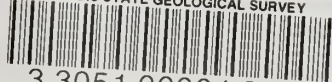
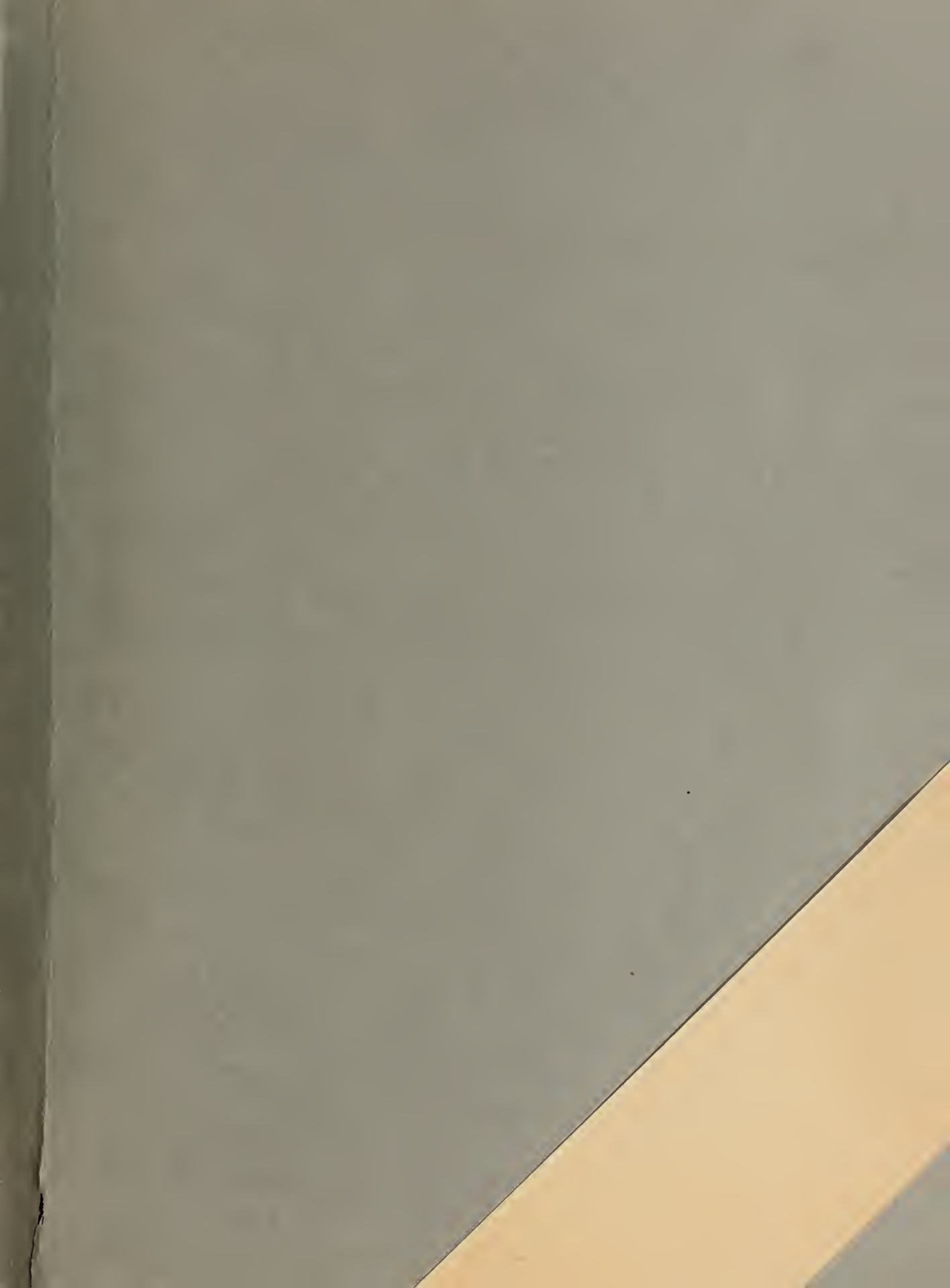



ILLINOIS STATE GEOLOGICAL SURVEY



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Division of the
S T A T E G E O L O G I C A L S U R V E Y
M. M. Leighton, Chief
Urbana, Illinois

No. 72

C I R C U L A R

May 1941

AGRICULTURAL LIMESTONE DISTRIBUTION IN ILLINOIS IN 1940

Preliminary Report*

By

W. H. Voskuil and G. N. Oliver

- - - - -

Consumption of agricultural limestone rose above the two million ton mark in 1940. Not only are the old established areas of limestone consumption maintaining their position, but the use of agricultural limestone in substantial quantities is being extended into areas where, hitherto, the interest in stone was not pronounced. Figures of consumption in 1940 are not strictly comparable with the previous year because, through cooperation with the offices of the Agricultural Adjustment Administration, it has been possible to secure consumption and distribution data in counties where production is furnished entirely by small local producers and roadside quarries and from whom direct replies were not received.

The use of limestone on farms has been substantially stimulated through the agricultural conservation program administered

* In cooperation with the Illinois Limestone Institute.

under the Agricultural Adjustment Administration. The grant-in-aid program which permits a farmer to receive limestone in lieu of cash payments has also served a useful purpose in encouraging limestone consumption. Under this arrangement, the farmer is permitted to draw a supply of soil conservation materials--limestone, superphosphate, and other materials--before the cropping season begins, and payment for these materials is deducted from any cash payment due to the grantee for his part in adhering to the soil conservation program. By this sort of an arrangement, he receives part of his allotment at the beginning of the season and is also saved the payment of interest on limestone purchases if he had made such purchases direct from producers with arrangements to make payments when his allotment was received.

Participation in the 1940 agricultural conservation program included 158,239 out of a total of 281,170 participating farms in the State, an average of 56.3 per cent.

The grant-in-aid program has been particularly effective in promoting limestone utilization in the southern counties of the State where, hitherto, limestone has not been extensively used. The percentage of farms in the southernmost counties^{1/} participating in the agricultural conservation program varied from 60 to 80 per cent and, with two exceptions, all were above the state average of 56.3 per cent participation. This part of the State is also characterized by a high percentage of farms operated by owners. Owner-operators in this area average approximately 70 per cent as compared with an average of 51 per cent for the State.

An area of high percentage of farm participation also exists across the central part of the State, embracing the area on both sides of the Illinois Waterway from the mouth of the river as far north as Tazewell and Peoria counties. Unlike the southern group of counties where owner-operator percentage is high, operation of farms by tenants is above the average for the State, especially in Fulton, Tazewell, Mason, Logan, Sangamon, Menard, Cass, and Schuyler counties, in which counties the average tenancy is 57 per cent.

In view of the fact that the soil conservation program provides for a division of allotments among landlords, tenants, and sharecroppers in the proportion that they are determined to be entitled, as of the time of harvest, to share in the crops in 1941, there is an incentive for each of the parties concerned to adopt a soil-building program. To this extent, the difficulty of promoting limestone use on tenant-operated farms is being overcome.

^{1/} Alexander, Union, Pulaski, Massac, Johnson, Pope, Hardin, Saline, Gallatin, and White.

Limestone in the soil conservation program.^{2/}

Among the fundamental purposes of the agricultural conservation program for 1941, the first is stated "to conserve and improve the soil resources of the nation." The program, according to the published instructions to which reference is made in the footnote, provides for payments to farmers to help them pay at least part of the cost of carrying out these purposes by diverting acreage from soil-depleting crops and by adopting soil-building practices.

"The program provides that a soil-building allowance for carrying out approved soil-building practices will be paid at the rate of

- (1) 50 cents per acre of cropland in the farm in excess of the total soil-depleting allotment for the farm.
- (2) \$1.80 per acre of commercial orchards on the farm.
- (3) A county flat rate per acre of noncrop open pasture land in the farm based upon 2 cents per acre of such pasture land in the county, plus 90 cents for each animal unit of grazing capacity.
- (4) 70 cents for each acre in the commercial vegetable allotment for the farm.
- (5) Non-general-allotment farms - \$1.10 per acre, adjusted for the productivity of the farm, for each acre in the total soil-depleting allotment for the farm in excess of the sum of (a) the special crop allotments for which payments are computed for the farm and (b) the acreage of sugar beets planted on the farm.
- (6) Special tree-planting allowance. In addition to soil-building allowance, a special allowance of \$15 will be computed for each farm for planting trees."

2/

1941 Agricultural Conservation Program, Illinois, U. S. Dept. of Agriculture, January 24, 1941.

Application of limestone and other approved fertilizer materials with seedings of perennial or biennial legumes, perennial grasses, winter vetch, lespedeza, or permanent pasture, or the application of approved fertilizers to land on which these legumes or grasses are already growing, will qualify as soil-building practice.

"The ground limestone must contain calcium and magnesium carbonates equivalent to not less than 80 per cent of calcium carbonate. It must not be coarser than that obtained by grinding calcareous or dolomitic limestone, with all finer particles obtained in the grinding process included, so that (1) not less than 90 per cent will pass through an 8-mesh sieve; or (2) not less than 30 per cent will pass through an 8-mesh sieve and the multiplication of the percentage of calcium carbonate (equivalent) times the percentage of ground limestone that will pass through an 8-mesh sieve equals not less than .7200.

"The following quantities of other calcareous substances are equivalent to one ton of ground limestone: 1,400 pounds of hydrated lime; two cubic yards of marl, sugar-beet refuse lime, calcium-carbide refuse lime, or water-softening-process refuse lime, calcium-carbide refuse lime, or water-softening-process refuse lime; $\frac{1}{2}$ ton of commercial burnt lime; four cubic yards of calcareous clay; one ton of burnt lime waste; one ton of agricultural limestone meal; 2750 pounds of limestone screenings; 2750 pounds of by-product of lead mines of which 90 per cent will pass through an 8-mesh sieve and which contains at least 80 per cent calcium carbonate equivalent; one ton of by-product of lead mines with the lead separated out by the water table method and the sludge ground so that the product applied contains at least 80 per cent calcium carbonate and 90 per cent will pass through an 8-mesh sieve; or 2750 pounds of blast furnace slag which will pass through an 8-mesh sieve."

Up to the maximum payments allowed for following an approved soil-building program, the application of one ton of ground limestone in the following counties--

Bond, Brown, Cass, Clay, Clinton, Edwards,
Effingham, Fayette, Fulton, Hamilton,
Franklin, Jefferson, Marion, Mason, Perry,
Richland, Schuyler, Shelby, Wabash, Washington,
Wayne, White, and Williamson--
will earn. \$2.00 per ton.

The application of one ton of ground limestone
in all other counties will earn. \$1.50 per ton.

(From the foregoing reference.)

Effect of Rearmament Program on the Supply of Limestone Grinding Machinery.

In view of the fact that certain shortages of materials have developed as a result of the unusual demands growing out of the rearmament program, the Office of Production Management has put into effect a plan of inventory control designed to prevent the accumulation of excess stocks and supplies. This type of control is being applied to sixteen metals and classes of metal. This plan does not involve a rationing of materials and inventories. It merely provides that shipments of the materials affected in this order may not be made to customers in amounts which will increase inventories to unnecessary levels. Among the materials listed for control which are of interest to the rock-crushing and grinding industry, are iron and steel products, including rolled, drawn, forgings, castings, and pig iron; also alloying metals which are needed in steel making as well as secondary metals and scrap.

Manufacturers and users of rock crushing and grinding machinery need not, under this plan, fear any shortage of needed materials or a decrease in their normal inventory by government order. Restrictions may be anticipated if there is a widespread overbuying of materials among manufacturers and an accumulation of excess supplies.

Table 1. contains figures for agricultural limestone consumed in Illinois in 1939 and 1940 and pounds used per acre in each county.

Table 2. contains figures for agricultural limestone produced in other states and marketed in Illinois, 1935-1940.

Table 3. contains figures for agricultural limestone produced in Illinois and marketed in other states.

Table 1.--Consumption of Agricultural Limestone
in Illinois, by Counties, 1939 and 1940

| County | Produced in Illinois | Produced in other states | Total used, 1940 | Total used, 1939 | Arable land (acres) | Average limestone con- sumption in pounds per acre of arable land | |
|------------|----------------------------|-----------------------------------|------------------------|------------------------|---------------------------|---|------|
| | | | | | | 1939 | 1940 |
| Adams | 30,335 | | 30,335 | 28,054 | 256,222 | 218 | 236 |
| Alexander | 2,160 | 185 | 2,345 | 1,600 | 48,999 | 66 | 96 |
| Bond | 20,123 | | 20,123 | 9,569 | 132,099 | 144 | 304 |
| Boone | 12,268 | | 12,268 | 8,106 | 115,787 | 140 | 210 |
| Brown | 11,065 | 188 | 11,253 | 4,677 | 78,104 | 120 | 288 |
| Bureau | 25,468 | 276 | 25,744 | 20,000 | 359,529 | 111 | 142 |
| Calhoun | 13,473 | | 13,473 | 5,750 | 68,901 | 164 | 390 |
| Carroll | 33,588 | | 33,588 | 15,000 | 153,278 | 196 | 438 |
| Cass | 10,000 | | 10,000 | 5,538 | 144,961 | 76 | 140 |
| Champaign | 33,312 | | 33,312 | 23,103 | 510,585 | 90 | 130 |
| Christian | 35,986 | | 35,986 | 14,669 | 338,156 | 86 | 212 |
| Clark | 33,334 | 4,056 | 37,390 | 46,915 | 151,845 | 600 | 492 |
| Clay | 26,589 | | 26,589 | 5,500 | 151,435 | 72 | 350 |
| Clinton | 28,048 | | 28,048 | 16,585 | 192,686 | 177 | 290 |
| Coles | 21,256 | | 21,256 | 15,000 | 214,023 | 140 | 198 |
| Cook | 9,650 | | 9,650 | 9,826 | 178,385 | 110 | 112 |
| Crawford | 12,560 | 6,497 | 19,057 | 8,240 | 124,307 | 132 | 306 |
| Cumberland | 23,367 | 646 | 24,013 | 10,526 | 119,122 | 176 | 400 |
| DeKalb | 26,402 | | 26,402 | 10,895 | 307,266 | 71 | 172 |
| DeWitt | 13,606 | | 13,606 | 10,120 | 182,562 | 110 | 148 |
| Douglas | 11,865 | 1,072 | 12,937 | 7,950 | 207,392 | 76 | 124 |
| DuPage | 7,668 | | 7,668 | 5,541 | 106,526 | 104 | 144 |
| Edgar | 14,945 | 2,908 | 17,853 | 11,729 | 273,073 | 86 | 130 |
| Edwards | 15,825 | 385 | 16,210 | 6,050 | 85,356 | 140 | 380 |
| Effingham | 29,726 | 5,122 | 34,848 | 13,052 | 163,598 | 160 | 426 |
| Fayette | 21,679 | | 21,679 | 14,000 | 228,559 | 123 | 196 |
| Ford | 21,774 | | 21,774 | 21,490 | 247,539 | 173 | 176 |
| Franklin | 14,201 | 250 | 14,451 | 7,367 | 113,057 | 131 | 254 |
| Fulton | 15,088 | 3,714 | 18,802 | 11,890 | 290,102 | 82 | 130 |
| Gallatin | 6,236 | | 6,236 | 4,773 | 104,998 | 91 | 118 |
| Greene | 25,000 | | 25,000 | 16,125 | 178,198 | 181 | 278 |
| Grundy | 14,161 | | 14,161 | 7,329 | 200,769 | 73 | 140 |
| Hamilton | 12,467 | 26 | 12,493 | 6,500 | 134,746 | 97 | 180 |
| Hancock | 31,065 | 231 | 31,296 | 8,161 | 274,919 | 59 | 220 |
| Hardin | 10,618 | | 10,618 | 4,800 | 29,189 | 328 | 726 |

Table 1.--(Continued)

| County | Produced in Illinois | Produced in other states | Total used, 1940 | Total used, 1939 | Arable land (acres) | Average limestone con- sumption in pounds per acre of arable land | |
|------------|----------------------------|-----------------------------------|------------------------|------------------------|---------------------------|---|------|
| | | | | | | 1939 | 1940 |
| Henderson | 20,460 | | 20,460 | 13,035 | 130,350 | 200 | 314 |
| Henry | 19,158 | 10,842 | 30,000 | 31,484 | 334,421 | 188 | 179 |
| Iroquois | 35,000 | 10,000 | 45,000 | 26,438 | 554,440 | 95 | 162 |
| Jackson | 19,170 | | 19,170 | 13,300 | 172,337 | 154 | 282 |
| Jasper | 34,036 | 156 | 34,192 | 5,881 | 176,936 | 66 | 386 |
| Jefferson | 31,488 | | 31,488 | 13,500 | 177,301 | 153 | 214 |
| Jersey | 20,520 | | 20,520 | 9,953 | 115,901 | 171 | 354 |
| JoDavies | 26,420 | | 26,420 | 10,000 | 145,556 | 138 | 360 |
| Johnson | 20,046 | | 20,046 | 7,010 | 72,686 | 193 | 550 |
| Kane | 17,248 | | 17,248 | 14,224 | 223,860 | 127 | 154 |
| Kankakee | 19,604 | | 19,604 | 25,153 | 309,935 | 162 | 126 |
| Kendall | 15,000 | | 15,000 | 13,500 | 155,459 | 180 | 192 |
| Knox | 11,217 | 15,303 | 26,520 | 20,700 | 254,902 | 162 | 208 |
| Lake | 8,400 | | 8,400 | 8,071 | 115,301 | 140 | 144 |
| LaSalle | 55,226 | | 55,226 | 44,719 | 519,354 | 172 | 212 |
| Lawrence | 4,111 | 6,189 | 10,300 | 3,700 | 117,274 | 63 | 174 |
| Lee | 39,779 | | 39,779 | 20,000 | 320,207 | 125 | 248 |
| Livingston | 50,806 | | 50,806 | 66,014 | 540,819 | 244 | 188 |
| Logan | 13,097 | | 13,097 | 12,300 | 300,583 | 83 | 86 |
| McDonough | 29,441 | 3,390 | 32,831 | 8,012 | 227,081 | 70 | 280 |
| McHenry | 16,787 | | 16,787 | 16,500 | 218,840 | 150 | 141 |
| McLean | 75,000 | | 75,000 | 66,716 | 581,994 | 228 | 220 |
| Macon | 19,950 | 50 | 20,000 | 11,480 | 278,949 | 82 | 142 |
| Macoupin | 42,124 | | 42,124 | 18,250 | 292,187 | 124 | 288 |
| Madison | 30,075 | | 30,075 | 30,320 | 267,693 | 226 | 224 |
| Marion | 29,764 | | 29,764 | 8,505 | 174,766 | 91 | 340 |
| Marshall | 12,669 | | 12,669 | 15,061 | 162,866 | 184 | 154 |
| Mason | 20,000 | | 20,000 | 8,431 | 228,957 | 74 | 174 |
| Massac | 19,440 | | 19,440 | 2,050 | 63,831 | 64 | 600 |
| Menard | 8,515 | | 8,515 | 5,528 | 134,833 | 83 | 126 |
| Mercer | 18,191 | 3,551 | 21,742 | 12,096 | 192,182 | 126 | 226 |
| Monroe | 14,164 | | 14,164 | 9,375 | 149,508 | 123 | 190 |
| Montgomery | 38,000 | | 38,000 | 10,290 | 269,517 | 74 | 280 |
| Morgan | 11,471 | 5,179 | 16,650 | 3,394 | 222,219 | 32 | 140 |
| Moultrie | 10,726 | 274 | 11,000 | 4,148 | 162,653 | 51 | 134 |

Table 1.--(Continued)

| County | Produced in Illinois | Produced in other states | Total used, 1940 | Total used, 1939 | Arable land (acres) | Average limestone con- sumption in pounds per acre of arable land | |
|----------------------------|----------------------------|-----------------------------------|------------------------|------------------------|---------------------------|---|------|
| | | | | | | 1939 | 1940 |
| Ogle | 50,000 | | 50,000 | 20,000 | 319,048 | 135 | 312 |
| Peoria | 29,440 | 287 | 29,727 | 31,460 | 218,763 | 288 | 270 |
| Perry | 18,475 | | 18,475 | 11,475 | 138,507 | 164 | 266 |
| Piatt | 15,809 | 191 | 16,000 | 10,662 | 220,133 | 97 | 144 |
| Pike | 35,000 | | 35,000 | 20,000 | 237,252 | 169 | 302 |
| Pope | 9,593 | | 9,593 | 4,800 | 66,401 | 143 | 288 |
| Pulaski | 5,007 | 95 | 5,102 | 1,600 | 66,790 | 48 | 150 |
| Putnam | 10,882 | | 10,882 | 9,843 | 59,339 | 334 | 366 |
| Randolph | 35,000 | | 35,000 | 11,952 | 204,931 | 117 | 340 |
| Richland | 19,433 | 17 | 19,450 | 6,558 | 133,173 | 99 | 292 |
| Rock Island | 12,962 | 2,288 | 15,250 | 11,150 | 133,212 | 168 | 228 |
| St. Clair | 44,794 | | 44,794 | 31,501 | 267,433 | 232 | 334 |
| Saline | 14,000 | | 14,000 | 9,514 | 120,108 | 158 | 232 |
| Sangamon | 29,852 | 148 | 30,000 | 8,310 | 377,487 | 44 | 158 |
| Schuyler | 8,938 | | 8,938 | 6,000 | 130,779 | 91 | 136 |
| Scott | 4,702 | 410 | 5,112 | 8,560 | 90,704 | 188 | 113 |
| Shelby | 24,193 | 104 | 24,297 | 12,375 | 297,999 | 86 | 162 |
| Stark | 10,371 | 5,629 | 16,000 | 5,475 | 122,206 | 91 | 260 |
| Stephenson | 45,000 | | 45,000 | 20,000 | 210,552 | 190 | 426 |
| Tazewell | 15,000 | | 15,000 | 12,930 | 284,658 | 91 | 104 |
| Union | 15,910 | 175 | 16,085 | 7,345 | 108,386 | 136 | 296 |
| Vermilion | 36,570 | 3,430 | 40,000 | 18,000 | 399,851 | 90 | 200 |
| Wabash | 6,047 | 2,953 | 9,000 | 310 | 92,213 | 7 | 196 |
| Warren | 28,713 | 4,841 | 33,554 | 20,000 | 215,866 | 185 | 310 |
| Washington | 34,616 | | 34,616 | 24,000 | 216,960 | 221 | 320 |
| Wayne | 22,197 | | 22,197 | 3,063 | 208,166 | 30 | 212 |
| White | 9,182 | 5,593 | 14,775 | 6,746 | 190,289 | 71 | 154 |
| Whiteside | 32,964 | 36 | 33,000 | 16,000 | 282,383 | 114 | 234 |
| Will | 20,000 | | 20,000 | 9,974 | 330,187 | 54 | 120 |
| Williamson | 14,775 | 225 | 15,000 | 2,854 | 98,094 | 54 | 306 |
| Winnebago | 37,000 | | 37,000 | 25,000 | 182,962 | 272 | 400 |
| Woodford | 18,471 | | 18,471 | 18,141 | 233,462 | 155 | 158 |
| Trucked, county unknown | 11,844 | | 11,844 | 89,292 | | | |
| Total | 2,258,751 | 106,912 | 2,365,663 | 1,497,458 | | | |

Table 2.--Agricultural Limestone Produced
in Other States and Sold in Illinois,
1935-1940, in Tons

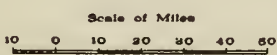
| Year | Amount sold in Illinois | Per cent of total Illinois consumption |
|------|----------------------------|--|
| 1935 | 54,803 | 10.5 |
| 1936 | 77,264 | 7.5 |
| 1937 | 87,479 | 7.9 |
| 1938 | 118,740 | 10.2 |
| 1939 | 71,775 | 5.1 |
| 1940 | 106,912 | 5.9 |

Table 3.--Agricultural Limestone Produced in Illinois and
Marketed in Other States, 1935-1940, in Tons

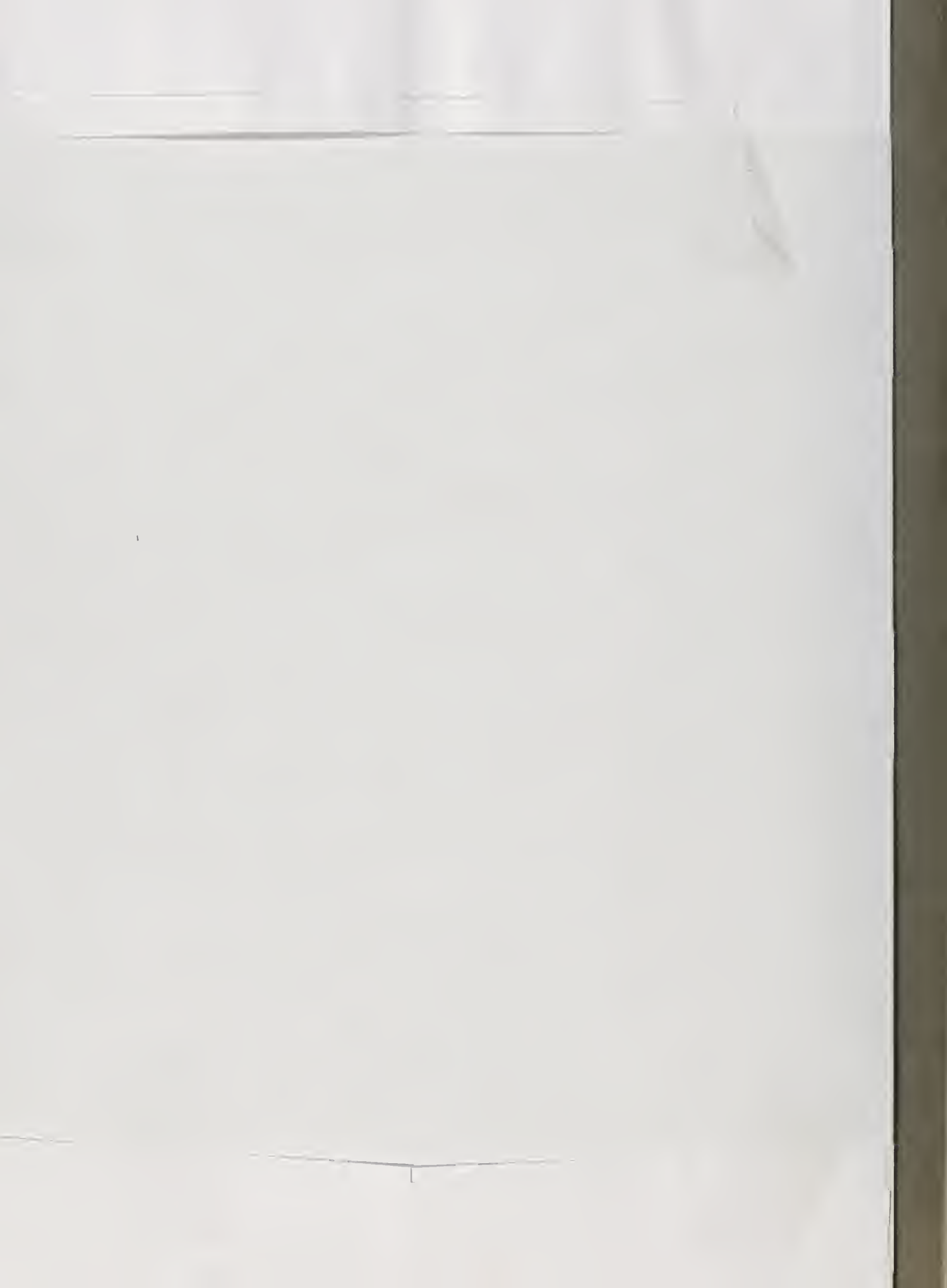
| Year | Indiana | Kentucky | Missouri | Michigan | Tennessee | Total |
|------|---------|----------|----------|----------|-----------|---------|
| 1935 | 10,102 | 32 | 130 | 4,135 | 1,095 | 15,562 |
| 1936 | 28,976 | 4,129 | 587 | 4,950 | 6,020 | 44,398 |
| 1937 | 53,375 | 12 | 845 | 7,522 | 2,703 | 64,746 |
| 1938 | 36,356 | 4 | 675 | 1,288 | 4,100 | 42,463 |
| 1939 | 3,527 | 4,735 | 441 | 500 | 18,950 | 28,169 |
| 1940 | 3,800 | 5,450 | 353 | 325 | 14,900 | 25,778* |

* Includes 950 tons to Wisconsin.

MAP OF
ILLINOIS



COUNTY LOCATION MAP



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