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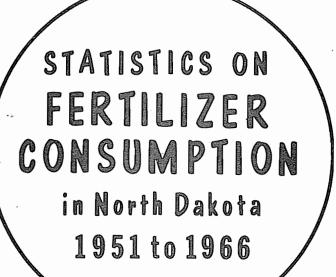
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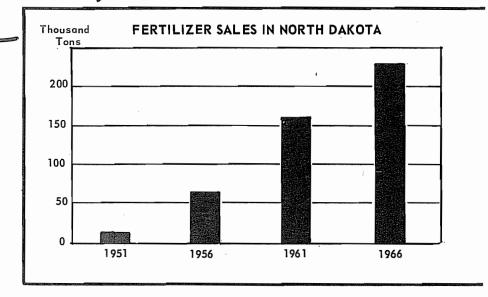
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# For Check Out Only! July 1967



BY LEROY W. SCHAFFNER AND STANLEY W. VOELKER



DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY
OF AGRICULTURE AND APPLIED SCIENCE
IN COOPERATION WITH
ECONOMIC RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

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#### FERTILIZER CONSUMPTION IN NORTH DAKOTA, 1951 TO 1966

LeRoy W. Schaffner and Stanley W. Voelker<sup>1</sup>

#### Introduction

This report summarizes estimates of fertilizer-consumption trends from 1951 to 1966, made by various agencies. In addition, it presents original estimates of 1964 fertilizer applications on each crop within each of the seven economic areas of the state. These estimates were developed for a national effort to estimate amounts of fertilizer and plant nutrients applied to each crop within each state and agricultural subregion. The national project was conducted by the Economic Research Service, the Statistical Reporting Service, and the Agricultural Research Service of the United States Department of Agriculture, in cooperation with the state agricultural experiment stations.

#### Statistics on Fertilizer Consumption for the State as a Whole

Sources of Fertilizer Consumption Statistics. Statistics from three sources provide approximations of the annual amounts of fertilizer consumed in North Dakota: (1) the semi-annual summaries of fertilizer tonnage compiled by the North Dakota State Laboratories Department; (2) annual estimates of fertilizer consumption in each state, made by the Statistical Reporting Service, U. S. Department of Agriculture; and (3) the estimates of fertilizer used on farms, made by the U. S. Census of Agriculture in 1954, 1959, and 1964. For sake of brevity, these three sources are indicated in this report as "NDSLD," "USDA," and "Census," respectively.

The "NDSLD" estimates are compiled from reports of the tonnage of each analysis or grade sold during each six-month period, ending June 30 and December 31, submitted to the North Dakota State Laboratories Department by fertilizer "registrants." The North Dakota fertilizer law requires each brand and analysis of fertilizer sold in the state to be registered with the Laboratories

<sup>&</sup>lt;sup>1</sup>Assistant Professor, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University; and Agricultural Economist, Economic Research Service, United States Department of Agriculture, stationed at North Dakota State University, respectively.

<sup>&</sup>lt;sup>2</sup>The fertilizer statistical activity formerly was handled by the Soil and Water Conservation Research Division of the Agricultural Research Service. This function was transferred to the Statistical Reporting Service in November, 1965.

The assistance of Dr. Enoch B. Norum, Chairman, Department of Soils, North Dakota Agricultural Experiment Station, and Virgil L. Weiser, Soils Specialist, North Dakota Cooperative Extension Service, is gratefully acknowledged.

Department. Most of the registrants are either national manufacturers or regional distributors, although some are local blenders and retailers.

USDA reports include estimated tonnages of each primary plant nutrient (N,  $P_2O_5$ , and  $K_2O_5$ ) as well as total tonnages of mixed fertilizers and fertilizer materials. These estimates, available for each state by 12-month periods ending June 30, are based on fertilizer shipments to each state reported to USDA by fertilizer manufacturers and distributors throughout the country, supplemented by data compiled by state agencies.

The census fertilizer-consumption data for 1954, 1959, and 1964 were based on returns from samples of farms, composed of all farms of 1,000 acres or more and 20 percent of all farms smaller than 1,000 acres. The North Dakota sample amounted to 33 percent of all farms in 1954, 36 percent in 1959, and 41 percent in 1964. The census data included acreage fertilized and tons of material applied to six groups of crops in each county. The six groups in North Dakota were: (1) corn for all purposes; (2) wheat and durum; (3) potatoes; (4) hay and cropland pasture; (5) noncropland pasture; and (6) all other crops, the most important of which were barley, oats, rye, flaxseed, soybeans, sugar beets, tame mustard, sunflowers, safflower, and millet.

Trends in Annual Fertilizer Consumption. Both the NDSLD and USDA statistics indicate a steeply rising trend of fertilizer consumption since 1951 (Figure 1 and Table 1). These two series are in close agreement for all years except 1957. The USDA series are essentially tonnages shipped to North Dakota by manufacturers and regional distributors, while the NDSLD data are summarizations of amounts of each brand and analysis sold in the state. For some brands, the reported sales were those of manufacturers to distributors and retailers; for other brands, the sales were of distributors to retailers; and for still other brands the reported sales were of retailers and local blenders to consumers. The small differences between the USDA and NDSLD data probably are due to year-to-year variations in the July 1 inventories of distributors, retailers, and local blenders.

. The census estimates should provide reasonably accurate figures on farm consumption because of the large sample size, the approximate random design of the 20 percent portion of the sample, and the statistical methods used to derive the final estimates from the sample data. Census estimates were 14.1 percent larger than the NDSLD figures in 1954, 20.4 percent larger in 1959, and 2.9 percent smaller in 1964. Several reasons for these discrepancies are: (1) Census figures include only farm consumption, while the NDSLD and USDA estimates also include nonfarm uses (such as lawns, gardens, golf courses, parks, and cemeteries). Total nonfarm use is estimated to have been 1,126 tons in 1964. Estimates of nonfarm use are not available for 1954 and 1959, but likely were smaller than in 1964. (2) Census estimates are supposed to represent applications during the calendar year, including fall applications for crops to be harvested the following year. The USDA estimates, on the other hand, generally are given for 12-month periods ending June 30 in an attempt to relate fertilizer shipments and retail sales to the crop year, on the assumption that most of the fertilizer shipped to retailers between July 1 and December 31 would be applied to crops harvested during the following calendar year. Where fertilizer usage has increased very rapidly, as it has in North Dakota, use of the July 1 to June 30 period tends to understate the amount applied by farmers in any given calendar year.

(3) USDA and NDSLD data are affected by changes in the end of season fertilizer inventories of farmers, while census data are not. Operators who have storage facilities frequently buy fertilizer in the fall to take advantage of price reductions, to offset year-to-year fluctuations in farm income and to smooth out fluctuations in net farm income for income-tax purposes.

The above factors, however, do not explain all the discrepancies between the census estimates and the NDSLD and USDA data for 1954 and 1959. If census estimates of farm consumption for these years were reasonably accurate, then some of the fertilizer used by North Dakota farmers must have been included in the statistics for other states in the reports from the fertilizer industry to USDA and NDSLD. Interstate retail sales of fertilizer and fertilizer carried as a backhaul by trucks used to transport agricultural products to terminal markets contribute to the problem of crediting fertilizer to the state where it is consumed.

The 1964 census data on farm consumption, however, agree closely with the estimates based on shipment and sales data, after allowance is made for nonfarm use. The reason for the changed situation between 1959 and 1964 is not readily apparent. Possibly the fertilizer industry itself has devised more accurate procedures for apportioning data on fertilizer shipments and sales between states for their reports to federal and state agencies. Changes in retail-trade patterns (as might have been occasioned by the advent of bulk-mixing plants in North Dakota) may have resulted in a smaller proportion of the fertilizer being trucked into the state.

Despite these discrepancies among the three series of estimates used to measure consumption of fertilizer materials and mixtures, the three sets of estimates agree on the following points: (1) annual fertilizer consumption in North Dakota increased rapidly between 1951 and 1963, (2) decreased during 1963, and (3) has increased rapidly since 1963 (Figure 1 and Table 1).

Trends in Consumption of Plant Nutrients. Nigrogen, phosphorus, and potassium are the most important plant nutrients in commercial fertilizer. Standardized analytical procedures to measure the amounts of these nutrients in fertilizer materials and mixtures have been adopted by the fertilizer industry and state regulatory agencies for quality-control and guarantee purposes, under which amounts of the primary plant nutrients are expressed in terms of elemental nitrogen (N), available phosphoric oxide (P2O5), and water soluable potash (K2O). Until recently, almost all fertilizer statistics have been in terms of elemental nitrogen and the oxide equivalents of phosphorus and potassium.

There is a growing tendency, particularly among research people, to express amounts of phosphorus and potassium in fertilizer as elemental P and K rather than as oxides. State regulatory agencies and the fertilizer industry eventually may adopt this newer system of expression. In this report, estimated amounts of phosphorus and potassium are given in terms of both the elemental and oxide forms.

Phosphorus has been the most important of the three fertilizer elements, accounting for 47 to 69 percent of the total tonnage of fertilizer elements used annually in North Dakota (Figure 2). Phosphate fertilizers are used

extensively on all crops except grass hay and pasture. Use of nitrogen increased much faster than use of other elements between 1951 and 1965, with a forty-seven-fold increase, compared with an eighteen-fold increase for phosphorus. One reason for the rapidly increasing use of nitrogen has been the increasing practice of fertilizing nonfallowed land. Only small amounts of nitrogen, if any, are used for crops planted on fallow. Nonleguminous crops planted on nonfallowed land, however, generally respond to nitrogen applications in conjunction with phosphorus.

The place for potassium for North Dakota conditions is less well defined, but its use is increasing. The rate of increase in potassium consumption has been much lower than that of either phosphorus or nitrogen--only three-fold. Potassium usually is included in fertilization of potatoes and sugar beets in the Red River Valley. Some is used for wheat, barley, and corn in localized areas.

The quantity of plant nutrients used in North Dakota has increased faster than the total tonnage of commercial fertilizer because of the trend towards higher analysis fertilizers. Before 1949, the total tonnage of nitrogen, phosphorus, and potassium never was more than 17 percent of the total fertilizer tonnage used in North Dakota. Between 1949 and 1959, this percentage increased steadily and has since remained at a high level of about 30 percent (Table 3 and Figure 3).

Technological advances by the fertilizer industry made the use of high-analysis fertilizers both physically possible and economically feasible. This trend towards higher analysis has been general throughout the country, but high-analysis fertilizers are especially important to North Dakota because of the long distances to the principal sources of supply. Freight costs, therefore, account for a relatively high proportion of the retail price of fertilizer.

### Estimates of Fertilizer Consumption By Specified Crops in 1964

The estimated acreage of each crop fertilized in 1964 and the tonnage of fertilizer and primary plant nutrients applied to each crop were based on the 1964 census estimates for the six crop groupings and the USDA statewide estimates of fertilizer consumption, after adjustments for nonfarm use of fertilizer. The proportion of each crop fertilized and rates of fertilizer application were estimated from data obtained from: (1) various farm management surveys; (2) annual records of farm practices and production inputs kept by farm operators on nearly 1,400 fields; 3 and the authors general knowledge of farm practices in different parts of the state.

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These fields are located in all parts of the state. The records are kept for the Soils Survey and Interpretation Project of the North Dakota Agricultural Experiment Station, in cooperation with the Soil Conservation Service, USDA.

These estimates were made initially for seven groups of counties, known as Census Economic Areas (Figure 4).

Acreage of Each Crop Fertilized. Estimated acreages of the more important crops fertilized during 1964 in the seven economic areas are given in Table 4. Wheat was by far the leading crop fertilized, accounting for 59 percent of the fertilized acreage for the state as a whole.

Barley accounted for 21 percent of the fertilized acreage and oats for 8 percent. These three were the leading crops fertilized in all economic areas except Area 3C, in which the large acreage of corn fertilized was exceeded only by that of wheat.

Percentage of Each Crop Fertilized. The 1964 fertilized acreages of each crop, expressed as a percentage of their respective harvested acreages in each of the seven economic areas, are shown in Table 5. These percentages provide a convenient measure of the relative use of fertilizer for each crop.

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For the state as a whole, practically all the sugar beet and commercial-potato acreage, 52 percent of the wheat acreage, 46 percent of the barley acreage, 26 percent of the corn acreage, and 22 percent of the oats acreage received fertilizer in 1964. There were wide differences among the seven different economic areas in the proportion of each crop fertilized. For example, only 19 percent of the wheat acreage was fertilized in south central North Dakota (Economic Area 2B), compared with 84 percent in the Red River Valley (Economic Area 4).

Amount of Fertilizer Applied to Each Crop. Estimated tonnage of commercial fertilizer applied to each crop in each economic area is given in Table 6, and the percentage of the total tonnage is given in Table 7. For the state as a whole, 50 percent of the total tonnage was applied to wheat, 21 percent to barley, 7 percent to oats, and 17 percent to row crops (corn, potatoes, sugar beets, and soybeans). These percentages varied greatly from one economic area to another. The percentage applied on wheat, for example, ranged from 28 percent in Economic Area 3C to about 75 percent in the two western-most economic areas, 1 and 2A.

Average Application Rates Per Acre. Average amounts of fertilizer applied per acre tended to be highest in the eastern, more humid areas of the state and lowest in the western, drier areas (Table 8). This east-west variation in average application rates, roughly in accordance with average annual precipitation, is especially noticeable in the case of corn and cereal grains. However, the highest of fertilizer application rates, for potatoes and sugar beets, are found in the three western-most economic areas, 1, 2A, and 2B, where all of the sugar beets and most of the potatoes are grown under irrigation.

Average Amounts of Plant Nutrients Per Acre. The average amounts of nitrogen, phosphorus, and potassium used per acre for each specified crop in each of the seven economic areas are given in Tables 9, 10, 11, 12, and 13, respectively. The phosphorus and potassium amounts are given on the basis of both oxides and elements. Average application rates for nitrogen and phosphate

tend to vary from east to west roughly in accordance with precipitation zones (Tables 9 and 10). Very little potassium, however, is used in the three western-most, less humid economic areas, except for potatoes (Tables 12 and Actes, as Rever to the property of the book of the actes of green and a strength of the st

#### to the test for the control of the Changes In Fertilizer-Consumption with the property . A plant Patterns Between 1959 and 1964

The acreage of each crop fertilized in 1959 and the tonnage of fertilizer and plant nutrients applied to each crop were estimated from 1959; census data and other information by procedures quite similar to those described above for the 1964 estimates.5 duran Duried, of decided behave

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The 1959 estimates were developed for three "economic subregions" of the state, instead of for the seven census economic areas. The Missouri Slope agricultural subregion comprises the same counties as Economic Area 1, and the Red River Valley agricultural subregion consists of the same counties as Economic Area 4. The Till Plains agricultural subregion includes the counties in census economic areas 2A, 2B, 3A, 3B, and 3C.

Changes In Fertilized Acreage. The total fertilized acreage in North Dakota increased hearly 31 percent, from 4,232,000 acres in 1959 to 5,539,000 acres in 1964. Most of this increase resulted from substantial increases in the fertilized acreage of wheat in all three agricultural subregions (Table 14). The fertilized acreage of barley, on the other hand, decreased 467,000 acres, largely because of the reductions in barley acreage as a result of the feed-grain program. In addition, some farmers in the eastern third of the state may have reduced the use of nitrogen on malting barley because of highprotein problems. The fertilized acreage of corn, tame hay, and cropland pasture also declined during this five-year period, while that of other crops increased.

Fertilized acreage, expressed as a percentage of harvested acreage, increased for all crops except improved permanent open pasture (Table 15). Generally speaking, this increase in the percentage of each crop fertilized occurred in all agricultural subregions. All a local and a second assess

Changes In Amount of Fertilizer Used. The total quantity of fertilizer used on farms increased 14 percent, from 157,000 tons in 1959 to over 179,000 tons in 1964 (Table 16). The increase in total tonnage of fertilizer used amounted to 21 percent for wheat, 75 percent for oats, 86 percent for sugar beets, and 23 percent for potatoes. The amount of fertilizer used on barley and flax, however, declined by 21 percent and 8 percent, respectively! The

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<sup>&</sup>lt;sup>5</sup>These estimates were reported in "Statistics on Fertilizer Consumption in North Dakota," by Stanley W. Voelker, and Marvin T. Nordbo, Agricultural Economics Department Report Number 25, North Dakota Agricultural Experiment Station, Mimeographed, September, 1962. Inasmuch as the 1959 report is out of print, most of the 1959 data and estimates are included in this report.

relatively large increases in amount of fertilizer used on "other crops" were due to the increased acreage of several minor crops--sorghum, grass-legume silage, proso millet, sunflower seed, mustard seed, and pinto beans--some of which were almost unknown in North Dakota in 1959.

Changes In the Amounts of Primary Plant Nutrients. The tonnage of nitrogen used by North Dakota farmers increased by 12 percent between 1959 and 1964 (Table 17). About one-third less nitrogen was used on barley in 1964 than in 1959, but the amount used on all other crops increased.

The amount of phosphorus used on all crops increased 25 percent during the five-year period (Table 18). There was a slight decrease in the amount used on corn, but increases of varying amounts on all other crops.

The total amount of potassium used on farms increased 27 percent (Table 19). A decreased amount used on barley was more than offset by substantial increases in the amounts used for corn and potatoes.

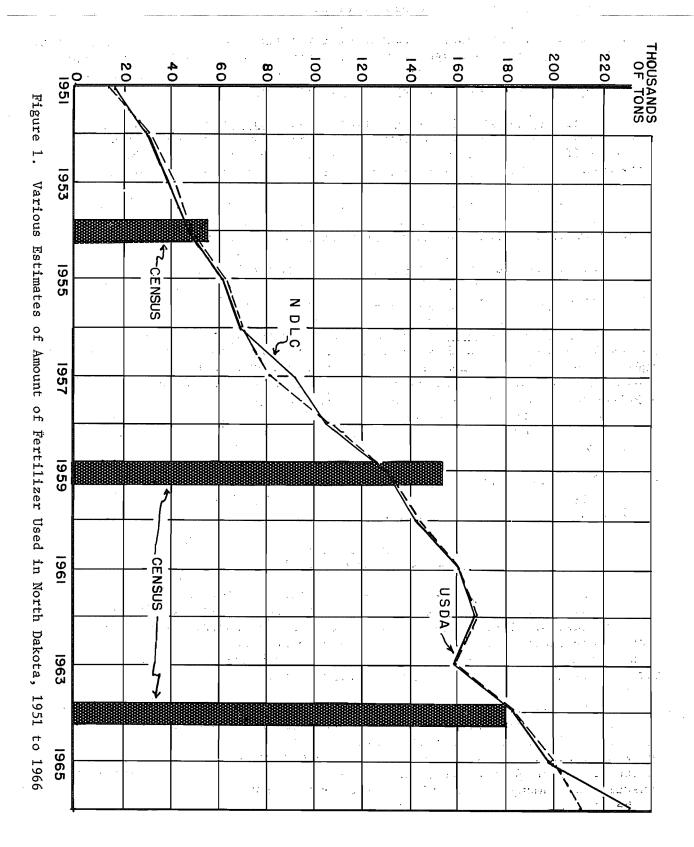
<u>Changes In Application Rates</u>. The average amount of fertilizer applied per acre increased about 8 percent between 1959 and 1964 (Table 20). Average application rates increased for all crops except rye, flax, and improved permanent open pasture. Generally speaking, the largest increases in average application rates occurred in the Red River Valley subregion. Application rates for potatoes and sugar beets in the Missouri Slope subregion increased substantially, but for other crops there were either very modest increases or decreases.

The average amount of nitrogen, phosphrus, and potassium applied per acre to specified crops in the three agricultural subregions in 1959 and 1964 is shown in Tables 21, 22, and 23.

#### <u>Census Data on Fertilizer Use</u> <u>By Counties</u>, 1959 and 1964

The tables in this section contain basic county data on fertilizer use from the U. S. Census of Agriculture for 1959 and 1964 (Tables 24 through 29). Also included are computations of the percentage of acreage fertilized and average application rates per acre in each county, for the convenience of the reader in making intercounty comparisons. In each table, the counties are arranged alphabetically by census economic areas.

Two maps of North Dakota show the relative intensity of fertilizer use among the various counties. Figure 5 shows the percentage of total crop acreage fertilized in each county. Figure 6 gives the percentage of wheat acreage fertilized. The highest concentrations of fertilized acreage occur in the Red River Valley and adjacent counties, while the lowest concentrations generally are among the counties in the south central and northwestern parts of the state.



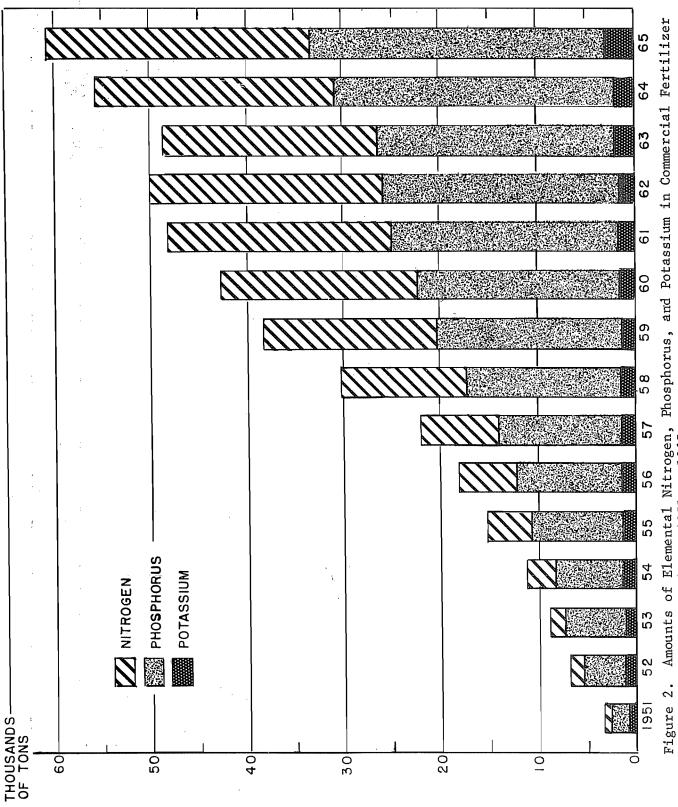


Figure 2. Amounts of Elemental Nitrogen, Phosphorus, and Potassium in Commercial Fertilizer Consumed in North Dakota, 1951 to 1965

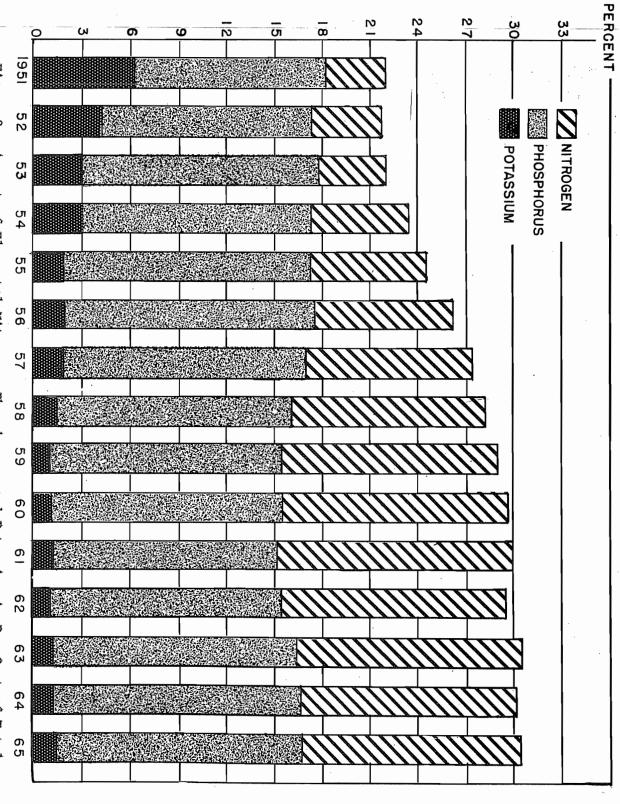


Figure 3. Amount of Elemental Nitrogen, Phosphorus, and Potassium in Per Cent of Total Fertilizer Consumption in North Dakota, 1951 to 1965

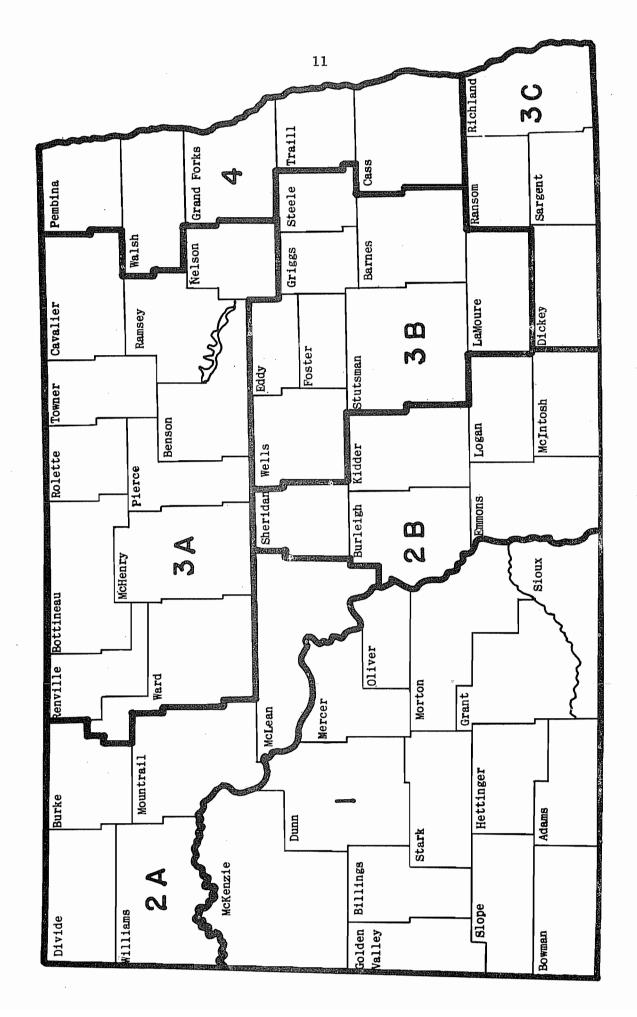


Figure 4. Economic Areas, North Dakota

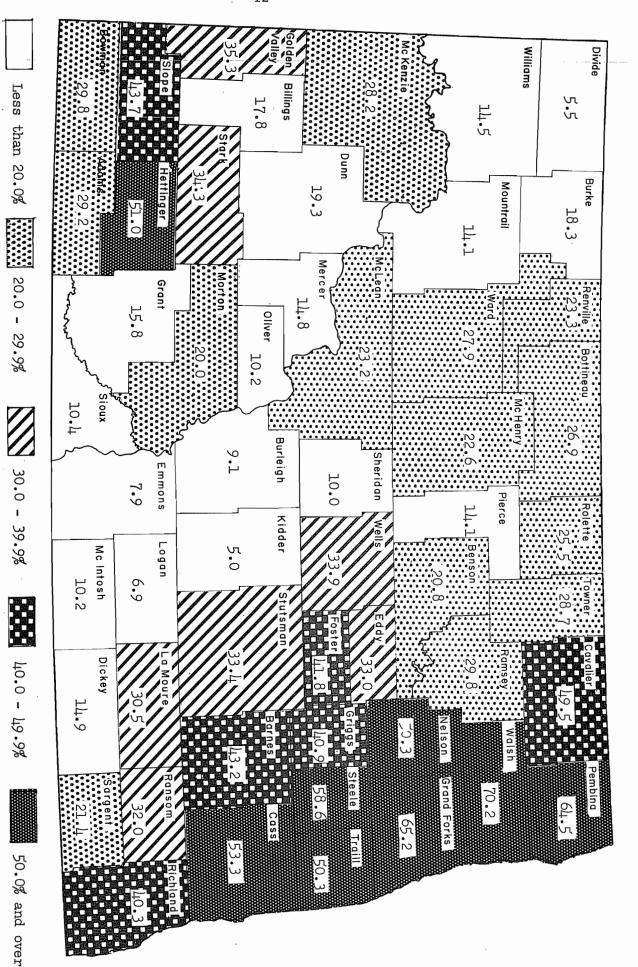


Figure 5. Total Fertilized Acreage As A Per Cent of Harvested Acreage of All Crops, 1964

Source: U. S. Census of Agriculture, 1964

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Figure 6. Percentage of Harvested Wheat Acreage Fertilized in 1964

TABLE 1. ANNUAL CONSUMPTION (TONS) OF COMMERCIAL FERTILIZER IN NORTH DAKOTA, 1951
TO 1966, AS INDICATED BY VARIOUS STATISTICAL SERIES

2.	Total consumpti periods, end	on, by 12-month ling June 30	Farm consumption during calendar
Year	As compiled by N. D. State Lab- oratories Dept. <sup>a</sup>	As estimated by U. S. Dept. of Agriculture <sup>b</sup>	year, as estimated by U. S. Census of Agriculture <sup>C</sup>
		tons	
1951	17,017	14,205	
1952	30,642	31,148	
1953	38,380	40,495	
1954	47,271	47,677	54,248
1955	62,644	63,010	
1956	69,010	69,168	
1957	92,621	81,745	
1958	105,426	106,742	
1959	130,425	131,834	156,978
1960	142,733	143,977	
1961	160,974	160,816	
1962	166,795	168,052	
1963	158,412	158,851	
1964	183,657	183,630	179,222
1965	197,515	199,097	
1966	230,955	210,945 <sup>d</sup>	

<sup>a</sup>Compiled from semi-annual reports of the North Dakota State Laboratories Department, Bismarck, North Dakota.

bUnited States Department of Agriculture, Statistical Reporting Service, Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States, 1850-1964, and by States, 1945-1964, Statistical Bulletin No. 375, Washington, D. C., June, 1966, p. 18.

United States Department of Agriculture, Statistical Reporting Service, <u>Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States</u>, <u>Year Ended June 30</u>, <u>1965</u>, SpCr 7(6-66), Washington, D. C., June, 1966, p. 7.

<sup>C</sup>Compiled from 1959 and 1964 United States Census of Agriculture for North Dakota.

dPreliminary.

TABLE 2. TONNAGE OF PRIMARY PLANT NUTRIENTS IN COMMERCIAL FERTILIZERS CONSUMED IN NORTH DAKOTA, 1951 TO 1965, WITH PHOSPHORUS AND POTASSIUM EXPRESSED BOTH AS OXIDES AND ELEMENTS

Year ending June 30	Total amount of fertilizer mixtures and materials	N Dega	Potass	rus and ium as des	Tota1  N, $P_2O_5$ , and $K_2O$	Phosphor Potassi eleme pa	lum as	Total N, P,
	tons		· · · · · · · · · · · · · · · · · · ·	tons	Commence Commence of the Comme	رائين داد مدد د د د د د د د د د د د د د د د د	tons	Sandra Committee (1984)
1951 1952 1953 1954 1955 1956 1957 1958 1959	14,205 31,148 40,495 47,677 63,010 69,168 81,745 106,742 131,843	573 1,356 1,614 2,924 4,598 6,101 8,458 12,923 18,033	9,515 14,088 16,541 22,329 24,935 28,858 36,483 43,697	1,038 1,560 1,437 1,275 1,359 1,446 1,626 1,674 1,519	5,509 12,431 17,139 20,740 28,286 32,482 38,942 51,080 63,249 70,236	1,701 4,153 6,148 7,219 9,745 10,882 12,594 15,922 19,070 21,032	862 1,295 1,193 1,058 1,128 1,200 1,350 1,390 1,261 1,318	3,136 6,804 8,955 11,201 15,471 18,183 22,402 30,235 38,364 42,806
1961 1962 1963 1964 1965	143,977 160,816 168,052 158,851 183,630 199,097	20,456 23,884 23,921 22,459 24,871 27,206	52,226 56,038 56,176 66,059 70,342	1,588 1,869 1,539 1,982 2,373 3,294	77,979 81,498 80,617 93,303 100,842	22,792 24,456 24,516 28,829 30,699	1,552 1,278 1,645 1,970 2,735	48,228- 49,655 48,620 55,670 60,640

 $<sup>^{</sup>a}P_{2}0_{5}$  times 0.43642 = P.

Source: United States Department of Agriculture, Statistical Reporting Service,

Consumption of Commercial Fertilizers and Primary Plant Nutrients in the
United States, 1850-1964, and by States, 1945-1964, Statistical Bulletin No.
375, Washington, D. C., June, 1966, p. 18.

United States Department of Agriculture, Statistical Reporting Service, Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States, Year Ended June 30, 1965, SpCr 7 (6-66), Washington, D. C., June, 1966, p. 18.

The rider of a to the real beingwest too are 8

 $<sup>^{</sup>b}$ K<sub>2</sub>0 times 0.83016 = K.

TABLE 3. AMOUNT OF PRIMARY PLANT NUTRIENTS IN PERCENT OF TOTAL FERTILIZER CONSUMP-TION IN NORTH DAKOTA, 1951 TO 1965, WITH PHOSPHORUS AND POTASSIUM EXPRESSED BOTH AS OXIDES AND ELEMENTS

Year Potassium as N, Potassium as To	
and the second of the second o	tal
ending N oxides P205, elements N,	Ρ,
	d K
percent good Appercent	her in the little in the later
1951 4.0 27.4 27.3 38.7 12.0 00 6.1 22	.1
	.8-
The state of the s	.1
1954 6.1 34.7 2.7 43.5 15.2 2.2 23	
1955 7.3 35.4 2.2 3 44.9 15.5 1.8 24	.6
And the second of the second o	200
	. 3
	.4
	. 3
1939 13.7 33.1 1.2 40.0 30.9 29	.1
1960 14.2 33.5 41.1 SE 48.8 14.6 We 0.9 29	.7
1961 14.8 32.5 21.2 48.5 21.0 30	.0
	. 6
	. 6
1964 13.5 36.0 1.3 50.8 15.7 1.1 30	
	.5

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i di situata di Nacionalia prompto da Presidenza di Estable Segui e il residua e

ting ning sing bear have also in the second of the second

i linguit la dite incedi i republica computità particale della computatione della computatione della computati

na de la composição de la composiç Composição de la compo

Source: Compiled from data in Table 2.

TABLE 4. ESTIMATED FERTILIZED ACREAGE OF SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

		<u> </u>								
Specified crop		in a little	r	Cens	sus econo	omic	areas	į		State
or pasture		1	2A	2B	3A	1000	3B	3C	4 0000	total
			21.100		1,000 a	cres	o * grando na naciona.	reach the description for the first of the second s	FF gr. 5 FF - FF 5 St. St. St. St. St. Compression on the St.	and an array and the con-
					•					
Corn, all purpos	ses	15.7	3.9	8.7	13.5	5	42.5	110.7	58.4	253.4
Potatoes	1	0.9	0.1	0.0	( . f ; 2.4	+	0.2	0.3	94.6	98.5
Sugar beets	-1 - 11/1	5.4	2.3	С	1.0010.0	)	0.1	1.7	42.9	52.4
Wheat and durum		724.5	243.2	108.8	798.0	) <sub>(1,1</sub>	632.4	140.2	11 1 1 1 4 1 2 miles	3,274.4
Barley	f :	57.0	24.7	12.2	259.9	9 e.s	283 <b>.</b> 5⊜	69.8	442.6	1,149.7
Oats		32.5	4.8	<b>8.7</b>	52.3	3 4 , , ; .	94.8	67.8	170.6	431.5
Rye		1.1	0.3	0.9	6.3 43.6	5	20.7	3.3	7.8	91.6
Flax	` , i	0.5	1.4	7.9	13.3	3	7.5	3.4	27.5	2 11 1 11
Soybeans	1.19	0.0	0.0	0.0	· · · 0.0	)	0.0	12.0	4.6	16.6
Tame hay and cro	op -								was to	24.4 - 1 - E
land pasturea	- 4	7.7	1.5	2.3	3.4	<b>4</b> . ψ	13.5	15.3	9.5	53.2
Other cropsb		6.1	2.0	0.1	3.4	4	9.6	4.4	33.8	59.4
Improved permane	ent							,1,	GOATAMILA E	
open pasture	٠	2.0	0.6	0.8	5 O.S	<b>9</b>	2.3	2.2		10.9
					,**-				bin soci	o trijoff
Total crops and								unsi	ogan to Par	
improved perma	nent							33	,	ray file o
pasture		853.4	284.8	150.4	1,190.	7 1,	107.1	431.1	1,521.7	5,539.2

<sup>&</sup>lt;sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

rane di agratica. Descriptivas i barasser vicini tali Secubilis refer

Children Sena Charling a chemon

CLess than 50 acres.

TABLE 5. FERTILIZED ACREAGE IN PERCENT OF HARVESTED ACREAGE OF SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

							distance of Laborator for the control of the	
Specified crop	6 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	<u>iti zlungu</u>	Census	conomic	areas		acaa bali	State
or pasture	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2A	2B	3A	3B	3C	992 <b>4</b> 0882	average
		a sea to 1975	r e	percent				To the second se
Corn, all purposes	s 5.5	12.5	5.9	19.3	27.7	53.8	ere 65.815	25.9
Potatoes	104.9°	41.5	33.0	75.8	<b>22:2</b> 0	88.5	104.3 <sup>C</sup>	102.4°
Sugar beets	101.5°	103.6°	100.0	0.0	100.0	102.8 <sup>c</sup>	103.0°	102.9c
Wheat and durum	57.5	27.5	19.3	46.9	74.5	53.9	83.7	52.2
Barley	29.3	10.5	10.0	30.1	70.4	69.3	79.2	46.4
Oats	10.1	3.6	3.3	15.5	27.5	23.7	58.0	21.8
Rye	3.4	0.4	2.0	25.1	23.5	7.9	38.1	15.9
Flax	1.5	1.5	2.9	4.2	1.5	3.1	10 <b>.7</b>	3.9
Soybeans	0.0	0.0	೦.೦ ಿ. ್	0.0	0.0	10.9	5.8 <sub>m// ii</sub>	8.8
Tame hay and crop-	•						a ima yad	101.77
land pasture <sup>a</sup>	1.0	0.8	0.7	0.8	3.1	6.6	4.9	2.1
Other cropsb	25.0	15.8	1.3	12.7	37.7	5.8	38.1	22.4
Improved permanent	<b>:</b>					151.5	usen ja jo ov	Ar and
open pasture	1.3	1.8	1.8	1.9	4.8	6.8	14.2	2.9
Total crops and							,	
improved permane	ent						285 JULY	. 500
pasture	26.6	16.4	8.2	29. <u>6</u>	38.4	29.2	60.2	31.3

<sup>&</sup>lt;sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

<sup>C</sup>Fertilized acreage exceeds harvested acreage because some of the fertilized acreage was not harvested.

Specified corn	/-	J. 1. 1793		Census	economi	c areas.	!	an yo	State
or pasture	J.,	1	2A 💠	2B :	3A	3B.	3C	4 .	total
À			1. 11.1011		tons	e * as	of reservational section 2.5	erade i Mirat Iadrigis i	ag hit occupie hat hade in in index in ign the
Corn, all purposes		599	1,60	348	a 464:	1,786	4,939	3,048	11,344
Potatoes		118	7	5		18	33	11,305	11,702
Sugar beets		1,164	647	8	0.5	15	189	4,910	6,933
Wheat and durum		15,156	5,112	2,682	19,735	18,294	4,524	24,047	89,550
Barley		1,458	618		7,610	8,166	2,306	16,709	37,231
Oats		807	119	258		2,642	2,204	5,800	13,056
Rye	4 _ 1 )	27	9	22			105	293	1,964
Flax	4 1	<b>12</b>	35	191		162	67	554	1,351
Soybeans	~ .	0	0	0		0	348	133	481
Tame hay and crop-	٠	.,	•	., .				noro bu	3 1 C., 1788
land pasturea	.,	375	83	156	· 207	7.33	887		3,003
Other cropsb		214	61		88	303	192	1,159	
Improved permanent	. ,	-,	,				*1		a in the
open pasture	~ ·1	69	26	45	<b>27</b> ()	95	107	122	491
Total crops and	K = 12	77	-79	π.	: '11/	1 2 57		in Ma	
improved permaner	ıt						ol en e	THE STATE OF	erregia de la Maria. No como esta esta esta esta esta esta esta esta
pasture		19,999	6.877	4.088	.30,829	32.796	15,901	68,642	179,132

aSummations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

1,500,100 1,000

Source: Estimates based on data from 1964 United States Census of Agriculture for North Dakota.

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bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

TABLE 7. AMOUNT OF FERTILIZER APPLIED TO SPECIFIED CROPS AND PASTURE IN PERCENT OF TOTAL CONSUMPTION BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

Specified crop	0.00	i je prese	Census	economi	c areas	1		State
or pasture	1	<b>2A</b>	2B	3 <b>A</b>	3B	3 <b>C</b>	4:200	average
		8759 T	yay jamaa aa	percent				
Corn, all purposes	3.0	2.3	8.5 <sup>5.5</sup>	1.5	5.4	31.1	4.4	1.6.3·
Potatoes	0.6	0.1	0.1	0.7	0.1	0.2	16.5	6.5
Sugar beets	5.8	9.4	0.2	0.0	c.	1.2	7.2	3.9
Wheat and durum	75.8	74.4	65.6	64.0	55.8	28.4	35.0	50.0
Barley	7.3	9.0	8.9	24.7	24.9	14.5	24.3	20.8
Oats Water	4.0	1.7	6.3	4.0	8.1	13.9	8.5	7.3
Rye	0.1	0.1	0.6	3.0	1.8	0.6	0.4	1.1
Flax	0.1	0.5	4.7	1.0	0.5	0.4	0.8	0.7
Soybeans	0.0	0.0	0.0	o.o	0.0	2.2	0.2	0.3
Tame hay and crop-							disa pur	
land pasture <sup>a</sup>	1.9	1.2	3.8	0.7	2.2	5.6	0.8	1.7
Other crops <sup>b</sup>	1.1	0.9	0.2	0.3	0.9	1.2	1.7	1.1
Improved permanent						2	100000	lurye, sami
open pasture	0.3	0.4	1.1	0.1	0.3	0.7	0.2	0.3
Total crops and								M: 1.4203
improved permanent						. Pro-	ភភ ។១១ ១៩	we notifie
pasture	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

aSummations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

Post by Pakons.

EcLess than 0.05 percent: like in 1000 migl, more wastern beaut accommon to the two

TABLE 8. AVERAGE POUNDS OF FERTILIZER APPLIED PER FERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS, 1964

Specified crop		<u> </u>	Census	economi	c areas		Land Contract	State
or pasture	1 ]	2A	2B	3A	3B	3 C	4177	average
		,		pounds				
Corn, all purposes	76.3	82.8	79.7	68.8	84.1	89.3	104.5	89.5
Potatoes	260.2	237.3	277.8	178.7	176.5	258.8	239.0	237.6
Sugar beets	430.0	550.3	398.0	0.0	228.0	228.0	228.8	6 264.6°
Wheat and durum	41.7	42.0	49.3	49.5	57.9	64.5	2007 <b>6.7</b> 0	54.7
Barley	51.1	50.0	59.5	58.6	57.6	66.0	73.9	64.8
Oats	49.6	50.0	59.5	46.9	55.7	65.0	66.4	60.5
Rye	47.6	50.0	50.0	42.5	56.3	64.0	75.6	50.6
Flax	45.9	50.0	48.0	50.0	43.1	40.0	38.7	43.9
Soybeans	0.0	0.0	0.0	0.0	0.0	58.0	58.1	58.0
Tame hay and crop-						** 4	er ye garanta	
land pasture <sup>a</sup>	97.6	113.5	136.4	121.6	108.4	115.8	118.8	112.9
Other crops <sup>b</sup>	69.7	60.2	135.3	52.1	63.4	86.8	68.7	68.2
Improved permanent							La Contraction	in the special
open pasture	68.2	84.6	119.0	58.9	82.5	98.8	117.0	90.1
Total crops and							Brown to be	1.5
improved permanent					,	200		
pasture	46.9	48.3	54.3	51.8	59.2	73.8	90.2	64.7

<sup>&</sup>lt;sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

TABLE 9. AVERAGE POUNDS OF NITROGEN APPLIED PER FERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

									1 14, 1
Specified crop			g milysty		economic			Here the law	State
or pasture	i i	1	2A	2B	3A .	3B	3C	400	average
			- 1.		pounds				,
**									
Corn, all purposes	S :	13.7	10.8	14.3	15.8	14.3	14.3	21.9	16.0
Potatoes	1.77%	49.4	49.8	44.4	28.6	28.2	41.4		38.1
Sugar beets	5 1	94.6	99.0	91.5	0.0	5.80	5.8	6.9	4.5
Wheat and durum	43-43	3.3	0.4	7.9	3.6	7.4	12.0	13.8	6.5.
Barley	9.1	6.6	2.0	8.3	5.9	8.1	9.2	13.3	9.5
Oats	. ",	5.0	7.5	10.7	7.5	10.0	9.2	13.3	10.5
Rye	. 32	3.2	5.5	8.0	2.1	12.4	1.2	8.3	5.5
Flax	. : -	5.0	0.0	7.7	15.0	11.2	6.0	4.3	7.9
Soybeans	, Br.	0.0	0.0	0.0	0.0	0.0	1.2	10.0	:: 3.6
Tame hay and crop-	-							in in the	115
land pasturea	1	7.6	20.7	13.7	33.7	9.1	3.8	20.0	11.4
Other cropsb		6.3	2.7	24.1	15.0	3.9	17.9	12.2	10.6
Improved permanent	-						4	and ordered d	
open pasture		22.5	34.7	65.5	19.4	27.2	32.6	38.6	32.0
Total crops and								11:10	1000
improved permane	ent						jersu.	2 2 St. 1 1	1.19.00
pasture		4.5	1.8	8.9	4.7	8.2	11.1	15.1	8.7

<sup>&</sup>lt;sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

TABLE 10. AVERAGE POUNDS OF PHOSPHORUS, EXPRESSED AS OXIDE (P205), APPLIED PER FERTILIZED ACRE ON SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

Specified crop				Census	econom	ic area	S		State
or pasture		1	2A	2B	3A	3в	`-3C	4	average
	,		Comment of the second	e the second of	pounds	Production of the second section of the second	المهدر المعلودوأياه	Markey to the state of the	rape grown er av andere
Corn, all purpose	es :	17.5	32.3	28.7	. 23.0	26.9	25.0	26.1	25.2
Potatoes	1	49.4	49.8	44.4	28.6	28.2	41.4	38.2	38.1
Sugar beets	1	11.8	99.0	115.4	0.0	98.1	98.1	98.4	99.8
Wheat and durum		18.8	19.7	18.7	22.3	23.0	22.6	27.1	22.3
Barley	,,,	18.5	17.6	22.0	22.9	20.7	23.4	24.5	22.7
Oats		18.0	17.0	17.0	18.7	22.0	22.8	22.7	21.5
Rye		18.8	18.1	17.0	20.0	14.1	22.4	26.3	19.1
Flax	7.	22.0	22.5	9.6	20.0	15.0	18.0	18.6	17.4
Soybeans		0.0	0.0	0.0	0.0	0.0	19.1	25.0	20.8
Tame hay and crop	<b>)</b> –				1 ' 9'	17.55	1.5 %		
land pasturea	,	35.6	14.4	52.9	33.1	40.9	48.3	27.7	39.2
Other cropsb		, ,	22.9	1	19.3	24.9	20.2	24.6	23.9
Improved permaner			***		1, 4	iz Alla	Alice 1		
open pasture	7.7.	0.0	a 0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total crops and	`						is a second second second	man in the state of the state o	
improved perman	nent		,						
pasture		19.5	20.3	19.6	22.2	22.5	24.4	28.3	23.5

aSummations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

TABLE 11. AVERAGE POUNDS OF PHOSPHORUS, EXPRESSED AS ELEMENT (P), APPLIED PER FERTILIZED ACRE ON SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

Specified crop		Aprova 20	Census economic areas State
or pasture	1	2A	2B 3A 3B 3C 4 averag
			pounds
Corn, all purposes	7.6	14.1	12.5 10.0 4411.7 10.99 4011.4
Potatoes	21.6	21.7	19.4 12.5 12.3 18.1 16.7 16.6
Sugar beets	48.8	43.2	50.4 0.0 42.8 42.8 42.9 43.6
Wheat and durum	8.2	8.6	8.2 9.7 10.0 9.9 11.8 9.7
Barley	8.1	7.7	9.6 10.0 9.0 10.2 10.7 9.9
Oats	7.9	7.4	7.4 8.2 9.6 10.0 9.9 9.4
Rye	8.2	7.9	7.4 0.68.7 4.66 6.26.60 9.8 11.5 (8.3)
Flax	9.6	9.8	1.2 8.7 6.5 7.9 8.1 7.6
Soybeans	0.0	0.0	0.0 20 0.0 20 0.0 20 8.3 10.9 20 20 9.1
Tame hay and crop-		,	my a limit of
land pasturea	15.5	6.3	23.1 14.4 17.8 21.1 21.1 17.1
Other cropsb	10.4	10.0	15.1 8.4 10.9 8.8 10.7 10.4
Improved permanent			
open pasture	0.0	0.0	0.0 (45 0.0 ) 0.0000 0.0 0.000 0.0 0.0

<sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

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Source: Figures in Table 10 times .43642.

TABLE 12. AVERAGE POUNDS OF POTASSIUM, EXPRESSED AS OXIDE (K20), APPLIED PER FERTILIZED ACRE ON SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964

Specified crop			Cens	sus econo	mic areas	<b>3</b>	State
or pasture	1	2A	2B	3A	3B	3C	4 average
			: :	pound	ls	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	anti Mandunio III nini independi profit il di unita il unita il
Corn, all purpose	s 0.0	9.0.0	9 0 0 0	0.0	a a 0.0	o. a 3.6.	3.1:1: a2.3
Potatoes		14.2	22.2			20.7	
Sugar beets	0.0			0.0		1.5	1.6
Wheat and durum		J. G 0.0					0.7
Barley	0.0	0.0	1 4 0.0	0.1	0.2	(., 0 0.9	2.2 1.0
Oats	0.0	0.0	€ 0.0	0.2	3.4 0.1	0.00	1.3 0.6
Rye	0.0	0.0	3.3 O.O	0.0	0.0	0.0 0.0	0.0 0.0
Flax	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0
Soybeans	0.0	0.0	9.9 0.0	0.0	0.0	6.4	0.0 4.6
Tame hay and crop	_					~~	กุลพล โกล หมูป พ.ศ.
land pasturea	0.0	9.0 O.O	0.0 0.0	0.0	0.0	(r 0.0	
Other crops <sup>b</sup>	0.1	0.3	∂. 0 <b>4.5</b>	0.0	0.1	1.0	0.1
Improved permanen	t					:3	namusiam barotrati
open pasture	0.0	0.0	0.0 0.0	0.0	0.0	a. 0.0	0.0
Total crops and					Trought putting on a gro	1 1 to the state of the section and the	establican a service of engineers and and the service
improved perman	ent :	a alimi	at which the	gar pa ji danga	there are the second	anga ang a	er transita
pasture/			0.9	0.1	0.1	1.4	2.4 0.8

<sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay.

c Less than .05 pounds per acre.

TABLE 13. AVERAGE POUNDS: OF POTASSIUM, EXPRESSED AS ELEMENTO (K), APPLIED PER DESIGN OF FERTILIZED ACRE ON SPECIFIED CROPS AND PASTURE BY CENSUS ECONOMIC AREAS OF NORTH DAKOTA, 1964 DALUTAL 1964

The second secon	The same of the sa						
Specified crop		aga on o by	Censu	is 'econo	mic areas		chan ke / State .
or pasture	1	2A	2B	3A	3B	3C	4 average
			il de la companya de	pound		A Acres to the	CARTON MARKON TALLES PARTON OF P. C. A Layer Co.
				•			
Corn, all purpose	es : 0.0	0.0	0.0	0.0	0.0 0.0	U. (; 3.0 %	9.00 - 1.9
Potatoes	17.3	11.8	<b>18.4</b>	11.9	0.21 <b>1.7</b>	8.0 <b>17.2</b>	15.9 15.8
Sugar beets	0.0	0.0	0.0	0.0	5.0 <b>1.2</b>	0.0° <b>1.2</b>	1.3
Wheat and durum	0.0	0.0	0.0	. 0.1	0.1	0.6 <b>0.2</b>	0.6
Barley	0.0	0.0	0.0	0.1	6.0 O.2	○ 0.7	1.8 0.8
0ats	0.0	0.0	0.0	<b>0.2</b>	0.1	○ 40.2	$1.1 \qquad 0.5$
Rye	0.0	9.0.0	0.0	⊝ 0.0	₹. 0.0	(, o 0.0	0.0
Flax	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soybeans	0.0	0.0	- 0.0 D	0.0	0.0	⊕, , <b>5.3</b>	0.0 Salas 3.8
Tame hay and cro	p <del>-</del>					e i	gotta ikas gas air t
land pasturea		0.0	JP . P 0.0 (	0.0	6.0.0		0.1 <sub>3.0</sub>
Other crops <sup>b</sup>	0.1 O.1	0.2	0.0 <b>3.7</b> 3	0.0	5.00.1	8.0	$0.1_{0.20}$ $0.1$
Improved permaner	nt					·	a 900 ma tabo i po vili jiyi.
open pasture	9.6 0.0	ೆ.೦ 0.0	0.0	0.0	⊕. ⊝ <b>0.0</b>	0.0	0.0
							table generalized

<sup>a</sup>Summations of separate estimates made for alfalfa and alfalfa-grass mixtures, clover, and clover-grass mixtures, grain hay, other tame hay (mostly grasses), and cropland pasture.

bSummations of separate estimates made for sorghums (all purposes), vegetables, safflower seed, sunflower seed, tame mustard seed, proso millet, dry field beans, and grass-legume silage. Does not include wild hay. descriptions of the abate officerors and thing segging to

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CLess than .05 pounds per acre. ase the companies of the second and the second assessment of

Source: Figures in Table 12 times .83016.

ARBEN 15. FREEDIGER ACTRACE IN PERCENT OF FLAVORED BELAGED, LEGARING COLOR BARE

UBREGIONS	
TURAL S	 Z
AGRICUL	
E BY	. i
ASTUR	
AND	3 e
CROPS	
SPECIFIED	A.C
OF	
ACREAGE	. •
) FERTILIZED ACREAGE OF SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS	1959 AND 1964
ESTIMATED	OF NORTH DAKOTA, 1959
14.	NORTH
TABLE	OF

1.3	State total	1959 1964	500 L 500 C 500 C 500 C	292.7 253.3	98.5	38:1 52.5	1,617.2 1,149.9	304.3 431.6	4.2 77.6	58.2	0.0	- C	4.7		0 01				5,232.0 5,539.5						riculture for North				
	Red River Valley subregion <sup>C</sup>	1959 1964	cres : 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	87.7 58.4	\$2.9 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7.7	9.8			29.3 27.5	2.5 0 0 4.6	7600 1800 1800 1800 1800 1800 1800 1800 1	7 33 7	1.CO		T.		-	1,485.9 1,521.5	. V . 5 t. . 2 0 0 1 . 2 4 . 3 5 . 4 6 . 5 . 6	36 3r and 3C	) one arra	<b>~</b> €	Π	States Census of Agric	7 (1) 3 (1) 3 (1) 4 (2)	(5 20 30 10 20 20 20 20 20 20 20 20 20 20 20 20 20	LETT.	
	Till Plains Plains subregion <sup>b</sup>	1959 1964	1,000 acres	173.1 179.2	1.5	40 <b>,</b>	1,658.4 1,922.5	214.2	;; ;-	28.1	3.1	. 6 <b>0</b> %		T	୍ୟ ୁଧ	)			3,059.0 3,164.2	conomic Area 1.	C C C C C C C C C C C C C C C C C C C	Dieds 4n, 4U,	conomic Area 4.	in i	1959 and 1964 United	20.00 20.00		o u t read read read incl incl incl incl	200 cm
Special Control of the Control of th	Missouri Slope subregion <sup>a</sup>	-	20 E	31.9	H.	ب در در در	.549.3 /24.5 80.6 57.0	12.2	0.5	0.8	0.0			?		0.0			687.7 853.6	c area as Census Economic	ं हैं '' ' ' हिंदी	OT CETTS OF	Carea as Census Economic	3.	on data from			: \$16 D	::- ::::::::::::::::::::::::::::::::::
	Specified crop or pasture			Corn, all purposes	es	Sugar beets	Wheat and durum Barley	Oats	Rye	Flax	Soybeans	Tame hay and crop-	Tand pasture	Uther crops	Improved permanent	open pasture	Total crops and	improved permanent	pasture	s Same geographic ar	Duff, or other states of the s	Tue comprued a	Same geographicar	1	Source: Estimates based Dakota.				

TABLE 15. FERTILIZED ACREAGE IN PERCENT OF HARVESTED ACREAGE, SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

. 634	. PV		1		1:0	17.	†	1
200 *1	Miss	ouri	Ti	11 %	Red	River		1
Specified crop	1	ope .	Pla		1	Lley	St	ate -
or pasture	, .	gion <sup>a</sup>		gionb		gionc	1.5	tal
	1959		1959	7		1964	1959	1964
				perce	ent		-	
Corn, all purposes	7.2	5.5	23.7	29.5	63.4	65.8	22.3	25.9,
Potatoes	118.0 <sup>d</sup>	104.9 <sup>d</sup>	26.9		88.9	104.3 <sup>d</sup>	85.7	102.4 <sup>d</sup>
Sugar beets	100.0	101.5 <sup>d</sup>	100.0	103.1 <sup>d</sup>	100.0	103.1 <sup>d</sup>	100.0	102.9 <sup>d</sup>
Wheat and durum	41.0	57.5	38.2	45.1	73.6	83.7	42.9	52.2
Barley	28.0	29.3	35.0	37.7	75.4	79.2	43.0	46.4
Dats	6.5	10.1	18.3	16.8	32.2	58.0	19.0	21.8
Rye	2.0	3.4	2.0	15.8	5.0	38.1	2.2	15.9
lax	2.0	1.5	2.0	2.6	10.0	10.7	3.3	3.9
Soybeans	0.0	0.0	2.5	10.9	3.0	5.8	2.7	8.8
Came hay and crop-						ä		
land pasture	0.8	1.0	<b>2.3</b>	2.2	5.7	4.9	2.1	2.1
Other crops	0.0	25.2	0.0	14.0	17.3	43.5	3.3	24.6
Improved permanent			. , 3-7					
open pasture	1.3	1.3	4.8	3.3	20.4	14.2	4.0	2.9
Cotal crops and improved permanent	• • •	<i>(1)</i>		, , v.g. (c)	The leng 1			
pasture	21.1	27.8	24.7	26.9	55.3	61.7	28.6	32.0

<sup>&</sup>lt;sup>a</sup>Same geographic area as State Economic Area 1.

bCombined area of State Economic Area 2A, 2B, 3A, 3B, and 3C.

<sup>&</sup>lt;sup>c</sup>Same geographic area as State Economic Area 4.

dFertilized acreage exceeds harvested acreage because some of the fertilized acreage was not harvested.

TABLE 16. ESTIMATED TONS OF COMMERCIAL FERTILIZER APPLIED TO SPECIFIED CROPS BY AGRICULTURAL SUBRECIONS OF NORTH DAKOTA, 1959 AND 1964

								-
	     					1	,	,
	Missouri	uri	Till		Red I	Red River		
Specified crop	Slope	pe	Plains	us Su	Valley	ley	State	·
or pasture	subregion	gion	subregion	gion	subre	subregion	total	1
	1959	1964	1959	1964	19 59	1964	1959	1964
				tons	Su			
Corn, all purposes	824	599	5,942	7,697	3,715	3,048	10,481	11,344
Potatoes	117	118	126	279	9,283	11,305	9,526	11,702
Sugar beets	655	1,164	174	859	2,892	4,910	3,721	6,933
Wheat and durum	12,207	15,156	42,567	50,347	19,398	24,047	74,172	89,550
Barley	1,974	1,458	25,083	19,064	19,848	16,709	46,905	37,231
Oats	277	807	4,864	6,449	2,337	5,800	7,478	13,056
Rye	13	27	78	1,644	17	293	108	1,964
Flax	21	12	562	785	879	554	1,462	1,351
Soybeans	0	0	109	348	74	133	183	481
Tame hay and crop-		• ••	ž.	2 21				
land pasture	289	375	1,608	2,066	634	562	2,531	3,003
Other crops	0	214	0	653	117	1,159	117	2,026
Improved permanent		4.					eren e	
open pasture	20	69	152	300	72	122	767	491
Total crops and		*.:	•					*
improved permanent				,		,		
pasture	16,447	19,999	81,265	90,491	59,266	68,642	156,978	179,132a
					•			

<sup>a</sup>This figure differs from the total given in the Census because of adjustment in the tonnage of fertilizer used for potatoes.

Estimates based on data from 1959 and 1964 United States Census of Agriculture for North Dakota. Source:

TABLE 17. ESTIMATED TONNAGE OF NITROGEN APPLIED TO SPECIFIED CROPS BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

	- 4			-	المراب المرابع	1 1.1	,	<del></del>
Specified crop or pasture	Misso Slo subre	pe	Til Plai subre		Val	River ley eg <b>io</b> n	Sta tot	1 -
	1959	1964	1959	1964	1959	1964	1959	1964
	Ř : 1			t	ons	: :		*.
Corn, all purposes	136	108	1,032	1,285	522	639	1,690	2,032
Potatoes	21	22	21	45	1,663	1,807	1,705	1,874
Sugar beets	84	256	32	123	86	148	202	527
Wheat and durum	1,029	1,196	4,641	5,103	2,480	4,328	8,150	10,627
Barley	198	188	4,208	2,312	3,796	2,943	8,202	5,443
Oats	36	81	654	•		1,134	963	2,262
Rye	1	2	9	180		32	12	214
Flax	2	1	62	183	140	59	204	243
Soybeans	0	0	12	7	8	23	20	30
Tame hay and crop-						:		
land pasture	12	29	151	179	39	95	202	303
Other crops	0	20	0	88	19	207	19	315
Improved permanent	iv 1							
open pasture	23	23	50	. 111	24	40	97	174
Total crops and	1 12	` .	3		等 海 为 图 \$	, product	-	Ü
improved permanent					2.5		1	
pasture	1,542	1,926	10,872	10,663	9,052	11,455	21,466	24,044

TABLE 18. ESTIMATED TONNAGE OF PHOSPHORUS, EXPRESSED BOTH AS OXIDE AND ELEMENT, APPLIED TO SPECIFIED CROPS BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

	- 1771 ton 1 fb d 1 2		Y					
		1				•		
		ouri	Til	, , , , , , , , , , , , , , , , , , , ,	Red R			
Specified crop	1	ope	Plai		Va11	•	gon: Sta	, ,
or pasture		egion		gion	subre			al
	1959	1964	1959	1964	1959	1964	1959	1964
		1.11.17			tons			
Expressed As Oxide:			•			variota.	do ed or e	
Corn, all purposes	237	138	1,944	2,296	ୀ,035	762	3,216	3,196
Potatoes	42	22	27	0 47	1,754	1,807	1,823	1,876
Sugar beets	22 <b>143</b>	303	49	<b>9 206</b>	$_{\odot}$ 1,181	2,112	1,373	
Wheat and durum	5,371	6,811	16,902	21,167	7,309	8,485		- /
Barley	802	∴528	7,159	7,079	4,244	5,422	12,205	
Oats	108	293	1,707	2,419	467	1,932	2,282	4,644
Rye	ີ 5	9 <b>11</b>	37	628	j 6	102	48	741
Flax	10	- 6	<b>270</b>	273	176	256	456	535
Soybeans	n 0	€ 6 <b>0</b>	53	r 115	35	57	.88	172
Tame hay and crop-							***** * *****	
land pasture	123	137	9 533	774	231	131	887	1,042
Other crops	0	. 73	9 0	, 222	56	415	56	710
Improved permanent						ry, e	1. 74 Pd 36	
open pasture	0	: 0	<u> </u>	. 0	<i>;</i> 0	0	0	0
Total crops and								11.15
improved permanent								1.1
pasture	6,841	8,322	28,681	35,226	16,494	21,481	52,016	65,029
Expressed As Element:							·	
Corn, all purposes	104	60	848	1,002	452	333	1,404	1,395
Potatoes	19	10	12	20	765	789	796	819
Sugar beets	62	132	22	90	515	922	599	1,144
Wheat and durum	2,344	2,972	7,376	9,238	3,190	3,703	12,910	15,913
Barley	350	231	3,125	3,089	1,852	2,366	5,327	4 4 1.7
Oats	9 47	128	745	1,056	204	843	996	2,027
Rýe	9 2	. 5	16	0 274	3	44	21	323
Flax	4	2	118	119	77	112	199	:233
Soybeans	· 0	0	23	50	15	25	- 38	75
Tame hay and crop-	v	•					Arry John	** / 1
land pasture	<b>○</b> 54	9 60	232	9 338	a <b>101</b>	57	387	455
Other crops	i 0	32	0	97		181		, -
Improved permanent	•		-			12373731		i
open pasture	୍ 0	0	0	5 0	0		0	0
Total crops and		-					randina. Panggan	
improved permanent						Market was a con-	yr Sermira	
pasture	2,986	3,632	12,517	15,373	7,198	9,375	22,701	28,380
					<del></del>		Committee Commit	

Source: Estimates based on data from 1959 and 1964 United States Census of Agriculture for North Dakota.

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TABLE 19. ESTIMATED TONNAGE OF POTASSIUM EXPRESSED BOTH AS OXIDE AND ELEMENT,
APPLIED TO SPECIFIED CROPS BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND
1964

	-			7				
3		;				•		
		souri	Til		Red R			
Specified crop		lope	Plai		Vall		II.	ite 🤼
or pasture		region		gion	subre		tot	
	1959	1964	1959	1964	1959	1964	1959	1964
	4.04			to	ons			
Expressed As Oxide:						· 655 2	f. 2,1	ne er er
Corn, all purposes	C	ა°. <b>0</b>	9	195	V. 9	91	are the contract of	286
Potatoes	(		9	22	738	904		935
Sugar beets		-	1	1	32	35	ada: <b>33</b> :	
Wheat and durum				92	277	212 gra		304
Barley			90	82	619	487		569
Oats			0	16	4.97 0	111	0	127
Rye			√ 0	0	. 0	0	0	0
Flax	. (		0	- 0	. 0 ⊙≛ 0	0	•	0
Soybeans	, (	, , , ,	i 0	38	i 0	0		38
Tame hay and crop-		0	. 0	- 30				4.1
land pasture	÷ c	0 %	₹ 6 0	0	1.11 ° 0	1		1
Other crops	<i>ੇ ਹ</i>		0	1	0	2		<b>–</b> വച്ച് 3
Improved permanent		<b>.</b>	U	~ 1				a call
open pasture		0	: 0	. 0	<b>0</b>	0		0
Total crops and		, ,	U	U	0		53.0	· . • • . · • . · . · . · . · . · . · .
improved permanent							t far	
pasture	, (	9	133	447	1,675	1,843		2,299
pascure		<u> </u>	ل.ل.ك.	777	2,0/5	2,013		
Expressed As Element:							1.2	4. 45.5
Corn, all purposes	(	6 6	44 h 7	162	3 GJ - <b>8</b>	76	15	238
Potatoes		8	7	⇒ <b>18</b>	613	750	620	776
Sugar beets		0	1	1	. 6 26	29	27	30
Wheat and durum	(	0	20	76	230	176	250	252
Barley	(	0	75	. 68	514	404	589	472
Oats	<sup>7.</sup> (	0	i. i 0	13	i , 0	92	Ő	105
Rye	(	0	<b>0</b>	·: 0	Ş <b>0</b>	0	0	0
Flax	(	0	0	. 0	: <b>0</b>	0	0	0
Soybeans	(	0 54 0	83 <b>0</b>	⊕ 32	0	0	0	32
Tame hay and crop-						1:	300 84	A TABLE
land pasture	· · · · (	0	<b>0</b>	. 0	e e 0	1	0.	1
Other crops	· (	) " a		1	0	2	, 0.	:58.00 <b>3</b>
Improved permanent						*2.00		$\mathbb{C}_{I_{n}}$
open pasture	. (	0	0	: 0	0	0	0	. 0
Total crops and						1.00	aysia i	1.5
improved permanent						Dan Sala		C- 3
pasture	(	8	110	371	1,391	1,530	1,501	1,909
						the content of the second	1. 18.198 T. str	

aLess than one-half ton.

TABLE 20. AVERAGE POUNDS OF FERTILIZER APPLIED PER FERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964.40

Specified crop or pasture	Miss S1			Till Plains subregion		River ley egion	.70 → 303 ···.0 State total
The state of the s	1959	1964	1959	1964	1959	1964	1959 1964
		TREE I		po	ounds		
Corn, all purposes	51.7	76.3	68.6	85.9	84.7	104.5	71.6 089.5
Potatoes	183.8	260.2	166.8	186.0	223.8	239.0	222 22 237.6
Sugar beets	380.0	430.0	305.5	409.0	172.4	228.8	195.2 264.6
Wheat and durum	44.4	41.7	51.3	52.4	70.1	76.7	53.7 54.7
Barley	49.0	51.1	53.6	58.6	66.2	73.9	58.0 64.8
Oats	45.4	49.6	45.4	56.4	60.0	66.4	49.1 8.60.5
Rye	50.0	47.6	50.0	47.9	60.0	75.6	51.6 50.6
Flax	50.0	45.9	40.0	46.7	60.0	38.7	50.2 43.9
Soybeans 0.01	ੇ ਹੈ•0	0.0	70.0	58.0	60.0	58.1	65.6 58.0
Tame hay and crop-						m the latest to	
land pasture	82.3	97.6	88.6	114.8	103.5	118.8	91.1 112.9
Other crops	0.0	69.7	0.0	67.3	50.0	68.7	<sup>2</sup> 50 •0 → 68 • 2
Improved permanent							លាច់នថ់ គ្នះស្រស់ ឃ្
open pasture	231.4	68.2	92.6	88.2	148.9		121:1 - 90.1
Total crops and							Total cropy o
improved permanent	c	· • •,			. ,		Au, bestatignt
pasture	47.8	46.9	53.1	57.2	79.8	90.2	60.0 64.7

TABLE 21. AVERAGE POUNDS OF NITROGEN APPLIED PERSFERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

Specified crop	subregion	Till Plains subregion	Red River Valley subregion	State State	
	1959   1964	1959   1964	1959 1964	1959 1964	
	e to une	pot	inds	Showing the second make the second of	
Corn, all purposes	9 3 8.5 / 13.7	11.9 14.3	11.9 21.9	11.5 16.0	
Potatoes	33.1 49.4	28.0 30.0	40.1 38.2	39.8 38.1	
Sugar beets	48.7 94.6	56.2 58.6	5.1 6.9	10.6 20.1	
Wheat and durum	1.0.3.7 3.3	5.6 5.3	9.0 13.8	5.9 6.5	
Barley ( ) ( )	4.9 6.6	9.0 7.1	12.7 13.3	10.1 9.5	
Oats	్ర. 5.9 <del>్ర</del> .0	6.1 9.2 5.5 5.2	7.0 13.3	6.3 10.5	
Rye	3.9 3.2	5.5 5.2	8.7 8.3	5.7 5.5	
Flax grove Tag	5.5 5.0	4.4 10.9	9.6 4.3	7.0 7.9	
Soybeans	0.000.0 0.000	7.7 1.2	6.6 10.0	7.2 3.6	
Tame hay and crop-		• • •	e Ne	orang managan Managa dan kabupatèn managan	
land pasture		8.3 9.9	6.5 20.0	7.3 11.4	
Other crops	0.0 6.3	0.0 9.1	8.0 12.2	8.0 10.6	
Improved permanent			- 1	- Permana 1 autonomia	
(open pasture	76.4 22.5	30.6 32.6	49.1 38.6	40.0 32.0	
Total crops and				Two retired to tests V	
improved permanent			· .		
pasture	4.5 4.5	7.1 6.7	12.2 15.1	8.2 8.7	

TABLE 22. AVERAGE POUNDS OF PHOSPHORUS, EXPRESSED AS OXIDE AND ELEMENT APPLIED PER FERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

	Miss		Ti		A Committee of the comm	River		- 4-
Specified crop	S1		Pla		Val:	, •		ate
or pasture		egion		egion		egion		tal
	1959	1964	1959	1964		1964	1959	1964
	in internet	·		pou	inds			1 10 100 mm
Expressed As Oxide:	at in	-			20.6			
Corn, all purposes	14.9	17.5	22.5	25,.6	23.6	26.1	22.0	25.2
Potatoes	66.2	49.4	36.0	31.3	42.3	38.2	42.5	38.1
Sugar beets	83.0	111.8	86.0	98.1	70.4	98.4	72.0	99.8
Wheat and durum	19.6	18.8	20.4	22.0	26.4	27.1	21.4	22.3
Barley	19.9	18.5	15.3	21.8	14.2	24.5	15.1	22.7
Oats	17.7	18.0	15.9	21.2	12.0	22.7	15.0	21.5
Rye	20.8	18.8	24.0	18.3	22.9	26.3	22.9	19.1
Flax	24.0	22.0	19.2	16.3	12.0	18.6	15.7	17.4
Soybeans	0.0	0.0	33.6	19.2	28.8	25.0	31.5	20.8
Tame hay and crop-						+11)		ron kash
land pasture	35.0	35.6	29.4	43.0	37.7	27.7	31.9	39.2
Other crops	0.0	23.9	0.0	22.9	24.0	24.6	24.0	23.9
Improved permanent						5. 3	89.554.W	r rownia si
open pasture	0.0	0:0	0.0	0.0	0.0	0.0	0.0	0.0
Total crops and			4				bar in	en e
improved permanent						imarra		
pasture	19.9	19.5	18.8	22.3	22.2	28.3	19.9	23.5
				t etc. significações s				and a section of a section of
Expressed As Element:		: <b>-</b>	0.0	11 0	10.2	11.4	0.6	
Corn, all purposes	6.5	7.6	. 19.↑8 19.↑8	11.2	10.3	11.4	9.6	11.0
Potatoes	28.9	21.6	15.7	13.7	18.5	16.7	18.5	16.6
Sugar beets	36.2	48.8	37.5	42.8	30.7	42.9	31.4	43.6
Wheat and durum	8.6	8.2	8.9	9.6	11.5	11.8	9.3	9.7
Barley	8.7	8.1	6.7	9.5	6.2	10.7	6.6	9.9
Oats	7.7	7.9	6.9	9.3	5.2	9.9	6.5	9.4
Rye (1 ).0 0 ()	9.1	8.2	10.5	8.0	10.0	11.5	10.0	8.3
Flax	10.5	9.6	8.4	7.1	5.2	8.1	6.9	7.6
Soybeans	0.0	0.0	14.7	8.4	12.6	10.9	13.7	9.1
Tame hay and crop-						- · · · · ·		
land pasture	15.3	15.5	12.8	18.8	16.5	12.1	13.9	17.1
Other crops	0.0	10.4	0.0	10.0	10.5	10.7	10.5	10.4
Improved permanent						· ; · ; .	,	
open pasture	0.0	0.0	0,00	0.0	0.0	0.0	0.0	0.0
Total crops and								
improved permanent						17.8111	e vite inter	an in off
pasture	8.7	8.5	8.2	9.7	∂,9,•,7	12.4	8.7	10.3

Charles and the Second

TABLE 23. AVERAGE POUNDS OF POTASSIUM, EXPRESSED AS OXIDE AND ELEMENT, APPLIED PER FERTILIZED ACRE OF SPECIFIED CROPS AND PASTURE BY AGRICULTURAL SUBREGIONS OF NORTH DAKOTA, 1959 AND 1964

Specified crops or pasture		ouri ope egion	Ti Pla subr		Red Val subr			ate More
		1964	1959	1964	1959	1964	1959	1964
		110,0			ounds	J.,		
Expressed As Oxide:								
Corn, all purposes	0.0	0.0	0.1	2.2	0.2	3.1	0.1	2.3
Potatoes	0.0	20.8	11.4	14.7	17.9	19.1	17.4	19.0
Sugar beets	0.0	0.0	0.7	0.5	1.9	1.6	1.7	1.4
Wheat and durum	0.0	0.0	а	0.1	1.0	0.7	0.2	0.2
Barley	0.0	0.0	0.2	0.3	2.1	2.2	0.9	
Oats	0.0	0.0	0.0	0.1	0.0	1.3	0.0	0.6
Rye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soybeans	0.0	0.0	0.0	6.3	0.0	0.0	0.0	4.6
Tame hay and crop-							n Mi	115 4.0
land pasture	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
Other crops	0.0	0.1	0.0	0.1	0.0	0.1	0.0	, <b>0.1</b> ;;, ∈
Improved permanent						2.5		Server in I
open pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total crops and						1	,	a
improved permanent						_ :	<u>.</u>	2012
pasture	0.0	2.3	0.1	0.3	2.3	2.4	0.7	0.8
Expressed As Element:							sty sa	sas et de
Corn, all purposes	0.0	0.0	0.1	1.8	0.2	2.6	0.1	1.9
Potatoes	0.0	17.3	9.5	12.2	14.8	15.9	14.4	15.8
Sugar beets	0.0	0.0	0.6	0.4	1.6	1.3	1.4	
Wheat and durum	0.0	0.0	a	0.1	0.8	0.6	0.2	0.2
Barley	0.0	0.0	0.2	0.2	1.7	1.8	0.7	0.8
Oats	0.0	0.0	0.0	0.1	0.0	1.0	0.0	0.5
Rye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soybeans	0.0	0.0	0.0	5.2	0.0	0.0	0.0	3.8
Tame hay and crop-		•••				·. :	1 13	₹ : 83
land pasture	0.0	0.0	0.0	0.0	0.0	0.1	0.0	а
Other crops	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
Improved permanent			- •			94: 2	ing a stage	Displaced to
open pasture	0.0	0.0	ં0઼0	0.0	0.0		0.0	
Total crops and	J., J	- • •		-				and the state of
improved permanent							100 22	
pasture	0.0	1.9	-0-1	0.2	1.9	2.0	0.6	
pascare							<del></del>	** / 1 / / / / / / / / / / / / / / / / /

Less than .05 pound per acre; [ "[]] Hard has be bound in the set of account and the contract of the contract

TABLE 24. SUMMARY OF FERTILIZER USE IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964

,			1				• • •	
	Numb	er of		z de zana na wasana eza	Fertilized	acreage	Total	amount
Census economic		using	Ferti1	ized	in perc			tilizer
area and county		lizer		age:	harvested	1		ed says
	1959	1964	1959	1964	1959	1964	1959	1964
		ber		es	perc		to	
Facromia Area 1		3,960	687,695	853,638	21.1.		16,447	19,995
Economic Area 1 Adams	190	234	44,549	66,078	18.7	29.2 <sup>C</sup> at	55 939 ·	1,355
Billings	65	97	7,687	13,581	10.0	17.8	184	ਾਾਂ 392 392
Bowman	151	207	44,695	65,479		29.8	945	1,421
Dunn	271	375	44,197	60,964	14.3	19.3	1,213	1,463
Golden Valley	144	132	33,195	46,267	23.0	35.3	782	968
Grant	265	331	* *	52,777		15.8	923	1,180
			39,852	158,150		51.0	2,487	2,992
Hettinger	415	467	125,204	C 41 167	127775	28.2	2,652	2,619
McKenzie	448	393	92,795	75,965	16.7	14.8	914	763
Mercer	296	209	37,954	31,030 72,332		20.0	1,982	1,941
Morton	541	509	68,236		12.9	10.2	443	469
Oliver Sioux	148 22	121 <sub>4</sub>	17,976	14,980 11,506	3.9	10.4	89	191
	129	44 211	3,452 36,071	65,789	43.34.1	43.7	834	1,517
Slope		211	A 14 T	118,740	26.7	34.3	2,060	2,724
Stark	495	630	91,832	110,740	20.70	34.3	2,000	*: , 7 24
Economic Area 2A	1,689	1,363	368,667	284,816	20.3	16.4	7,888	6,876
Burke	223	173	49,361	41,407	20.5	18.3	1,059	854
Divide	113	84	19,246	13,420	7.5	5.5	354	-3-323
McLean	657	613	142,775	128,406	23.5	23.2		2,819
Mountrail	308	216	64,769	47,621		14.1	1,320	24 4
Williams	388	277	92,516	53,962	24.6	14.5	1,985	1,844
Economic Area 2B	1 358	901	212,823	150,493	11.6	8.2	5,513	4,093
Burleigh	384	178	65,508	31,528	20.0	9.1	1,708	
Emmons	444	183	69,798	32,054	16.3	7.9	1,822	778
Kidder	128	· - 83° ·	18,724	14,139			5 v 467	315
Logan	154	113 <sup>2000</sup>	23,204	17,671			593	
McIntosh	107	210	11,625	32,249	3.6	10.2	394	933
Sheridan	141	134	23,964	22,852	10.1	10.0	529	663
bilet raan	1-71	134	20,704	22,002				
Economic Area 3A		-	L,3 <b>0</b> 7,767	1,190,777	30.8	29.6	32,414	30,862
Benson	474	384	101,060	76,803	24.7	20.8	2,771	1,994
Bottineau	484	469	109,204	120,550	24.2	26.9	2,554	3,094
Cavalier	847	83 <b>7</b>	237,713	239,101	47.9	49.5	5,626	6,226
McHenry	597	512	106,287	97,714	23.6	22.6	2,542	2,471
Nelson	695	647	183,654	155,525	55.1	50.3	5,295	4,520
Pierce	385	216	70,344	45,156		14.1	1,604	1,100
Ramsey	442	417	119,164	111,364	27.9	29.8	3,252	2,946
Renville	258	275	60,019	57,476		23.3	1,308	1,304
Rolette	179	222	44,062	49,340		25.5	972	1,139
Towner	366	345	101,929	92,097	29.1	28.7	2,618	2,533
Ward	760	632	174,331	145,651	32.2	27.9	3,872	3,535
		*						

TABLE 24. SUMMARY OF FERTILIZER USE IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964 (continued)

The second secon								
- thema (good) by	Numb	er of the			Fertilize	, –		
Census economic		using	Ferti	lized	1947	cent of		tilizer
area and county	ferti	lizer	acr	eage:	harvested	acreage	a, <sub>coroo</sub> us	ed anna
	1959	1964	1959일	1964	1959	1964	1959	1964
	nun	nber	acres		per	cent	to	ns
Economic Area 3B	3,927	4,552	884,635	1,106,896	30.4	38.4	25,593	-
Barnes	832	858	202,212	222,930	36.9	43.2	6,022	7,167
Eddy	222	279	50,559	55,432	29.5	33.0	1,265	-
Foster	370	366	107,925	98,384	51.8	41.8	3,090	
Griggs	349	396	65,376	93,288	30.1	40.9	1,646	2,833
LaMoure	404	621	59,985	126,679	14.5	30.5	2,164	3,755
Steele	600	578	145,087	157,368	50.7	58.6	3,872	4,436
Stutsman	666	869	144,668	212,444	22.8	33.4	4,417	6,616
Wells	484	585	108,823	140,371	25.45	33.9	3,117	3,568
		4.8		400 700	18.3	29.2	0.857	15,896
	1,776	2,192	285,180	430,780	8.0	14.9	•	1,739
Dickey	211	333	28,681	53,636	* 4	32.0		2,299
Ransom	300	384	44,191	81,414	16.2	40.3	•	9,681
Richland	1,052	1,133	183,305	236,701	29.3	21.4	•	•
Sargent	213	342	29,003	59,029	9.7	21.4	1,043	2,177
Economic Area 4	5,962	5.603 1	,485,882	1,520,584	55.3	60.2	59,266	68,688
Cass	1,390	1,480	346,936	406,852	42.4	53.3	11,114	15,402
Grand Forks	1,355	1,205	355,674	337,434	65.4	65.2	16,501	17,007
Pembina	1,035	844	294,761	257,608	67.8	64.5	12,166	12,097
Traill	808	848	152,527	186,145	38.7	50.3	5,312	7,347
Walsh	1,374	1,226	335,984	332,545	67.7	70.2	14,173	16,835
State Total 2	23.779	23.527 5	. 232 . 649	5.537.984	28.6	31.3	156,978	179,222
				140,00	276			al ora
		\$2.00 i	1011 J. 111	nd barvests	a cropla	nd used o	only for	pasture

180,1 aHarvested acreage includes cropland harvested, cropland used only for pasture, crop failure, and improved pasture. Wild hay cut is not included. ASA SI 5.00

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TABLE 25. FERTILIZATION OF CORN IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964

Census economic area and county	Ferti acr	lized eage	in per	ed acreage cent of ed acreage	of fe	amount rtilizer sed	of fe	e pounds ertilizer acre	
	1959	1964	1959	1964	1959	1964	1959	1964	
	acres		percent			tons		pounds	
Economic Area 1	31,863	15,709	7.2	5.5	824	599		76.3	
Adams	2,055	1,136	7.5	6.2	40	41	38.9	72.2	
Billings	114	0	1.4	0.0	2	0	35.1	0.0	
Bowman	920	363	3.4	2.8	28	10	60.9	55.1	
Dunn	5,187	2,295	9.0	5.7	155	52	59.8	45.3	
Golden Valley	610	440	2.8	3.7	23	. 8	75.4	36.4	
Grant	2,713	1,671	5.6	5.1	57	60	42.0	71.8	
Hettinger	4,734	1,023	14.0	7.6	129	40	54.5	. 78 <b>.2</b> 0	
McKenzie	5,752	2,266	33.5	18.3	156	86	54.2	75.9	
Mercer	2,654	1,568	6.3	5.2	69	42	52.0	53.6	
Morton	1,337	2,644	2.6	6.6	48	े 134	71.8		
Oliver	1,491	1,178	5.9	5.9	40	99	53.7	168.1	
Sioux	0	180	0.0	0.0	0	4	0.0	# <b>44 . 4</b> . 4	
Slope	1,906	225		3.2	24	9	25.2	80.0	
Stark	2,390	720	4.6	2.5	53	14	44.4	38.9₹	
Economic Area 2A	9,322	3,865		12.5	209	160	44.8		
Burke	180	148	14.4	15.7	6	6	66.7	81.1	
Divide	75	0	3.7	0.0	3	0	80.0		
McLean	7,399	2,593	19.3	11.7	135	90	36.5	69.4	
Mountrail	582	140	9.6	7.0	13	6	44.7	85.7	
Williams	1,086	984	15.7	19.4	S 52		95.8	117.9	
Economic Area 2B	14,921	8,732		5.9	427	348	57.2	75.8	
Burleigh	6,196	4,015	13.7	11.0	173	184	55.8	83.2	
Emmons	4,710	2,355	9.4	5.1		92	55.2	78.1	
Kidder	1,768	837		4.0	41	19	46.4	45.4	
Logan	722	490		2.8	24	18	66.5	73.5	
McIntosh	895	550	6.8	3.7	28	18	62.6	65.5	
Sheridan	630	485	4.6	4.0	31	17	98.4	70.1	
Economic Area 3A	19,061	13,479		19.3	558	464	58.5	68.8	
Benson	1,186	1,195		12.6	39	41	65.8	68.6	
Bottineau	2,488	2,214		28.1	62	60	49.8	54.2	
Cavalier	150	245		47.4	6	8	80.0	65.3	
McHenry	4,307	3,115	15.1	15.9	117	112	54.3	71.9	
Nelson	1,489	1,789		46.0	62	74	83.3	82.7	
Pierce	1,997	1,114		12.9	58	41	58.1	73.6	
Ramsey	1,146	1,428		39.5	37	52	64.6	72.8	
Renville	880	283		8.5	24	8	54.5	56.5	
Rolette	645	35		2.4	20	2	62.0	114.3	
Towner	300	90		8.9	9	3	60.0	66.7	
Ward	4,473	1,971	22.2	18.7	124	63	55.4	63.9	

TABLE 25. FERTILIZATION OF CORNAIN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC RATE AND AREAS, 1959 AND 1964 (continued)

			7 A		100 2000 1 1 1			
Abraton aparter		Islah ngap	Fertilized	acreage	Total a	mount	Average	pounds
Census economi	Fer	ilized	in perc					tilizer
area and count	y a	reage 🗀 🖰	harvested	acreage	use	d	per	acre 6-20
160 P. 16.16.	1959	1964	22.1959	1964	1959	1964	1959	1964
* 7 (37)	in a	icres	ing perce	ent	to	ns	po	unds
Economic Area	3B 36,281	42,466	20.8	27.7.	1,248	1,786	68.8	84.1
Barnes		7,974		30.2	387	<b>36</b> 8	80.0	92.3
Eddy 3		2,137		27.1	58	71	61.3	66.4
Foster	5,339	7,707	42.6	59.1	181	353	67.8	91.6
Griggs	1,705	2,278	19.6	27.0	49	. 66	57.5	57.9
LaMoure	6,218	7,877	16.1	22.8	180	321	57.9	73.2
Steele	4,510	3,598	42.8	59.3	138	163	61.2	90.6
Stutsman	4,924	5,682	12.6	15.4	192	241	78.0	84.8
Wells	•	, j. <b>5,213</b>	9.5	26.3	63	203	62.5	77.9
Economic Area	- 1	110,675	38.5	53.8	3,500	4,939	74.8	89.3
Dickey	_ · ·	11,104	17.	28.9	182	377	51.7	67.9
Ransom 0.0	*	14,996		43.1	437	494	73.7	65.9
Richland		72,458	A .	74.1	2,510	3,525	77.0	97.3
Sargent	•	2.12,117	7	34.8	371 <sub></sub>	543	78.4	89.6
Enamenta Amas	. 07:702	EO 261	63.4	65.8	3,715	3,048	84.7	104.5
Economic Area 4 Cass		58,361 37,167	e w it in the contract of the	65.6	2,462	1,788	77.0	96.2
Cass Grand Forks	-		and the second of the second	75.2	768	722	127.5	137.9
Pembina		3,256		103.7*	38	181	94.4	111.2
Traill		4,995	44.5	46.0	349	244	78.0	97.7
Walsh	•	2,468	46.2	59.7	98	113	101.0	91.6
WG LUII	, >-1 =	2, 2, 100			· ·		· · ·	18
State Total	292,695	253,287		25.9 1	.0,481	11,344	71.6	89.6
	3.	4.7	.1: 7.81	P (0)		$(\pm, \theta)$	35	delasi
*May be	an error in	the censu	ıs data.	čan,		[T - 6		3213.4 p
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TABLE 26. FERTILIZATION OF POTATOES IN NORTH DAKOTA BY CENSUS ECONOMIC AREAS AND COUNTIES IN THE RED RIVER VALLEY, 1959 AND 1964 PAGE 1984 SHOT LUARTA CIMP

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	ារស ស្រែកម្លាំងក្នុងស	Fertilized acreage	Total amount	Average pounds
Census economic	Fertilized	in percent of 5	of fertilizer	of fertilizer
area and county	acreage	harvested acreage	used	per acre
	1959 1964	1959 1964	1959 0 1964	1959 1964
	acres	percent	covetons	pounds
Economic Area 1ª	1,273 907	118.0 <sup>b</sup> 104.9 <sup>b</sup>	₹ <b>117</b> 388 <b>,</b> 2 <b>118</b>	183.8 260.2
		TO 10.70 HILOS	904,00	the state
Economic Area 2Aª		24.5 41.5	<b>3</b> 800,0 <b>7</b>	95.2 <sub>3 3.71</sub> 237.3
	1.1 COV			20,00000
Economic Area 2B <sup>a</sup>		ି <b>35.8</b> .୫୬୬ <b>33.0</b> ୍ର	•	89.6 277.8
and Arthur Burkham 1997 Burkham	9.13	0.66 0.66		Value Value 1
Economic Area 3Aa	600 2,417	⊅ <b>16.9</b> .8≗ <b>75.8</b> E,∆	- 561″0,£216 <sup>℃</sup>	186.7 178.7
				Tagna Leti
Economic Area 3B <sup>a</sup>	565 204	35 <b>45.1</b> 36 <b>22.2</b> €	•	113.3 176.5
in the second of		18		The state of
Economic Area 3Ca				296.3 ის <b>258.8</b>
				Tay-16-
		\$ 88.9 104.3 <sup>b</sup> 9		223.8 239.0
	795 78			105.7 153.8
		94.7.02 96.9 <sub>0.04</sub>		240.4 264.6
et a contract of the contract			3,001 3,119	234.5 242.5
the contract of the contract o		64.602 74.6 S		212.8 203.1
Walsh	31,437 40,400			207.9 <sub>32</sub> 225.4
Ctata Tata1		A <b>85.7</b> 04 <b>102.4</b> 08	160,61 0 52600110702C	222.2 237.7
State Total	85,738 98,472	03.4.04 LU2.4 OC		
	The state of the s	Z A ZE NEST	108,53	$\Delta$ kind Americal

aData for each county are not given because of small acreages involved.

bThe fertilized acreage exceeds the harvested acreage. This may be due to abandonment of a part of the planted acreage prior to harvest.

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TABLE 27. FERTILIZATION OF ALL WHEAT IN NORTH DAKOTA BY COUNTIES AND CENSUS ECO-NOMIC AREAS, 1959 AND 1964

The state of the s	THE RESERVE AND A STREET AS A STREET OF THE PROPERTY OF THE PR	Charles - To Pilos I and Brown to an			<u> </u>		·	
Common agreem (	Spoons Inde	reage Po	ertilize	d acreage	Total a	mount	Averag	ge pounds
Census economic	Fertil		2 2 2007 141	cent of	of fert			rtilizer
area and county	1	age		d acreage	use			acre
र वस्य १	1959	1964	1959		1959		1959	1964
	e acr		saur's per	<del> </del>	ton		pot	ınds
Economic Area 1	\$549,328\L	724,543	0141.0.8	££ <b>57.5</b> ≎€	12,207	15,156	44.4	41.8
Adams	39,098	60,102	32.3	53.9	828	1,159	42.4	38.6
Billings	6,603	11,681	24.7	52.4	154	291	46.6	49.8
Bowman	37,901	59,663	35.3	59.7	793	1,277	41.8	42.8
Dunn	32,209	49,984	28.9	51.7	770	1,110	47.8	44.4
Golden Valley	26,410	37,998	39.6	59.7	519	713	39.3	37.5
Grant \ \ 3	31,012	44,172		40.8	732	868	47.2	39.3
Hettinger	101,741	134,276	55.0	85.6	1,946	2,421	38.3	36.1
McKenzie	ී 65,891	56,771		48.2	1,414	1,243	42.9	43.8
Mercer	30,566	27,523	35.7	35.4	733	640	48.0	46.5
Morton	₹ 55,340€	61,228		49.0	1,565	1,514	56.6	. 49.5
01iver	13,653	11,563	33.0	24.9	337	283	49.4	48.9
	2.08 2,861 6S				76	148	53.1	29.9
Slope Salva	30,725	59,465			699	1,311	45.5	44.1
Stark	75,318	100,232			1,641	2,178	43.6	43.5
* 1.47	at a room		II. A.A.					
Economic Area 2A	279,422	243,152	30.0	27.5	5,912	5,112	42.3	42.0
Burke	38,953	36,228		•	828	739	42.5	40.8
Divide	15,831	11,371	10.2	8.2	289	246	36.5	43.3
McLean	99,082	110,323	40.8		2,266	2,337	45.7	42.4
Mountrail	52,864	41,584	27.5	22.8	1,060	835	40.1	40.2
Williams	72,692		32.9	20.6	1,469	955	40.4	43.8
, ,			The second of the first of the second	Walay .	-11 K 316 16	27.2.17	41 2 20 In	•
Economic Area 2B	130,060	108,762	23.3	19.3	3,395	2,682	52.2	49.3
Burleigh	36,032	20,600	48.9	24.0	954	505	53.0	49.0
Emmons	42,392	22,046	33.1	16.3	1,111	466	52.4	
Kidder water	10,052	8,559	16.3	13.5	254	172	50.5	40.2
Logan	16,867	14,675	18.1	16.8	441	354	52.3	48.2
McIntosh	7,305	23,472	6.8	23.3	259	659	70.9	56.2
Sheridan	17,412	19,410	18.6	21.2	376	526	43.2	54.2
Economic Area 3A	723,604	797,970	41.6	46.9	17,672	19,735	48.8	49.5
Benson	62,525	57,904	38.0	36.8	1,649	1,461	52.7	50.5
Bottineau	68,627	83,065		40.7	1,572	2,067	45.8	49.8
Cavalier	95,075	125,036		59.0	2,310	3,076	48.6	49.2
McHenry	76,404	75,720		49.5	1,830	1,853	47.9	48.9
Nelson	77,896	83,343	76.2	82.9	2,247	2,392	57.7	57.4
Pierce	48,684	32,357	36.7	25.7	1,080	735	44.4	45.4
Ramsey	59,657	79,085		46.2	1,633	2,004	54.7	50.7
Renville	39,765	46,913		44.5	868	1,022	43.7	43.6
Rolette	26,017	39,971		46.8	571	893	43.9	44.7
Towner	54,592	66,210		41.4	1,412	1,756	51.7	53.0
Ward	114,362	108,366		48.1	2,500	2,476	43.7	45.7
Watu	114,504			,	-	-		

TABLE 27. FERTILIZATION OF ALL WHEAT IN NORTH DAKOTA BY COUNTIES AND CENSUS ECO-NOMIC AREAS, 1959 AND 1964 (continued)

Census economic area and county acreage harvested acreage used per 1959 1964 1959 1964 1959 1964 1959		
Census economic area and county         Fertilized acreage         in percent of harvested acreage         of fertilizer used         of fertilizer percent           1959         1964         1959         1964         1959         1964         1959         1964         1959           Economic Area 3B         464,083         632,383         53.5         74.5         13,656         18,294         58.9           Barnes         102,434         113,255         61.7         73.7         3,026         3,604         59.1           Eddy         29,667         36,641         62.5         83.2         757         928         51.0           Foster         46,228         53,597         88.7         86.7         1,292         1,502         55.9           Griggs         31,998         48,710         58.9         86.3         834         1,465         52.1           LaMoure         39,694         79,038         34.5         71.3         1,527         2,343         76.9           Stutsman         93,423         143,817         45.1         70.8         2,859         4,324         61.2           Wells         61,966         88,803         40.8         60.7         1,695	ge pounds	
1959   1964   1969   1964   1959   1964   1969   1966   1969   1966	of fertilizer	
Economic Area 3B 464,083 632,383 53.5 74.5 13,656 18,294 58.9 Barnes 102,434 113,255 61.7 73.7 3,026 3,604 59.1 Eddy 29,667 36,641 62.5 83.2 757 928 51.0 Foster 46,228 53,597 88.7 86.7 1,292 1,502 55.9 Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7  Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5	per acre	
Economic Area 3B 464,083 632,383 53.5 74.5 13,656 18,294 58.9 Barnes 102,434 113,255 61.7 73.7 3,026 3,604 59.1 Eddy 29,667 36,641 62.5 83.2 757 928 51.0 Foster 46,228 53,597 88.7 86.7 1,292 1,502 55.9 Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7  Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5	1964	
Barnes 102,434 113,255 61.7 73.7 3,026 3,604 59.1 Eddy 29,667 36,641 62.5 83.2 757 928 51.0 Foster 46,228 53,597 88.7 86.7 1,292 1,502 55.9 Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7 Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Richland 30,342 58,119 37.3 62.6 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	pounds	
Eddy 29,667 36,641 62.5 83.2 757 928 51.0 Foster 46,228 53,597 88.7 86.7 1,292 1,502 55.9 Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7 Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	57.9	
Foster 46,228 53,597 88.7 86.7 1,292 1,502 55.9 Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7 Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	63.6	
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Griggs 31,998 48,710 58.9 86.3 834 1,465 52.1 LaMoure 39,694 79,038 34.5 71.3 1,527 2,343 76.9 Steele 58,673 68,522 79.7 93.7 1,666 1,945 56.8 Stutsman 93,423 143,817 45.1 70.8 2,859 4,324 61.2 Wells 61,966 88,803 40.8 60.7 1,695 2,183 54.7 Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	56.0	
Steele       58,673       68,522       79.7       93.7       1,666       1,945       56.8         Stutsman       93,423       143,817       45.1       70.8       2,859       4,324       61.2         Wells       61,966       88,803       40.8       60.7       1,695       2,183       54.7         Economic Area 3C       61,218       140,217       24.8       53.9       1,932       4,524       63.1         Dickey       9,275       25,322       17.3       42.2       266       753       57.4         Ransom       13,133       30,386       25.6       59.9       371       788       56.5         Richland       30,342       58,119       37.3       62.6       1,005       2,067       66.2         Sargent       8,468       26,390       14.1       46.6       290       916       68.5         Economic Area 4       553,736       627,309       73.6       83.7       19,398       24,047       70.1	60.2	
Steele       58,673       68,522       79.7       93.7       1,666       1,945       56.8         Stutsman       93,423       143,817       45.1       70.8       2,859       4,324       61.2         Wells       61,966       88,803       40.8       60.7       1,695       2,183       54.7         Economic Area 3C       61,218       140,217       24.8       53.9       1,932       4,524       63.1         Dickey       9,275       25,322       17.3       42.2       266       753       57.4         Ransom       13,133       30,386       25.6       59.9       371       788       56.5         Richland       30,342       58,119       37.3       62.6       1,005       2,067       66.2         Sargent       8,468       26,390       14.1       46.6       290       916       68.5         Economic Area 4       553,736       627,309       73.6       83.7       19,398       24,047       70.1	59.3	
Stutsman       93,423       143,817       45.1       70.8       2,859       4,324       61.2         Wells       61,966       88,803       40.8       60.7       1,695       2,183       54.7         Economic Area 3C       61,218       140,217       24.8       53.9       1,932       4,524       63.1         Dickey       9,275       25,322       17.3       42.2       266       753       57.4         Ransom       13,133       30,386       25.6       59.9       371       788       56.5         Richland       30,342       58,119       37.3       62.6       1,005       2,067       66.2         Sargent       8,468       26,390       14.1       46.6       290       916       68.5         Economic Area 4       553,736       627,309       73.6       83.7       19,398       24,047       70.1	56.8	
Economic Area 3C 61,218 140,217 24.8 53.9 1,932 4,524 63.1 Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	60.1	
Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	49.2	
Dickey 9,275 25,322 17.3 42.2 266 753 57.4 Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1		
Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	64.5	
Ransom 13,133 30,386 25.6 59.9 371 788 56.5 Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	59.5	
Richland 30,342 58,119 37.3 62.6 1,005 2,067 66.2 Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	51.9	
Sargent 8,468 26,390 14.1 46.6 290 916 68.5 Economic Area 4 553,736 627,309 73.6 83.7 19,398 24,047 70.1	71.1	
	69.4	
	76.7	
Grand Forks 138,458 147,928 87.8 91.5 5,537 6,086 80.0	(41.	
Pembina 120,563 127,072 77.2 82.1 4,204 4,711 69.7		
Traill 56,288 68,795 60.7 74.3 1,884 2,464 66.9		
Walsh 130,070 143,210 77.2 86.3 4,445 5,575 68.3		
State Total 2,761,451 3,274,336 42.9 52.2 74,172 89,550 53.7	54.7	

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TABLE 28. FERTILIZATION OF TAME HAYA AND CROPLAND PASTURE IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964

Census economic area and county		Fertilized acreage		Fertilized acreage in percent of harvested acreage			amount rtilizer sed	Average pounds of fertilizer	
	1959	1964	1959	1964		959	1964	1959	1964
	acres		percent			tons		pounds	
Economic Area 1	7,022	7,682	0.8	4.0	· 2	289	375	82.3	97.6
Adams	170	310	.3	.5		4	11	47.1	71.0
Billings	265	155	1.0	.5		10	12	75.5	154.8
Bowman	105	385	.3	.9		3	19	57.1	98.7
Dunn	715	661		. 7		62	23	173.4	69.6
Golden Valley	240	305		1.4		11	34	91.7	223.0
Grant	990	1,092	. 9	1.2	* * * * * * * * * * * * * * * * * * *	38	76	76.8	139.2
Hettinger	67	455		1.0		2	13	59.7	57.1
McKenzie	2,209	1,244		2.1	· · · · · · · · · · · · · · · · · · ·	83	71	75.1	114.1
Mercer	760	20	, k	ъ	14.	16	2	42.1	200.0
Morton	808	580		.6	(.)	34	31	84.2	
Oliver	. 0	653	0.0	1.6		. 0	29	0.0	88.8
Sioux	· , 0	374		1.2		0	5	0.0	26.7
Slope	140	244		.8		4	7	57.1	57.4
Stark	553	1,204	.7	1.5		22	42	79.6	69.8
Economic Area 2A	2,311	1,462	1.1	.8	·: , , .	87	83	74.6	
Burke	590	44	2.8	ь		22	2	74.6	90.9
Divide	. O	220	0.0	1.2		0	20	0.0	181.8
McLean	371	817	.4	1.2		7	28	37.7	68.5
Mountrail	115	45		. 1	· · :	4	2	69.6	88.9
Williams	1,235	336	2.9	.8	•	54	31	87.4	184.5
Economic Area 2B	1,128	2,288	. 3	.7		31	156	55.0	136.4
Burleigh	385	1,123	.4	1.4		6	92	31.2	163.8
Emmons	20	95	Ъ	.2		1	6	100.0	189.5
Kidder	345	40	.4	ъ		9	4	52.2	200.0
Logan	308	290		.7		12	18	77.9	124.1
McIntosh	50	450	.2	1.1		2	20	80.0	88.9
Sheridan	20	290	.1	.9		1	16	100.0	110.3
Economic Area 3A	11,504	3,405	2.5	.8	3	326	207	56.7	121.6
Benson	310	235		.5		8	15	51.6	127.7
Bottineau	482	440		1.1		21	27	87.1	122.7
Cavalier	500	292	1.9	.9		22	43	88.0	294.5
McHenry	1,160	780	1.3	.9		27	42	46.6	107.7
Nelson	2,300	78		.2		78	8	67.8	205.1
Pierce	110	256		.6		2	10	36.4	78.1
Ramsey	1,210	175	3.5	.5		36	8	59.5	91.4
Renville	0 .	130	0.0	.6		0	4	0.0	61.5
Rolette	770	0		0.0		27	0 .	70.1	0.0
Towner	441	457		2.0		13	27	59.0	118.2
Ward	4,221	562	6.8	1.1		92	23	43.6	81.9

TABLE 28. FERTILIZATION OF TAME HAY<sup>a</sup> AND CROPLAND PASTURE IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964 (continued)

		 14551. <sup>1</sup>	Fertiliz	ed acreage	Total	amount	Average	e pounds	
Census economic	Fertilized			rcent of	1	of fertilizer		of fertilizer	
area and county	1 .	acreage		ed acreage		sed	per acre		
	1959	1964	1959		1959		1959	1964	
	acres		percent		t	tons		pounds	
Economic Area 3B	9,061	13,520	2.2	3.1	328	733	72.4	108.1	
Barnes	2,019	2,019	, , , , , , , , , , , , , , , , , , ,	3.3·	83	137	82.2	135.7	
Eddy	649	654		1.9	22	30	67.8	91.7	
Foster	2,265	2,408	6.7	5.8	86	106	75.9	87.2	
Griggs	595	1,157		3.4	20	37	67.2	64.0	
LaMoure	760	1,666		2.3	18	109	47.4	129.7	
Steele	1,040	1,083		6.Ĝ· ଼	33	76	63.5	140.4	
Stutsman	1,173	4,283	1 3	3.3	27	206 <sup>7</sup>	46.0	96.2	
Wells	560	250	1	.6	39	32	139.3	256.0	
		11	1 -	13 v 1	7)	2.5		5 (5 CV)	
Economic Area 3C	12,313	15,321	6.1	6.6	836	88 <b>7</b>	135.8	115.4	
Dickey	544	1,147		1.6	11	76	40.4	127.3	
Ransom	1,530	3,106	3.3	6.3	63	164	82.4	105.6	
Richland	10,027	10,315		15.5°	752	610	150.0	118.3	
Sargent	212	753		1.7	10	37	94.3	98.3	
Economic Area 4	12,253	9,463	5.7	4.9	634	562	103.5	116.0	
Cass	3,896	4,439		6.5	216	282	110.9	122.6	
Grand Forks	4,942	1,911	. 1	4.3	290	118	117.4	120.4	
Pembina	330	876		3.4	16	49	97.0	111.9	
Traill	895	1,718	Y .	6.4	54	89	120.7	103.6	
Walsh	2,190	519		1.8	58	24	53.0	92.5	
State Total	55,592	53,141	2.1	2.1		3,003	<b>191.1</b>	112.3	
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<sup>&</sup>lt;sup>a</sup>Does not include wild hay.

TABLE 29. FERTILIZATION OF IMPROVED OPEN PERMANENT PASTURE IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964

Alta egi in in en	1.000	AL "C")	Fertilize	d acreage	Total	amount	Averag	e pounds
Census economic	Fertilized		in percent of		of fertilizer		of fertilizer	
area and county	acr	eage	harvested		us		per	acre
	1959	1964	1959	1964	1959	1964	1959	1964
14 14 14 14 14 14 14 14 14 14 14 14 14 1	ac	res	Perc		<b>t</b>	ons	p.	ounds
Economic Area 1	605	2,023	1.3	1.3	70	69	231.4	68.2
Adams	0	75	0.0	0.9	. 0	3	0.0	80.0
Billings	0	0	0.0	0.0	0	0	0.0	0.0
Bowman	40	., <b>0</b>	2.8	0.0	1	0	50.0	0.0
Dunn	210	65	3.8	0.3	52	4	495.2	123.1
Golden Valley	<b>30</b> /	0	0.4	0.0	2	. 0	133.3	0.0
Grant	0	100	0.0	0.9	0	5, 5,	0.0	100.0
Hettinger	85	100	1.7	0.8	5	. (;;; <b>:3</b> ;;	117.6	60.0
McKenzie	40	1,054	2.2	13.0	4	34	200.0	64.5
Mercer	0	0	0.0	0.0	· · · 0	" O	0.0	0.0
Morton	110	339	1.9	3.4	. 3	<b>8</b> , .	54.5	47.2
Oliver	0	138	0.0	5.4	0	3	0.0	43.5
Sioux	0	80	0.0	0.7	0	5	0.0	125.0
Slope 7	0	60	0.0	0.8	0	3	0.0	100.0
Stark	90	12	1.1	ъ	<b>3</b>	1	66.7	166.7
Economic Area 2A	85	615	0.9	1.8	6	26	141,2	84.6
Burke	0	, 0	0.0	0.0	0	0	0.0	0.0
Divide	0 🐇	12	0.0	0.3	0	1	0.0	166.7
McLean	85	. 0	2.3	0.0	. 6	0	141.2	0.0
Mountrail	0 .	420	0.0	5.1	0	17	0.0	81.0
Williams	0	183	0.0	2.3	0	<b>.</b>	0.0	87.4
Economic Area 2B	160	756	1.0	1.8	. 8	45	100.0	119.0
Burleigh	0	410	0.0	2.7	0	9	0.0.	43.9
Emmons	90	0	3.9	0.0	4	0	88.9	0.0
Kidder	70	0	1.1	0.0	4	0	114.3	
Logan	0	0	0.0	0.0	0	0	0.0	0.0
McIntosh	0	10	0.0	0.3	0	1	0.0	200.0
Sheridan	0	336	0.0	14.2	0	35	0.0	208.3
Economic Area 3A	1,882	917	9.2	1.9	71	27	75.5	58.9
Benson	175	180	8.8	2.6	31	6	354.3	
Bottineau	452	20	18.4	0.5	11	1	48.7	100.0
Cavalier	0	0	0.0	0.0	0	0	0.0	0.0
McHenry	80	310	1.2	2.4	4	6	100.0	38.7
Nelson	315	75	27.1	2.7	7	5	44.4	133.3
Pierce	0	0	0.0	0.0	0	0	0.0	0.0
Ramsey	20	0	1.8	0.0	1	0	100.0	0.0
Renville	40	0	4.5	0.0	2	0	100.0	0.0
Rolette	0	293	0.0	7.2	0	8	0.0	54.6
Towner	0	39	0.0	2.3	0	1	0.0	51.3
Ward	800	0	36.9	0.0	15	0	37.5	0.0

TABLE 29. FERTILIZATION OF IMPROVED OPEN PERMANENT PASTURE<sup>a</sup> IN NORTH DAKOTA BY COUNTIES AND CENSUS ECONOMIC AREAS, 1959 AND 1964 (continued)

					· · · · · · · · · · · · · · · · · · ·			
Census economic	Fertilized			ed acreage cent of	Total amount of fertilizer		Average pounds of fertilizer	
area and county		eage	-	d acreage			per acre	
,	1959	1964	1959	1964	1959	1964	1959	1964
	a	cres	percent		tons		pounds	
Economic Area 3B	800	2,302	5.8	4.8	41	95	102.5	82.5
Barnes	30	63	1.5	.8	2.	4	133.3	127.0
Eddy	0	373	0.0	7.0	0	9	0.0	48.3
Foster	400	870	15.6	20.5	15	31	75.0	71.3
Griggs	0	30	0.0	1.6	0	1	0.0	66.7
LaMoure	280	696	19.3	7.7	14	34	100.0	97.7
Steele	50	0	20.0	0.0	2	0	80.0	0.0
Stutsman	40	260	.9	1.7	8	15	400.0	115.4
Wells	0	10	0.0	.5	0	1	0.0	200.0
Economic Area 3C	355	2,167	3.6	6.8	26	107	146.5	98.8
Dickey	0	296	0.0	3.3	0	12	0.0	81.1
Ransom	40	670	1.3	7.8	5	32	250.0	95.5
Richland	285	1,181	14.3	25.3	20	62	140.4	105.0
Sargent	30	20	1.7	.2	1	1	66.7	100.0
Economic Area 4	967	2,085	20.4	14.2	72	122	148.9	117.0
Cass	465	878	21.9	29.1	35	56	150.5	127.6
Grand Forks	105	1,064	10.8	27.6	10	59	190.5	110.9
Pembina	0	20	0.0	2.0	0	1	0.0	100.0
Traill	222	120	41.3	2.9	19	6	171.2	100.0
Walsh	175	3	19.3	.1	8	С	91.4	0.0
State Total	4,854	10,865	4.0	2.9	294	491	121.1	90.4

a"Improved open pasture" is pastureland that is not cropland or woodland and on which one or more of the following practices have been used: liming, fertilizing, seeding, irrigating, draining, and clearing of weeds or brush growth.

bLess than .05 percent.

<sup>&</sup>lt;sup>C</sup>Reported in small fractions.

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