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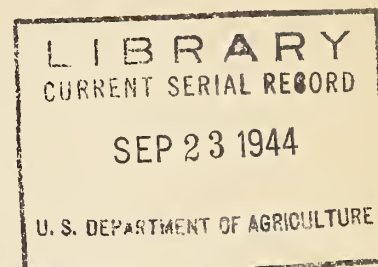
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Eastern Regional Research Laboratory
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Vegetable Wastes
Availability and Utilization

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INTRODUCTION

The Eastern Regional Research Laboratory has undertaken to find industrial uses for the waste incident to the commercial production and processing of vegetables. This waste, which occurs on the farm and at the packing shed and processing plants, consists essentially of the discarded culls, vines, leaves, tops or roots, trimmings and peelings. In addition, there is another large source of waste in the crops that are not harvested because of unsatisfactory quality, market conditions, and shortage of labor.

Because of the highly perishable nature of this waste and its rapid accumulation, it must be disposed of as quickly as possible. On the farm it is usually fed to livestock, if suitable, or turned under to enrich the soil. The processing-plant waste may be returned in part, to neighboring farms, hauled to a dump, or treated for sewage disposal. These methods, however, entail expense.

No comprehensive collected information has been available on the quantity, kinds, location, and season of the various types of waste, although this information would constitute the necessary background for their commercial utilization. The data in this publication were assembled from widely scattered sources with the object of supplying this background information for the use of anyone considering the utilization of vegetable wastes. It is impossible to predict the exact quantity of suitable raw material that would be available in any particular region, inasmuch as there is wide variation in farm and processing-plant practices, crop yields, quality and potential value of waste materials, and many other factors that would materially affect the quantity of waste available. The information assembled here should prove useful, however, in determining the most suitable location for the commercial utilization of these wastes.

Present information on these wastes indicates that the leaves are by far the richest in valuable constituents. For this reason, this survey deals mainly with the leafy wastes. The outlook is most promising for the production of animal feeds, carotene, and chlorophyll from this material. Chlorophyll is used as a dye and is attracting attention as a constituent of therapeutic ointments. Carotene (pro-vitamin A), which is sold for therapeutic and nutritive purposes, is now made from carrot roots.

An effort has been made to simplify the presentation of the large amount of data necessarily involved in this type of survey by using tables and illustrations instead

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of detailed descriptions and explanations. The tables and illustrations are grouped separately and arranged in sequence within the group. For ready reference the titles are listed in the Contents, under the topic to which the data pertain.

The year 1942 was selected as the basic year for the survey, because it was the most recent period for which complete data could be obtained. The source of the data is indicated under the tables.

CROP PRODUCTION

To arrive at a basis for estimating the quantities and distribution of vegetable-waste materials, it is necessary to know the quantities and location of the crops produced and processed. Therefore in this report information on crop production and processing precedes the discussion of occurrence and utilization of waste.

Table 1 and Figure 1 show the total production of the twenty-six important truck crops for fresh market and processing over the 14-year period 1929-1943. These data indicate a decided trend toward the processing of vegetables, a trend which is of particular interest in this study because of the centralization of waste materials at processing plants. Areas in which the vegetables are grown and their processing centers are located are shown in Figures 2 and 3.

From the standpoint of abundance, occurrence in large concentrations, and nutritional value, the leafy wastes of the following vegetables seem to have the greatest promise, and therefore attention has been largely devoted to them.

Beets	Carrots	Lima beans	Turnips
Broccoli	Cauliflower	Peas	Spinach
Cabbage	Kale	Rutabagas	Tomatoes ^{4/}

^{4/} Although tomatoes do not have a utilizable leafy waste, they have an abundant processing plant waste, which is now commercially processed for animal feed.

Tables 2 and 3 contain data on the production of these crops, with the exception of rutabagas and turnips. These vegetables represent 43 percent, by weight, of all important crops grown for fresh market and 69 percent of all grown for processing. Table 4, which gives data on the production of each vegetable for fresh market and processing by States, shows that in certain States these crops are produced largely for fresh market, while in others they are produced primarily for processing. The factors in Table 6 were used to convert the fresh market units to a tonnage basis. As few data are available on some crops for 1942, the estimated production for 1939, based on the 1939 acreage shown in the 1940 census, is given in Table 5.

The rank of each State in the production of vegetable crops for fresh market and processing is presented in Table 7. California ranks first for both. This table should be useful in determining both the relative importance of each State in the production of the different vegetables and the leading vegetables grown and processed in the different States. The quantity of each vegetable grown or processed in any particular locality in any State may be estimated from the data in Figures 4 to 20 inclusive.

PROCESSED CROP PRODUCTION

General methods of processing various vegetables are graphically portrayed in Figure 21.

Inasmuch as the canned pack constituted more than 96 percent, by weight, of the crops processed in 1942, a detailed break-down by States for each vegetable processed by this method is shown in Table 8. The frozen pack for 1942 is shown by region in Table 9. The estimated dehydrated pack for 1942 and 1943 is shown in Table 10.

The quantities in Tables 8, 9, and 10 have been converted to their equivalent farm weight in Table 11. By farm weight is meant that portion of the harvested crop prepared for shipment to either processing plants or fresh market. The fresh market totals in Table 11 were obtained by subtracting all the additional known processed quantities from the fresh market quantities of Table 4.

Distribution of processing plants by States is indicated in Table 12. Forage driers have been included, as some of these may be adapted to drying vegetable wastes. Additional information on forage driers is given later in the paper.

The number of plants processing the vegetables selected for this survey is shown by States in Table 13. Owing to the fact that many of the plants pack more than one vegetable and by more than one process, it is not possible to total these figures horizontally, that is, by States.

OCCURRENCE OF VEGETABLE WASTES

Distribution

An estimate of the quantity of waste available from different sources, obtained by the application of waste factors to the estimated farm weights of crops in Table 11, is shown in Table 14. The waste factors are based on information obtained from fresh-market packing plants, processing plants, and trade organizations and publications. Where possible, allowance has been made for variations in practice in different sections of the country.

As indicated in Table 14, the wastes occur at the farm, vinery, packing plant, and processing plant. The vineries, generally owned by the processing plants, are strategically located to handle the lima bean and pea vines directly from the field.

In considering the waste that might be available for commercial utilization, it should be taken into account that in addition to the quantities indicated in Table 14 there are appreciable quantities available from crops not harvested because of unsatisfactory conditions, such as poor quality, unfavorable markets, or labor shortage. At best, only a rough approximation of wastes is possible, as there are many unpredictable factors, such as differences in yields, quality, and farming and processing procedures.

Seasonal Availability

Tables 15 and 16 and Figures 22 to 48, inclusive, indicate the period during which these waste materials are available in different sections of the country. Table 15 and related Figures 22 to 28 show the peak of the growing season by regions; Table 16 and the corresponding Figures 29 to 48 show the operating dates for packing by States. These dates naturally vary somewhat from year to year. For any commercial operation, the production period should be extended over as long a time as possible in order to reduce overhead costs.

UTILIZATION OF VEGETABLE WASTES

Present Practice

The waste on the farm may be used for feed if suitable and easy to collect. In many cases, however, it can be used only as a supplementary feed. It may also be plowed under to enrich the soil, but there is possible danger that it may cause soil infection, especially if the material is not composted or the crops are not rotated.

Disposal of the refuse from the processing plant usually represents a much more serious problem, owing to the large quantities involved and their rapid decomposition, which may be a definite menace to health. If the distance is not too great, this material is frequently returned to neighboring farms. Otherwise, it may be either hauled to a dump or treated for subsequent disposal in a municipal or processing-plant sewage system. As a rule, the disposal of this material entails a definite expense to the processor, especially if it necessitates an initial capital expenditure for a sewage-treatment plant. Some packing and processing plants dispose of their pea vines and other suitable materials by feeding them to cattle, which they keep for this purpose.

In the Salinas Valley of California, one company is artificially drying waste lettuce for poultry feed. Wastes from processing of tomatoes are also being commercially dried for feed.

Current Investigations

Research work on wastes at this Laboratory has included a study of the carotene and riboflavin content of various leafy wastes, methods of extraction and purification of carotene, separation of the high-value leaf blades from the stems and midribs,^{5, 6} preparation of relatively large quantities of dried leaf meals and a study, in cooperation with the Delaware Agricultural Experiment Station, of their value as poultry feed,⁷ and an investigation on the best methods of preparing dried leaf meals from vegetable wastes on a commercial scale.

Processing: Studies on the most suitable drying equipment and the costs involved have not been completed. The wastes, however, have been divided into two classes according to their behavior in driers. Materials such as pea vines and carrot tops, which form a porous bed readily permitting passage of air through it, are in Class I. Such products could probably be dried in certain types of alfalfa driers. The location of some of the driers now in operation and the names of their manufacturers are shown in Table 17 and Figure 49. Since the pea season is so short, it would not be profitable to install a drier for this product alone,

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5. Carotene in Vegetable Wastes, by E. G. Kelley and M. E. Wall. Vegetable Growers Association of America Annual Report 1942, p. 62.
 6. Vegetable Wastes as Animal Feedstuffs, by E. G. Kelley, M. E. Wall and J. J. Willaman. Feedstuffs, vol. 15, no. 26, p. 18, 1943.
 7. Preliminary Investigation on the Use of Certain Dried Vegetable Wastes as Poultry Feeds, by A. E. Tomhave and Edward Hoffman (Delaware Agricultural Experiment Station) in cooperation with E. G. Kelley, Monroe E. Wall, and David A. Colker (Eastern Regional Research Laboratory). Delaware Agricultural Experiment Station Bulletin 247, 32 pp., 1944.

unless the vines could be ensiled to extend the drying season. This may be feasible and is now under investigation. As it might also be desirable to include alfalfa in this drying program, data on the production of alfalfa are given in Table 18 and Figure 50. In Tables 19 and 20 are shown the relative tonnages of sun-cured and dehydrated alfalfa meals produced in the different States and the States to which they are shipped.

In Class II are wastes such as beet tops, broccoli, turnip tops, and lima bean leaves, which form an almost impervious bed and therefore must be agitated at intervals during drying. A drier for Class II should be provided with a series of aprons or conveyors running at progressively slower speeds. The material turns over as it falls from one apron to the next, and the depth of the bed increases on succeeding aprons, thereby increasing the overall capacity of the drier. A drier suitable for material in Class I would be cheaper but probably could not be used for materials in Class II. A drier suitable for Class II material, however, should handle materials of the first group.

The process for recovering the leaf blade portion of all the wastes investigated, except pea vines, consists in flash drying the material with air at about 240° F. The leaf portion becomes dry and brittle while the stems remain moist and tough. The dried product is tumbled with stones in a rotating screen, causing it to fracture and pass through the screen into the grinding equipment. Pea vines are entirely dried, then ground and screened much in the same manner as alfalfa.

Yields: Exact figures on yields obtained by drying various vegetable wastes cannot be given, owing primarily to the wide variation in the moisture content of the raw material. However, the estimated yields in Table 21, which are based on the results of some experimental runs in our pilot plant, may be used as a guide. These data were obtained by determining the weight after the material was dried to 5 percent moisture.

To prevent spoilage, the moisture content of the dried product should be not more than 10 percent.

Nutritional value: The percentages of selected nutrients in the dried leaves and stems are given in Table 22. For comparison with a commercial product, alfalfa-leaf meal is included. These data show that the leaves are about twice as nutritious as the stems. Broccoli leaves are particularly high in all nutrients. Owing to the wide variations that occur, these figures should be used only as a guide. The factors 454 grams per pound and 1.6 International Units per microgram of carotene may be useful in converting micrograms per gram to International Units per pound.

Preliminary feeding tests⁷ with chicks showed that broccoli-leaf meal is somewhat better than lima bean-leaf meal; that turnip and carrot tops are about equal to alfalfa; and that pea vines are somewhat inferior to alfalfa.

Inasmuch as vegetable crops are frequently treated with insecticides that contain toxic materials such as lead arsenate and copper compounds, it is necessary to make sure that their residues are within a safe limit in the final, prepared product.

Markets

Owing to the relatively high nutritional value of these dried vegetable materials, they should be in demand as an ingredient in feeds, of which there is at present a serious shortage (Table 23). The dried leaf portion shows promise as a source of protein and vitamins for poultry feeds, and the stems may be useful as a feed for other animals or as poultry litter.

Comparison of the production and distribution of poultry feed with alfalfa meal and other feeds may be obtained from Tables 24 and 25. Of the 517,671 tons of alfalfa meal produced in 1942, approximately 260,000 tons, or 50 percent, were artificially dried.

That areas in which most of the vegetable wastes occur approximately coincide with those for poultry growing can be seen by reference to Figures 2 and 3, which show the vegetable growing and processing areas, and Table 26 and Figure 51, which show the distribution of chickens. Therefore, poultry feeds prepared from vegetable wastes could be used within the areas of production, eliminating high charges for freight.

SUMMARY

This survey shows the distribution and production of vegetable crops, gives information on processing plants, and indicates the estimated quantities of vegetable wastes available from fresh marketing and processing plants. It also gives some information pertaining to the utilization of vegetable wastes, especially as an ingredient of poultry feeds.

TABLE 1

Commercial Acreage and Production of 26 Truck Crops 1/, 1929-1943

Year	Acreage			Production - Tons		
	For fresh market	For processing		For fresh market	For processing	
		Acres	%		Tons	Total
1929	1,381,710	1,181,410	44.3	6,044,600	3,033,500	9,078,100
1930	1,533,230	1,374,740	47.3	6,150,500	3,332,100	9,482,600
1931	1,571,900	1,117,390	41.5	5,945,300	2,380,100	8,325,400
1932	1,630,740	779,370	32.3	6,004,000	2,043,000	8,047,000
1933	1,536,590	894,260	36.7	5,333,100	1,982,900	7,316,000
1934	1,728,280	1,153,050	40.0	6,176,000	2,636,000	8,812,000
1935	1,695,850	1,454,350	46.1	5,986,300	3,352,300	9,338,600
1936	1,793,260	1,364,940	43.2	6,203,000	3,323,100	9,526,100
1937	1,710,340	1,562,470	47.8	6,294,900	3,835,500	10,130,400
1938	1,751,880	1,393,840	44.3	6,718,300	3,623,300	10,341,600
1939	1,775,540	1,138,560	39.0	6,723,100	3,390,600	10,113,700
1940	1,719,530	1,377,000	44.5	6,801,000	3,969,200	10,770,200
1941	1,695,420	1,640,660	49.2	6,551,600	5,101,600	11,653,200
1942	1,662,470	1,968,050	54.2	7,013,200	5,817,900	12,831,100
1943	1,559,850	1,902,150	54.9	6,507,700	4,981,200	11,488,900

1/ Crops for market: Artichokes, asparagus, lima beans, snap beans, beets, cabbage cantaloups, carrots, cauliflower, celery, sweet corn, cucumbers, eggplant, escarole, honeyballs, honeydews, kale, lettuce, onions, green peas, green peppers, shallots, spinach, tomatoes, and watermelons.

Crops for processing: Asparagus (Calif.), lima beans, snap beans, beets, cabbage for kraut, sweet corn, cucumbers for pickles, green peas, pimientos, spinach and tomatoes.

TABLE 2

Crops for Fresh Market - Total United States

	Beets	Broccoli	Cabbage	Carrots	Cauli- flower	Kale	Lima beans	Peas	Spinach	Tomatoes
	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>2/</u>	<u>2/</u>	<u>1/</u>	
<u>Acreage</u>										
10 yrs. ave. 1931-1940	11,470		158,000	43,730	30,870	1,780	18,470	105,710	65,310	192,500
1941	12,270	2/ 8,500	141,360	56,380	32,150	1,700	25,050	85,550	64,150	198,730
1942	11,380	8,550	170,070	60,780	32,230	1,600	22,380	70,980	70,280	211,730
1943	12,300	8,750	159,640	83,690	26,440	1,650	19,150	62,250	72,200	220,180
<u>Yield per acre</u>	<u>Bushel</u>	<u>Crate</u>	<u>Ton</u>	<u>Bushel</u>	<u>Crate</u>	<u>Bushel</u>	<u>Bushel</u>	<u>Bushel</u>	<u>Bushel</u>	<u>Bushel</u>
10 yrs. ave.	184	3/ 120	6.55	305	266	360	64	79	221	115
1941	172	120	6.77	320	265	520	61	92	206	121
1942	187	155	7.51	333	294	275	70	88	211	126
1943	179	130	6.46	322	286	445	63	97	201	119
<u>Production in thousands</u>										
10 yrs. ave. 1931-1940	2,113	2/ 1,020	1,034.8	13,332	8,207	619	1,178	8,375	14,403	22,130
1941	2,108	1,020	956.9	18,034	8,524	884	1,530	7,911	13,186	24,075
1942	2,128	1,325	1,276.5	20,216	9,481	440	1,574	6,214	14,815	26,618
1943	2,203	1,138	1,031.2	26,911	7,569	734	1,206	6,058	14,531	26,101
<u>Price per unit</u>										
10 yrs. ave.	.46	3/ 1.35	13.84	.68	.64	.34	1.38	1.17	.42	1.18
1941	.43	1.35	20.87	.75	.79	.23	1.51	1.26	.50	1.54
1942	.62	1.80	16.72	1.21	1.03	.55	1.82	1.59	.61	2.10
1943	1.21	3.50	46.23	1.37	1.87	.85	2.84	2.31	.94	2.85
<u>Farm value</u>										
10 yrs. ave.	950	2/ 1,377	13,825	8,940	5,247	196	1,626	9,740	6,021	25,957
1941	914	1,377	19,888	13,576	6,707	203	2,313	9,957	6,594	37,132
1942	1,330	2,385	19,667	24,445	9,758	242	2,863	9,894	9,049	55,781
1943	2,668	3,829	47,571	36,610	14,170	624	3,427	13,973	13,691	74,277

1/ Undetermined quantities used for processing.

2/ Unshelled.

3/ Ten year average not available.

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TABLE 3

Crops for Processing - Total United States

	Beets	Cabbage	Lima beans 1/	Peas 1/	Spinach	Tomatoes
<u>Acreage</u>						
10 yrs. ave. 1931-1940	7,920	19,610	34,010	273,040	17,430	372,800
1941	17,790	23,480	62,650	361,390	19,940	460,450
1942	16,730	15,000	66,080	434,120	46,240	601,200
1943	17,630	12,840	63,750	433,780	39,030	551,650
<u>Yield per acre</u>						
10 yrs. ave. 1931-1940	5.81	<u>Tons</u> 7.78	.57	.75	2.90	4.38
1941	7.48	8.99	.61	.96	2.25	6.09
1942	7.88	10.75	.57	.98	2.47	5.27
1943	7.87	7.44	.44	.93	2.10	4.80
<u>Production in thousands</u>						
10 yrs. ave. 1931-1940	46.0	152.5	19.5	209.7	45.3	1,631.8
1941	133.0	211.0	38.1	345.6	44.9	2,802.2
1942	131.9	161.3	37.8	423.9	114.4	3,166.8
1943	138.7	95.5	28.3	403.0	82.0	2,645.6
<u>Price per unit</u>		<u>Dollars</u>				
10 yrs. ave. 1931-1940	11.15	7.00	64.43	49.52	14.14	12.02
1941	13.11	9.70	71.25	48.67	24.03	15.06
1942	15.17	7.96	84.59	63.71	38.72	19.70
1943	20.99	21.82	103.21	80.03	53.00	26.14
<u>Farm value</u>		<u>Thousand Dollars</u>				
10 yrs. ave. 1931-1940	513	1,068	1,257	10,504	646	19,608
1941	1,743	2,047	2,714	16,821	1,079	42,196
1942	2,001	1,284	3,200	27,007	4,429	62,400
1943	2,911	2,084	2,925	32,257	4,346	69,160

1/ Shelled.

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TABLE 4

Crop Production by States for Fresh Market and Processing - 1942 - Tons

State	Beans		Broccoli	Cabbage		Carrots		Cauliflower		Kale		Lima Beans		Peas		Spinach		Tomatoes		State Totals		
	Fresh Market	Process		Fresh Market	Process	Fresh Market	Fresh Market	Fresh Market	Fresh Market	Process	Fresh Market	Process	Fresh Market	Process	Fresh Market	Process	Fresh Market	Process	Fresh Market	Process		
Maine	-	2/	-	-	-	-	-	-	-	-	-	-	-	-	5,100	-	-	-	-	-	5,100	
Connecticut	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
New York	-	47,800	-	291,200	80,500	56,950	53,300	-	-	-	-	7,120	2/	9,290	47,840	8,210	-	49,960	175,000	476,090	351,140	
Pennsylvania	12,560	2/	-	60,300	2/	17,000	-	-	-	-	-	-	2/	-	11,250	13,680	-	13,600	162,400	173,690	173,690	
New Jersey	10,190	8,200	-	39,400	2/	10,400	5,000	-	-	-	-	4,220	7,120	1,370	2/	11,250	-	52,870	225,000	134,700	240,320	
West Virginia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/	-	-	
Delaware	-	-	-	-	-	-	-	-	-	-	-	-	8,910	-	2,200	-	-	1,190	55,500	1,190	66,610	
Maryland	-	2/	-	6,000	2/	-	-	-	-	-	-	2,400	1,750	180	9,120	1,850	4,200	36,250	334,000	46,680	349,070	
Ohio	-	2/	-	32,100	18,400	25,630	-	-	-	-	-	-	2/	-	6,380	-	-	24,300	217,800	62,030	242,580	
Wisconsin	-	33,800	-	69,500	34,000	-	-	-	-	-	-	-	1,200	-	130,240	-	-	-	2/	69,500	199,240	
Illinois	-	2/	-	25,200	2,100	22,000	-	-	-	-	-	-	2/	-	20,150	2,270	-	10,100	44,000	59,570	66,250	
Indiana	-	1,400	-	6,400	3,800	1,930	-	-	-	-	-	-	2/	-	11,470	-	-	25,120	567,300	33,450	583,970	
Michigan	-	6,100	-	34,400	5,200	17,250	3,870	-	-	-	-	-	1,230	-	11,960	-	-	29,680	53,600	85,200	78,090	
Missouri	-	2/	-	4,400	-	-	-	-	-	-	-	-	-	-	-	3,600	-	18,990	55,700	26,950	55,700	
Kansas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/	-	-	-	2/	-	-	
Iowa	-	2/	-	10,400	2/	-	-	-	-	-	-	-	-	-	3,270	-	-	1,720	23,500	12,120	26,770	
Nebraska	-	2/	-	-	-	-	-	-	-	-	-	-	-	-	2/	-	-	-	2/	-	-	
Minnesota	-	2/	-	21,500	1,500	2,250	-	-	-	-	-	-	2/	-	36,580	-	-	-	2/	-	-	
Virginia	1,120	2/	-	27,100	2/	300	-	-	-	-	-	560	2/	630	1,940	8,330	9,400	7,160	124,800	23,750	38,080	
North Carolina	1,040	2/	-	38,300	2/	750	-	-	-	-	-	1,230	2/	1,130	-	-	-	1,700	2/	44,160	136,840	
South Carolina	2,500	-	-	12,600	-	-	-	-	-	-	-	2,820	2/	2,100	-	-	-	10,200	2/	30,220	-	
Georgia	-	2/	-	13,300	-	-	-	-	-	-	-	1,650	2/	1,260	2/	-	-	8,830	2/	25,040	-	
Florida	-	-	-	108,000	-	-	-	-	-	-	-	5,180	-	3,680	-	-	-	90,740	2/	207,600	-	
Alabama	-	-	-	4,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/	4,700	-	
Mississippi	-	2/	-	34,600	-	-	-	-	-	-	-	-	-	1,610	-	-	-	15,270	2/	51,480	-	
Tennessee	-	2/	-	12,800	2/	-	-	-	-	-	-	-	2/	-	2/	-	-	16,460	21,000	29,260	21,000	
Kentucky	-	-	-	2,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/	22,300	-	
Louisiana	2,080	2/	-	18,100	-	5,630	-	-	-	-	-	-	2/	-	-	900	-	5,910	2/	32,620	-	
Texas	25,840	2/	-	237,500	2/	61,750	2,040	-	-	-	-	-	-	6,360	2/	58,460	8,800	110,640	2/	502,590	8,600	
Oklahoma	-	2/	-	-	-	-	-	-	-	-	-	-	-	-	2/	2,940	25,200	-	2/	2,940	25,200	
Arkansas	-	-	-	-	-	-	-	-	-	-	-	-	2/	-	2/	1,130	14,200	10,070	70,200	11,200	84,400	
New Mexico	-	-	-	5,000	-	13,030	16,840	-	-	-	-	-	-	300	-	-	-	-	2/	-	-	
Colorado	-	2/	-	50,000	2,300	8,130	-	-	-	-	-	-	2/	23,930	4,540	-	-	16,460	19,800	118,426	26,640	
Utah	-	2/	-	6,300	2/	2,430	-	-	-	-	-	-	2/	21,200	2/	3,060	-	1,330	86,200	10,060	107,400	
Idaho	-	-	-	-	-	3,380	-	-	-	-	-	-	2/	2,940	2/	-	-	-	2/	5,920	-	
Wyoming	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2/	-	-	-	-	-	-	
Montana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
California	-	2/	27,830	84,500	-	198,900	84,270	-	-	-	-	-	2/	37,250	3,550	12,050	52,600	127,120	798,000	571,920	874,150	
Oregon	-	16,300	-	6,400	2/	7,030	2,390	-	-	-	-	-	2/	1,080	40,280	-	-	7,020	2/	23,920	56,580	
Washington	-	2/	-	9,400	3,000	11,500	2,960	-	-	-	-	-	2/	3,320	40,020	5,620	-	9,540	2/	42,340	43,020	
Nevada	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-	-	230	
Arizona	-	-	-	5,000	-	39,200	4,760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other States	-	18,300	-	-	10,500	-	-	-	-	-	-	-	14,920	-	16,820	-	-	-	110,700	-	48,960	-
U.S. Total	55,330	131,900	27,830	1,276,500	161,300	505,440	175,430	3,960	25,180	37,830	96,260	423,910	133,350	114,400	705,420	3,166,800	3,004,700	4,036,140	-	-	4,036,140	

1/ Undetermined quantities used for processing

2/ Included in "Other States"

"Commercial Truck Crops," Bureau of Agricultural Economics
(Fresh market converted to tons)

TABLE 5

Estimated Crop Production, 1939 (Tons)
(Supplement to Table 4)

State	Broccoli	Kale	Rutabagas	Turnips
Maine	7	-	72	1,096
New Hampshire	7	-	-	160
Vermont	3	-	9	176
Connecticut	145	80	-	1,480
Massachusetts	40	48	-	3,480
Rhode Island	290	-	-	200
New York	1,069	310	423	4,168
Pennsylvania	2,524	48	1,206	4,256
New Jersey	3,425	128	381	3,208
West Virginia	-	42	9	248
Delaware	528	6	-	88
Maryland	462	1,152	549	2,712
Ohio	46	333	27	6,944
Wisconsin	3	-	1,242	224
Illinois	76	-	9	1,936
Indiana	-	99	27	1,904
Michigan	36	13	1,224	1,648
Missouri	-	150	-	2,328
Kansas	-	10	-	2,104
Iowa	-	-	-	336
Nebraska	3	-	36	328
Minnesota	7	-	7,758	128
North Dakota	-	-	63	16
Virginia	3,105	9,270	1,674	2,632
North Carolina	512	400	72	2,320
South Carolina	983	-	54	3,480
Georgia	7	-	54	16,192
Florida	257	19	144	4,736
Alabama	-	-	81	7,752
Mississippi	-	-	54	8,400
Tennessee	3	890	-	2,520
Kentucky	-	1,882	-	1,312
Louisiana	861	-	63	7,352
Texas	7,240	10	99	18,344
Oklahoma	3	-	-	1,008
Arkansas	3	3	-	2,872
New Mexico	66	-	108	320
Colorado	162	-	180	2,216
Utah	7	-	-	104
Idaho	-	-	72	56
Wyoming	-	-	18	40
Montana	-	-	225	112
California	17,150	51	783	7,160
Oregon	647	70	27	840
Washington	195	61	1,503	1,112
Nevada	-	-	-	16
Arizona	693	-	9	664
Other States	-	29	-	-
Total	40,565	15,104	18,261	130,728

TABLE 6

Factors Used to Convert Unit Measures to Pounds and Tons

Crop	Unit	Pounds per unit	Tons per unit
Beets	Bushel	52	.026
Broccoli	Crate	42	.021
Carrots	Bushel	50	.025
Cauliflower	Crate	37	.0185
Kale	Bushel	18	.009
Lima beans <u>1</u> /	Bushel	32	.016
Peas <u>1</u> /	Bushel	30	.015
Spinach	Bushel	18	.009
Tomatoes	Bushel	53	.0265

1/ Unshelled.

TABLE 7

Rank of States in Production of Crops for Fresh Market and Processing

State	Beets		Cabbage		Carrots		Cauli- flower		Lima beans		Peas		Spinach		Tomatoes		All crops listed	
	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process
Maine	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	26
New York	-	1	1	1	3	-	2	1	-	3	2	-	6	-	5	6	3	3
Pennsylvania	2	-	6	-	8	-	-	-	-	-	10	-	-	-	14	7	7	8
New Jersey	3	4	8	-	11	-	4	3	2	10	-	4	-	4	4	5	5	6
Delaware	-	-	-	-	-	-	-	-	1	-	17	-	-	-	15	12	34	14
Maryland	-	-	25	-	-	-	-	5	4	17	11	6	12	3	6	15	15	4
Ohio	-	-	12	-	5	-	-	-	-	-	12	-	-	5	9	9	5	5
Wisconsin	-	2	5	2	-	6	-	-	-	-	1	-	-	-	-	-	10	7
Illinois	-	-	14	8	6	-	-	-	-	-	7	-	-	-	17	14	11	15
Indiana	-	6	22	5	18	-	-	-	-	-	9	-	-	-	8	2	18	2
Michigan	-	5	11	4	7	5	6	-	-	-	8	-	-	-	7	13	8	13
Missouri	-	-	29	-	-	-	-	-	-	-	-	-	-	-	10	11	22	17
Iowa	-	-	20	-	-	-	-	-	-	-	16	-	-	-	25	15	27	20
Minnesota	-	-	15	9	17	-	-	-	-	-	5	-	-	-	-	-	25	19
Virginia	6	-	13	-	20	-	-	-	-	-	18	-	4	-	21	8	13	10
North Carolina	7	-	9	-	19	-	-	7	3	12	-	-	-	-	26	-	16	-
South Carolina	4	-	19	-	-	-	4	4	-	8	-	-	-	-	16	-	20	-
Georgia	-	-	17	-	-	-	-	6	-	11	-	-	-	-	20	-	23	-
Florida	-	-	3	-	-	-	-	2	-	5	-	-	-	-	3	-	4	-

TABLE 7 (Continued)

State	Beets		Cabbage		Carrots		Cauli- flower		Lima beans		Peas		Spinach		Tomatoes		All crops listed	
	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process	Fresh	Process
Alabama	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	32	-
Mississippi	-	-	10	-	-	-	-	-	-	-	9	-	-	-	13	-	12	-
Tennessee	-	-	18	-	-	-	-	-	-	-	-	-	-	-	11	17	21	24
Kentucky	-	-	30	-	-	-	-	-	-	-	-	-	-	-	24	16	31	23
Louisiana	5	-	16	-	14	-	-	-	-	-	-	-	14	-	23	-	19	-
Texas	1	-	2	-	2	-	9	-	-	-	4	-	1	5	2	-	2	25
Oklahoma	-	-	-	-	-	-	-	-	-	-	-	-	10	2	-	-	33	22
Arkansas	-	-	-	-	-	-	-	-	-	-	-	-	13	3	10	-	28	12
New Mexico	-	-	26	-	9	-	3	-	-	-	15	-	-	-	18	-	26	-
Colorado	-	-	7	7	12	-	-	-	-	-	2	14	-	-	11	18	6	21
Utah	-	-	24	-	16	-	-	-	-	-	-	6	-	-	27	9	29	11
Idaho	-	-	-	-	15	-	-	-	-	-	7	-	9	-	-	-	30	-
California	-	-	4	-	1	-	1	-	-	-	1	15	3	1	1	1	1	1
Oregon	-	3	22	-	13	-	8	-	-	-	13	3	-	-	22	-	24	16
Washington	-	-	21	6	10	-	7	-	-	-	6	4	7	-	19	-	17	18
Nevada	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	35	-
Arizona	-	-	26	-	4	-	5	-	-	-	-	-	-	-	-	-	14	9

Based on data in Table 4.

TABLE 8

Canned Pack, 1942 (Cases of 24/2's)

State	Beets	Carrots	Lima beans	Peas	Spinach	Tomatoes		
						Solid Pack	Juice 1/	Pulp 2/
Maine	-	-	-	252,912	-	-	-	-
New York	2,330,344	406,800	-	3,497,531	234,179	1,544,287	-	82,605
Maryland	286,659	123,425	409,539	1,465,360	1,044,642 3/	8,897,205	-	-
Delaware	-	-	760,978	-		752,892	-	71,194 3/
New Jersey	132,545	-	56,136 5/	141,049 4/	-	350,241	-	-
Pennsylvania	-	-	-	742,247	-	883,672	-	250,566 5/
Virginia and West Virginia	-	-	-	-	-	2,685,852	-	-
Ohio	-	-	44,754	563,914	-	2,278,084	-	166,877
Indiana	295,052	-	-	970,019	-	4,251,746	-	714,316
Illinois	-	-	-	1,783,832	-	-	-	-
Michigan	241,484	58,419	107,416	874,348	-	-	-	26,600
Wisconsin	1,755,575	731,698	88,938	12,478,490	-	-	-	-
Minnesota	-	-	-	2,762,915	-	-	-	-
Tennessee and Kentucky	-	-	-	-	-	1,463,624	-	-

1/ Breakdown by States not available.

2/ Cases of 6/10's.

3/ Total for Maryland and Delaware.

4/ Total for Delaware and New Jersey.

5/ Total for New Jersey and Pennsylvania.

TABLE 8 (Continued)

State	Beets	Carrots	Lima beans	Peas	Spinach	Tomatoes		
						Solid Pack	Juice 1/	Pulp 2/
Missouri and Arkansas	-	-	-	-	2,549,800	4,227,760	-	-
Texas and Oklahoma	-	-	-	-	1,249,643	-	-	-
Montana	-	-	-	374,005	-	-	-	-
Colorado	-	-	-	-	-	327,329	-	-
Idaho	-	-	-	-	-	-	-	-
Utah	13,186	44,335	-	2,100,716	6/	1,319,981	-	240,020
Oregon	858,690	-	-	-	-	-	-	-
Washington	55,644	350,310	7/	5,553,151	7/	-	-	-
California	-	-	-	291,456	3,563,518	7,818,752	-	2,007,122
Other States	736,459	567,662	1,059,237	1,404,000	925,001	4,450,357	-	190,195
Total	6,705,638	2,282,649	2,526,998	35,255,945	9,566,783	41,251,782	25,177,653	3,749,495

6/ Total for Idaho and Utah.

7/ Total for Oregon and Washington.

National Cannery Association.

TABLE 9
Frozen Pack, 1942 (Pounds)

Vegetable	East and South	Midwest	West	Total
Broccoli	905,337	68,088	2,249,770	3,223,195
Carrots	192,754	690,208	159,922	1,042,884
Cauliflower	410,539	1,000	788,258	1,199,797
Lima beans	18,601,222	4,609,596	6,192,257	29,403,075
Peas	23,951,841	10,892,633	24,232,689	59,077,163
Peas and carrots	66,538	48,720	941,230	1,056,488
Spinach	10,592,061	312,625	5,670,439	16,575,125
Succotash	37,512	24,054	-	61,566
Miscellaneous ^{1/}	1,828,693	496,358	1,083,184	3,408,235
Total	56,586,497	17,143,282	41,317,749	115,047,528

^{1/} Includes beets, collards, kale, mixed vegetables, peppers, pimientos, pumpkin, and turnip greens.

National Association of Frozen Food Packers.

TABLE 10
Estimated Dehydrated Pack, 1942 and 1943 (Pounds)

<u>Vegetable</u>	<u>1942</u>	<u>1943</u>
Beets	200,000	2,500,000
Cabbage	400,000	3,000,000
Carrots	2,000,000	20,000,000
Greens	50,000	275,000
Rutabagas	100,000	800,000
Tomato flakes	-	900,000
Tomato juice	<u>750,000</u>	<u>750,000</u>
Total	3,500,000	28,225,000

War Food Administration.

TABLE 11

Estimated Farm Weight of Crops Produced for Fresh Market and Processing, 1942 (Tons)

Vegetables	Fresh market	Canned	Dehydrated 1/	Frozen	Total
Beets	55,330	134,110	1,300	-	190,740
Broccoli	24,900	-	-	2,930	27,830
Cabbage	1,272,500	2/161,300	4,000	-	1,437,800
Carrots	450,530	41,500	12,000	1,410	505,440
Cauliflower	173,430	-	-	2,000	175,430
Greens	-	-	400	-	400
Kale	3,960	-	-	-	3,960
Lima beans	25,180	28,080	-	15,480	88,740
Peas	96,260	371,070	-	30,930	498,260
Peas and carrots	-	-	-	1,430	1,430
Rutabagas and turnips	-	-	600	-	600
Spinach	133,350	119,590	-	15,940	268,880
Succotash	-	-	-	80	80
Tomatoes	705,420	1,736,510	5,250	-	2,447,180
Miscellaneous 3/	-	-	-	3,410	3,410
Total	2,940,860	2,592,160	23,550	73,610	5,630,180

1/ Since 1942 dehydration has been greatly expanded.

2/ Sauerkraut

3/ Includes beets, collards, kale, mixed vegetables, peppers, pimientos, pumpkin, and turnip greens.

TABLE 12

Number of Food and Forage Processing Plants in Each State, 1943

State	Food processing plants			Forage driers
	Canneries	Frozen food packers	Vegetable dehydration plants	
Maine	21	6	9	-
New Hampshire	1	-	-	-
Vermont	3	-	-	-
Connecticut	2	-	-	1
Massachusetts	2	2	1	-
Rhode Island	-	-	-	-
New York	81	53	13	7
Pennsylvania	53	8	4	6
New Jersey	24	2	6	2
West Virginia	11	-	-	-
Delaware	20	2	-	-
Maryland	137	7	4	3
Ohio	67	10	4	22
Wisconsin	98	7	4	-
Illinois	37	2	-	2
Indiana	127	1	3	3
Michigan	27	19	4	1
Missouri	54	-	-	3
Kansas	1	-	1	1
Iowa	34	-	1	-
Nebraska	4	2	2	3
Minnesota	15	3	4	2
North Dakota	-	-	2	-
Virginia	158	1	1	4
North Carolina	15	1	2	-
South Carolina	8	-	4	-
Georgia	17	2	4	1

TABLE 12 (Continued)

State	Food processing plants			Forage driers
	Canneries	Frozen food packers	Vegetable dehydration plants	
Florida	29	-	3	-
Alabama	6	4	1	-
Mississippi	4	1	1	2
Tennessee	24	4	4	-
Kentucky	19	-	1	-
Louisiana	17	4	5	2
Texas	45	1	8	1
Oklahoma	8	-	-	-
Arkansas	87	-	1	7
New Mexico	2	-	-	-
Colorado	11	1	3	-
Utah	17	6	1	-
Idaho	4	-	9	-
Wyoming	1	-	-	-
Montana	3	-	1	1
California	84	24	29	5
Oregon	35	22	10	-
Washington	30	30	8	1
Arizona	-	-	1	-
Total	1,443	225	159	80

Source:

National Canners Association.

War Food Administration.

Bureau of Plant Industry, Soils and Agricultural Engineering.

Processing Plants for Various Crops in Each State, 1943

[illegible]

TABLE 13 (Continued)

State	Beets			Broc- coli			Cabbage		Carrots			Cauli- flower			Kale		Lima beans		Peas		turnips and Spinach			Tomatoes	
	Canneries	Frozen Food	Packers	Dehydration	Plants	Canneries	Frozen Food	Packers	Dehydration	Plants	Canneries	Frozen Food	Packers	Canneries	Frozen Food	Packers	Canneries	Frozen Food	Packers	Canneries	Dehydration	Plants	Canneries	Frozen Food	Packers
South Carolina	-																								
Georgia	1																								
Florida	-																								
Alabama	-																								
Mississippi	3																								
Tennessee	3																								
Kentucky	-																								
Louisiana	6																								
Texas	9																								
Oklahoma	-																								
Arkansas	-																								
New Mexico	-																								
Colorado	2																								
Utah	5																								
Idaho	-																								
Wyoming	1																								
Montana	-																								
California	9																								
Oregon	8																								
Washington	7																								
Total	154	11	15	4		91	16	135	36	31	4	42	10	4	92	55	307	64	78	5	132	57	1090	3	

National Cannery Association.
 Frozen Food Directory - Food Industries, November 1943.
 War Food Administration.

TABLE 14

Estimated Quantity of Vegetable Waste, 1942 (Tons)

Vegetable	Fresh-Market Waste			Processing Waste				Total
	Field	Packing Plant	Total	Field	Vinery	Canning	Dehydration 1/	
Beets	3,320	1,660	4,980	37,920	-	40,230	390	78,540
Broccoli	14,940	9,960	24,900	1,760	-	-	1,320	3,080
Cabbage	1,272,500	-	1,272,500	165,300	-	32,260	1,040	198,600
Carrots	31,540	45,050	76,590	20,320	-	8,300	890	32,510
Cauliflower	346,860	8,670	355,530	4,000	-	-	1,400	5,400
Greens	-	-	-	-	-	-	70	70
Kale	-	-	-	-	-	-	-	-
Lima beans	67,140	1,260	68,400	-	264,320	1,400	850	266,570
Peas	212,940	-	212,940	-	1,736,480	18,550	1,700	1,756,730
Peas and carrots	-	-	-	530	-	-	900	1,430
Rutabagas and turnips	-	-	-	150	-	-	70	220
Spinach	-	2,670	2,670	-	-	23,920	7,650	31,570
Succotash	-	-	-	-	-	-	50	50
Tomatoes	-	105,810	105,810	-	-	306,820	260	307,080
Miscellaneous 2/	-	-	-	-	-	-	1,700	1,700
Total	1,949,240	175,080	2,124,320	229,980	2,000,800	431,480	4,830	2,683,550

1/ Since 1942, the dehydration has been greatly expanded.

2/ Includes beets, collards, kale, mixed vegetables, peppers, pimientos, pumpkin, and turnip greens.

TABLE 15

Seasonal Availability of Crops

Peak of Season

Region	Beets	Broccoli	Cabbage	Carrots	Cauliflower	Kale	Lima Beans	Peas	Rutabagas and Turnips	Spinach	Tomatoes
Northeast <u>1/</u>	July-Oct.	Sept.-Oct.	June-Nov.	Aug.-Nov.	Sept.-Nov.	May-June Sept.-Nov.	Aug.-Sept.	June-July	Oct.-Jan.	May-June Sept.-Oct.	July-Sept.
Great Lakes <u>2/</u>	June-Aug.	Sept.-Oct.	July-Oct.	Aug.-Nov.	Oct.		Aug.	June	Oct.	May-June Oct.	Aug.-Sept.
Midwest <u>3/</u>	July-Aug.		July-Sept.	July-Aug.			July-Sept.			Apr.	July-Sept.
Southern <u>4/</u>	June	Feb.-May	Apr.-May Sept.-Oct.	May-July		Dec.-Feb.	June-Aug.	Apr.-May	Mar.-Apr.	Nov.-Dec. Apr.	May-July
Southwest <u>5/</u>	Mar.-Apr.	Feb.	Feb.-Apr.	Jan.-May	Dec.-Jan.		June-July	Apr.	Feb.-Mar.	Dec.-Apr.	May-June
Rocky Mt. <u>6/</u>	July-Aug.	Aug.-Sept.	Oct.	Aug.	Aug.-Sept.		Aug.	July-Aug.	Sept.-Oct.	July	Sept.
Pacific <u>7/</u>	Year around	Oct.-Feb.	Mar.-Apr. Oct.	Mar.-June	Sept.-Feb.		July-Sept.	Feb.-May	Sept.-Oct.	Jan.-May	May-Sept.

1/ Me, N.H., Vt., Conn., Mass., R.I., N.Y., Pa., N.J., W. Va., Del., Md.

2/ O., Wis., Ill., Ind., Mich.

3/ Mo., Kans., Iowa, Neb., Minn., N. Dak., S. Dak.

4/ Va., N.C., S.C., Ga., Fla., Ala., Miss., Tenn., Ky.

5/ La., Tex., Okla., Ark.

6/ N. Mex., Colo., Utah, Idaho, Wyo., Mont.

7/ Calif., Oreg., Wash., Nev., Ariz.

"Normal Seasonal Availability of Fresh Fruit and Vegetable Supplies," War Food Administration

TABLE 16

Opening and Closing Dates of Packing Season

State	Beets	Cabbage	Carrots	Lima beans	Peas	Spinach	Tomatoes
New York	Aug. 1 Dec. 31	Sept. 1 May 1	Sept. 15 Dec. 31		June 20 Aug. 1	June 5-Sept. 28 June 20-Oct. 18	Aug. 20 Oct. 15
Pennsylvania				Aug. 1 Oct. 1	June 1 July 10		Aug. 10 Oct. 1
New Jersey	June 1 July 31			Aug. 1 Oct. 1	May 20 June 10	Apr. 1-May 31 Oct. 20-Nov. 30	July 15 Oct. 15
West Virginia							Aug. 1 Sept. 30
Delaware				Aug. 5 Oct. 10	May 25 June 10		July 20 Oct. 15
Maryland	June 1 July 15	Oct. 1 Feb. 1		Aug. 5 Oct. 10	May 20 July 15	Apr. 1-May 31 Nov. 1-Nov. 30	July 15 Oct. 15
Ohio	July 20 Nov. 30	July 15 Nov. 20			May 28 July 4		Aug. 10 Oct. 15
Wisconsin	July 20 Nov. 30	July 15 Nov. 20	July 25 Nov. 20		June 15 Aug. 20	May 20-June 20 Sept. 10-Nov. 1	Aug. 10 Oct. 10
Illinois				Aug. 15 Sept. 15	June 3 July 30		Aug. 15 Oct. 15
Indiana	Sept. 15 Oct. 15	Year around		Aug. 1 Oct. 15	June 1 June 30	May 15-June 15 Oct. 1-Oct. 25	Aug. 8 Oct. 15
Michigan	Aug. 1 Nov. 20	Sept. 10 Dec. 31	Oct. 1 Nov. 25	Sept. 1 Sept. 30	June 25 Aug. 1	May 10-July 1 Sept. 20-Oct. 20	Aug. 15 Sept. 30
Missouri					June 1 July 15	May 1 June 15	Aug. 10 Oct. 20
Kansas					May 15 June 15	June 1 July 1	Aug. 15 Oct. 1
Iowa					June 10 July 15		Aug. 10 Oct. 20
Nebraska							Aug. 10 Oct. 1
Minnesota	July 20 Nov. 30			June 15 Aug. 15			
Virginia				(Aug. 1 Oct. 10)	May 15 June	Apr. 1-May 25 Oct. 15-Nov. 30	July 15 Oct. 15

TABLE 16 (Continued)

State	Beets	Cabbage	Carrots	Lima beans	Peas	Spinach	Tomatoes
North Carolina							July 1 Aug. 15
South Carolina							June 15 July 15
Florida							Mar. 1 May 1
Tennessee	July 10 Aug. 15	Year around		Aug. 15 Sept. 30	May 15 June 15	Apr. 25-June 1 Sept. 15-Oct. 10	Aug. 1 Oct. 15
Kentucky	July 10 Aug. 15	Year around		Aug. 15 Sept. 30	May 15 June 15	Apr. 25-June 1 Sept. 15-Oct. 10	Aug. 1 Oct. 15
Louisiana							June 1 July 1
Texas						July 1 Aug. 31	May 15-Aug. 1 Dec. 1-Jan. 15
Oklahoma					May 15 June 15	Apr. 1-May 15 Oct. 15-Dec. 31	
Arkansas				July 1 Nov. 15		Apr. 1-May 15 Oct. 15-Dec. 31	Aug. 1 Oct. 20
New Mexico							Aug. 15 Oct. 15
Colorado		Oct. 1 Jan. 15			June 15 Aug. 1		Aug. 15 Oct. 15
Utah	June 1 Oct. 15	Oct. 1 Jan. 15	Aug. 15 Oct. 15	Aug. 5 Oct. 1	June 10 Aug. 10		Aug. 15 Oct. 15
Idaho					June 1 July 20		Aug. 20 Oct. 15
Wyoming	July 1 Sept. 25		(Sept. 1 (Sept. 30	Aug. 15 Sept. 15	July 1 Aug. 25		Sept. 10 Sept. 25
Montana		Oct. 15 Jan. 1			July 1 Aug. 20		
California	May 5 Dec. 20			Sept. 1 Oct. 31	Apr. 10 June 30	Feb. 20-May 10 Oct. 1-Dec. 15	July 10 Nov. 10
Oregon	July 1 Oct. 15	Nov. 15 Feb. 28	Aug. 20 Oct. 15		June 10 July 31	Sept. 1 Oct. 15	Aug. 15 Oct. 1
Washington	July 1 Oct. 15	Nov. 15 Feb. 28	Aug. 20 Oct. 15		June 10 July 31	Sept. 1 Oct. 15	Aug. 15 Oct. 1

TABLE 17

Forage Driers in Operation, 1942

(Partial List)

<u>User</u>	<u>Product dried</u>	<u>Make</u>	<u>Manufacturer</u>
<u>Arkansas</u>			
Chapman & Dewey Marked Tree	Alfalfa	Ardrier	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
F. P. Jacobs Grider	Alfalfa	Ardrier	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
Luxora Gin Co. Luxora	Alfalfa	Homemade	
Ohlendorf-Cromer Co. R. #1, Osceola	Alfalfa	Ardrier	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
Ralston-Purina Osceola	Alfalfa	Ardrier	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
Lee Wilson & Co. Armored	Alfalfa and some sagrain	Arnold	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
<u>California</u>			
Balfour-Guthrie Co. Calipatria	Finishing hay	Homemade	
Mealfalfa Co. Dixon	Alfalfa	Ardrier	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
Poultry Producers of Central California, 84 Battery St. San Francisco			
Plants located at		Western Con-	
Gerber	Alfalfa	densing Co.	
Vorden	Alfalfa	" "	
Ryer Island	Alfalfa	" "	
<u>Connecticut</u>			
Geo. Pratt, Jr. New Milford	Hay	Homemade	
<u>Georgia</u>			
University of Georgia Athens			
<u>Illinois</u>			
Wells & Scott Monmouth		Arnold	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.
The Western Alfalfa Meal Co. Belleville		Arnold	Arnold Dryer Company 1200 Montana Ave., Milwaukee, Wis.

TABLE 17 (Continued)

<u>User</u>	<u>Product dried</u>	<u>Make</u>	<u>Manufacturer</u>
<u>Indiana</u>			
Dwiggins & Sons Alfalfa Mills, New Paris			
Lewis F. Rauth Boonville		T.V.A. plans	
Rush Co. Alfalfa Dehydrating Coop., Rushville	Alfalfa and soybeans	Randolph	O. W. Randolph Co. Toledo, Ohio
<u>Kansas</u>			
W. J. Small Neodasha	Alfalfa	Ardrier	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
<u>Louisiana</u>			
Godchaux Sugars, Inc. Reserve	Drying sugar and bagasse to make Servall litter	Ardriers (2)	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
<u>Maryland</u>			
Cold Saturday Farm Finksburg	Alfalfa and dry chopped corn stalks	Homemade	
R. L. Forrest, Java Farm R.F.D., Edgewater	Alfalfa	Homemade	
Indian Springs Farm Darlington	Alfalfa	Homemade	
<u>Michigan</u>			
O. W. Randolph Expt. Plant Erie		Randolph	O. W. Randolph Co. Toledo, Ohio
<u>Minnesota</u>			
Mr. Lanby Swift	Alfalfa for meal		
Morin Farms Alden	Alfalfa for meal	Ardrier	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
<u>Missouri</u>			
Clark Bros.	Alfalfa	Ardrier	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
Pecos Valley Alfalfa Mill Co., Wyatt		Arnold	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
St. Albans Farms Becker	Alfalfa		

TABLE 17 (Continued)

<u>User</u>	<u>Product dried</u>	<u>Make</u>	<u>Manufacturer</u>
<u>Missouri</u>			
Delta Alfalfa Products Co. c/o J. B. Voskamp, P.O. Box 173, Greenville		L. R. Christie	
Trail Lake Plantations Trail Lake		L. R. Christie	
<u>Montana</u>			
Montana Land & Water Co. Valier		Randolph	O. W. Randolph Co. Toledo, Ohio
<u>Nebraska</u>			
Denver Alfalfa Milling & Products Co., Lanar, Colo. Dry at Lexington & Cozad	Alfalfa	Commercial	
L. L. Coryell Co. Lincoln	Alfalfa	Commercial	
<u>New Jersey</u>			
Walker-Gordon Co. Plainsboro		Ardrier.	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis
Walker-Gordon Lab. Co. Juliustown	Agricultural products	American Process	American Process Company 55 Park Place, New York City
<u>New York</u>			
Ashgrove Farm Saratoga Springs	Hay for feed	Arnold	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis
Genesee Valley Alfalfa Corp. Geneseo		Randolph	O. W. Randolph Co. Toledo, Ohio
Genesee Valley Alfalfa Corp. Avon		Randolph	O. W. Randolph Co. Toledo, Ohio
Leroy Alfalfa Corp. Leroy		Randolph	O. W. Randolph Co. Toledo, Ohio
Jesse Moulton, Avon Avon) LeRoy) Geneseo)	Hay for alfalfa feed		
<u>Ohio</u>			
Arnold Dehydrating Co. Napoleon			
Chas. Ackerman Mechanicsburg			
A. B. Caple Co. Toledo & Tontogany	Agricultural products	Fulmer	Fulmer Alfalfa Dryer Co. Nazareth, Pa.

TABLE 17 (Continued)

<u>User</u>	<u>Product dried</u>	<u>Make</u>	<u>Manufacturer</u>
Ohio (Continued)			
Central Mills Dunbridge			
Cooperative Dehydrating Co. Payne		Randolph	O. W. Randolph Co. Toledo, Ohio
Early & Daniel Co. Cincinnati			
Farm Industries, Inc. DeGraff			
Sherman Hart Hicksville			
Hayward, Inc. Oak Harbor			
Larro Milling Co. Fremont			
Logan County Dehydrators West Liberty			
O'Brien Milling Co. Greenville			
Ohio Sugar Co. Ottawa			
Pecos Valley Milling Co. Toledo			
Randolph Alfalfa Co. 2917 Imlay St. Toledo			
Rohloff Bros., Inc. Graytown			
Saunders Mill, Inc. Box 192, Toledo			
Snyder's Milling Ser. Marengo			
Weaver & Son Hoytville			
Chas. B. Wing Mechanicsburg			
Zeigler Milling Co. Bucyrus			

TABLE 17 (Continued)

<u>User</u>	<u>Product dried</u>	<u>Make</u>	<u>Manufacturer</u>
<u>Pennsylvania</u>			
Green Acres Nazareth	Agricultural products	Fulmer	Fulmer Alfalfa Dryer Co. Nazareth, Pa.
Keystone Dehydrating Co., Nazareth	Agricultural products	Fulmer	Fulmer Alfalfa Dryer Co. Nazareth, Pa.
Meadow Brook Farms Nazareth	Agricultural products	Fulmer	Fulmer Alfalfa Dryer Co. Nazareth, Pa.
Schoeneck Farms Nazareth	Alfalfa	Proctor & Schwartz	Proctor & Schwartz 7th St. & Tabor Rd., Phila., Pa.
Trexler Farms Allentown	Agricultural products	Fulmer	Fulmer Alfalfa Dryer Co. Nazareth, Pa.
White Swan Farms Erie		Randolph	O. W. Randolph Co. Toledo, Ohio
<u>Texas</u>			
Waldo Milling Co. Bryan	Alfalfa hay some green oats	Ardrier	Arnold Dryer Co. 1200 Montana Ave., Milwaukee, Wis.
<u>Virginia</u>			
I. C. Choate Sugar Grove	Clover		
Royster Guano Co.	Agricultural products	American Process	American Process Co. 55 Park Place, New York City
R. F. Stevens Radford	Alfalfa		
Virginia Poly. Inst. Blacksburg	Clover		
<u>Washington</u>			
Chris Knudsen Burlington	Alfalfa		

TABLE 18

Acreage and Production of Alfalfa Hay, 1930-1943

State	Acreage				Average 1930-39	Production			
	1941	1942	1943	Thousand tons		1941	1942	1943	
	Thousand acres								
Maine	6	6	7		9	8	9		
New Hampshire	3	5	5		6	6	10		
Vermont	11	19	21		25	29	46		
Connecticut	13	24	25		37	48	59		
Massachusetts	6	15	17		15	27	41		
Rhode Island	1	1	1		2	2	2		
New York	277	428	460		513	749	897		
Pennsylvania	172	281	268		322	506	482		
New Jersey	41	62	63		89	127	132		
West Virginia	18	43	47		34	90	89		
Delaware	6	4	5		14	9	10		
Maryland	31	39	40		61	70	64		
Ohio	384	486	448		719	923	829		
Wisconsin	762	1,255	969		1,459	2,698	2,132		
Illinois	377	582	494		767	1,368	936		
Indiana	340	476	452		578	833	814		
Michigan	930	1,295	1,227		1,422	1,813	1,902		
Missouri	186	328	320		357	853	784		
Kansas	658	580	722		972	1,247	1,408		
Iowa	746	1,055	991		1,504	2,426	2,329		
Nebraska	1,043	632	746		1,583	1,106	1,343		
Minnesota	928	1,322	1,412		1,659	2,776	3,036		
North Dakota	178	131	181		185	196	299		
South Dakota	467	211	286		431	264	458		
Virginia	55	54	62		95	103	112		
North Carolina	7	7	6		12	13	12		
South Carolina	2	2	2		3	3	3		
Georgia	5	5	5		9	10	10		

TABLE 18 (Continued)

State	Acreage				Production			
	Thousand acres				Thousand tons			
	Average 1930-39	1941	1942	1943	Average 1930-39	1941	1942	1943
Florida	4	5	5	6	5	9	8	9
Alabama	47	65	66	68	105	150	152	143
Mississippi	43	84	100	115	70	160	205	207
Tennessee	135	182	206	206	217	328	433	391
Kentucky	18	35	28	29	38	74	59	58
Louisiana	74	146	124	135	167	365	347	364
Texas	240	298	298	280	407	670	670	476
Oklahoma	68	90	90	81	125	207	202	122
Arkansas	89	140	133	136	211	378	359	367
New Mexico	677	646	852	632	1,265	1,389	1,369	1,327
Colorado	469	444	453	426	962	1,043	997	953
Utah	779	780	788	772	1,886	1,911	1,852	1,853
Idaho	371	324	324	310	545	567	535	542
Wyoming	671	650	696	682	1,061	1,202	1,253	1,159
Montana	746	780	819	868	3,038	3,198	3,440	3,819
California	256	303	291	282	640	773	728	705
Oregon	236	330	320	330	593	858	819	808
Washington	137	137	138	137	296	329	345	295
Nevada	155	186	181	206	446	474	489	587
Arizona								
Total	12,867	14,963	15,814	14,983	24,907	32,388	36,478	32,465

Bureau of Agricultural Economics.

Alfalfa Meal, Sun Cured and Dehydrated. Production by Groups of States and by Regions, 1941-1943

AAA regions 1/
Northeast and
East Central
South
North Central
West

1/ The Northeast region includes the New England States, New York, Pennsylvania, and New Jersey. The East Central region includes Delaware, Maryland, Virginia, West Virginia, North Carolina, Kentucky, and Tennessee. The South includes the Southern States, including Oklahoma and Texas. The North Central region includes the three Lake States, the five Corn Belt States, and South Dakota and Nebraska. North Dakota and Kansas are included in the Western region.

TABLE 19 (Continued)

States and regions	Firms reporting	Total			
		1941	1942	1943	
		Tons	Tons	First half	Second half
	Number	Tons	Tons	estimated	estimated
				Tons	Tons
N.Y., Pa., Md.	8	26,873	32,770	6,514	15,775
Miss., Ark.	9	11,350	17,740	9,158	4,615
Okla., Texas	6	25,249	26,091	11,596	12,527
Mich., Minn.	5	8,299	11,395	3,952	6,357
Ohio, Ind., Ill.	9	58,765	94,414	45,906	43,740
Iowa, Mo.	9	27,009	38,000	18,001	18,682
Nebr., Kans., Colo.	9	158,415	199,505	85,991	101,994
Idaho, Wash.	3	11,602	9,719	2,888	3,025
Ariz., Utah, Nev., N. Mex.	4	24,787	32,564	23,409	22,609
California	13	38,447	83,913	40,349	56,106
Total	75	390,796	546,111	247,764	285,430
AAA regions 1/ Northeast and					533,194
East Central	8	26,873	32,770	6,514	15,775
South	15	36,599	43,831	20,754	17,142
North Central	28	234,994	316,661	145,448	156,479
West	24	92,330	152,849	75,048	96,034
					22,289
					37,896
					301,927
					171,082

Bureau of Agricultural Economics.
Agricultural Adjustment Administration.

TABLE 20 (Continued)

States in which produced	States of destination 1/									
	Iowa, Mo.	N. Dak., S. Dak., Nebr., Kans.	Mont., Wyo., Colo.	Wash., Oreg., Idaho	Nev., Utah, Ariz., N. Mex.	California :	Total	Tons	Tons	Tons
N.Y., Pa., Md.							32,036			
Miss., Ark.	222	2,083					17,879			
Okla., Texas	741	205					26,010			
Mich., Minn.	879	220					10,597			
Ohio, Ind., Ill.	290	20	30	25			77,274			
Iowa, Mo.	(8,979)	145				25	35,553			
Nebr., Kans., Colo.	30,721	(45,168)	(8,754)	30	20		194,829			
Idaho, Wash.	1,010	725	185	(3,817)	575	1,869	9,619			
Ariz., Utah, Nev., N. Mex.	2,234	1,331		3,646	(925)	10,725	32,289			
California				2,458	35	(78,477)	81,585			
Total	45,076	49,897	8,969	9,976	1,555	91,096	519,784			

1/ Figures in parenthesis represent tons of feed used in the group of States in which the feed was mixed.

Bureau of Agricultural Economics.
Agricultural Adjustment Administration.

TABLE 21

Estimated Yields of Dried Vegetable ^WWastes

<u>Raw material</u>	<u>Yields, percent of raw material</u>	
	<u>Leaves</u>	<u>Leaves and stems</u>
Beet tops	6-8	12-15
Broccoli-leaf waste	7-8	13-16
Carrot tops	11-12	20
Kale	10	18
Lima bean leaf fraction (from viner apron)	23	28
Pea vines (from viner)	-	15-19
Turnip tops	6-8	15-17
Spinach	8	12

Based on results of preliminary pilot-plant tests at this Laboratory.

TABLE 22

Nutrients in Certain Dried Materials

Material	Protein		Crude Fiber		Fat		Carotene		Riboflavin	
	Leaves %	Stems %	Leaves %	Stems %	Leaves %	Stems %	Leaves Micrograms/gm.	Stems Micrograms/gm.	Leaves Micrograms/gm.	Stems Micrograms/gm.
Alfalfa	20	-	18	-	2.3	150	15	-	15	-
Beets	32	17	6	13	6	460	37	17	6	6
Broccoli	33	-	10	-	6	670	-	23	-	-
Cabbage (Savoy)	22	-	8	-	5	295	-	10	-	-
Carrots	18	10	9	17	4	274	122	9	6	6
Cauliflower	27	17	9	17	4	185	28	23	9	9
Kale	27	16	7	10	6	266	25	16	8	8
Lima beans	18	12	10	27	4	176	-	11	-	-
Rutabagas	31	18	6	15	6	257	13	21	8	8
Turnips	30	18	8	10	4	264	54	15	12	12
Spinach	32	22	7	9	4	314	120	15	8	8

Vegetable Wastes as Animal Feedstuffs, by E. G. Kelley and M. E. Wall. Feedstuffs, vol. 15, no. 26, p. 18, 1943.

TABLE 23

Estimated Feed Requirements and Supply for 1944

<u>Class of Livestock</u>	<u>Quantity Required for 1944 in 1000 Tons</u>			
	<u>Grains and millfeed</u>	<u>High protein feed</u>	<u>Total conc. feeds</u>	<u>Alfalfa hay</u>
Chickens	24,028	3,151	27,179	264.9
Others	107,652	10,963	118,615	452.5
Total	131,680	14,114	145,794	717.4
Available	117,226	10,580	127,806	
Shortage	14,454	3,534	17,988	
Per cent	11.0	25.0	12.3	

Feed Supply Still below Needs, 1944 Survey by Council Reveals, Feedstuffs, vol. 16, no. 6, p. 1, February 5, 1944.

TABLE 24

Production of Mixed Feed and Alfalfa Meal, 1941, 1942 and 1943

Feed	1941		1942		1943	
	Tons	%	Tons	%	first half	second half 1/
Poultry	5,768,291	7.684,525	57.6	57.6	6,174,239	-
Dairy	2,856,225	3,484,367	26.1	26.1	2,641,812	-
Other	1,419,999	2,184,503	16.3	16.3	1,709,818	-
Total	10,034,225	13,353,395	100.0	100.0	10,525,869	-
Alfalfa meal	389,396	546,111	4.1	4.1	247,764	285,430

1/ Estimated.

TABLE 25

Distribution of Mixed Feed and Alfalfa Meal, 1942

Area of destination	Mixed Feed				Alfalfa Meal	
	Poultry		Dairy		Total	
	Tons	%	Tons	Other Tons	Tons	%
Northeast	2,098,580	28.2	1,297,634	359,289	3,755,503	90,823 17.5
North Central	1,679,693	22.6	575,522	1,063,659	3,318,874	206,074 39.8
Southern	2,637,265	35.5	1,010,537	899,423	4,547,225	109,178 21.1
Western	1,009,368	13.6	183,865	147,396	1,340,629	111,596 21.6
Unknown	4,148	.1	9,278	62,075	75,501	-
Total	7,429,054	100.0	3,076,836	2,531,842	13,037,732	517,671 100.0
Percent	57.0		23.6	19.4	100.0	4.0

Commercial Feed Production, Feedstuffs, December 25, 1943.

TABLE 26

Number of Chickens in the United States, 1942 and 1943 (Thousands)

State	1942	1943	State	1942	1943
Maine	2,250	2,606	Virginia	9,604	10,215
New Hampshire	1,874	2,099	North Carolina	12,068	14,156
Vermont	960	1,134	South Carolina	4,978	5,476
Connecticut	2,997	3,417	Georgia	9,159	10,244
Massachusetts	4,435	5,094	Florida	2,657	2,970
Rhode Island	504	548	Alabama	9,136	10,190
New York	14,331	16,218	Mississippi	8,569	9,705
Pennsylvania	20,547	23,346	Tennessee	11,446	13,562
New Jersey	7,717	8,984	Kentucky	12,258	14,517
West Virginia	4,426	4,937	Louisiana	6,105	6,801
Delaware	1,304	1,322	Texas	31,681	36,975
Maryland	4,193	4,412	Oklahoma	13,417	15,930
Ohio	22,711	24,578	Arkansas	9,719	10,929
Wisconsin	16,919	18,471	New Mexico	1,227	1,565
Illinois	23,707	26,832	Colorado	3,918	4,585
Indiana	16,545	18,645	Utah	2,505	2,663
Michigan	13,125	14,088	Idaho	2,607	2,816
Missouri	25,444	28,558	Wyoming	875	1,007
Kansas	17,264	20,338	Montana	2,297	2,661
Iowa	36,912	41,016	California	16,688	17,765
Nebraska	15,338	19,308	Oregon	3,710	4,039
Minnesota	24,342	29,297	Washington	6,698	6,979
North Dakota	5,580	7,083	Nevada	284	284
South Dakota	9,197	10,964	Arizona	678	778
			Total	474,910	540,107

Bureau of Agricultural Economics.

COMMERCIAL PRODUCTION OF 26 TRUCK CROPS

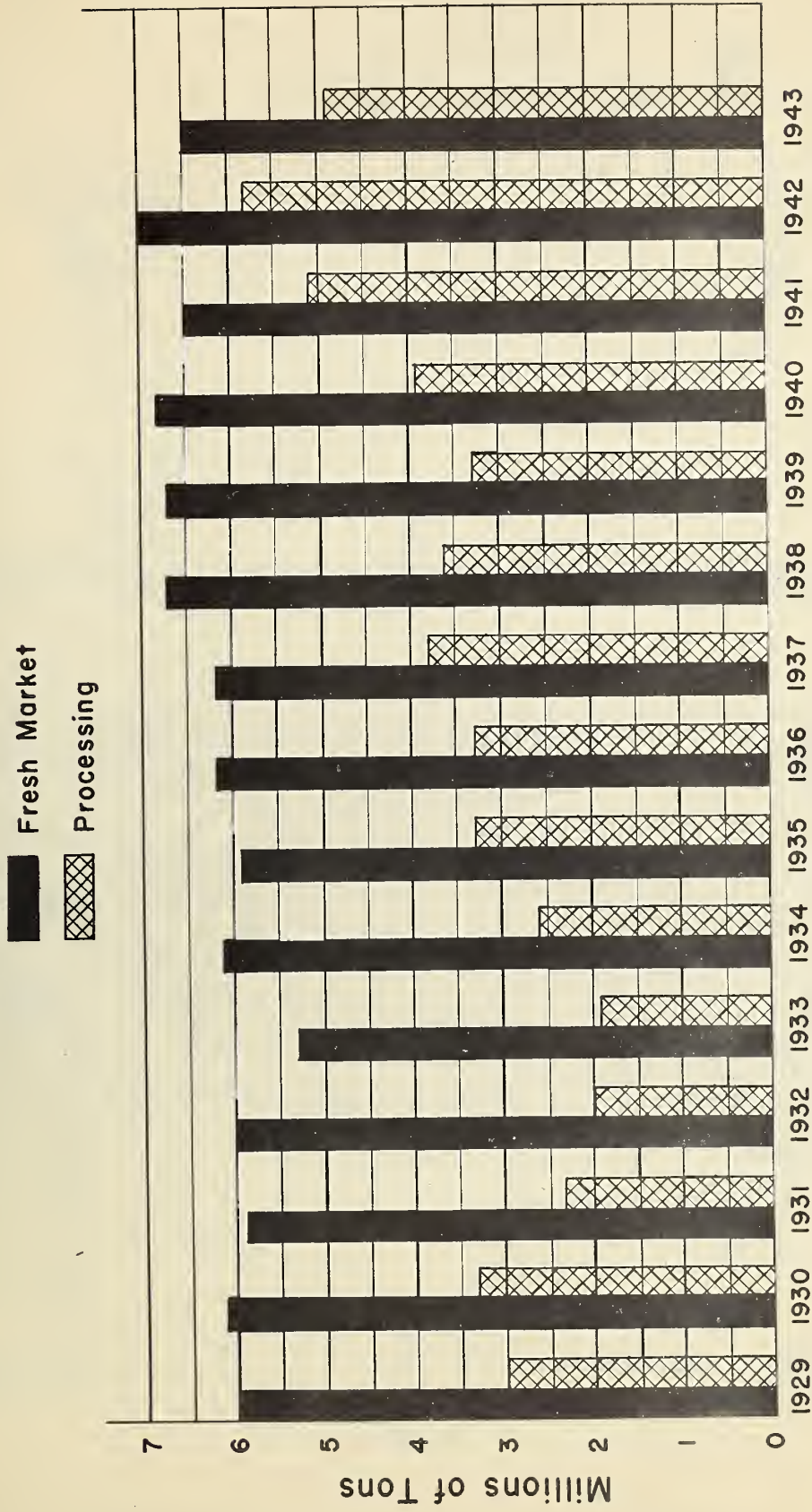


Figure 1

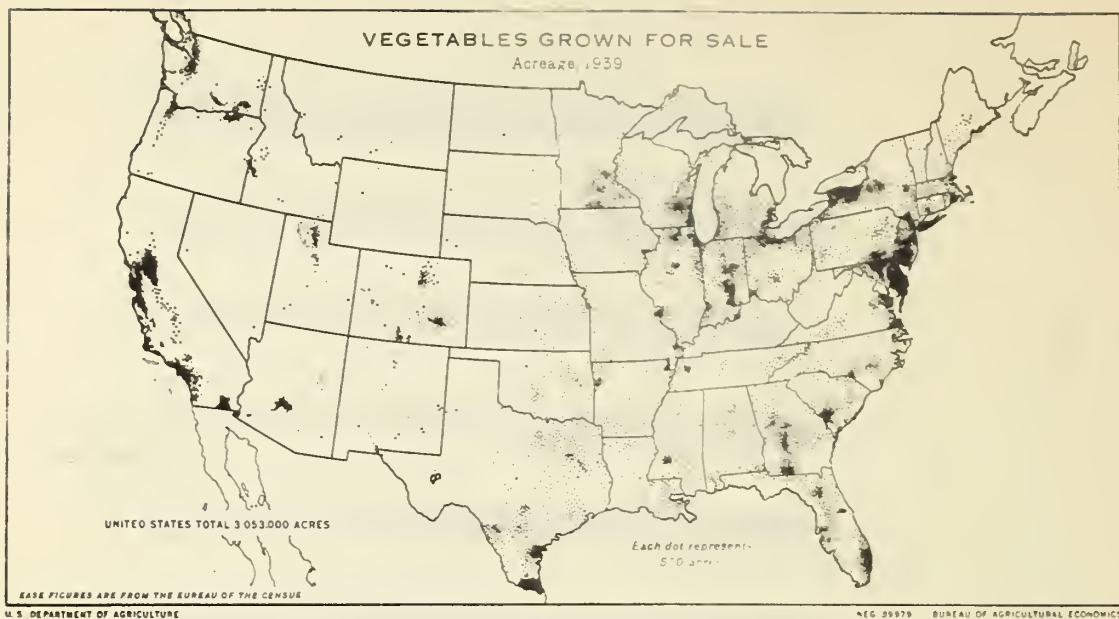


Fig.2

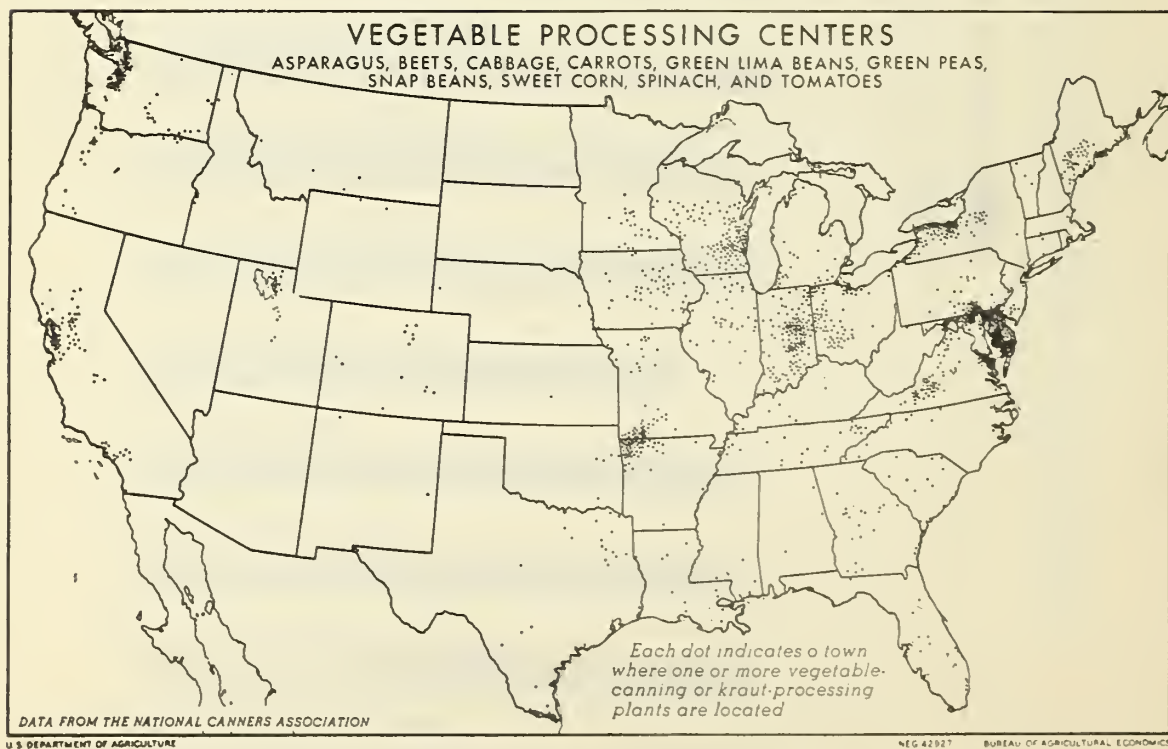


Fig.3

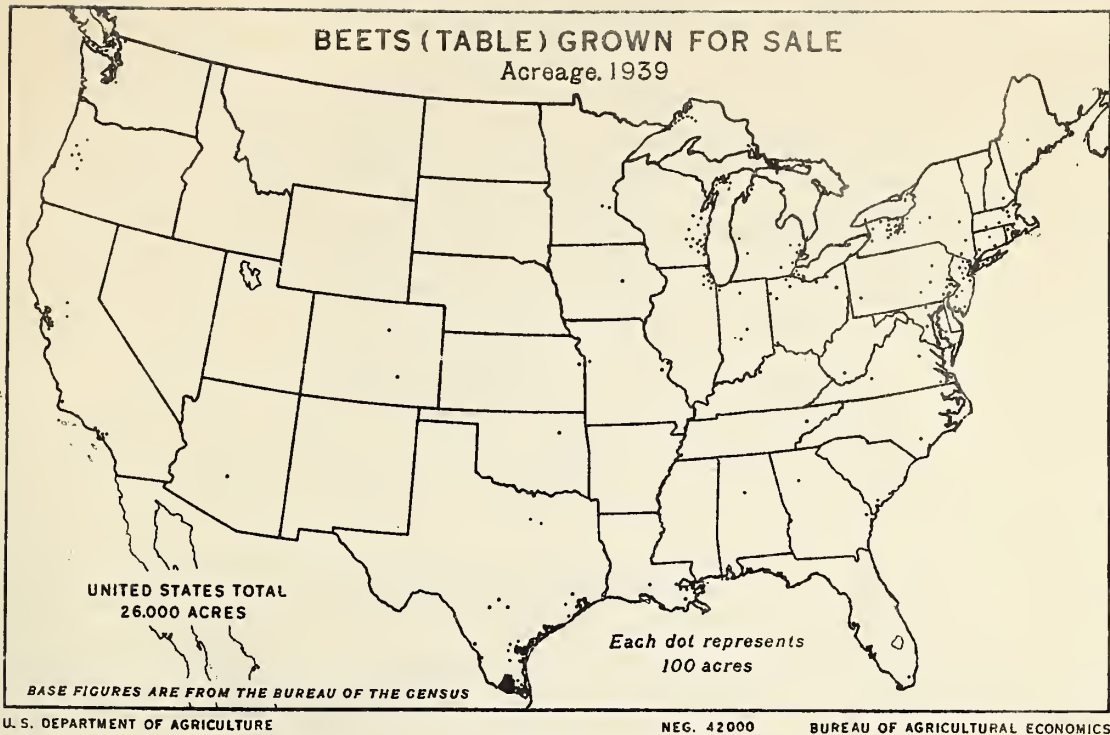


Fig.4

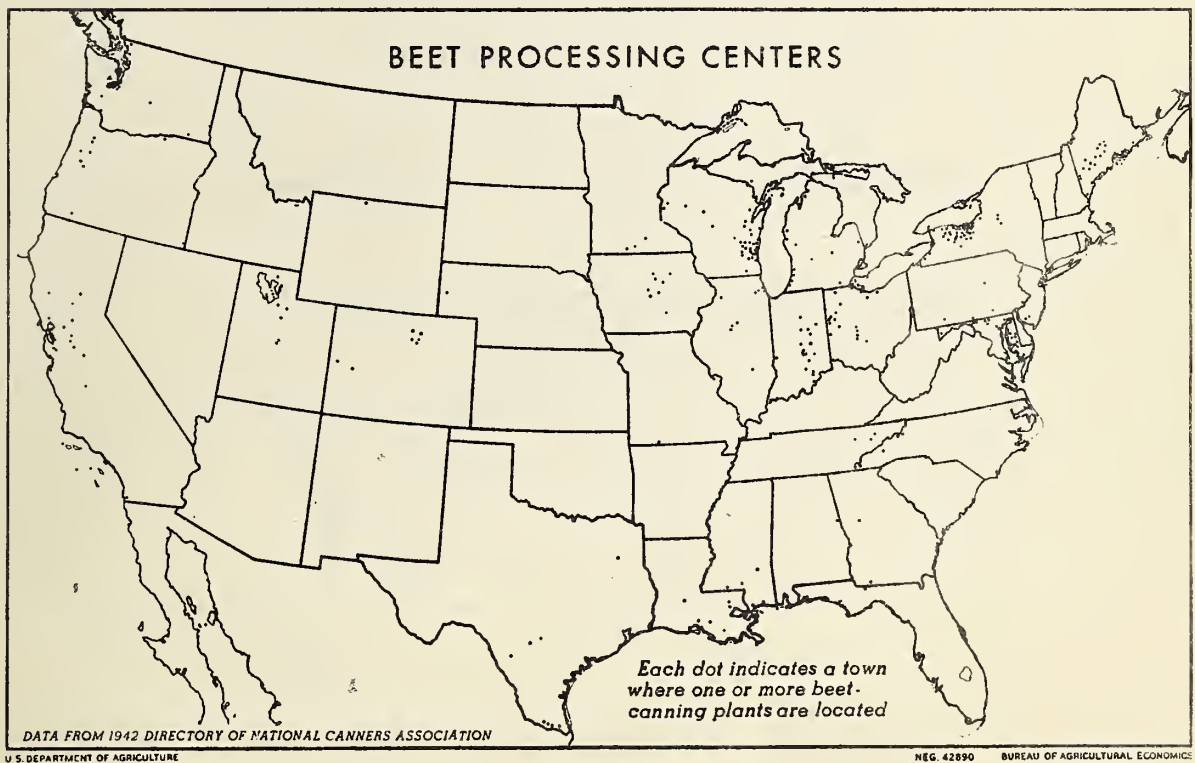


Fig.5

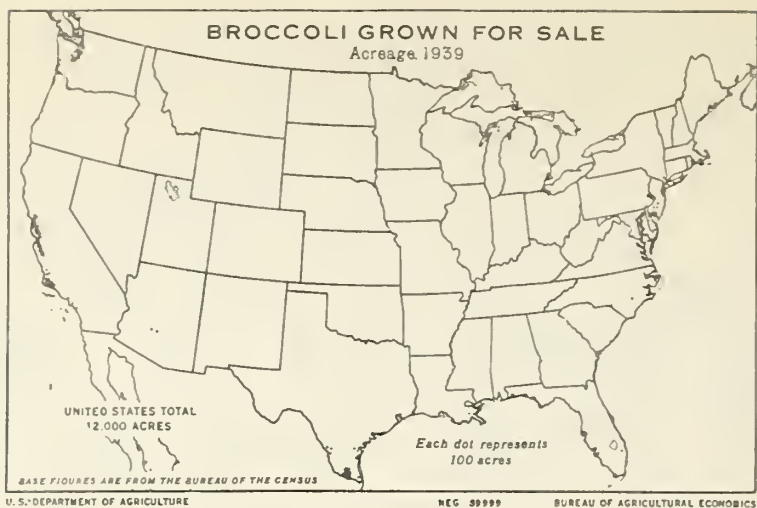


Fig.6

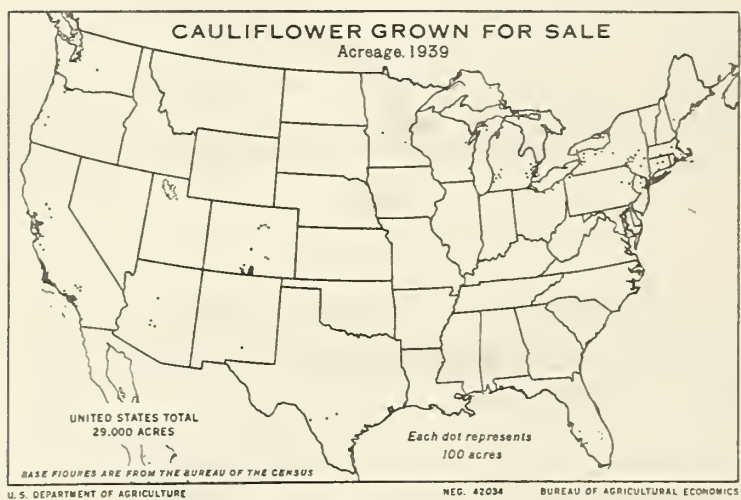


Fig.7

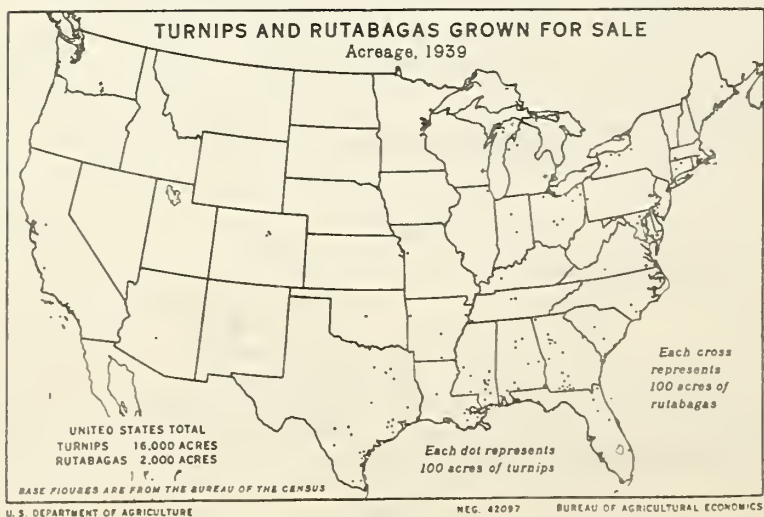


Fig.8

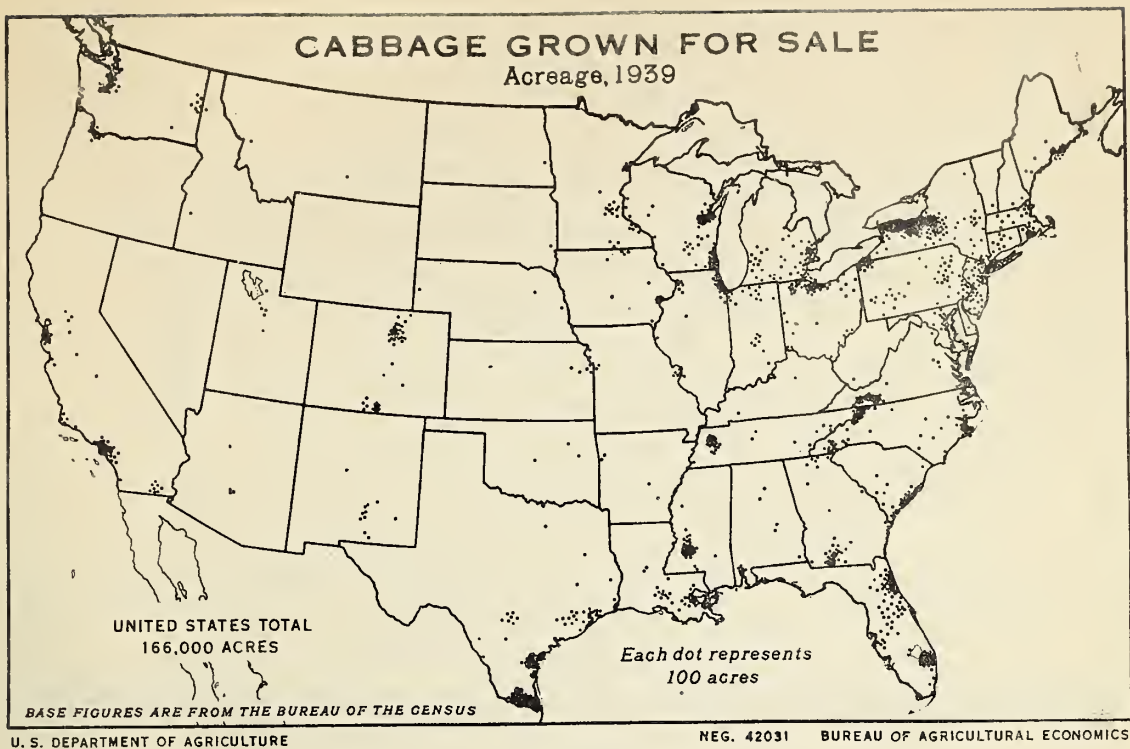


Fig.9

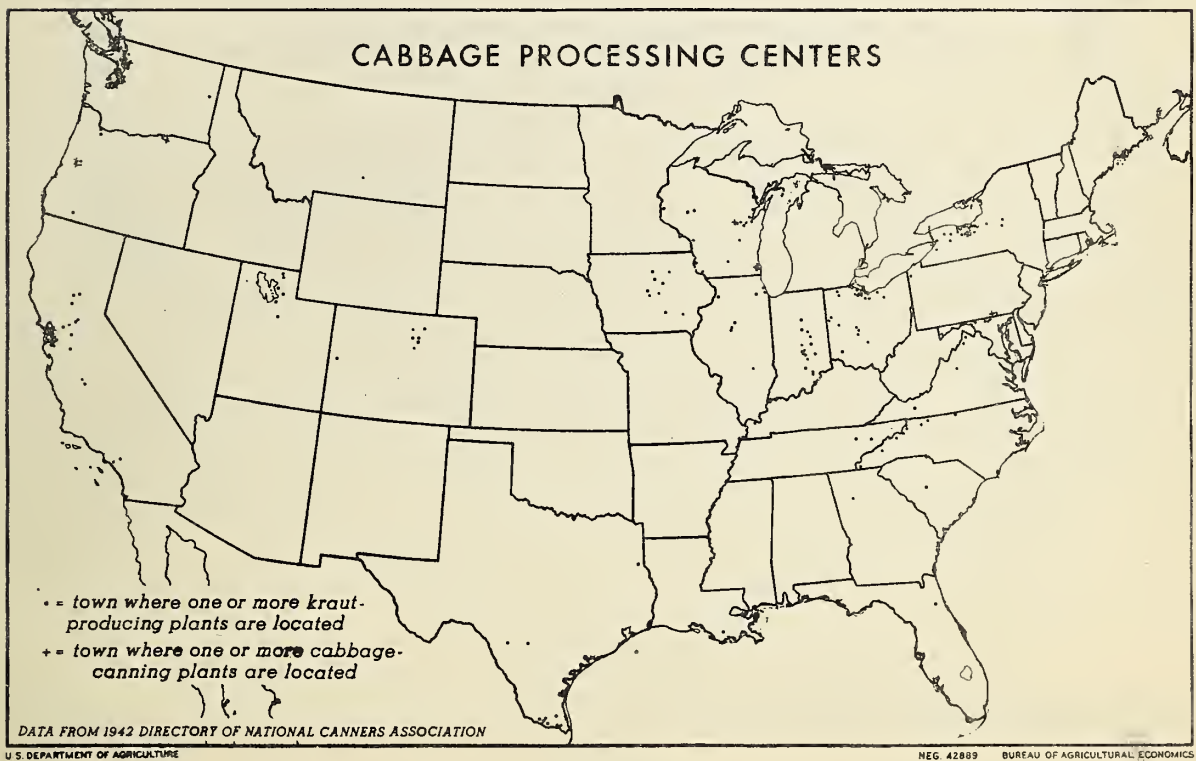


Fig.10

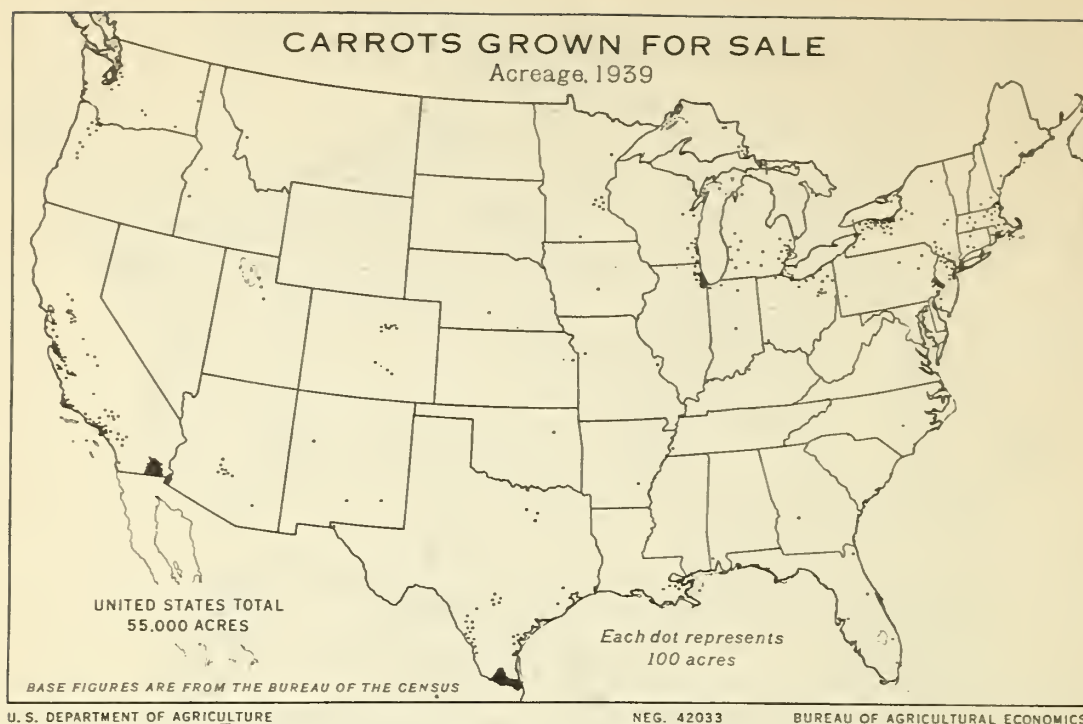


Fig. 11

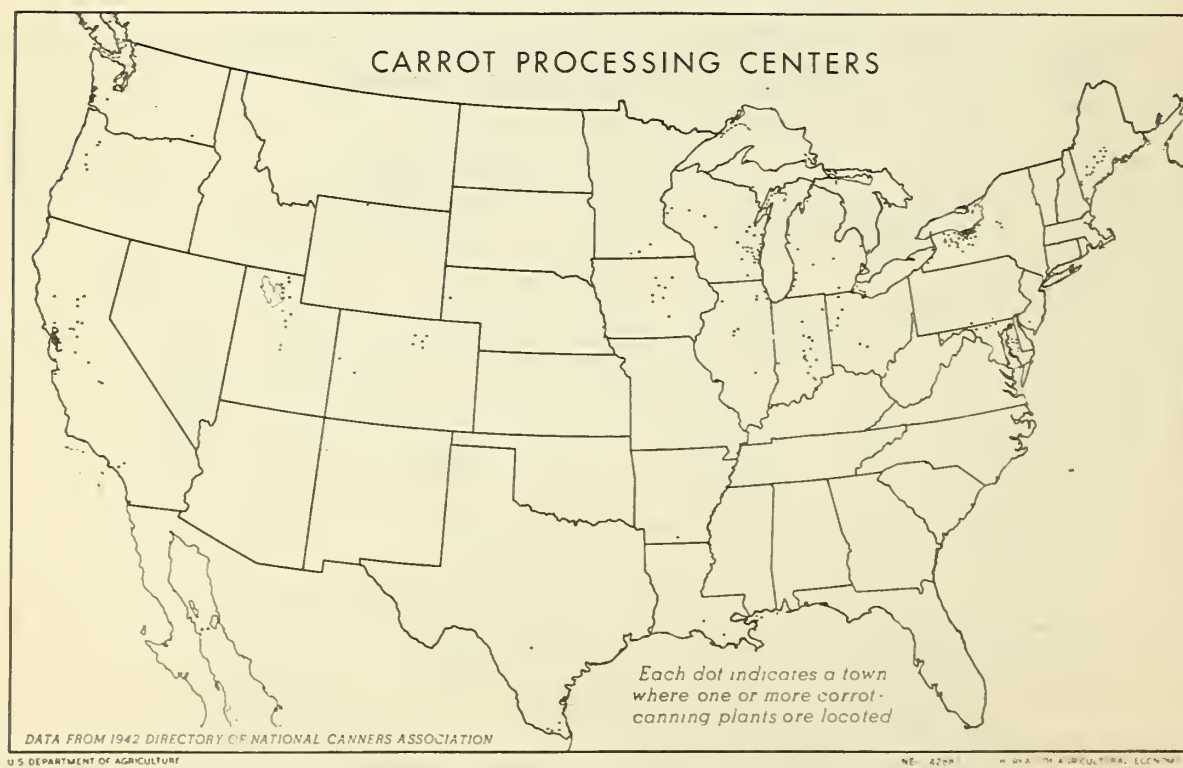


Fig. 12

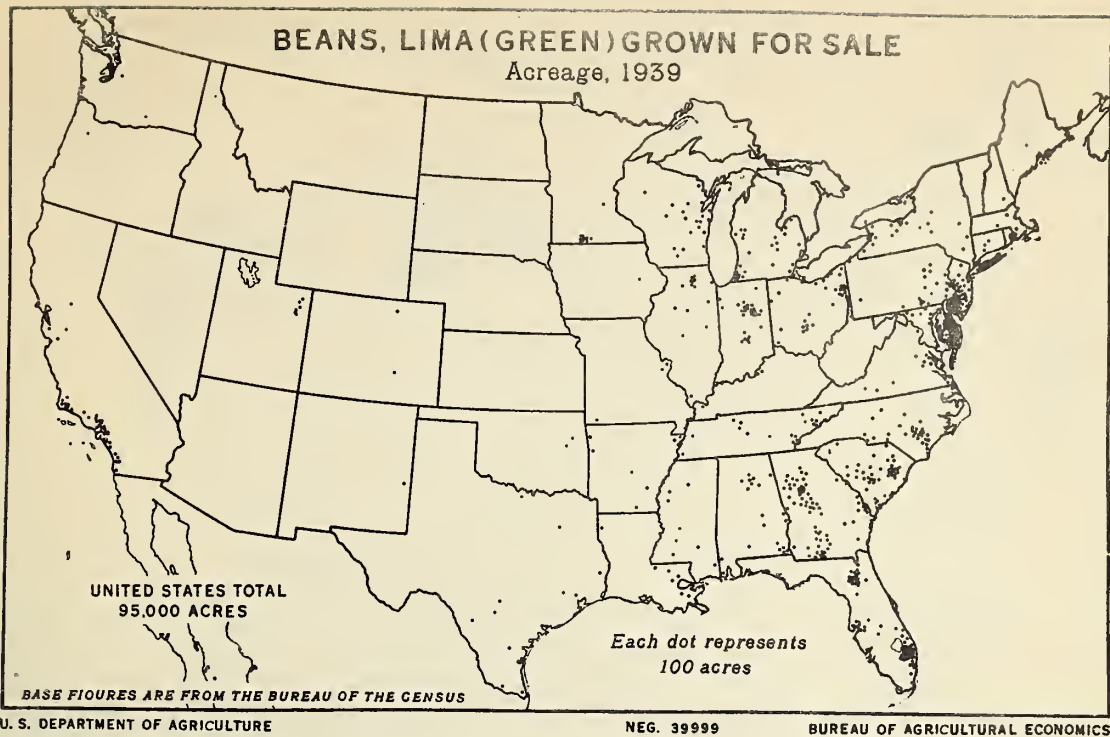


Fig.13

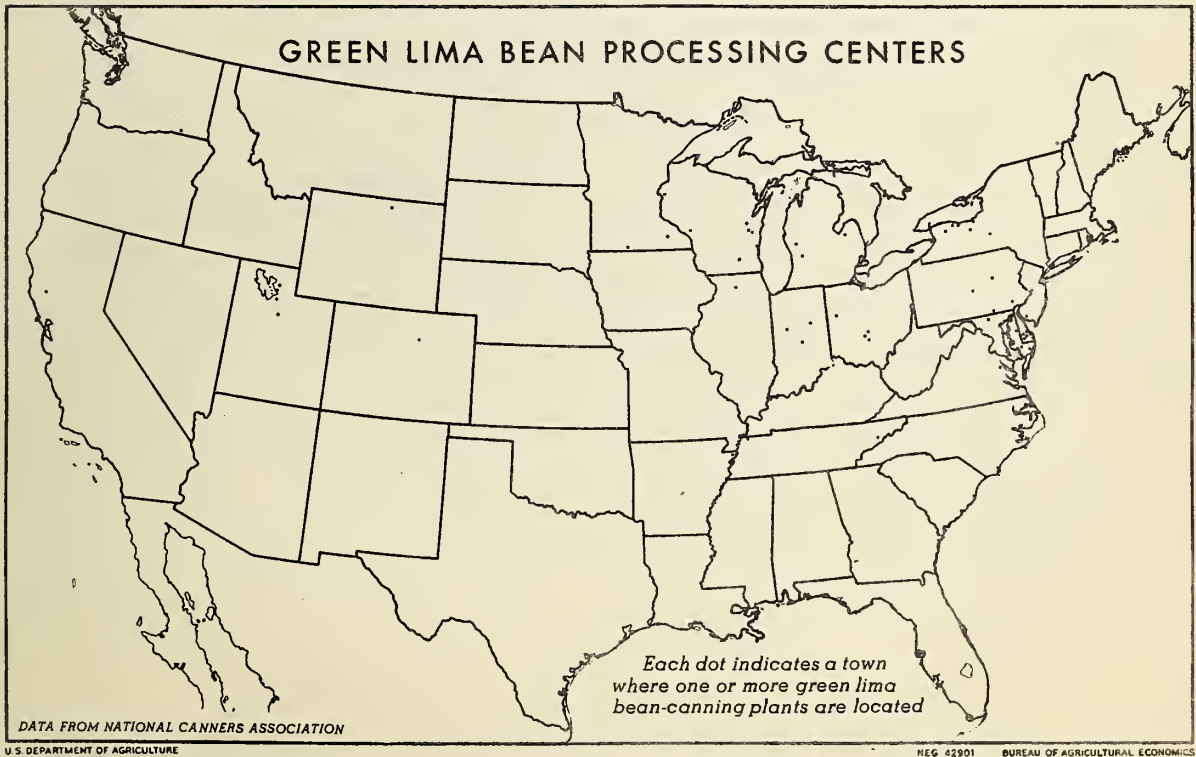


Fig.14

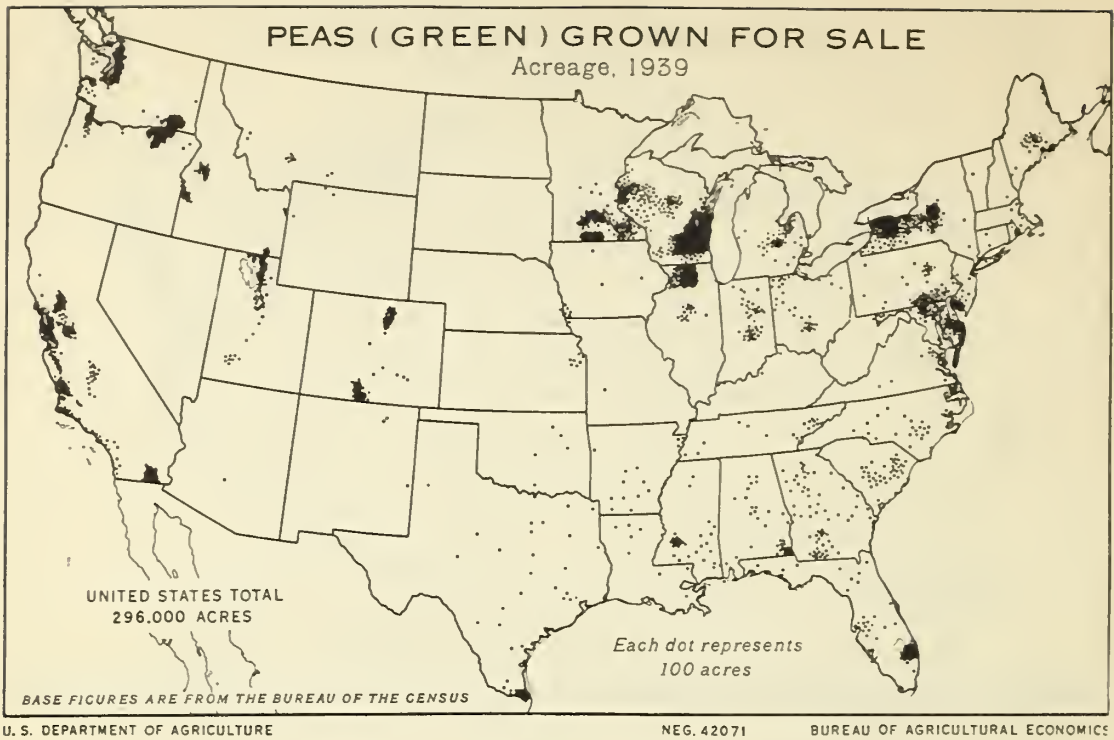


Fig.15

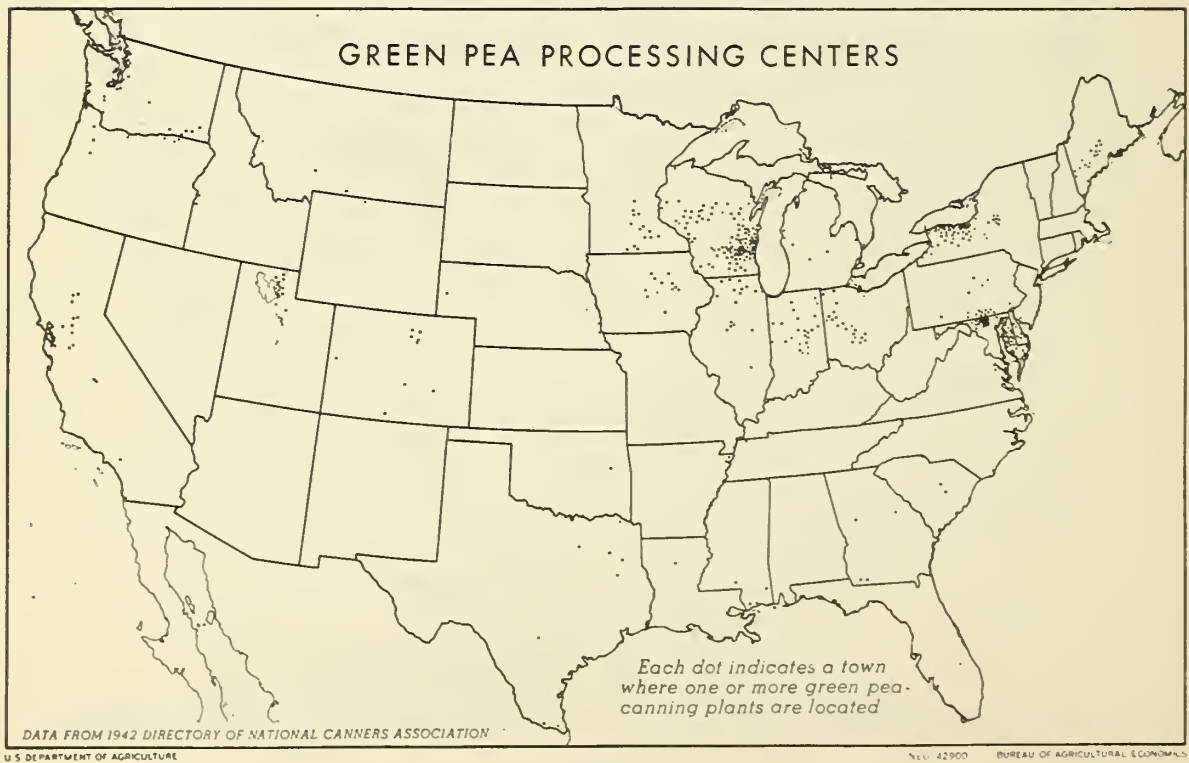


Fig.16

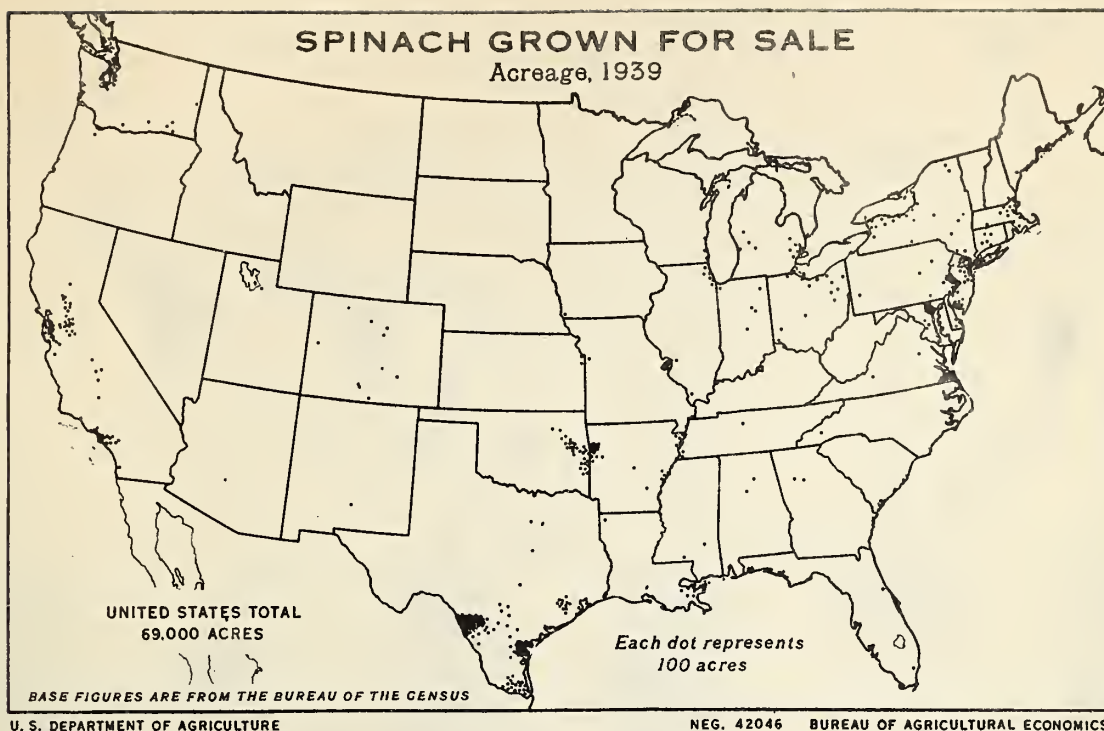


Fig. 17

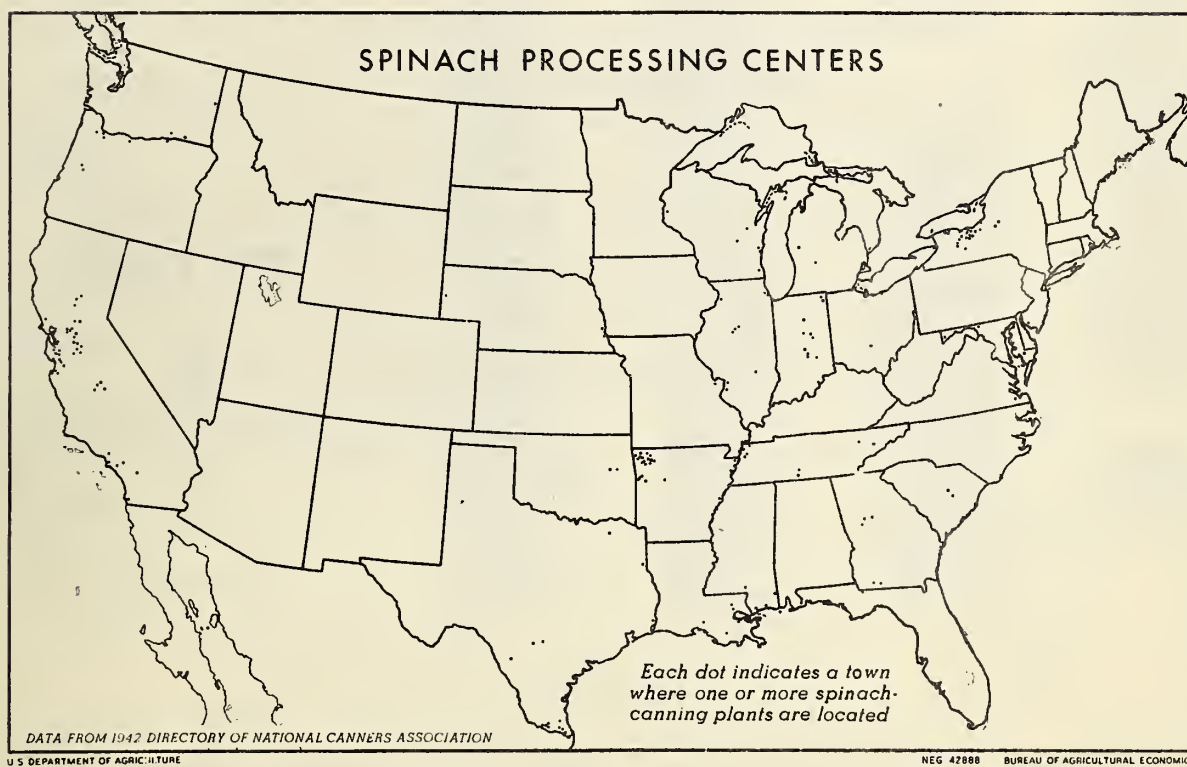


Fig. 18

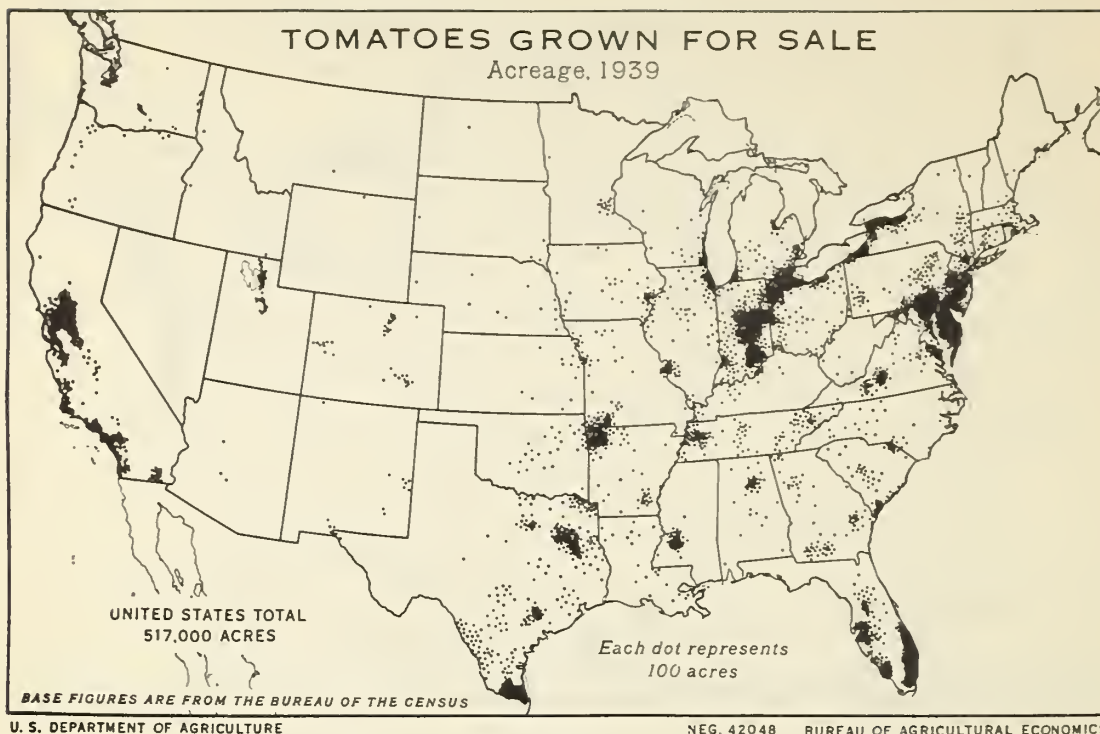


Fig.19

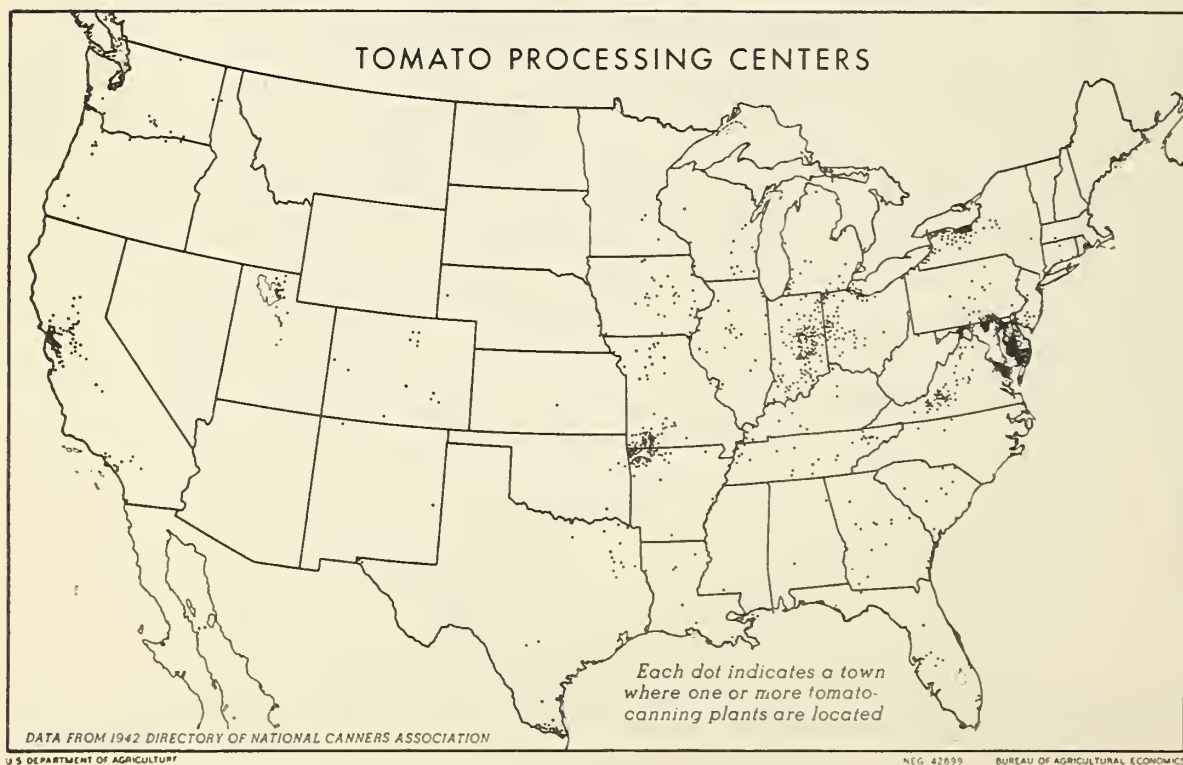


Fig.20

METHODS OF PROCESSING

	Fresh Packed		Canned		Dehydrated		Frozen
Beets							
Broccoli							
Cabbage							
Carrots							
Cauliflower							
Kale							
Lima Beans							
Peas							
Rutabagas & Turnips							
Spinach							
Tomatoes							

Fig. 21

SEASONAL AVAILABILITY OF CROPS

NORTHEAST

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Cauliflower												
Kale												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 22

MIDWEST

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Cabbage												
Carrots												
Lima Beans												
Spinach												
Tomatoes												

Fig 24

SOUTHWEST

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Cauliflower												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 26

GREAT LAKES

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Cauliflower												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 23

SOUTHERN

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Kale												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 25

ROCKY MOUNTAINS

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Cauliflower												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 27

PACIFIC

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Brccoli												
Cabbage												
Carrots												
Cauliflower												
Lima Beans												
Peas												
Rutabagas & Turnips												
Spinach												
Tomatoes												

Fig 28

OPENING AND CLOSING DATES OF PACKING SEASON

NEW YORK

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Cabbage												
Carrots												
Peas												
Spinach												
Tomatoes												

Fig 29

MARYLAND

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Cabbage												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig-30

PENNSYLVANIA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lima Beans												
Peas												
Tomatoes												

Fig-31

OHIO

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Cabbage												
Peas												
Tomatoes												

Fig-32

NEW JERSEY

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig-33

WISCONSIN

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Cabbage												
Carrots												
Peas												
Spinach												
Tomatoes												

Fig-34

DELAWARE

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lima Beans												
Peas												
Tomatoes												

Fig-35

ILLINOIS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lima Beans												
Peas												
Tomatoes												

Fig-36

INDIANA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Beets												
Cabbage												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig-37

VIRGINIA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig-38

OPENING AND CLOSING DATES OF PACKING SEASON

MISSOURI

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Peas												
Spinach												
Tomatoes												

Fig-39

MICHIGAN

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Cabbage												
Carrots												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig-41

KANSAS

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Peas												
Spinach												
Tomatoes												

Fig-43

UTAH

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Cabbage												
Carrots												
Lima Beans												
Peas												
Tomatoes												

Fig-45

WYOMING

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Carrots												
Lima Beans												
Peas												
Tomatoes												

Fig-47

TENNESSEE AND KENTUCKY

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Cabbage												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig 40

ARKANSAS

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Lima Beans												
Spinach												
Tomatoes												

Fig 42

COLORADO

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Cabbage												
Peas												
Tomatoes												

Fig-44

CALIFORNIA

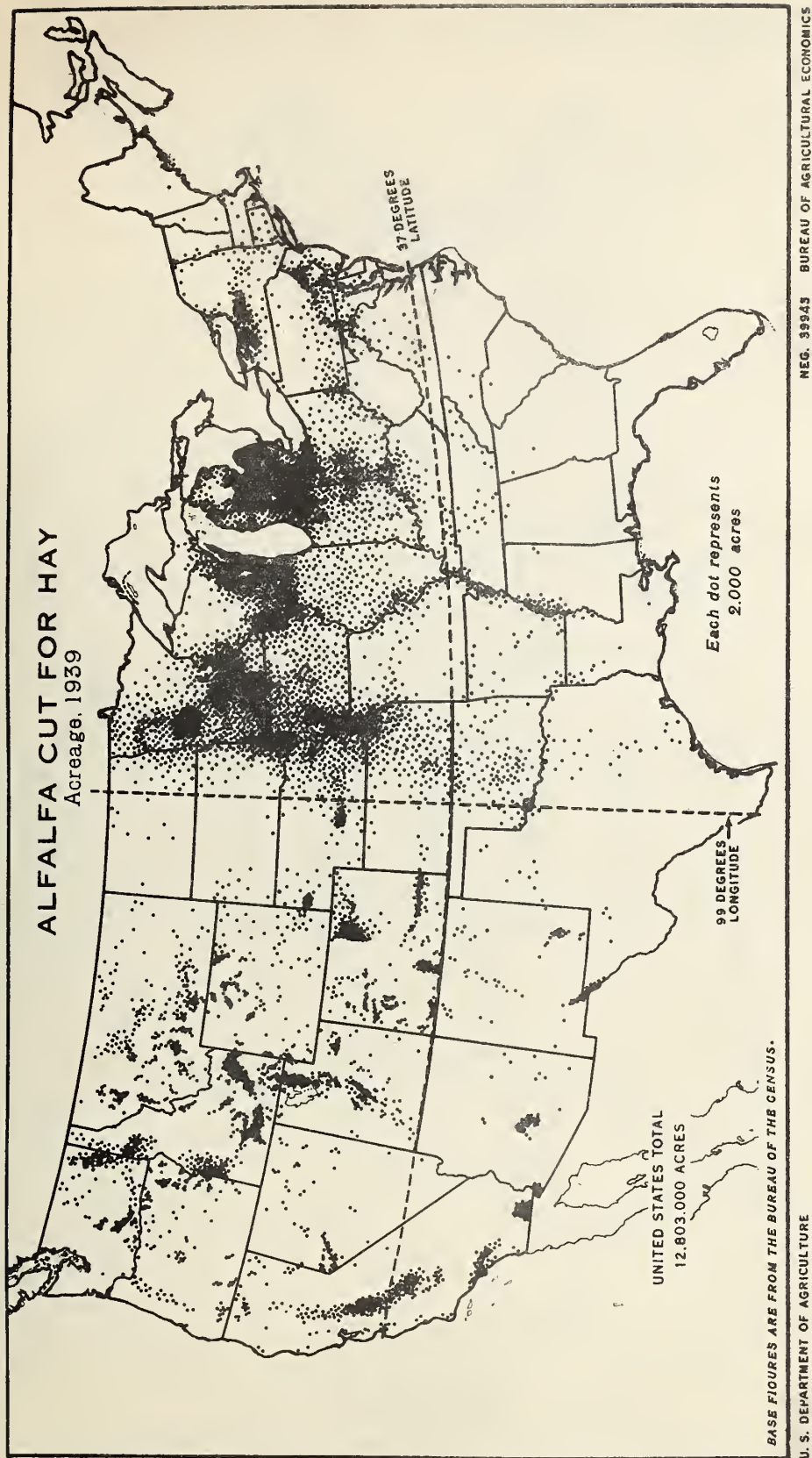
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Lima Beans												
Peas												
Spinach												
Tomatoes												

Fig 46

OREGON AND WASHINGTON

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Beets												
Cabbage												
Carrots												
Peas												
Spinach												
Tomatoes												

Fig 48



NEG. 39943 BUREAU OF AGRICULTURAL ECONOMICS

Fig. 50

FORAGE DRIER DISTRIBUTION

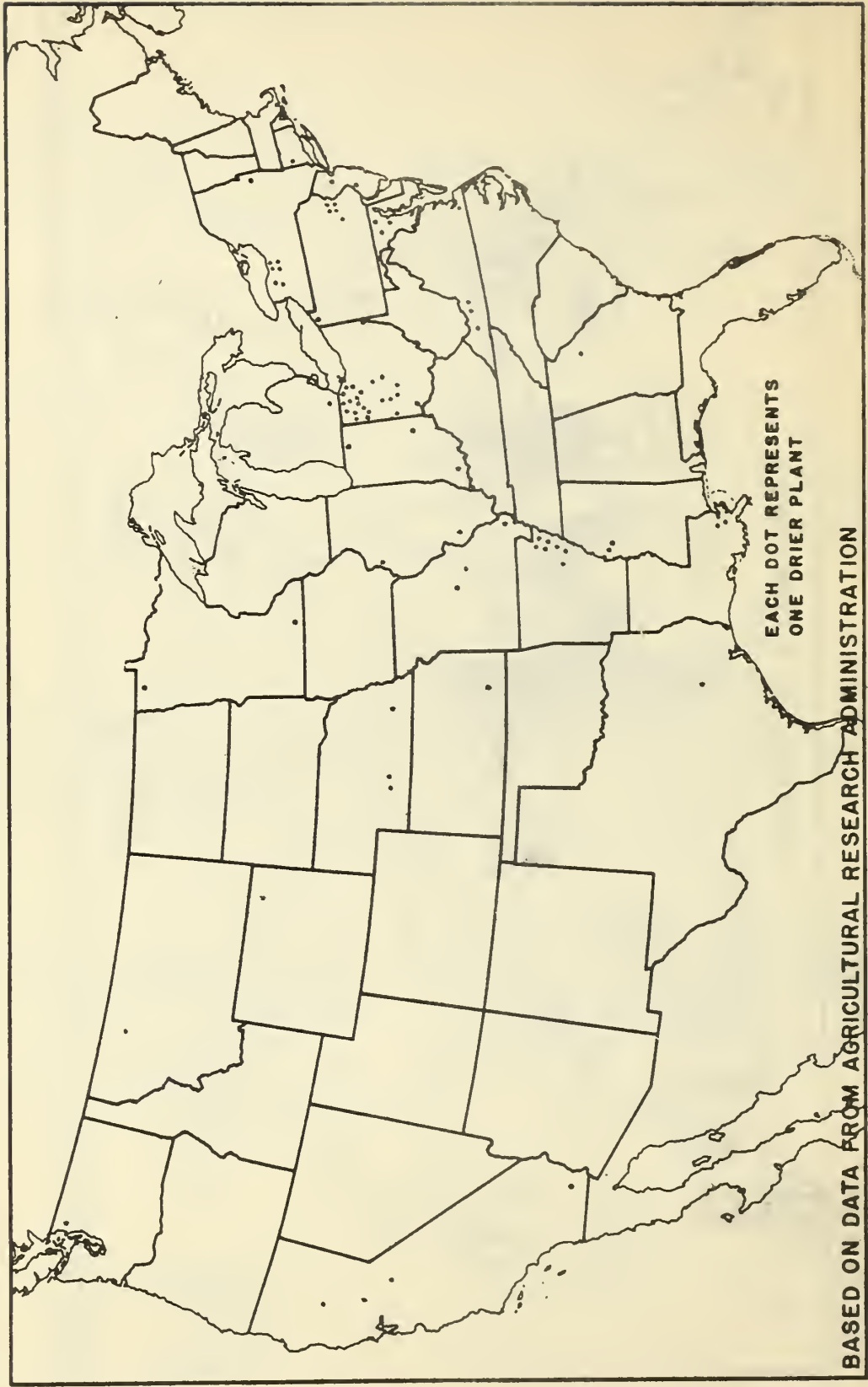


Fig. 49

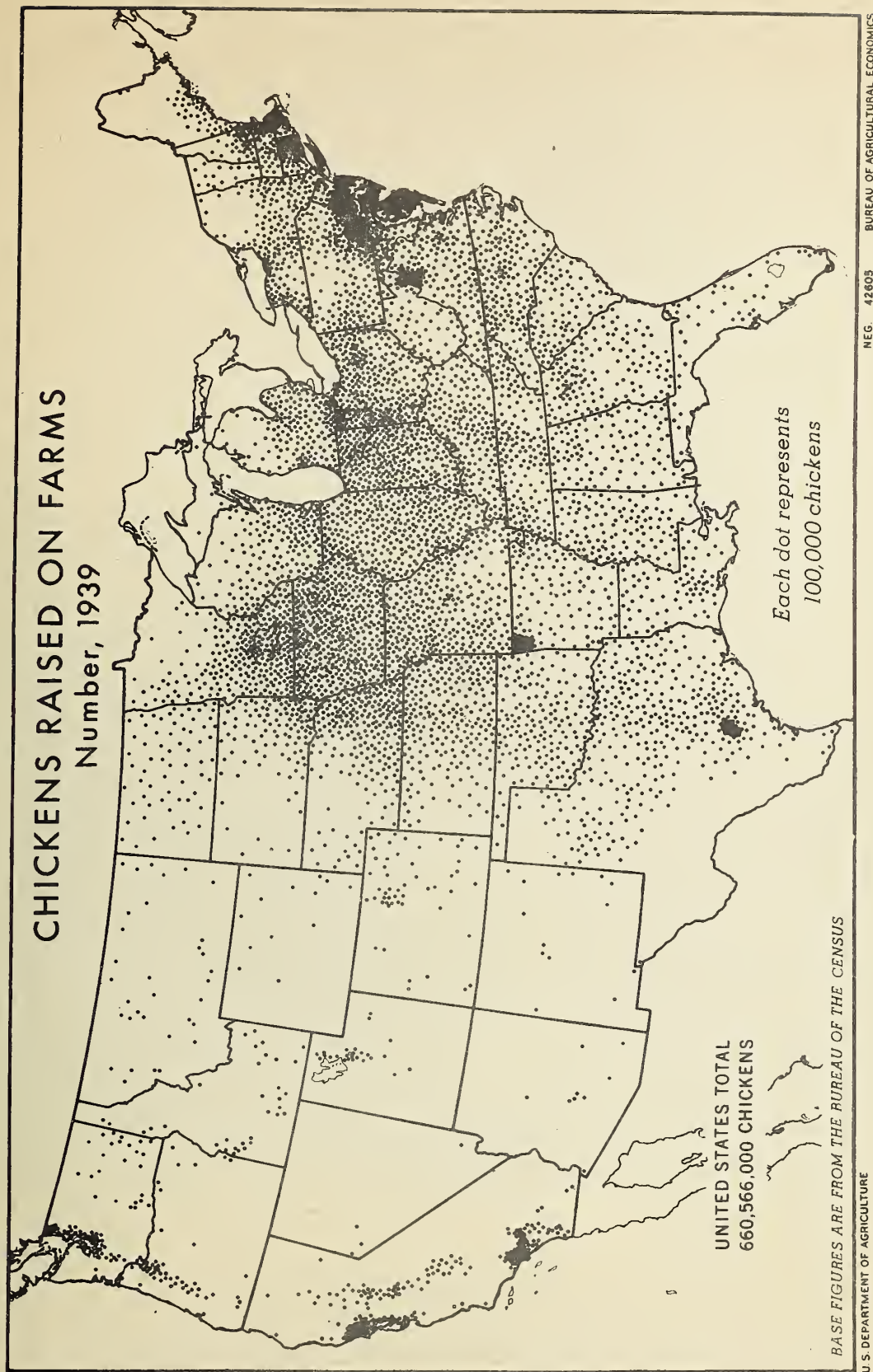


Fig. 51

