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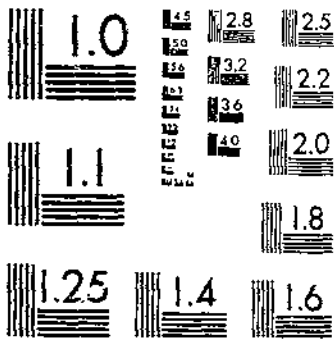
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CORN GROWING PRACTICES, 1965

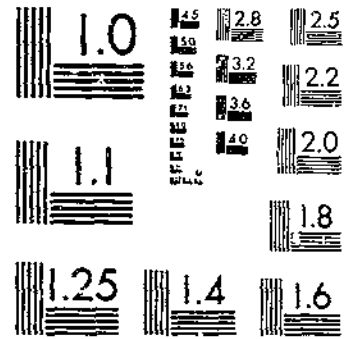
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MICROCOPY RESOLUTION TEST CHART  
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# Corn

GROWING PRACTICES  
1965

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## SUMMARY

In 1965, 65.1 million acres of corn were planted for all purposes in the 48 States. Of this acreage, 85 percent was harvested for grain, 12 percent was harvested for silage, and the remainder was used for forage or abandoned. Yield of corn for grain averaged 74 bushels per acre.

Preparation of soil before planting seed is one of the basic operations to insure good corn production. Ninety percent of the acreage planted to corn for all purposes was plowed and 90 percent was disked or harrowed before planting (not always the same acreage), with an average of 1.9 times over the field for disking and harrowing.

Fifty-four percent of all corn planted was drilled; 28 percent was hill-dropped; 1 percent was check-row planted. The other 17 percent was planted in a combination of tilling and planting operations or the planting pattern was not specified. Density of plants and average row widths on sample plots, together with definitions of other special tillage operations, are included in the appendix.

Ninety-seven percent of the acreage in the 48 States was cultivated, with an average of 2.1 times over the field. Where chemical treatment was used for the control of weeds and insects, the average number of times of cultivation was reduced from 2.4 to 1.9.

About 23 percent of the corn planted received preemergence chemical treatment for weed control and about 32 percent received postemergence treatment. Nearly one-third of all corn planted was treated with chemicals for control of insects. Each State reported some kind of chemical treatment.

Stalks were chopped or shredded on 43 percent of the acreage harvested for grain; 52 percent was disked, and on 5 percent, stalks were left standing.

## CORN GROWING PRACTICES, 1965

by

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### INTRODUCTION

This publication shows, in statistical form, the extent of and differences in corn growing practices in the 48 States, by State and region. The data are based on information furnished to the Statistical Reporting Service, U.S. Department of Agriculture, by farmers serving as voluntary crop reporters. A questionnaire was mailed in February 1966 and 24,000 useable reports were received.

The reporters were asked about their preparation of soil before planting, methods of planting, tillage and planting in one operation, frequency of cultivation, pre- and postemergence treatment with chemicals for weed control, treatment of soil and plants for insect control, and methods of disposing of stalks on fields where corn was harvested for grain.<sup>1/</sup>

Data for each State were tabulated in seven size-of-farm groups, making possible the weighting of sample results by the number of farms in each group in each State as enumerated by the 1964 Census of Agriculture. Data are shown separately for each State for which the sample appeared statistically significant, otherwise State data are combined.

Several methods are reported for preparation of seedbeds and planting of seed. The effect of the use of chemicals for the control of weeds and insects on the frequency of cultivation of plants is shown.

Planted and harvested acreage, as well as density of plants and row spacing in sample plots, were reported in annual reports of the Crop Reporting Board of the Statistical Reporting Service and are given as supplementary statistics.

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<sup>1/</sup> See questionnaire, p. 18.

## ACREAGE OF CORN PLANTED AND HARVESTED, 1965

Corn planted for all purposes in the 48 States totaled 65.1 million acres in 1965 and corn acreage harvested totaled 64.6 million. About 86 percent of the acreage harvested was corn for grain. About 12 percent was used for silage and 2 percent for other forage purposes (table 1). Among the regions, distribution of acreage planted for all purposes varied slightly from acreage harvested. About 49 percent of both planted and harvested corn was in the Corn Belt, 16 percent in the Lake States, 15 percent in the Northern Plains, and 20 percent in other regions.

Production of corn for grain amounted to 4,084 million bushels or 74 bushels per acre. Of this amount, about 51 percent was used as feed and seed on the farms where grown.<sup>2/</sup>

### PREPARATION OF SOIL BEFORE PLANTING

The extent of soil preparation before planting is related to texture and moisture content of soil, amount of residue left from preceding crops, slope of terrain (and the related risk of wind or water erosion), as well as methods and machines used in planting operations. Routine planting usually requires a thorough preparation of the seedbed, which may involve chopping or shredding stalks, plowing, and disking or harrowing.

About 90 percent of all acreage planted to corn was plowed before planting (table 2). In the Northeast, 97 percent of the ground was plowed and in the Lake States, Corn Belt, and Appalachian regions about 95 percent was plowed. In the Northern Plains, 68 percent was plowed; Southeast, 88 percent; Delta States, 87 percent; Southern Plains, 92 percent; Mountain States, 88 percent; and the Pacific region, 65 percent.

Disking and harrowing were common in each of the regions. These practices ranged from 81 percent of acreage planted in the Northern Plains to 95 percent in the Delta States and the Pacific region. For the 48 States, the proportion was 90 percent of all acreage planted, the same as the proportion plowed but not always the same acreages.

The average number of times over a field for disking and harrowing ranged from 1.6 in Florida and Missouri to 2.6 in Louisiana. The average for the 48 States was 1.9

### PLANTING PRACTICES

Only 16 percent of the corn acreage in the 48 States was planted in the Appalachian, Southeast, Delta, and Southern Plains States. Therefore, the summaries of crop reports for these States do not reflect the proportions planted by various methods as accurately as those in the more important corn-producing States. A higher proportion was reported as hill-dropped and a correspondingly lower proportion was reported as drilled. This area was combined with the western States and shown as Other States in table 3. About 53 percent of the corn planted in the 25 States was drilled,

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<sup>2/</sup> Crop Reporting Board, Statistical Reporting Service, U.S. Dept. Agr., Field and Seed Crops, CR-PR 1 (66), May 1966.



Table 1.--Acreage of corn planted, acreage harvested for grain, silage, and other uses, by State and region, 1965

State and region	Planted, all purposes	Harvested			
		Total	For grain	For silage	Other uses <sup>1/</sup>
		1,000 acres	1,000 acres	1,000 acres	1,000 acres
New England-----	153	152	4	148	---
New York-----	701	692	200	475	17
New Jersey-----	116	115	62	50	3
Pennsylvania-----	1,225	1,216	920	387	9
Delaware-----	210	209	199	9	1
Maryland-----	565	564	474	86	4
Northeast-----	2,970	2,968	1,752	1,155	34
Michigan-----	1,945	1,920	1,481	404	35
Wisconsin-----	2,638	2,617	1,606	963	48
Minnesota-----	5,626	5,513	4,280	1,171	62
Lake States-----	10,209	10,050	7,367	2,538	145
Ohio-----	3,308	3,295	3,054	228	13
Indiana-----	4,867	4,858	4,701	140	17
Illinois-----	10,079	10,059	9,777	262	20
Iowa-----	10,467	10,457	9,933	466	58
Missouri-----	3,237	3,140	2,947	162	36
Corn Belt-----	31,958	31,809	30,406	1,252	144
North Dakota-----	904	886	196	558	132
South Dakota-----	3,433	3,398	2,361	886	151
Nebraska-----	3,873	3,830	3,565	222	43
Kansas-----	1,289	1,261	1,050	198	43
Northern Plains-----	9,499	9,372	7,172	1,864	339
Virginia-----	668	667	494	164	9
West Virginia-----	87	86	58	26	2
North Carolina-----	1,477	1,470	1,316	121	33
Kentucky-----	1,157	1,149	1,049	87	13
Tennessee-----	900	895	792	81	22
Appalachian-----	4,289	4,267	3,709	479	79
South Carolina-----	444	441	387	24	30
Georgia-----	1,598	1,585	1,368	47	170
Florida-----	455	445	352	11	82
Alabama-----	1,038	1,033	938	36	59
Southeast-----	3,535	3,504	3,045	118	341
Mississippi-----	563	555	508	30	17
Arkansas-----	110	109	98	8	3
Louisiana-----	213	209	182	14	13
Delta States-----	886	873	788	52	33
Oklahoma-----	66	64	52	9	3
Texas-----	654	650	587	41	22
Southern Plains-----	720	714	639	50	25
Montana-----	65	62	3	44	15
Idaho-----	82	80	20	58	2
Wyoming-----	31	50	14	27	9
Colorado-----	414	395	192	187	16
New Mexico-----	35	34	15	17	2
Arizona-----	33	33	20	11	2
Utah-----	41	40	3	34	3
Nevada-----	6	6	---	6	---
Mountain-----	727	700	267	384	63
Washington-----	61	61	23	35	3
Oregon-----	38	37	13	22	2
California-----	227	227	144	79	4
Pacific-----	326	325	180	136	9
48 States-----	65,119	64,565	55,332	8,035	1,298

<sup>1/</sup> Includes forage; corn hogged, grazed, and that cut and fed without removing ears.

Source: Crop Reporting Board, Statistical Reporting Service, U.S. Dept. Agr., Crop Production, 1966 Annual Summary, CR-PR 2-1 (66), Dec. 20, 1966.

Table 2.--Preparation of soil before planting corn, by State and region, 1965

State and region	Planted, all purposes	Preparation of soil before planting corn		
		Plowed	Disked, harrowed, etc.	Average times disked, harrowed, etc.
	1,000 acres	Percent	Percent	Number
New England-----	153	94	86	2.0
New York-----	701	99	88	2.2
New Jersey-----	116	100	96	2.0
Pennsylvania-----	1,225	99	93	2.2
Delaware-----	210	99	100	1.9
Maryland-----	565	99	97	2.1
Northeast-----	2,970	97	90	2.1
Michigan-----	1,945	97	74	1.9
Wisconsin-----	2,638	97	88	1.9
Minnesota-----	5,626	94	95	1.9
Lake States-----	10,209	95	88	1.9
Ohio-----	3,308	99	92	1.8
Indiana-----	4,867	97	89	1.8
Illinois-----	10,079	96	93	1.8
Iowa-----	10,467	93	93	2.0
Missouri-----	3,237	95	92	1.6
Corn Belt-----	31,958	95	92	1.8
North Dakota-----	904	90	80	1.7
South Dakota-----	3,433	84	82	2.0
Nebraska-----	3,373	50	88	1.9
Kansas-----	1,289	76	89	1.8
Northern Plains-----	9,499	68	81	1.9
Virginia-----	668	98	95	2.0
West Virginia-----	87	97	91	2.0
North Carolina-----	1,477	91	93	1.8
Kentucky-----	1,157	95	93	2.1
Tennessee-----	900	97	97	2.0
Appalachian-----	4,289	95	94	2.0
South Carolina-----	444	88	95	1.8
Georgia-----	1,598	88	93	1.8
Florida-----	455	79	80	1.6
Alabama-----	1,038	94	97	1.8
Southeast-----	3,535	88	92	1.8
Mississippi-----	563	85	95	2.2
Arkansas-----	110	96	97	2.3
Louisiana-----	213	87	95	2.5
Delta States-----	886	87	95	2.3
Oklahoma-----	66	98	87	2.1
Texas-----	656	92	90	2.2
Southern Plains-----	720	92	90	2.2
Colorado-----	414	85	90	2.4
Other Mountain States-----	313	92	86	1.8
Mountain-----	727	88	88	2.1
California-----	227	51	96	2.4
Other Pacific States-----	99	96	91	2.7
Pacific-----	326	65	95	2.5
48 States-----	65,119	90	90	1.9

Table 3.--Corn planting methods, by State and region, 1965

State and region	Planted, all purposes	Planting method			
		Drilled	Hill dropped	Checked	Other and not specified <u>1/</u>
	1,000 acres	Percent	Percent	Percent	Percent
New England-----	153	78	6	---	16
New York-----	701	81	6	---	13
New Jersey-----	116	85	11	---	4
Pennsylvania-----	1,225	82	12	---	6
Delaware-----	210	90	10	---	---
Maryland-----	565	90	5	---	5
Northeast-----	2,970	84	9	---	7
Michigan-----	1,945	68	7	---	25
Wisconsin-----	2,638	71	15	2	12
Minnesota-----	5,626	40	45	5	10
Lake States-----	10,209	53	30	3	14
Ohio-----	3,308	91	1	---	8
Indiana-----	4,867	76	5	---	19
Illinois-----	10,079	45	44	1	10
Iowa-----	10,467	37	49	2	12
Missouri-----	3,237	81	5	---	14
Corn Belt-----	31,958	55	32	1	12
North Dakota-----	904	42	14	2	42
South Dakota-----	3,433	38	25	5	32
Nebraska-----	3,873	38	1	---	61
Kansas-----	1,289	57	6	---	37
Northern Plains-----	9,499	41	12	2	45
Other States-----	10,483	53	34	---	13
48 States-----	65,119	54	28	1	17

1/ Combinations of tilling and planting and operations not specified.

34 percent was hill dropped, and 13 percent was reported planted by other methods or not specified--not greatly different from the 48-State average.

### Drilled Corn

Fifty-four percent of the corn planted in 1965 was drilled (table 3). In the Northeast, 84 percent was planted by this method. Proportions for other regions shown ranged from 41 percent in the Northern Plains to 55 percent in the Corn Belt.

### Hill-Dropped Corn

Hill-dropping of corn is another method of planting after either spring or fall plowing. A specified number of grains of corn is dropped at regular intervals or distances. Seed count and distances are preset on the planter. About 28 percent of the corn planted in the 48 States was hill-dropped and 34 percent was reported hill-dropped in Other States (table 3).

### Check-Row Planted Corn

When corn is check-rowed, the distance between hills in the row is generally the same as the distance between the corn rows. Hills in the row are planted at a uniform distance and in squares, making weed control by cross cultivation easier than with other methods of planting. However, since newer varieties of corn yield better when planted more closely and chemicals have proven effective in controlling weeds, check-row planting of corn has declined. In 1948, approximately 28 percent of the corn planted was check-rowed, but in 1965, only 1 percent was check-rowed, mainly in 6 States with small proportions in each.<sup>3/</sup>

### Other and Not Specified

Some farmers did not report their planting methods, while others reported a combination of tilling and planting. A total of about 17 percent were in these 2 groups, ranging from 7 percent in the Northeast to 45 percent in the Northern Plains where planting with a lister was frequently reported.

## TILLING AND PLANTING OPERATIONS

One of the objectives of the survey was to determine the extent to which farmers were using reduced tillage techniques. Some of the more common methods are till-plant and plow and plant. Because these methods of planting are relatively new, the extent of their use varied considerably according to whether the farmer had the necessary equipment available.

Farmers were asked to describe their till-planting operation. Many farmers who did not use till-plant methods described other operations, and summaries were made from these reports, although these operations were used on very small acreages in most States.

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<sup>3/</sup> Brodell, Albert P., Planting and Fertilizing Corn, U.S. Dept. Agr. F.M. 84, June 1951.

Till-planting in one operation was used on only 1 percent of the planted acreage. The largest acreages planted by this method were in the Northern Plains (table 4). (See the appendix for a detailed description of till-planter operations.)

Plow and plant usually means that corn is planted in freshly plowed ground within a few hours with no other tillage operations. Some compaction of soil is avoided and only two operations are required. All States reported plow and plant operations, with proportions ranging from 2 percent in New Jersey and Illinois to 20 percent in Michigan and North Dakota. Regional percentages ranged from 4 percent in the Northeast, Corn Belt, Appalachian, Southeast, and Pacific regions to 11 percent in the Northern Plains. The Lake States reported 6 percent, Delta States 5 percent, Southern Plains 7 percent, and Mountain region 10 percent. The average was 5 percent for the 48 States.

A planter with cultivator or harrow attached was used after prior tillage operations had been performed. This method permits final preparation of soil and planting in one trip over the field. (As farmers strive for more efficient planting and cultivating methods, their basic concern is to make as few trips as possible over a field.) While the Corn Belt had 49 percent of the total acreage planted to corn in the 48 States, only 3 percent of the Corn Belt acreage was planted with a cultivator or a harrow attached to the planter. Five percent of the acreage in Illinois and Indiana was planted this way and 1 percent in each of the other States in the region. While these percentages are small, they mark the beginning of a different method of tillage reduction in the largest corn-producing area.

Disking once and planting without plowing was reported in nearly half of the States. About 2 percent of the corn acreage was planted this way. The Northern Plains and Mountain regions had the greatest proportions.

Disking or harrowing 2 or more times and planting without plowing was reported by more States and with larger proportions than disking once and planting. The acreage ranged from 1 percent in Wisconsin and Indiana to 30 percent in Nebraska. Regionally, the Northeast reported less than 1 percent and the Northern Plains 17 percent. About 4 percent of the total acreage was planted by this method.

## CULTIVATION AND CHEMICAL TREATMENT

In 1965 nearly all (97 percent) of the corn was cultivated (table 5). Proportions for the States ranged from 90 percent in Missouri and West Virginia to 100 percent in Delaware, Ohio, North and South Dakota, Nebraska, Alabama, and Oklahoma. Regional proportions of corn cultivated ranged from 96 percent in the Northeast to 99 percent in the Northern and Southern Plains and Mountain region.

The average number of trips over fields ranged from 1.2 in New England to 3.2 in Arkansas. The average for the 48 States was 2.1.

Average number of trips over fields where there had not been chemical treatment for weed control ranged from 1.9 in Delaware to 3.2 in Arkansas. Regional averages varied from 2.2 trips in the Northeast and Southeast to 2.7 in the Delta States. The average was 2.4 trips for the 48 States.

Table 4.--Tilling and planting operations, by State and region, 1965 <sup>1/</sup>

State and region	Planted, all purposes	Till- plant (one op- eration)	Plow and plant	Planter with cul- tivator (prior tillage)	No plowing	
					Disk once and plant	Disk or harrow 2 or more times
	1,000 acres	Percent	Percent	Percent	Percent	Percent
New England-----	153	---	6	---	---	3
New York-----	701	---	5	---	1	---
New Jersey-----	116	---	2	---	---	---
Pennsylvania-----	1,225	---	5	---	---	---
Delaware-----	210	---	4	---	---	---
Maryland-----	565	1	3	---	---	---
Northeast-----	2,970	1	4	---	2/	2/
Michigan-----	1,945	1	20	---	---	2
Wisconsin-----	2,638	1	10	---	---	1
Minnesota-----	5,626	1	4	---	1	3
Lake States-----	10,209	1	6	---	2/	2
Ohio-----	3,308	---	5	1	---	---
Indiana-----	4,867	1	7	5	2	1
Illinois-----	10,079	1	2	5	---	---
Iowa-----	10,467	1	4	1	---	---
Missouri-----	3,237	2	6	1	2	2
Corn Belt-----	31,958	1	4	3	1	2/
North Dakota-----	904	2	20	---	2	4
South Dakota-----	3,433	3	14	---	5	6
Nebraska-----	3,873	7	7	---	12	30
Kansas-----	1,289	2	7	---	4	15
Northern Plains-----	9,499	4	11	---	7	17
Appalachian-----	4,289	1	4	---	2	2
Southeast-----	3,535	1	4	---	2	6
Delta States-----	886	1	5	---	2	7
Southern Plains-----	720	---	7	---	1	7
Mountain-----	727	2	10	---	3	4
Pacific-----	326	1	4	---	2	28
48 States-----	65,119	1	5	2	2	4

<sup>1/</sup> Included in table 3.

<sup>2/</sup> Less than 0.5 percent.

Table 5.--Cultivation: Times with and without chemical treatment for weed control, by State and region, 1965

State and region	Planted, all purposes	Cultivated			
		Total	Average times		
			Total	With treatment	Without treatment
	1,000 acres	Percent	Number	Number	Number
New England-----	153	93	1.2	0.8	2.0
New York-----	701	95	1.3	1.1	2.0
New Jersey-----	116	94	1.7	1.4	2.3
Pennsylvania-----	1,225	96	1.6	1.4	2.2
Delaware-----	210	100	1.7	1.7	1.9
Maryland-----	565	97	1.8	1.6	2.2
Northeast-----	2,970	96	1.6	1.4	2.2
Michigan-----	1,945	97	2.0	1.7	2.4
Wisconsin-----	2,638	94	2.0	1.6	2.7
Minnesota-----	5,526	98	2.5	2.3	2.7
Lake States-----	10,209	97	2.3	2.0	2.7
Ohio-----	3,308	100	1.6	1.5	2.1
Indiana-----	4,867	99	1.6	1.5	2.0
Illinois-----	10,079	99	1.9	1.8	2.1
Iowa-----	10,467	98	2.4	2.3	2.6
Missouri-----	3,237	90	2.0	1.7	2.3
Corn Belt-----	31,958	98	2.0	1.9	2.3
North Dakota-----	904	100	2.5	2.2	2.6
South Dakota-----	3,433	100	2.4	2.3	2.5
Nebraska-----	3,873	100	2.5	2.4	2.5
Kansas-----	1,289	96	2.0	1.8	2.1
Northern Plains-----	9,499	99	2.4	2.2	2.5
Virginia-----	668	95	1.7	1.3	2.4
West Virginia-----	87	90	1.4	1.0	2.3
North Carolina-----	1,477	97	2.0	1.8	2.3
Kentucky-----	1,157	92	1.7	1.3	2.1
Tennessee-----	900	97	2.1	1.6	2.5
Appalachian-----	4,289	95	1.9	1.5	2.3
South Carolina-----	444	98	2.4	1.8	2.6
Georgia-----	1,598	98	2.1	1.7	2.2
Florida-----	455	94	2.1	1.9	2.2
Alabama-----	1,038	100	2.1	1.9	2.2
Southeast-----	3,535	98	2.1	1.8	2.2
Mississippi-----	563	99	2.4	2.0	2.5
Arkansas-----	110	98	3.2	2.9	3.2
Louisiana-----	213	98	2.5	2.0	2.7
Delta States-----	886	98	2.5	2.0	2.7
Oklahoma-----	66	100	2.3	2.1	2.3
Texas-----	654	99	2.6	2.0	2.6
Southern Plains-----	720	99	2.6	2.0	2.6
Colorado-----	414	99	2.3	2.1	2.4
Other Mountain States-----	313	98	2.2	1.9	2.3
Mountain-----	727	99	2.3	2.0	2.4
California-----	227	97	2.3	2.2	2.3
Other Pacific States-----	93	98	2.2	1.9	2.4
Pacific-----	326	98	2.2	2.1	2.3
48 States-----	65,119	97	2.1	1.9	2.4

Where chemical treatment for weed control was used, corn was cultivated an average of 1.9 times. Without treatment, corn was cultivated an average of 2.4 times.

### ACREAGE TREATED WITH CHEMICALS FOR WEED AND INSECT CONTROL

When corn must compete with weeds for moisture and nutrients, yields are reduced. Therefore, use of chemicals to control the growth of weeds helps to increase corn yields and reduce production costs. Herbicides may be applied before, during, or after the corn is planted.

Use of chemicals in controlling weeds is steadily increasing. In 1949, about 7 percent of the acreage planted to corn was treated for the control of weeds.<sup>4/</sup> In 1952, about 11 percent of the acreage planted to corn was treated.<sup>5/</sup> In 1958, 3 percent was treated preemergence and 25 percent was treated postemergence.<sup>6/</sup> In 1962, more than 25 million acres of corn were treated with chemicals. This represented 39 percent of the harvested acreage.<sup>6/</sup> In 1964, according to the Census of Agriculture, 27 million acres of corn were treated with chemicals for the control of weeds, grass, or brush, an increase of 2 million acres over the acreage treated in 1962. In 1965, about 15 million acres were treated preemergence and 21 million postemergence for the control of weeds.

Preemergence weedkiller sprayed in a band frequently permits delaying the first cultivation for some time. Twenty-three percent of the corn acreage planted in 1965 received preemergence treatment ranging from 7 percent in North Dakota to 36 percent in New Jersey (table 6). The regional range was from 4 percent in the Southern Plains to 34 percent in the Northeast.

Postemergence treatment with chemicals amounted to 32 percent of the acreage of all corn planted. Some duplications exist in acres of preemergence and postemergence treatment, but the amount could not be determined from data reported. The range among the States shown was from 10 percent in North Dakota to 50 percent in Ohio. The regional range was from 4 percent in the Southern Plains to 39 percent in the Northeast.

The proportion of acres treated with insecticides for control of insects varied widely among the States. The range was from 2 percent in New Jersey to 57 percent in Nebraska. About 20 million acres or 31 percent of all acreage planted received this type of treatment (table 6).

<sup>4/</sup> Brodell, Albert P., Strickler, Paul E., and Phillips, Harold C., Extent and Cost of Spraying and Dusting on Farms, 1952. U.S. Dept. Agr., Statis. Bul. 156, Apr. 1955.

<sup>5/</sup> Strickler, Paul E., and Hinson, William C., Extent of Spraying and Dusting on Farms, 1958, With Comparisons. U.S. Dept. Agr., Statis. Bul. 314, May 1962.

<sup>6/</sup> U.S. Dept. Agr., Agr. Res. Serv., and Fed. Ext. Serv., A Survey of Extent and Cost of Weed Control and Specific Weed Problems, ARS 34-23-1, Aug. 1965.



Table 6.--Corn: Proportion treated chemically, preemergence and post-emergence, for weed and insect control, by State and region, 1965

State and region	Planted, all purposes	Proportion of planted acreage treated chemically for weed control		Planted acres treated for insect control
		Pre- emergence	Post- emergence	
	1,000 acres	Percent	Percent	Percent
New England-----	153	30	35	7
New York-----	701	35	44	6
New Jersey-----	116	36	28	2
Pennsylvania-----	1,225	34	40	8
Delaware-----	210	35	42	6
Maryland-----	565	33	35	5
Northeast-----	2,970	34	39	7
Michigan-----	1,945	27	37	9
Wisconsin-----	2,638	33	35	14
Minnesota-----	5,626	25	29	24
Lake States-----	10,209	27	32	19
Ohio-----	3,308	26	50	13
Indiana-----	4,867	33	42	25
Illinois-----	10,079	31	40	51
Iowa-----	10,467	20	33	45
Missouri-----	3,237	28	29	46
Corn Belt-----	31,958	27	38	41
North Dakota-----	904	7	10	5
South Dakota-----	3,433	10	30	20
Nebraska-----	3,873	13	21	57
Kansas-----	1,289	18	29	36
Northern Plains-----	9,499	12	24	36
Appalachian-----	4,289	27	24	8
Southeast-----	3,535	8	8	4
Delta States-----	886	15	8	7
Southern States-----	720	4	4	3
Mountain-----	727	7	32	22
Pacific-----	326	8	23	22
48 States-----	65,119	23	32	31

## POSTHARVEST HANDLING OF STALKS

After corn is harvested for grain, cornstalks must be handled properly if insects are to be controlled. A thorough disposal job is desirable. One of the two most common methods used to dispose of stalks is to cut, chop, or shred them. The other is to disk them. In many instances, farmers reported using both methods on the same field. However, for the purpose of this bulletin, where both methods were reported, disposal of stalks was classified as cut, chopped, or shredded, on the theory that the disking should be charged to land preparation for the next crop.

Proportions of stalks that were cut, chopped, or shredded ranged from 38 percent of the harvested acreage in the Northern Plains to 73 percent in the Southern Plains (table 7). About 43 percent of the acreage in 48 States was cut, chopped, or shredded.

Disking of the stalks ranged from 17 percent in the Southern Plains to 57 percent in the Northern Plains. About 52 percent of corn acreage in the 48 States was disked. On only 5 percent of the acreages were the stalks left standing.

### APPENDIX

#### Plant Density of Corn for Grain, 1962-66

Information on plant density (stalk count per acre) is sample data and averages for selected States and groupings of States, and not official estimates of the Crop Reporting Board. Enumerators visited farms and reported counts and measurements (table 8). Sample plots were selected at random.

The stalk count per acre on these plots has increased steadily since 1962. Increases ranged from 14 percent in one group of States to 29 percent in two other groups.

#### Row Spacing of Corn for Grain, 1948, 1962-66

Row spacing of corn plants is one of several factors used to determine plant density in a field. Optimum density helps increase corn yields.

Studies have been made on selected sample plots located in many States to determine the best spacing arrangements. Recent tests have shown that corn grown in narrow rows will produce higher yields when other improved cultural practices are used. The use of narrow rows has not increased very rapidly, but many farmers are changing row widths as they replace their planting equipment.

Some estimates are available for 1948 and are helpful in making comparisons. Ohio, Indiana, Illinois, and Iowa had average row widths of 40 inches. For selected groups of States, the averages were: North Central, 40; South Atlantic, 45; East South Central, 41; and West South Central, 41. The South Atlantic States reported the widest rows, ranging from an average of 41 inches in Virginia to 49 inches in South Carolina. Little corn in the major producing States (Ohio, Indiana, Illinois, and Iowa) was planted in more than 48-inch rows (see footnote 3).

Table 7.--Postharvest handling of cornstalks, by State and region, 1965

State and region	Corn harvested for grain	Proportion of harvested acreage		
		Cut, chopped, or shredded	Disked	Left standing
		1,000 acres	Percent	Percent
New England-----	4	55	44	1
New York-----	200	55	40	5
New Jersey-----	62	50	45	5
Pennsylvania-----	820	61	35	4
Delaware-----	199	55	39	6
Maryland-----	474	47	50	3
Northeast-----	1,759	56	40	4
Michigan-----	1,481	36	58	6
Wisconsin-----	1,606	56	42	2
Minnesota-----	4,280	41	52	7
Lake States-----	7,367	43	51	6
Ohio-----	3,054	38	41	21
Indiana-----	4,701	44	51	5
Illinois-----	9,777	45	55	---
Iowa-----	9,933	40	60	---
Missouri-----	2,941	31	59	10
Corn Belt-----	30,406	41	55	4
North Dakota-----	196	45	50	5
South Dakota-----	2,361	30	65	5
Nebraska-----	3,565	40	55	5
Kansas-----	1,050	46	50	4
Northern Plains-----	7,172	38	57	5
Virginia-----	494	57	41	2
West Virginia-----	58	50	30	20
North Carolina-----	1,316	52	36	12
Kentucky-----	1,049	30	55	15
Tennessee-----	792	32	49	19
Appalachian-----	3,799	42	45	13
South Carolina-----	387	50	38	12
Georgia-----	1,368	70	26	4
Florida-----	352	56	35	9
Alabama-----	938	53	42	5
Southeast-----	3,045	61	33	6
Mississippi-----	508	48	43	9
Arkansas-----	98	31	39	30
Louisiana-----	182	53	34	13
Delta States-----	788	47	40	13
Oklahoma-----	52	45	40	15
Texas-----	587	75	15	10
Southern Plains-----	639	73	17	10
Montana-----	3	60	35	5
Idaho-----	20	63	30	7
Wyoming-----	14	50	40	10
Colorado-----	192	46	50	4
New Mexico-----	15	35	42	23
Arizona-----	20	47	40	15
Utah-----	3	40	55	5
Nevada-----	---	---	---	---
Mountain-----	267	47	47	6
Washington-----	23	40	55	5
Oregon-----	13	50	40	10
California-----	144	60	35	5
Pacific-----	180	57	38	5
48 States-----	55,332	43	52	5

Table 8.--Plant density of corn for grain, selected States and groups of States, 1962-66 <sup>1/</sup>

State and group	Corn plants per acre					Percentage increase, 1962-66
	1962	1963	1964	1965	1966	
	Number	Number	Number	Number	Number	Percent
Ohio-----	13,600	15,100	14,100	14,500	15,300	12
Indiana-----	13,600	13,700	14,100	15,500	16,100	18
Illinois-----	13,600	14,100	14,200	15,500	16,500	21
Iowa-----	13,500	13,600	14,300	15,500	15,800	17
North Central <sup>2/</sup> --	12,900	13,000	13,400	14,400	14,900	16
South Atlantic <sup>3/</sup> --	8,000	8,700	8,600	9,300	10,300	29
East South Central <sup>4/</sup> -----	8,000	8,600	8,900	9,700	10,300	29
West South Central <sup>5/</sup> -----	6,500	6,600	6,900	7,100	7,400	14

<sup>1/</sup> Density based on stalk count in sample plots selected for objective yield determinations.

<sup>2/</sup> Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, South Dakota, Nebraska, and Kansas.

<sup>3/</sup> Virginia, North Carolina, South Carolina, Georgia.

<sup>4/</sup> Kentucky, Tennessee, Alabama, Mississippi.

<sup>5/</sup> Arkansas, Louisiana, Oklahoma, Texas.

Source: Crop Reporting Board, Statistical Reporting Service, U.S. Dept. Agr., Crop Production, 1966 Annual Summary, CR-PR 2-2 (66), Dec. 1, 1966.

A distribution of average row spacing of corn for grain is shown in table 9 for comparable States and groups of States during 1962-66. The trend during this period toward narrowing row widths is apparent, particularly in the North Central States. A comparison of changes in row widths from 1948 to 1966, by regions, indicates a narrowing of over 5 inches in row widths in the South Atlantic States (see footnote 3).

#### Other Tilling and Planting Operations

The till-planter is intended to be used for once-over seedbed preparations. It employs a sweep, which operates at shallow depths on the previous year's corn rows, moving any stalks, weeds, and volunteer corn to the middle of rows. The soil is firmed over the seed in the bottom of the seed trench. Fields planted this way have a rough appearance after planting, and equipment used for cultivation must cope with partially decomposed stalks and residue.

An attachment on the till-planter can apply insecticides and herbicides and do a fairly good job of controlling weeds that are present at planting time.

Combining tillage and planting reduces the number of trips over the field without decreasing the preparation of the seedbed. Ability of the till-planter to establish row cropping with little or no prior soil preparation makes it useful for double cropping.

Table 9.--Corn for grain: Number of samples, percentage distribution of samples by width of rows, and average width of rows, by States and groups of States, 1962-66 <sup>1/</sup>

State or group, and year	Number of samples	Row width in inches					Weighted average width
		34.5 and less	34.6 to 36.5	36.6 to 38.5	38.6 to 40.5	40.6 and greater	
	Number	Percent	Percent	Percent	Percent	Percent	Inches
<b>Ohio</b>							
1962	119	2.4	4.2	24.4	50.5	18.5	39.2
1963	116	.8	3.4	28.7	53.5	15.5	39.0
1964	111	0	2.7	23.4	53.2	20.7	39.4
1965	130	.7	7.7	28.5	47.7	15.4	39.2
1966	125	8.8	9.6	39.2	28.0	14.4	37.9
<b>Indiana</b>							
1962	112	0	2.7	26.8	59.8	10.7	39.2
1963	111	0	3.6	22.5	63.1	10.8	39.3
1964	107	.9	7.9	30.9	54.2	13.1	39.2
1965	136	.7	4.4	40.5	45.6	8.8	38.6
1966	137	7.3	2.9	48.9	36.5	4.4	37.9
<b>Illinois</b>							
1962	192	0	.5	14.6	65.1	19.8	39.8
1963	182	0	1.0	18.1	69.9	11.0	39.4
1964	188	.5	0	23.9	64.4	11.2	39.3
1965	188	2.6	2.7	35.7	48.4	10.6	38.8
1966	159	6.3	6.9	32.1	40.2	14.5	38.3
<b>Iowa</b>							
1962	194	0	.5	6.2	70.1	23.2	39.9
1963	189	.5	0	7.4	61.4	30.7	40.0
1964	191	0	0	5.2	62.3	32.5	40.2
1965	188	1.0	.6	11.7	64.9	21.8	39.6
1966	170	2.4	3.5	20.7	59.8	14.7	39.1
<b>North Central <sup>2/</sup></b>							
1962	1,274	.8	1.5	14.3	62.1	21.3	39.7
1963	1,463	.8	2.1	16.8	58.4	21.9	39.6
1964	1,527	1.6	1.4	16.9	57.4	22.7	39.6
1965	1,573	2.6	3.2	23.3	52.2	18.7	39.2
1966	1,509	4.9	5.0	28.4	46.5	15.2	38.6
<b>South Atlantic <sup>3/</sup></b>							
1962	555	2.2	12.4	19.6	18.8	47.0	40.2
1963	570	2.0	9.6	18.1	27.0	43.3	40.5
1964	564	1.6	8.7	22.7	25.5	41.5	40.5
1965	527	1.9	9.9	23.3	24.9	40.0	40.2
1966	482	3.7	11.4	27.9	25.0	32.0	39.7
<b>East South Central <sup>4/</sup></b>							
1962	620	1.8	6.5	23.2	35.9	32.6	39.9
1963	609	.8	5.4	23.7	40.2	29.9	39.7
1964	523	1.8	4.8	25.4	38.0	30.0	39.8
1965	531	1.2	5.8	27.3	37.3	28.4	39.6
1966	468	1.9	9.3	28.0	33.2	27.6	39.2
<b>West South Central <sup>5/</sup></b>							
1962	464	1.1	8.0	27.8	31.2	31.9	40.4
1963	441	1.1	9.3	28.4	29.9	31.3	40.1
1964	401	.8	11.7	23.2	25.9	38.4	40.5
1965	323	1.2	14.9	24.8	22.9	36.2	40.5
1966	350	.1	6.1	29.6	39.8	24.4	40.3

<sup>1/</sup> Spacing based on row measurements in sample plots selected for objective yield determinations. <sup>2/</sup> Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, South Dakota, Nebraska, and Kansas. <sup>3/</sup> Virginia, North Carolina, South Carolina, and Georgia. <sup>4/</sup> Kentucky, Tennessee, Alabama, and Mississippi. <sup>5/</sup> Arkansas, Louisiana, Oklahoma, and Texas.

Source: Crop Reporting Board, Statistical Reporting Service, U.S. Dept. Agr., Crop Production, CR-PR 2-2 (66), Dec. 1, 1966.

Lister planting with prior tillage involves placing seed at the bottom of furrows, with relatively high ridges between rows, in one operation. Formerly, this method was widely used for nonirrigated corn in semiarid areas. Prior preparation of the seedbed usually requires chopping or shredding stalks from a previous crop, then disking to level the field and destroy weeds. While the corn plants are small, ridges remaining between the rows after planting are worked down with a lister cultivator (a combination disk and shovel implement).

Hard-ground listing (lister planting without plowing) leaves the interrow residue partially exposed to minimize wind erosion.

Loose-ground listing (lister planting after plowing) is common in dry areas. The seeds are placed 5 to 7 inches deep in listed furrows about 12 inches wide.

Ridge planting with the lister is used in wet, slow-draining soils, permitting faster germination and quicker plant emergence. Seeds are planted near the top of the ridge, where warmth occurs earliest in the spring.

Wheel-track planting is done after the field has been plowed. For this type of planting either the tractor wheels or the planter must be adjusted so that the seed will be placed in the tracks of the planter. Wheel-track planting permits more intensive cropping on hilly ground and is adaptable to either fall- or spring-plowed ground. This is one of the basic planting methods. Other techniques are also used, depending upon the type of machinery available to the farmer.

Plowing and planting with the cultivator or harrow attached ahead of the planter completes two operations with three machines. Soil preparation and planting are done in one trip over the field, thus eliminating overworking of the soil. This method is not suited to all types of soils, but usually works well if the moisture content of the soil is right.

#### Acreage Planted With Till-Plant Machines

Till-plant operations were reported in 26 States, for 1 percent of the acreage of corn planted.

Some farmers reported that they had utilized pieces of existing equipment in improvising methods of till-planting corn. For the purposes of this study, different types of machines were given alphabetical codes. About 28 percent of the till-planted acreage was planted with unidentified machines (table 10).

Table 10.--Distribution of acreage planted to corn with till-plant machines identified by code, 1965 1/

Machine code	Proportion of--	
	Till-plant acreage	Acreage planted for all purposes
	<u>Percent</u>	<u>Percent</u>
A-----	18	0.2
B-----	20	.2
C-----	8	.1
D-----	6	.1
E-----	2	<u>2/</u>
F-----	1	<u>2/</u>
G-----	13	.1
H-----	4	<u>2/</u>
I <u>3/</u> -----	28	.3
Total-----	100	1.0

1/ Till-planting operations reported in 26 States with an acreage equal to 1 percent of corn planted for all purposes (65,119,000 acres).

2/ Less than 0.05 percent.

3/ Machines used in till-planting that were improvised or not identified.

# QUESTIONNAIRE 7/

C.E. 2-208A

UNITED STATES DEPARTMENT OF AGRICULTURE  
Statistical Reporting Service

Budget Bureau No. 40-R3410.1  
Approval expires 12/31/66

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February 1, 1966

## CORN GROWING PRACTICES AND MACHINE USE INQUIRY

Dear Sir:

Growing corn with reduced tillage and increased use of chemicals in weed and insect control are becoming important practices. Annual use of machines vary by size and type of farm and by states. The questions below are asked to determine the extent of these practices and the changes occurring over the Nation.

Please return this with your Farm Report even though you can answer only a few items. (Each report improves the accuracy of the state total). Even though you may not have exact information at hand your best estimates will be helpful. Your report is confidential, and will be used only in arriving at State and National totals.

Respectfully,

*G. D. Simpson*

G. D. Simpson,  
Chairman, Crop Reporting Board

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PLEASE REPORT FOR THE FARM OR RANCH YOU OPERATED IN 1965

---

1. How many acres were in the farm (s) or ranch (es) operated by you in 1965?  
(Include land rented from others but not land rented to others)..... Acres \_\_\_\_\_
2. Acreage planted to corn for all purposes..... Acres \_\_\_\_\_
3. Of the acreage planted to corn for all purposes in 1965, how many acres were:
  - a. Plowed (before planting)..... Acres \_\_\_\_\_
  - b. Disked, harrowed, etc. .... Acres \_\_\_\_\_  
If more than once, how many times? ..... Number of times \_\_\_\_\_
  - c. Planted by the following methods:
    - (1) Tillage and planting in one operation..... Acres \_\_\_\_\_
      - (a) Describe operation.....  
\_\_\_\_\_
      - (b) Name and model of machine used.....  
\_\_\_\_\_
    - (2) Planting operations only
      - (a) Drilled ..... Acres \_\_\_\_\_
      - (b) Hill dropped..... Acres \_\_\_\_\_
      - (c) Other (Specify) \_\_\_\_\_ )..... Acres \_\_\_\_\_
  - d. Cultivated after planting..... Acres \_\_\_\_\_  
If more than once, how many times? ..... Number of times \_\_\_\_\_
  - e. Treated chemically for weed control (pre-emergence) ..... Acres \_\_\_\_\_
  - f. Treated chemically for weed control (post emergence)..... Acres \_\_\_\_\_
  - g. Treated chemically for insect control..... Acres \_\_\_\_\_
  - h. On how many acres of corn harvested for grain in 1965 were  
or will the stalks be:
    - (1) Cut, chopped or shredded ..... Acres \_\_\_\_\_
    - (2) Disked ..... Acres \_\_\_\_\_

7/ Only part of the questionnaire is reproduced here. Questions about machine use are omitted.



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