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UNITED STATES DEPARTMENT OF COMMERCE

JESSE H. JONES, Secretary

BUREAU OF THE CENSUS

J. C. CAPT, Director (Appointed May 22, 1941)

WILLIAM LANE AUSTIN, Director (Retired January 31, 1941)

PHILIP M. HAUSER, Assistant Director



SIXTEENTH CENSUS OF THE UNITED STATES : 1940

# AGRICULTURE

## CROSS-LINE ACREAGE

### A SPECIAL STUDY

Farms Reporting and Acreage by Place of Enumeration and by  
Location of Acreage, With Relationship to all Farms,  
by Counties, With a Summary for the  
United States; 1940 and 1935

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UNITED STATES  
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# SIXTEENTH CENSUS OF THE UNITED STATES: 1940

## Reports on Agriculture, Irrigation, and Drainage<sup>1</sup>

Volume I.—Statistics by Counties for Farms and Farm Property, with Related Information for Farms and Farm Operators; Livestock and Livestock Products; and Crops (six parts):

- |  |                                   |
|--|-----------------------------------|
| Part 1.—New England, Middle Atlantic, and<br>East North Central States | Part 4.—East South Central States |
| 2.—West North Central States   | 5.—West South Central States      |
| 3.—South Atlantic States   | 6.—Mountain and Pacific States    |

Volume II.—Statistics by Counties for Value of Farm Products, Farms Classified by Major Source of Income, and Farms Classified by Total Value of Products (three parts):

- |                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| Part 1.—Northern States | Part 2.—Southern States | Part 3.—Western States |
|-------------------------|-------------------------|------------------------|

Volume III.—General Report—Statistics by Subjects for the United States, Geographic Divisions, and States (one volume):

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|--|--|
| Chapter I.—Farms and Farm Property               | Chapter VI.—Cooperation, Labor, Expenditures,<br>Machinery, Facilities, and<br>Residence |
| II.—Size of Farms                                | VII.—Livestock and Livestock Products  |
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| IV.—Farm Mortgages and Farm<br>Taxes             | IX.—Fruits and Nuts, and<br>Horticultural Specialties                                    |
| V.—Work Off Farm, Age, and<br>Years on Farm      | X.—Value of Farm Products  |

United States Summary Bulletins.—Statistics for the United States, Geographic Divisions, and States in condensed form as follows:

- First Series Summary—Number of Farms, Uses of Land, Values, Principal Classes of Livestock and Livestock Products; and Specified Crops Harvested.
- Second Series Summary—Farm Mortgages, Taxes, Labor, Expenditures, and Miscellaneous Farm Information; Goats and Mohair; and Fruits, Vegetables, and Minor Crops.
- Third Series Summary—Value of Farm Products, Farms Classified by Major Source of Income, and Farms Classified by Total Value of Products.

Territories and Possessions.—Farms and Farm Property, Livestock and Livestock Products, and Crops (one volume):  
(Separate agricultural bulletins are available for Hawaii and Puerto Rico).

- |              |                |                                     |
|--------------|----------------|-------------------------------------|
| Territories: | Possessions:   |                                     |
| Alaska       | American Samoa | Puerto Rico                         |
| Hawaii       | Guam           | Virgin Islands of the United States |

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- Twenty Separate State Maps Showing Irrigation by Drainage Basins.  
A Separate Composite Map Showing Irrigation by Drainage Basins.

Drainage of Agricultural Lands.—Statistics for 38 Drainage States with County Data for 38 States and a Summary for the United States (one volume).

- A Separate Map of the United States Showing Location of Land in Drainage Enterprises for 38 States.

### SPECIAL STUDIES AND MONOGRAPHS

Special Poultry Report.—Statistics by Geographic Divisions and States for Poultry of All Kinds on Hand and Raised; by Counties for Chickens and Chicken Egg Production by Number of Chickens on Hand; and by Counties for Farms Reporting Chickens and Turkeys Raised by Numbers Raised (one volume).

Cows Milked and Dairy Products.—Number of Cows Milked, Milk Produced, Disposition of Dairy Products, and Number of Cows Kept Mainly for Milk Production, Classified by Number of Cows Milked, by Counties; with Related Data for Other Classes of Livestock and Livestock Products for the States and also for the United States (one volume).

Special Cotton Report.—Cotton Harvested by Number of Bales Harvested, and by Counties, with Acreage and Production of Cotton, and Value of Farm Products (one volume).

Special Cross-line Acreage Report.—Farms Reporting and Acreage by Place of Enumeration and by Location of Acreage, with Relationship to All Farms, by Counties: 1940 and 1935 (one volume).

Drainage Monograph.—A Comparison of Agriculture Within and Outside of Drainage Enterprises in the Alluvial Lands of the Lower Mississippi Valley (paper bound).

Irrigation Monograph.—A Tabular and Graphic Presentation of Specified Irrigation Census Statistics (paper bound).

<sup>1</sup>Agriculture volumes I and II and the volumes "Irrigation of Agricultural Lands" and "Drainage of Agricultural Lands" are comprised of State bulletins. Separate bulletins for each State are available. Separate chapters of Agriculture volume III are also available.

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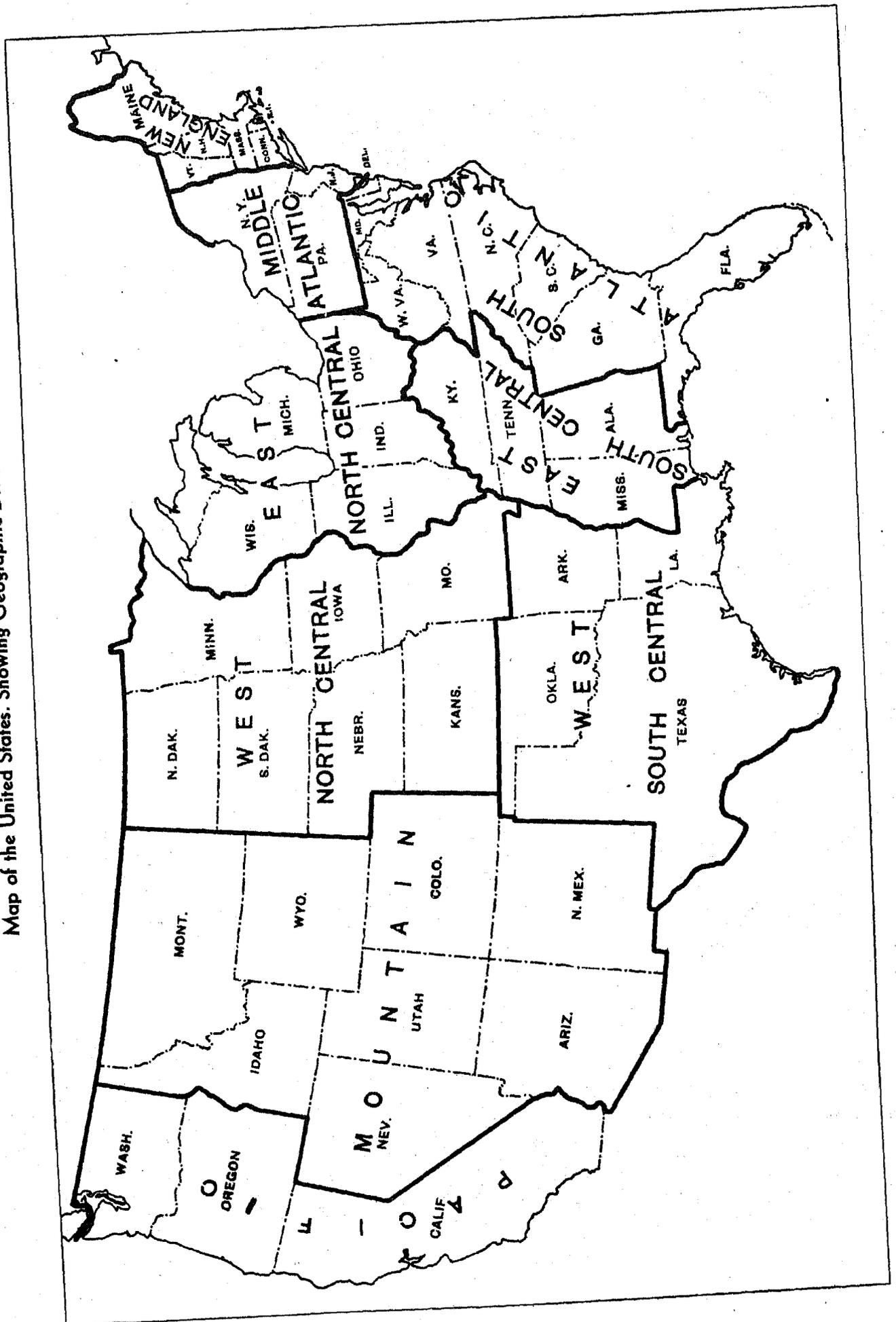
CROSS-LINE ACREAGE--FARMS REPORTING AND ACREAGE BY PLACE OF ENUMERATION AND BY LOCATION OF ACREAGE, WITH RELATIONSHIP TO ALL FARMS, BY COUNTIES: 1940 AND 1935

STATE	Page	STATE--Continued	Page	STATE--Continued	Page
Alabama-----	17	Maine-----	124	Oklahoma-----	217
Arizona-----	23	Maryland-----	126	Oregon-----	224
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California-----	32	Michigan-----	131	Rhode Island-----	234
Colorado-----	38	Minnesota-----	139	South Carolina-----	235
Connecticut-----	44	Mississippi-----	147	South Dakota-----	240
Delaware-----	45	Missouri-----	154	Tennessee-----	247
District of Columbia-----	45	Montana-----	165	Texas-----	256
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Georgia-----	52	Nevada-----	180	Vermont-----	282
Idaho-----	67	New Hampshire-----	182	Virginia-----	284
Illinois-----	72	New Jersey-----	183	Washington-----	293
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Iowa-----	89	New York-----	189	Wisconsin-----	302
Kansas-----	98	North Carolina-----	195	Wyoming-----	309
Kentucky-----	107	North Dakota-----	204		
Louisiana-----	118	Ohio-----	209		

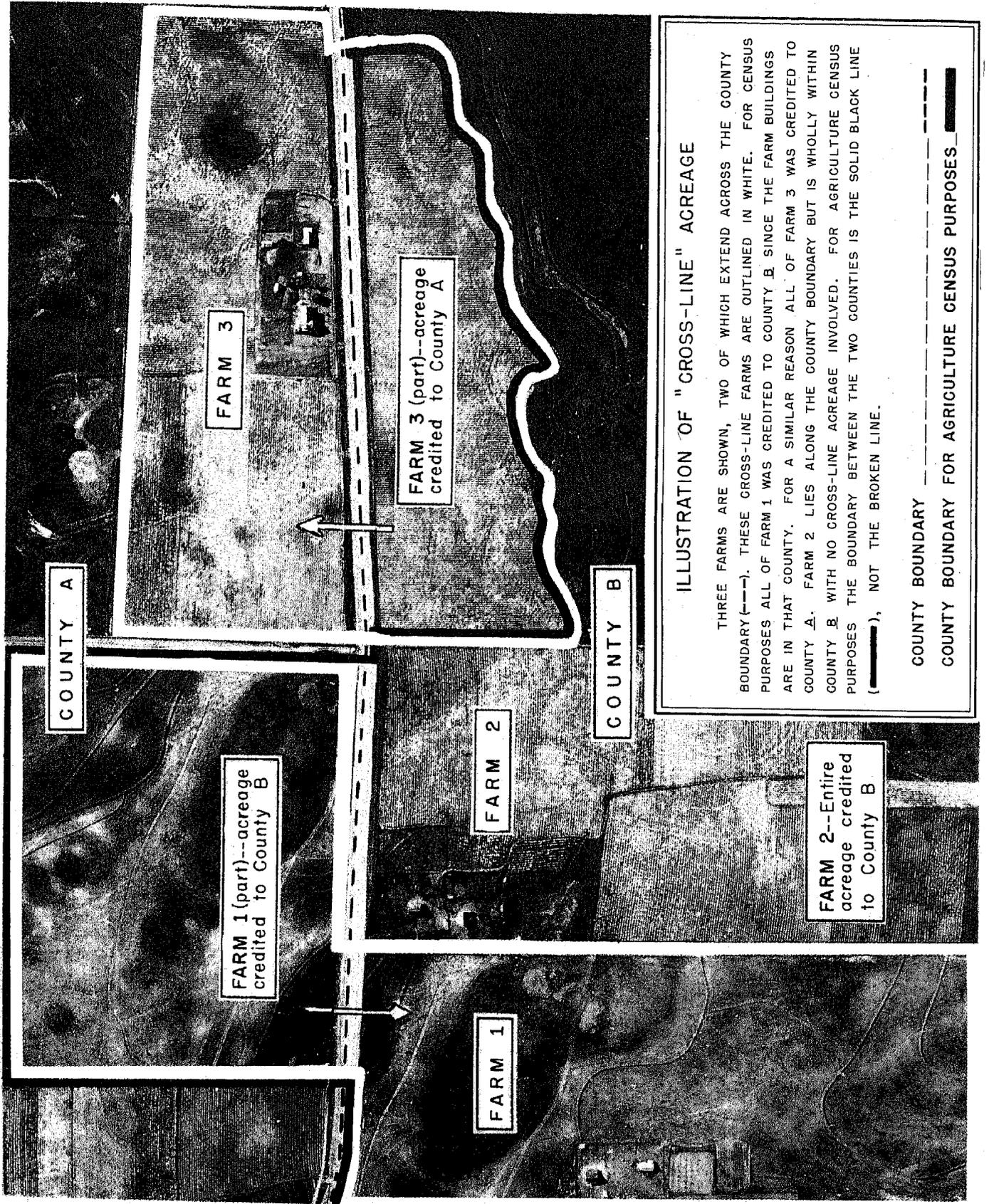
## GEOGRAPHIC DIVISIONS

<p><b>New England Division:</b>                  Maine                  New Hampshire                  Vermont                  Massachusetts                  Rhode Island                  Connecticut</p> <p><b>Middle Atlantic Division:</b>                  New York                  New Jersey                  Pennsylvania</p> <p><b>East North Central Division:</b>                  Ohio                  Indiana                  Illinois                  Michigan                  Wisconsin</p> <p><b>West North Central Division:</b>                  Minnesota                  Iowa                  Missouri                  North Dakota                  South Dakota                  Nebraska                  Kansas</p>	<p><b>South Atlantic Division:</b>                  Delaware                  Maryland                  District of Columbia                  Virginia                  West Virginia                  North Carolina                  South Carolina                  Georgia                  Florida</p> <p><b>East South Central Division:</b>                  Kentucky                  Tennessee                  Alabama                  Mississippi</p> <p><b>West South Central Division:</b>                  Arkansas                  Louisiana                  Oklahoma                  Texas</p>	<p><b>Mountain Division:</b>                  Montana                  Idaho                  Wyoming                  Colorado                  New Mexico                  Arizona                  Utah                  Nevada</p> <p><b>Pacific Division:</b>                  Washington                  Oregon                  California</p>
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Map of the United States. Showing Geographic Divisions



# ILLUSTRATION OF "CROSS-LINE" ACREAGE



# CROSS-LINE ACREAGE

BY HILTON E. ROBISON

**Introduction.**—This report<sup>1</sup> is concerned with farms lying in two or more minor civil divisions, counties, or States and particularly with the acreage in these farms which lies in a different minor civil division, county, or State from that in which the farm was enumerated. In the reports for the 1940 Census of Agriculture, data for farms having land in two or more minor civil divisions, counties, or States, were credited to only one of the geographic areas, namely, the one in which the farmstead was located. Thus the statistics for a particular geographic area may not exactly represent the agriculture in that area. Some areas were credited with considerable agriculture represented by farm lands lying outside these areas, and for others the figures were correspondingly short. In 1940 a minimum of 3.9 percent of the land in farms was credited to a different minor civil division from that in which the land was located, 1.6 percent to a different county, and 0.2 percent to a different State.

**Minor civil divisions.**—In general the term "minor civil division," or "M.C.D.," is used to designate the political units into which the county is divided for local administrative or judicial purposes. Where an independent municipality extends across county lines, such municipality represents a single minor civil division; however, it is included in the count of minor civil divisions in each of the counties in which it falls. For 1940 such duplications are excluded from the State totals. The figures given for the number of minor civil divisions for 1935 represent the units of area into which the counties were subdivided for the 1935 Agriculture Census. These units, for the most part, conform to minor civil divisions. Some examples of units not conforming to minor civil divisions are (1) an independent city, village, or town extending across county lines, in which case the part within each county was treated as a separate unit; (2) certain cases where an independent city was considered a single unit although containing several minor civil divisions of a county; and (3) units of unorganized territory. Thus the differences between the count of minor civil divisions shown for the two census years do not in all cases represent actual changes in the minor civil divisions.

These so-called minor civil divisions are given various designations in different States or, sometimes, even in the same county. In most States the designation is "townships," "towns," or "election precincts." Often there is a combination of two or more forms or unusual types. Table 1, presenting the number of counties and minor civil divisions by States, gives the various M.C.D. designations and the number of M.C.D.'s in each.

Of the 51,627 minor civil divisions in the United States, 48,179, or 93.3 percent, reported farms at the 1940 Census. Of those reporting farms, 25,949, or 53.9 percent, reported cross-line acreage.

**Census definition of a farm.**—A farm, for census purposes, is defined as all the land on which some agricultural operations are performed by one person, either by his own labor alone or with the assistance of members of his household, or hired employees. Thus a "farm" may consist of a single tract of land, or a number of separate tracts, and the several tracts may be held under different tenures, as when one tract is owned by the farmer and another tract is rented by him. If both an owned and a rented tract were farmed by the same operator both tracts were to be considered as one farm even though the tracts may not have been contiguous and even though each tract may have been locally called a farm.

**Farms in two or more minor civil divisions, counties, or States.**—From the Census definition, it is apparent that a farm, consisting of all the land operated by one person, does not necessarily need to lie wholly within an M.C.D., a county,

or a State. In most instances the M.C.D., county, and State boundaries follow survey lines or natural boundaries which are also the boundaries of the farms lying along the M.C.D., county, or State lines. In survey areas the patterns of both ownership tracts and of political areas were determined very largely by the survey. Therefore, in general, the property lines and the political boundaries in such areas follow township, range, or section lines. Where land was under private ownership prior to the organization of a political area, the property lines probably helped, in many instances, to determine the political boundaries; and where the political boundaries preceded private ownership, these probably helped to determine the property lines. Therefore, tracts representing original private holdings rarely extend across political boundaries.

Most of the cases of farms extending across political boundaries have occurred because of additional land added to an original ownership tract, or because of the consolidation, either by purchase or rental, of several original ownership tracts. Such consolidations have taken place to the greatest extent in those areas where the original tracts represented too small an economic unit, as, for example, the Great Plain and Mountain States. In the West North Central States, the average size of farm increased from 142 acres in 1880 to 252 acres in 1940. In the Mountain States, the average size was 159 acres in 1880 and 822 acres in 1940. In these areas the operating units often comprise a rather complex intermingling of separate tracts owned or rented by the farm or ranch operator or, in the case of a managed farm, his employer. This is particularly true in regard to range lands where, in order to provide range for all seasons, often rather widely separated tracts may be used. The owned and rented lands may be supplemented by open or public range, not included as a part of the acreage in the farm, such as National Forests or Taylor Grazing Lands grazed under permit. The leased range lands in 1940 included considerable acreages rented from Federal, State, or other government agencies. This was particularly true in the Mountain States where such leased range lands accounted for a large part of the increase of 22 percent in all land in farms in this area between 1930 and 1940. Probably much of this land was formerly open range.

In areas where there have been no substantial increases in the size of farms any consolidation of holdings is more likely to consist of adjacent tracts. In these areas consolidations have undoubtedly occurred with less frequency than in areas where increases in the size of farms have indicated numerous consolidations.

Thus, it is evident that the number of farms with land in two or more M.C.D.'s, counties, or States has tended to increase gradually and may be expected to continue to increase. In general, such farms probably had very little effect on the earlier censuses, except in a few instances of large ranches extending into several counties. In the more recent censuses such farms have undoubtedly had a considerable effect in many instances upon the Agriculture Census statistics by geographic areas. This is particularly true for the past three censuses, 1940, 1935, and 1930, since for these years figures for specified items have been presented by minor civil divisions. For the earlier censuses the county, as a general rule, was the smallest geographic area for which figures were shown.

**"Cross-line farms" and "cross-line acreage."**—For convenience farms with land in two or more minor civil divisions, counties, or States are referred to as cross-line farms and the land in the minor civil divisions, counties, or States other than where the farmstead is located are referred to as cross-line acreage.

<sup>1</sup>Special acknowledgment is due Lois Hutchison for the assembling of data and preparation of tables.

**Enumeration of cross-line farms.**—In the 1940 Census, the enumerators were instructed as follows: "Occasionally a farm will be found in your district that has part of the land extending into another township or county (or into another enumeration district when there are two or more enumeration districts in the same township). In such cases, the entire farm is to be enumerated in that district in which the farmstead is located. The word 'township,' as used above, is intended to cover the minor civil divisions locally called townships, towns, wards, precincts, districts, beats, etc., as called for in the Enumerator's Record."

Provision was made for entering on the schedule the minor civil division and county names and the cross-line acreage for each minor civil division in which the cross-line acreage was located. Provision was also made for entering, for survey areas, the location of all land in the farm by section, township, and range. This portion of the schedule was as follows:

If any part of this farm is in another Minor Civil Division, give location and acreage—

M.C.D.	COUNTY	ACRES
-----	-----	-----
-----	-----	-----
-----	-----	-----

If this farm is located—

In surveyed area, give Sec. No. \_\_\_\_\_; Township \_\_\_\_\_; Range \_\_\_\_\_  
 Sec. No. \_\_\_\_\_; Township \_\_\_\_\_; Range \_\_\_\_\_

The section, township, and range when reported were helpful in verifying cross-line acreage reports, in supplying omitted cross-line acreage where land was indicated as lying in other M.C.D.'s or counties, and in determining the location and extent of the cross-line acreage where there was some indication that acreage might extend into other minor civil divisions, counties, or States. Although the survey description applied to the entire acreage it was not feasible to check these descriptions to determine whether reports of cross-line acreage had been omitted.

**History of enumeration of cross-line acreage.**—Beginning with the Census of 1850, the first for which the number and acreage of farms were enumerated, there is an implication that farms lying partly in other districts were returned in the district where the operator lived although no specific mention regarding such farms is made in the instructions or in the reports for that year. The instructions for that census include the following statement in regard to the acreage to be included in the farm: "It is not necessary that it should be contiguous, but it must be owned or managed by the person whose name is inserted in the column." The following additional instructions related to unimproved land in the farm: "It \* \* \* may be a wood lot or other land at some distance but owned in connection with the farm, the timber or range of which is used for farm purposes." Specific mention of farms extending into another subdivision was first made in the instructions for the Census of 1870 as follows: "A distant wood lot or sheep pasture, even if in another subdivision, is to be treated as a part of the farm \* \* \*." Similar instructions were carried for the 1880 and 1890 Censuses. For 1900 the instructions were more explicit: "In reporting the acreage, value, and crops of each farm, care should be taken to include the acreage, value, and crops of all wood lots, pastures, meadows, plow lands, and other lands, occupied or used in connection therewith. This is to be done, although not all of such lands are situated in the same enumeration district, or are owned by the same individual, corporation, or institution." Further instructions stated: "In all sections of the country many farms are to be found with lands lying in two or more enumeration districts. When the occupant or manager of such a farm resides upon the same or any part of it, the whole farm should be reported in the enumeration district in which the occupant or manager has his habitation."

No reports of the cross-line farms or of the extent of the cross-line acreage were made by the enumerators until the Census of 1925. For that census the instructions to enumerators stated: "In case of a very large farm lying partly outside the county for which it is enumerated, note on the margin of

the schedule approximately the number of acres outside that county." In 1930, the reports for cross-line acreage were again limited to "very large" farms but the information to be entered in the margin of the schedule included the name of each county and township. As the reports for neither year were satisfactory no use was made of the information except occasionally for checking purposes where the acreage in farms returned for a particular county appeared to be unreasonably high as when it was in excess of the approximate land area of the county.

In the 1935 Census, for all farms lying in more than one M.C.D., the enumerators were asked to report, in the margin of the schedule, the name of each M.C.D. and the acreage located therein. Although again the reports were not entirely satisfactory, the cross-line acreage was tabulated by location of the farmstead, or place of enumeration, by counties. These data for 1935 are included in this report.

In the hope of securing more complete reports of cross-line acreage, blanks were provided on the 1940 schedule for entering this information under the Enumerator's Record and Certificate.

**Statistics for cross-line farms.**—The statistics presented in this report for cross-line acreage for 1940 are classified by the area to which such acreage was credited and also by the area in which the land was actually located. The figures presented include not only the farms reporting and the amount of cross-line acreage but also the total land in the farms which reported cross-line acreage. These statistics are presented by counties in table 5 and by divisions and States in table 2. Although the cross-line acreage statistics were tabulated by the M.C.D. in which the farms were enumerated, it was not feasible to present the figures by M.C.D.'s because of limitations of the data, particularly their inadequacy for obtaining the net cross-line acreage in each M.C.D. County totals, however, are given for farms having cross-line acreage in more than one M.C.D. within the county. It is believed that these data, although by counties rather than by M.C.D.'s, will nevertheless be of considerable value when using agriculture census statistics for M.C.D.'s.

Separate figures are given for farms with cross-line acreage in other counties within a State and for those with cross-line acreage in other States. The number of farms, total land in farms, and the cross-line acreage classified by the type of geographic area for which the cross-line acreage was reported are summarized in table 3. From this table, it will be noted that some farms report cross-line acreage in two or more types of geographic areas. Farms reporting cross-line acreage in other counties within the State may also have cross-line acreage in other M.C.D.'s within the county or in other States; and farms with cross-line acreage in other States may also have cross-line acreage in other counties of the State or in other M.C.D.'s of the county. In such cases, there will be duplications in the reports of cross-line acreage in other M.C.D.'s of the county, in other counties of the State, and in other States. These duplications are excluded in the county totals of all farms reporting cross-line acreage.

The tabulations by location of the cross-line acreage were restricted to the reports of cross-line acreage in other counties and in other States since there was a tendency, where the cross-line acreage extended into another county, to omit the M.C.D. when giving the location of the cross-line acreage. Since cross-line acreage for a particular farm was sometimes reported in two or more counties, the county figures for cross-line farms by location of the cross-line acreage contain some duplications. Such duplications have been eliminated from the State total, also geographic division and United States totals. The number and acreage of farms by number of counties for which cross-line acreage was reported and by number of States for which cross-line acreage was reported are given in table 4.

Supplemental information presented along with the statistics on cross-line acreage include the total number of M.C.D.'s, the M.C.D.'s with farms, and those with farms reporting cross-line acreage. Also presented are the approximate land area of each county and the number and acreage of all farms. These items are given as they appear in the Census Reports presenting agriculture census statistics by counties. The net difference in farm land reported as located within a county and the

acreage of farm land as enumerated is presented in order to provide some measure of the net effect on the figures of crediting the agriculture for an entire farm to the geographic area where the farmstead was located without regard to the location of the rest of the farm.

Comparable statistics when available are presented for the Census of 1935. Statistics of cross-line farms were tabulated for the first time at that census. For that year tabulations were made by counties of the number of farms reporting and the cross-line acreage in other M.C.D.'s of the county, in other counties of the State, and in other States, or with the location not specified. For 1935 the cross-line acreage in other States or with location not specified include a considerable number of reports with the location not specified. Therefore, the statistics for cross-line acreage in other States for 1935 are not comparable with those presented for 1940.

Differences in the cross-line statistics for 1940 and 1935 should not be taken as indications of change. The enumeration in both years was too incomplete to justify this use of the figures. The figures for the two censuses are given in order to present a more complete picture of the cross-line acreage than is possible from the tabulations for either year taken separately.

#### Appraisal of the enumeration of cross-line acreage.—

In the 1940 Census of Agriculture the reports of acreage in other minor civil divisions, counties, or States were obviously incomplete. No satisfactory enumeration of cross-line acreage has been made at any census. Prior to 1940, enumerators were asked to report cross-line acreage in the margin of the schedules. It was hoped that the enumeration for 1940 might be improved by making provision for this information on the schedule, but there is no evidence that this resulted in any improvement. In fact, from the tabulations, it appears that the cross-line acreage may not have been as well reported in 1940 as in 1935. Fewer cross-line farms and less cross-line acreage were reported for 1940 than for 1935. Some decrease in the actual number of cross-line farms might be expected to accompany the decrease in the number of all farms, but the percentage decrease in farms reporting cross-line acreage was more than the percentage decrease in all farms. With a general increase in size of farm a relatively greater proportion would have been expected to report cross-line acreage.

In many areas, the cross-line acreage reported in 1940 was considerably less than that reported in 1935 despite increases in the size of farms in those areas accompanied by increases in total farm land. For example, in Arizona the percent of the land in all farms reported as cross-line acreage decreased from 18.0 in 1935 to 0.5 in 1940. Only a part of this tremendous decrease can be explained by the decrease in number of M.C.D.'s from 336 to 42 since the cross-line acreage reported as located in other counties of the State and in other States also showed a large decrease, changing from 13.6 percent of land in all farms in 1935 to 0.4 percent in 1940. Yet in this 5-year period the average size of farm in Arizona nearly doubled and the number of farms of 10,000 acres and over increased from 240 to 383. Nevada is another extreme example. The cross-line acreage reported for Nevada in 1940 amounted to only 6.4 percent of the land in all farms as compared with 15.3 percent in 1935.

The incompleteness of the cross-line acreage reports becomes apparent when comparisons of the land in farms and the land area are made for M.C.D.'s and for counties. Many M.C.D.'s and a few counties show differences which indicate considerably more cross-line acreage than was reported. This failure to report appears to have been most serious in the western States particularly with the large farms and ranches.

There are several reasons why cross-line acreage may not have been reported. There appeared to be a rather general tendency to omit both the cross-line acreage and the survey descriptions of rented lands. Perhaps the operator did not realize that these inquiries applied to rented as well as owned lands, or perhaps he did not always know the locations of the rented lands by M.C.D.'s or have readily available the survey descriptions. Many of the larger farms and ranches were operated by managers who may not have known the M.C.D. locations of any of the cross-line acreage. In many areas the minor civil divisions and minor civil division boundaries are not

generally known, except to persons residing in the M.C.D. A part of the difficulty with the large farms and ranches may have been the large number of M.C.D.'s into which cross-line acreage sometimes extended and the limited space provided on the schedule for entering the cross-line acreage. Another reason why the enumeration of cross-line acreage, in the 1940 Census, may not have been as satisfactory as was hoped for may have been the question regarding the location of farms by section, township, and range. The enumerator may have seen no need for giving the location both by minor civil division and by section, township, and range.

Cross-line acreage extending into other counties was frequently reported without the M.C.D. location. Again the reports often omitted any intervening M.C.D.'s within the county. It is likely that in many such instances there was cross-line acreage in these intervening M.C.D.'s. In general, the acreage extending across county lines was probably reported somewhat better than that extending merely across M.C.D. lines.

Although the reports for cross-line acreage were not entirely satisfactory, they provide some means for measuring roughly the possible distortions in the agriculture census data when classified by geographic areas, especially small areas. The figures for cross-line acreage give some indication of the amount of the cross-line acreage and its relative importance in different sections even though the figures for any particular area may not be entirely satisfactory. See the discussion under "Effects of cross-line acreage on agriculture census statistics."

**Number of cross-line farms.**—For the United States, 2.4 percent of the farms in 1940 reported cross-line acreage. Only 0.73 percent of the farms reported acreage extending into other counties of the same State and into other States, and 0.04 percent extending into other States. Cross-line farms were most numerous in the West North Central States, amounting to 6.3 percent of all farms. The South Atlantic and East South Central States had the smallest proportion of farms reporting cross-line acreage with only 0.59 and 0.40 percent, respectively.

Note that the proportion of farms reporting acreage extending into other M.C.D.'s, that is, the proportion of farms reporting any cross-line acreage, is 3.3 times as great as the proportion of farms reporting acreage extending into other counties. This ratio is not quite as great as might be expected from the relationship between the perimeters and areas of the average M.C.D. and of the average county. From these relationships the expected ratio would be approximately 4 to 1. The recorded ratio would probably have been somewhat higher had the acreage extending only into other M.C.D.'s of the same county been reported equally as well as that extending across county lines. Although cross-line acreage extending into other counties was obviously incompletely reported it was probably better reported than cross-line acreage extending only into other M.C.D.'s.

The number of farms extending across geographic boundaries and the cross-line acreage in such farms in general depends upon the number of farms along or near such boundaries and their size. With farms of a given size the proportion reporting cross-line acreage tends to decrease with the size of the geographic area under consideration. For example: A township 6 miles square contains 144 quarter sections of which 44 or 30.6 percent touch the boundary. A county 24 miles square contains 2,304 quarter sections of which 188, or 8.2 percent, touch the boundaries. From this it is apparent why the agriculture on the cross-line acreage may affect the agriculture census statistics for minor civil divisions to a much greater extent than those for counties.

With an area of a given size the proportion of farms reporting cross-line acreage tends to increase with the size of the farms. For example, in a county 24 miles square only 8.2 percent of the quarter sections lie along the boundaries, as compared with 16.0 percent of the sections. Thus, in this example, an increase from quarter sections to sections resulted in an increase of 2 to 1 in the proportion of farms lying along the boundaries. This explains in part why farms with acreage extending into other counties are relatively more important in the western part of the country than in the eastern part. Farms east of the Mississippi River average 93.5 acres as compared with 284.9 acres for farms west of the Mississippi. For

the States east of the Mississippi 0.4 percent of the farms reported acreage extending into other counties as compared with 1.0 percent west of the Mississippi. See also the discussion under "Farms in two or more M.C.D.'s, counties, or States."

**Extent of the cross-line acreage.**—The total cross-line acreage reported at the 1940 Census amounted to 3.9 percent of the land in all farms and 40.7 percent of the total acreage in the farms reporting cross-line acreage. The extent of the cross-line acreage as a proportion of the land in all farms depends upon both the number of farms lying in two or more M.C.D.'s, counties, or States and the size of such cross-line farms as compared with the size of other farms. Often the cross-line acreage reported for a single farm represents a very large proportion of the total farm land enumerated in a particular M.C.D. or county. This is especially true of some of the larger ranches in the Great Plain, Mountain, and Pacific States. The range lands used by a large ranch are quite frequently located in several M.C.D.'s or counties. The cross-line acreage reported for many of the range States appears to be much less than the actual cross-line acreage. Many very large ranches in the range areas failed to report any cross-line acreage, yet it was obvious that the entire acreage in the ranch could not have been within the boundaries of the M.C.D. where the ranch was enumerated. The 1940 reports for Arizona represent an extreme example of such under enumeration. As mentioned under the "Appraisal of the enumeration of cross-line acreage," 18.0 percent of the land in all farms for Arizona was reported as cross-line acreage in 1935 but only 0.5 percent was reported as cross-line acreage in 1940.

The cross-line acreage reported in 1940 ranged from 0.4 percent for land in all farms for Kentucky, Maryland, and Mississippi, to 11.0 percent in Utah. North Dakota had the next highest percentage, with 9.7. Nebraska and Kansas followed with 9.5 and 8.4 percent, respectively.

**Size of cross-line farms.**—Cross-line farms are much larger on an average than are other farms. In general, the cross-line acreage averages considerably more than the total acreage in the average farm not reporting cross-line acreage. Farms reporting cross-line acreage in 1940 averaged 706 acres, the cross-line acreage averaging 287 acres. The average size of farms in the United States not reporting cross-line acreage was 161 acres. Farms with cross-line acreage extending into other counties, regardless of State, averaged 1,088 acres as compared with 167 for farms with no cross-line acreage reported in other counties. In general, the size of farms with cross-line acreage in other counties tends to increase with the number of counties into which the cross-line acreage extends. For example: Those with cross-line acreage in 1 county averaged 873 acres as compared with 6,549 acres for those with cross-line acreage in 2 counties, and 50,757 acres for those with cross-line acreage in 3 or more counties. Farms with cross-line acreage extending into other States averaged 1,711 acres as compared with 173 for farms with no acreage reported in other States. Farms with cross-line acreage in 1 State averaged 1,673 acres as compared with 9,726 for those with cross-line acreage in 2 States.

**Effects of cross-line acreage on agriculture census statistics.**—In general, the various items included in the 1940 Census of Agriculture were tabulated to secure county totals. The tabulations for most of the items were by M.C.D.'s. In these tabulations all items for farms lying in two or more geographic areas were credited to that area in which the farm

was enumerated. The statistics for a particular geographic area may therefore include some agriculture for land which lies outside of the area, or it may exclude the agriculture for some of the land lying within the area. For counties where the land in farms exceeded the approximate land area a footnote was used in the reports calling attention to the fact that the entire acreage of a farm was tabulated as in the county in which the headquarters was located, even though a part of the farm may have been situated in an adjoining county. Otherwise the reports give no explanation of possible distortions of the data which may have resulted from cross-line acreage.

The statistics by counties are published in State bulletins and in volumes I and II, and the statistics by States are published in volume III. The statistics by minor civil divisions for most items included in the 1940 Census are in tabular form. These tables have not been published but are available at cost of photographic reproduction.

The extent of the cross-line acreage credited to an area and the extent of cross-line acreage lying within an area but credited elsewhere gives some indication of the effects on the statistics for other agriculture items. In many areas, these effects tend to be offsetting. In others, the figures for a particular M.C.D. or county may be considerably under or considerably over the true figures for the farm lands lying within the area. The figures for the acreage and value of farms and for farm land by use are affected in all instances. Where the cross-line acreage is largely grazing lands, such as in the range areas of the Mountain and Pacific States, the only other statistics that might be appreciably affected would be livestock items. The livestock items, however, would not necessarily be affected by the cross-line acreage since there would be some tendency to credit livestock to the portion of the farm or ranch where the buildings are located regardless of the method followed in enumerating cross-line acreage. The statistics for crops are probably affected to a much greater extent than are those for livestock. Crop statistics are probably affected most in the West North Central States. In much of the Great Plains area it has been necessary for farm operators to bring several original ownership tracts into single operating units in order to obtain farms of economic size for crop production.

This crediting of data for farms having land in two or more M.C.D.'s, counties, or States to only one of the geographic areas, namely, the one in which the farmstead was located was also true of the Census Reports for Agriculture for earlier years.

Comparisons of historical Census data by geographic areas are not affected to any appreciable extent by cross-line acreage so long as the number and acreage of farms having such cross-line acreage remain constant. If, however, there has been much of a shift of cross-line acreage from one geographic area to another the comparability of the statistics for the various censuses may be practically destroyed. This is most likely to happen where the cross-line acreages represent rented tracts. For example, large acreages of range lands may be leased by one operator at the time of one census and by a different operator in another geographic area at the next census. Where the cross-line acreage represents lands owned by the operator there is much less likelihood that the comparability between censuses will be affected. However, in some instances shifts in the location of the headquarters of large operators from one county to another have destroyed the historic comparability of census data.

