</u> spp.
Rush, soft-----	<u>Juncus effusus</u> L.
Ryegrass-----	<u>Lolium</u> spp.
Ryegrass, Italian-----	<u>Lolium multiflorum</u> Lam.
Sagebrush(es)-----	<u>Artemisia</u> spp.
Sagebrush, big-----	<u>Artemisia tridentata</u> Nutt.
Sagebrush, fringed-----	<u>Artemisia frigida</u> Willd.
Sage, Mediterranean-----	<u>Salvia aethiopis</u> L.
Sagewort-----	<u>Artemisia campestris</u> L.
Saltcedar-----	<u>Tamarix pentandra</u> Pall.
Sandbur(s)-----	<u>Cenchrus</u> spp.
Sandbur, dune-----	<u>Cenchrus tribuloides</u> L.
Sandbur, field-----	<u>Cenchrus incertus</u> M. A. Curtis
Sandbur, southern-----	<u>Cenchrus echinatus</u> L.
Sassafras-----	<u>Sassafras albidum</u> (Nutt.) Nees
Sedge(s)-----	<u>Carex</u> spp.
Senna(s)-----	<u>Cassia</u> spp.
Sensitiveplant-----	<u>Mimosa pudica</u> L.
Sesbania, hemp-----	<u>Sesbania exaltata</u> (Raf.) Cory
Shattercane-----	<u>Sorghum bicolor</u> (L.) Moench
Shepherdspurse-----	<u>Capsella bursa-pastoris</u> (L.) Medic.
Sicklepod-----	<u>Cassia obtusifolia</u> L.
Sida-----	<u>Sida</u> spp.
Sida, prickly-----	<u>Sida spinosa</u> L.
Signalgrass-----	<u>Brachiaria</u> spp.
Signalgrass, broadleaf---	<u>Brachiaria platyphylla</u> (Griseb.) Nash
Smartweed(s)-----	<u>Polygonum</u> spp.
Smartweed, Pennsylvania---	<u>Polygonum pennsylvanicum</u> L.
Smartweed, water-----	<u>Polygonum amphibium</u> L.
Smutgrass-----	<u>Sporobolus poiretii</u> (Roem. & Schult.) Hitchc.
Sneezeweed, bitter-----	<u>Helenium amarum</u> (Rafin.) H. Rock
Snowberry, western-----	<u>Symphoricarpos occidentalis</u> Hook.
Soapweed, small-----	<u>Yucca glauca</u> Nutt.
Sorghum (crop)-----	<u>Sorghum bicolor</u> (L.) Moench
Sorrel-----	<u>Rumex</u> spp.
Sorrel, red-----	<u>Rumex acetosella</u> L.
Sourbush-----	<u>Pluchea odorata</u> (L.) Nees
Sowthistle-----	<u>Sonchus</u> spp.
Sowthistle, annual-----	<u>Sonchus oleraceus</u> L.
Sowthistle, perennial----	<u>Sonchus arvensis</u> L.

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Spanishneedles-----	<u>Bidens bipinnata</u> L.
Spatterdock-----	<u>Nuphar advena</u> (Ait.) Ait. f.
Speedwell(s)-----	<u>Veronica</u> spp.
Sphagnum-----	<u>Sphagnum</u> spp.
Spikerush-----	<u>Eleocharis</u> spp.
Spiraea-----	<u>Spiraea</u> spp.
Sprangletop-----	<u>Leptochloa</u> spp.
Sprangletop, bearded-----	<u>Leptochloa fascicularis</u> (Lam.) Gray
Spurge(s)-----	<u>Euphorbia</u> spp.
Spurge, cypress-----	<u>Euphorbia cyparissias</u> L.
Spurge, hyssop-----	<u>Euphorbia hyssopifolia</u> L.
Spurge, leafy-----	<u>Euphorbia esula</u> L.
Spurge, prostrate-----	<u>Euphorbia supina</u> Raf.
Spurge, spotted-----	<u>Euphorbia maculata</u> L.
Spurry-----	<u>Spergula</u> spp.
Spurry, corn-----	<u>Spergula arvensis</u> L.
Stargrass, Australian---	<u>Chloris divaricata</u> R. Br.
Star-of-Bethlehem-----	<u>Ornithogalum umbellatum</u> L.
Starthistle, tall-----	<u>Centaurea</u> sp.
Starthistle, yellow-----	<u>Centaurea solstitialis</u> L.
Starwort, little-----	<u>Stellaria graminea</u> L.
Steeplebush-----	see hardhack ( <u>Spiraea tomentosa</u> )
Sumac-----	<u>Rhus</u> spp.
Sumpweed, rough-----	<u>Iva ciliata</u> Willd.
Sunflower-----	<u>Helianthus</u> spp.
Sunflower, common-----	<u>Helianthus annuus</u> L.
Sunflower, Maximilian---	<u>Helianthus maximiliani</u> Schrad.
Sweetfern-----	<u>Comptonia peregrina</u> (L.) Coult.
Sweetgum-----	<u>Liquidambar styraciflua</u> L.
Swinecress-----	<u>Coronopus didymus</u> (L.) Smith
Switchgrass	<u>Panicum virgatum</u> L.
Tansy-----	<u>Tanacetum vulgare</u> L.
Tansymustard-----	<u>Descurainia pinnata</u> (Walt.) Britt.
Tansymustard, Richardson-	<u>Descurainia richardsoni</u> (Sweet) O.E.Schulz
Tarbrush-----	<u>Flourensia cernua</u> DC.
Tarweed, common-----	<u>Hemizonia congesta</u> DC.
Tasselflower, red-----	<u>Emilia sonchifolia</u> (L.) DC.
Teaweed-----	see sida ( <u>Sida</u> spp.)
Thistle(s)-----	<u>Cirsium-Carduus</u> spp.
Thistle, blessed-----	<u>Cnicus benedictus</u> L.
Thistle, bull-----	<u>Cirsium vulgare</u> (Savi) Tenore
Thistle, Canada-----	<u>Cirsium arvense</u> (L.) Scop.
Thistle, Flodman-----	<u>Cirsium flodmanii</u> (Rydb.) Arthur
Thistle, Italian-----	<u>Carduus pycnocephalus</u> L.
Thistle, musk-----	<u>Carduus nutans</u> L.
Thistle, pasture-----	<u>Cirsium pumilum</u> Spreng.
Thistle, plumeless-----	<u>Carduus acanthoides</u> L.
Thistle, Russian	<u>Salsola kali</u> L. var. <u>tenuifolia</u> Tausch

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Threeawn, prairie-----	<u>Aristida oligantha</u> Michx.
Titi-----	<u>Cliftonia monophylla</u> (Lam.) Britt.
Toadflax-----	<u>Linaria</u> spp.
Toadflax, yellow-----	<u>Linaria vulgaris</u> Hill
Tree seedlings-----	a complex
Trumpet creeper-----	<u>Ailanthus altissima</u> (Mill.) Swingle
Turnip, wild-----	<u>Brassica campestris</u> L.
Umbrellaplant, tall-----	<u>Cyperus eragrostis</u> Lam.
Vallisneria-----	<u>Vallisneria americana</u> Michx.
Vaseygrass-----	<u>Paspalum urvillei</u> Steud.
Velvetgrass-----	<u>Holcus lanatus</u> L.
Velvetgrass, German-----	<u>Holcus mollis</u> L.
Velvetleaf-----	<u>Abutilon theophrasti</u> Medic.
Vernalgrass, sweet-----	<u>Anthoxanthum odoratum</u> L.
Vervain-----	<u>Verbena</u> spp.
Vervain, hoary-----	<u>Verbena stricta</u> Vent.
Vetch-----	<u>Vicia</u> spp.
Vines-----	a complex
Waterbuttercup-----	<u>Ranunculus</u> spp.
Watercress-----	<u>Nasturtium officinale</u> R. Br.
Watergrass (complex)-----	a complex, mainly <u>Echinochloa</u> spp.
Waterhemp-----	<u>Amaranthus tuberculatos</u> (Mop.) J. Sauer
Waterhyacinth-----	<u>Eichornia crassipes</u> (Mart.) Solms
Waterlily-----	<u>Nymphaea</u> spp.
Waterlily, white-----	<u>Nymphaea tuberosa</u> Paine
Watermilfoil(s)-----	<u>Myriophyllum</u> spp.
Watermilfoil, northern---	<u>Myriophyllum exalbescens</u> Fernald
Waterprimrose-----	<u>Jussiaea</u> spp.
Watershield-----	<u>Brasenia schreberi</u> Gmel.
Waterstargrass-----	<u>Heteranthera dubia</u> (Jacq.) MacM.
Waxmyrtle-----	<u>Myrica</u> spp.
Whitebrush-----	<u>Aloysia lycioides</u> Cham.
Whitethorn-----	<u>Acacia constricta</u> Benth.
Whitetop-----	<u>Cardaria pubescens</u> (C. A. Mey.) Rollins
Willow(s)-----	<u>Salix</u> spp.
Wintercress-----	<u>Barbarea verna</u> (Mill.) Aschers
Witchgrass-----	<u>Panicum capillare</u> L.
Woodsorrel-----	<u>Oxalis</u> spp.
Woodsorrel, creeping-----	<u>Oxalis corniculata</u> L.
Woody plants-----	a complex
Wormwood-----	<u>Artemisia</u> spp.
Yankeeweed-----	<u>Eupatorium compositifolium</u> Walt.
Yarrow-----	<u>Achillea</u> spp.
Yarrow, common-----	<u>Achillea millefolium</u> L.
Yaupon-----	<u>Ilex vomitoria</u> Ait.

