Bulletin
B-557
June 1960

NITROGEN Fertilization of CORN with Supplemental IRRIGATION

O. H. Brensing
H. J. Harper

OKLAHOMA STATE UNIVERSITY
SCIENCE SERVING AGRICULTURE
1891
EXPERIMENT STATION

CONTENTS

Nitrogen Fertilization of Corn with Supplemental Irrigation

Cooperative Trials at Five Locations in Central and Eastern Oklahoma

1947-1953

By O. H. Brensing and H. J. Harper
Dept. of Agronomy, Oklahoma State University

Corn acreage in Oklahoma decreased from a maximum of 5,939,000 acres in 1910 to 234,000 acres in 1957. A principal cause of this decrease was low yields associated with erratic rainfall in June and July.

Supplemental irrigation could provide a corn crop with sufficient water during these two critical months in years when rainfall is low. However, most Oklahoma soils are too low in nitrogen for corn to take full advantage of suppplemental water or adequate rainfall. Hence data on the relation of nitrogen fertilization to corn yields, when rainfall is plentiful or supplemental water is used, is currently of interest.

This publication reports data from tests of various rates of nitrogen fertilization on corn given supplemental irrigation on five farms in central and eastern Oklahoma during the period 1947 through 1953.

General Conditions of the Tests

Locations of the tests, and years during which they were conducted, are shown in Table I.

A comparison was made in this study of six rates of nitrogen fertilization—0, 60, 90, 120, 150 and 180 pounds per acre of actual nitrogen[1]—applied on corn given supplemental irrigation during late June, July and early August. Ammonium nitrate was used as the nitrogen source. It was applied as a sidedressing about six weeks after planting, when corn plants were about 18 inches high.

A comparison also was made between nitrogen treatments without other fertilization and when used with a starter fertilizer applied at

[1]At the two test locations used in 1947, the rate of nitrogen application was 0, 75, 125 and 225 pounds per acre. At these locations in following years, and for all other locations and years, 30-pound increments beginning at 60 pounds per acre were used.

Table I. — Locations of tests, hybrid corn strains planted, dates of irrigation, and starter fertilizer used.

Location of Experiment	Year	Hybrid Planted	Dates of Irrigation			Starter Fertilizer Used	
			First	Second	Third	Kind	Rate (lb./A.)
Mont Davis Farm,	1947	U. S. 13	July 16	Aug. 4	--	3-27-15	125
Seminole County,	1948	Funk's G-711	*	*	*	10-20-10	200
8.5 mi. N of Seminole	1949	Funk's G-711	July 16	Aug. 5	--	5-10-10	400
	1950	Funk's G-711	July 3	--	--	5-10-10	400
	1951	Texas 26	July 21	--	--	5-10-10	400
Nelson Brensing Farm,	1947	Funk's G-711	July 22	Aug. 5	Aug. 15	5-30- 0	100
Pawnee County,	1948	Funk's G-711	June 17	July 31	--	10-20-10	180
6 mi. E of Pawnee	1949	Funk's G-711	July 27	Aug. 13	--	5-10-10	400
	1950	Funk's G-711	July 1	July 7	--	5-10-10	400
	1951	Texas 26	July 25**	--	--	5-10-10	400
	1952	Funk's G-711	July 2	July 29	--	5-10-10	400
	1953	Funk's G-711	July 3	July 30	--	5-10-10	400
Pat Fite Farm,	1949	Funk's G-711	July 7	July 27	--	5-10-10	400
Muskogee County,	1950	Funk's G-711	July 6	--	--	5-10-10	400
6 mi. E and 1 mi. N	1951	Funk's G-711	July 17	Aug. 8	--	5-10-10	400
of Muskogee	1952	Funk's G-711	July 26	July 9	--	5-10-10	400
	1953	Funk's G-711	July 1†	--	--	5-10-10	400
Richard Steakley Farm,	1949	Funk's G-711	July 9	--	--	5-10-10	400
Bryan County,	1950	Funk's G-711	July 4	--	--	5-10-10	400
2 mi. S and 2 mi. E	1951	Texas 26	July 12	July 19	--	5-10-10	400
of Kemp	1952	Texas 26	June 30	July 9	July 28	5-10- 5	225
Bob Jeffrey Farm,	1948	Dekalb 1002	*	*	*	10-20-10	200
Wagoner County,	1949	Dekalb 1008	July 25	Aug. 3	--	5-10-10	400
5 mi. W and 2.5 mi. S							
of Wagoner							

* No water applied in 1948. Combined June-July rainfall exceeded 12 inches.
** Water applied too late for optimum benefit.
† Water should have been applied about June 14.

planting time. The starter fertilizer usually was the equivalent of 200 pounds of 10-20-10 or 10-20-20 per acre. The specific treatment used each year at each location is shown in Table I. At one location, a third comparison was included, using 33 pounds of nitrogen applied as ammonium nitrate at time of planting.

Irrigation water usually was applied when the corn plants had removed most of the available moisture from the surface foot of soil. Tensiometers were used at times, but amount of rainfall and time interval between rains was more often used in determining when to irrigate. Water was not always applied at the optimum time. Four of the cooperative trials were located more than one hundred miles from Stillwater. Consequently, the moisture content of the soil could not be closely observed.

About three inches of water was applied at each irrigation.

In 1954, tests were planted in Pawnee and Muskogee counties, but no water was available for summer irrigation at those locations during that exceptionally dry year.

The rate of planting was approximately one kernel every 9 inches in rows 40 or 42 inches apart. This rate would give a stand of about 17,000 plants per acre if each kernel produced one stalk. Actual stands on plots given 0-, 60- and 90-pound rates of nitrogen fertilization and a starter fertilizer are shown in Table VII.

Yields shown in the tables reporting results are averages of four replications.

Specific conditions applying only at individual test locations are described in connection with results reported for each of these locations.

Results at Individual Locations

Mont Davis Farm, Seminole County

One of the first irrigation experiments was conducted on the Mont Davis farm north of Seminole in Seminole county, on a bottomland area of Pulaski fine sandy loam. Water was obtained by gravity flow through a 6-inch steel pipe from a pond on an adjacent drainage area.

Results are shown in Table II. There was some variation in yield among replications because the rate of water absorption was not uniform on all plots. Also, a buried soil was present under a portion of the field.

In 1949, a 6.7-inch rain fell a few days after the ammonium nitrate was applied. Plant growth was poor that year, even on plots receiving a

SEMINOLE COUNTY

Table II. — Corn yields under irrigation in relation to various rates of nitrogen fertilization, with and without starter fertilizer; Mont Davis Farm, Seminole, Okla.; 1947-1951.

(Bushels per acre)

Rate of Nitrogen Fertilization (pounds per acre)	1947	1948*	1949	1950	1951	Average 1948-51	Average 1947-51
			Without Starter Fertilizer				
None	17.4	67.3	49.9	51.8	45.9	53.7	46.5
60**	50.8	84.0	59.3	81.4	89.9	78.7	73.1
90	--	86.6	56.4	88.8	98.8	82.7	--
120	--	91.6	58.9	94.9	107.7	85.8	--
150	--	91.4	64.9	90.7	106.4	88.3	--
180	--	84.1	59.1	94.3	110.0	86.9	--
			With Starter Fertilizer				
None	44.4	61.6	46.6	61.9	66.5	59.9	56.2
60**	56.1	91.8	54.6	89.4	75.5	77.8	73.5
90	--	99.4	56.2	93.4	100.2	87.3	--
120†	64.6	99.7	61.0	85.4	98.9	86.2	81.9
150	--	96.6	76.5	102.0	99.9	93.8	--
180††	66.5	92.6	72.6	98.9	109.8	93.5	88.1

* Not irrigated. June-July rainfall exceeded 12 inches.
** 75 pounds per acre in 1947 † 125 pounds per acre in 1947 †† 175 pounds per acre in 1947.

high amount of nitrogen, because much of the nitrogen in the fertilizer was leached into the subsoil below the depth of root penetration.

Excellent response from nitrogen was obtained in 1950 and 1951.

Nelson Brensing Farm, Pawnee County

The test on the Nelson Brensing farm east of Pawnee in Pawnee county was on a Port silt loam. This soil is found on the flood plain of many small streams in north central Oklahoma. Water was pumped from Black Bear creek.

In 1947 and 1948, the test was planted on an area where cultivated crops had been grown for several years and the soil was low in available nitrogen. From 1949 through 1953, the experiment was on an adjacent area of the same soil type where alfalfa had been grown from 1945 through 1948.

The results presented in Table III strikingly illustrate the beneficial effect of alfalfa on the supply of available soil nitrogen. Average

PAWNEE COUNTY

Table III.—Corn yields under irrigation in relation to various rates of nitrogen fertilization, with and without starter fertilizer; Nelson Brensing farm, Pawnee, Okla.; 1947-1953.

(Bushels per acre)

Rate of Nitrogen Fertilization (pounds per acre)	1947*	1948*	2-yr. avg. '47-8	1949**	1950**	1951**	1952**	1953**	5-yr. avg. '49-53
				Without Starter Fertilizer					
None	44.4	69.6	57.0	112.5	112.2	94.3	68.0	35.6	84.5
60	87.4	99.4	93.4	112.0	112.5	101.1	63.1	38.7	85.5
90	--	112.5	--	117.4	112.7	104.6	65.9	58.3	91.8
120	94.0	108.7	101.3	118.5	112.4	100.1	66.1	47.7	89.0
150	--	112.6	--	108.9	112.4	104.1	66.9	38.4	86.1
180	85.7	125.2	105.5	118.7	107.8	97.6	63.1	38.0	85.0
				With Starter Fertilizer					
None	41.4	78.5	60.0	114.5	101.3	72.8	63.8	44.5	79.4
60†	78.5	97.8	88.1	112.5	106.6	75.2	61.5	51.4	81.4
90	--	109.1	--	110.2	104.5	84.1	62.0	49.2	82.0
120††	90.6	118.8	104.7	113.2	99.4	77.1	56.3	58.2	80.8
150	--	124.1	--	115.6	106.5	81.4	57.8	57.8	83.3
180***	81.5	115.8	98.7	107.8	102.4	80.1	58.4	56.1	81.0

* On land where no legume had been grown
** On land which was in alfalfa in 1946, '47 and '48.
† 75 pounds in 1947
†† 125 pounds in 1947
*** 175 pounds in 1947

corn yields with no commercial fertilizer were 112 bushels per acre the first two years following alfalfa; and no significant increase in yield was produced by any fertilizer treatment the third year after alfalfa. The fourth year (1953) severe drought and high temperatures during June and July were very unfavorable for corn production. Corn was a complete failure on adjacent land that was not irrigated.

A starter fertilizer was not required to produce a maximum yield on this soil, but it did increase early growth. In 1951, the earlier development of corn plants fertilized with a starter fertilizer resulted in a reduction in yield because irrigation water was not applied to this field until it was needed on the corn that did not receive a starter fertilizer. By that time, the corn which did receive a starter fertilizer had been needing water for several days.

Corn yields averaged 107 bushels per acre from heavy nitrogen fertilization when the average June temperature was 76.9° F., and was not higher than 77.9°. Corn yields averaged 64.9 bushels per acre in 1952 and 1953 when the same quantity of nitrogen was applied and the average June temperature was 83.1°.[2]

Pat Fite Sr. Farm, Muskogee County

The test on the Pat Fite Sr. farm near Muskogee in Muskogee county was on a McLain silty clay loam soil high in soluble phosphorus and potassium. Results are presented in Table IV.

MUSKOGEE COUNTY

Table IV. — Corn yields under irrigation in relation to various rates of nitrogen fertilization, with and without starter fertilizer; Pat Fite Sr. Farm, Muskogee, Okla.; 1949-1953.

(Bushels per acre)

Rate of Nitrogen Fertilization (pounds per acre)	1949	1950	1951	1952	1953	5-yr. avg.
			Without Starter Fertilizer			
None	65.8	55.3	32.7	10.8	29.4	38.8
90	98.0	105.8	82.3	41.2	63.5	78.2
			With Starter Fertilizer			
None	55.8	68.2	44.0	27.1	20.2	43.1
60	79.7	97.2	89.0	56.9	64.4	77.4
90	105.6	107.7	95.2	60.7	68.0	87.4
120	96.5	106.6	97.9	65.2	65.6	86.4
150	103.2	109.2	104.8	72.5	66.1	91.2
180	100.8	108.8	109.6	71.7	70.9	92.4

The 60- and 90-pound rates of nitrogen were profitable when adequate moisture could be supplied.

Starter fertilizer alone did not increase yields significantly, but it was needed when the supply of soil nitrogen was increased by fertilization. This effect is evident from a comparison of yields obtained where 90 pounds of nitrogen was applied with and without a starter fertilizer.

In 1950 and 1952 it was possible to compare the yield of irrigated corn receiving 60 pounds of nitrogen with an adjacent unirrigated area similarly fertilized. The yields in bushels per acre were:

	1950	1952
Unirrigated	65.9	35.1
Irrigated	97.2	56.9

[2]Wallace reported that in Iowa an increase in July temperature above 79° F. in the presence of an adequate moisture supply was unfavorable for corn production. **Monthly Weather Review** 48:439-446 (1920). July temperatures in Iowa are comparable to June temperatures in Oklahoma insofar as corn development is concerned.

Excessively high temperatures in June 1952 and June 1953 were very unfavorable for corn production. The average June temperature for 1949, 1950, and 1951 was 77.3° F. as compared with an average of 84.1° for June 1952 and June 1953.

Richard Steakley Farm, Bryan County

The test on the Richard Steakley farm near Kemp in Bryan county was located on a Minco very fine sandy loam soil near the Red river. Water was pumped from the river.

Water was not applied in 1949 until the lower leaves of the corn plants had turned brown. During many seasons in southern Oklahoma, an earlier application is required than in the central and northern part of the state.

Results are presented in Table V. The optimum fertilizer treatment for this soil appeared to be 90 pounds of nitrogen in combination with a starter fertilizer.

BRYAN COUNTY

Table V. — Corn yields under irrigation in relation to various rates of nitrogen fertilization, with and without starter fertilizer; R. E. Steakley farm, Kemp, Okla.; 1949-1952.

(Bushels per acre)

Rate of Nitrogen Fertilization (pounds per acre)	1949*	1950	1951	1952	Avg.
		Without Starter Fertilizer			
None	34.3	48.4	24.9	3.9	27.9
90	76.8	69.9	93.3	74.8	78.7
		With Starter Fertilizer			
None	49.6	54.7	34.9	2.6	35.4
60	74.3	84.2	86.1	58.2	76.9
90	76.2	87.3	98.2	77.8	84.9
120	76.6	83.8	106.4	78.5	86.3
150	86.7	91.6	114.3	73.5	91.5
180	87.7	110.5	110.5	75.8	96.1

* Water applied after lower leaves had turned brown.

The importance of providing an optimum supply of plant nutrients on soils that have a very favorable physical environment for root development is illustrated by comparing the yields obtained from 90 pounds of nitrogen per acre with and without a starter fertilizer.

The need for using additional nitrogen when corn is irrigated is illustrated by the 1952 yields without a starter fertilizer. A thick stand of corn on unfertilized plots yielded only 3.9 bushels per acre because of a high percentage of barren stalks, whereas plots that received 90 pounds of nitrogen per acre produced 74.8 bushels of corn and the percentage of barren stalks was low.

In 1952, adjacent unirrigated corn fertilized with 225 pounds of 5-10-5 and 120 pounds of nitrogen per acre yielded 19.7 bushels per acre. Corn on irrigated plots given the same fertilizer treatment produced 78.5 bushels.

Bob Jeffrey Farm, Wagoner County

The Wagoner county test was on a Verdigris silt loam soil on the Bob Jeffrey farm west and south of Wagoner. Water was pumped from the Verdigris river. The corn was grown in rotation with commercial vegetables. A crop of tomatoes grown on this field in 1947 was fertilized with 1,500 pounds of 4-12-4 per acre. Flood water covered this field to a depth of one to three feet on June 22, 1948, but corn production was not seriously reduced on three of the four replications. Spinach planted on this field in the fall of 1948 made a poor growth, and corn was planted rather late in 1949.

Corn yields obtained in this study are shown in Table VI. On one series of plots in this experiment, 33 pounds of nitrogen (100 pounds of ammonium nitrate) per acre was applied in the row as a starter fertilizer. Nitrogen applied as a sidedressing without a starter fertilizer was more profitable than a starter fertilizer plus nitrogen. Sixty pounds of nitrogen was the optimum rate in 1948. In 1949, ninety pounds of nitrogen per acre without a starter fertilizer produced 7.5 percent more corn than was obtained where 60 pounds of nitrogen was applied. A starter fertilizer was not a profitable investment on this highly productive soil.

General Results and Discussion

Effect of Fertilizer on Yield

Average yields for 16 of the location years reported in Tables II through VI are summarized in Figure 1.[3] Years when corn followed alfalfa on the Brensing farm are not included.

---

[3] Years included, by location, are: Davis farm, 1948-1951 (4 years); Brensing farm, 1948 (1 year); Fite farm, 1949-1953 (5 years); Steakley farm, 1949-1952 (4 years); and Jeffrey farm, 1948-1949 (2 years).

WAGONER COUNTY

Table VI. — Corn yields under irrigation in relation to various rates of nitrogen fertilization, with and without starter fertilizer; Bob Jeffrey farm, Wagoner, Okla.; 1948 and 1949.

(Bushels per acre)

Rate of Nitrogen Fertilization (pounds per acre)	1948*	1949	2-yr. avg.
	Without Starter Fertilizer		
None	79.5	41.8	60.6
60	97.8	70.5	84.2
90	98.1	83.1	90.6
120	97.8	75.1	86.4
150	105.4	87.6	96.5
180	100.1	88.2	94.2
	With 10-20-10 Starter		
None	91.6	40.1	65.9
60	101.4	73.9	87.7
90	102.1	84.8	93.5
120	98.6	87.1	92.9
150	100.1	90.7	95.4
180	107.8	97.8	102.8
	With 33-0-0 Starter		
None	88.4	32.3	60.4
60	95.3	60.4	77.9
90	104.7	80.7	92.7
120	97.2	83.9	95.0
150	98.1	85.9	92.0
180	93.1	94.8	94.0

* No irrigation. June-July rainfall was more than 12 inches.

By far the greatest increase in corn yield per pound of nitrogen came from the 60-pound rate. Rates above 90 pounds per acre showed little advantage.

A starter fertilizer had little influence on corn yields on fertile bottomland soils high in easily soluble phosphorus and potassium, as is shown in Figure 1 in connection with the zero and 90-pound rates of nitrogen fertilization. Figure 2 presents a photographic comparison.

A starter fertilizer was needed along with nitrogen on the Steakley farm to produce an optimum yield.

Nitrogen Efficiency and Cost

Table VII reports the average quantity of nitrogen required to produced a one-bushel increase in yield above the yield obtained from

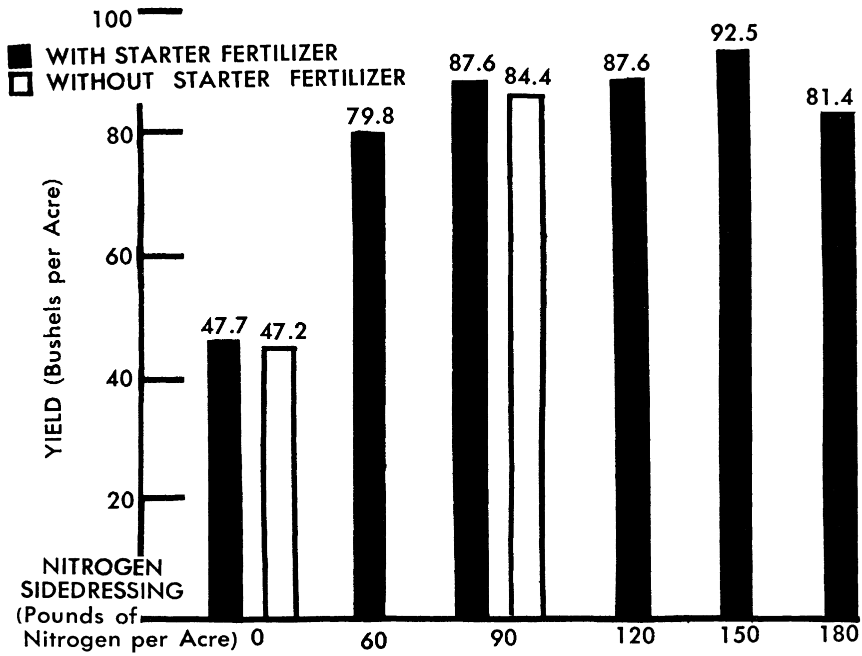

Fig. 1.—Yields of irrigated corn in relation to varying rates of nitrogen applied as sidedressing, with and without a starter fertilizer. Average of 16 location years (see footnote, page 12).

unfertilized plots or those where only a starter fertilizer was used. (The starter included 20 pounds of nitrogen per acre.) At the 60-pound rate, 1.7 pounds of nitrogen costing 20.7 cents was required for each bushel increase. At the 90-pound rate, the average requirement was 2.2 pounds per bushel, and the average cost was 26.6 cents per bushel. An increasing amount of nitrogen per bushel was required at higher rates of application.

An increase of one bushel of corn for each two pounds of nitrogen is considered an efficient use of nitrogen, on the basis of experiments conducted on nitrogen deficient soils in other states.

Relation of Fertilization to Stand and Ear Size

Data on the relation between stand, nitrogen fertilization, ear size, and yield are presented in Table VIII.

Normally, on plots adequately supplied with available nitrogen, high yields were associated with high ear weights and more than 10 thousand stalks per acre. Thick stands without adequate nitrogen pro-

Fig. 2.—The relative effect of a starter fertilizer as compared with a nitrogen sidedressing is illustrated by this comparison on the Mont Davis farm. The 4-year average yield with only starter fertilization was 6.2 bushels per acre higher than with no fertilizer. Corn yields were increased about 20 bushels an acre when an adequate sidedressing of nitrogen was applied.

duced smaller ears and lower yields than similar stands with ample nitrogen.

The percentage of barren stalks usually was higher on plots with thick stands without adequate nitrogen. The high percentage of barren stalks on the Brensing farm, where corn followed alfalfa, was principally due to suckers that developed because of the abundant supply of nitrogen.

Thinner stands tended to offset the disadvantage of producing fewer ears per acre by producing larger ears when enough nitrogen was supplied. More lodging occurred when the plant population was 14 to 16 thousand plants per acre than in stands of 10 thousand plants. One hundred bushels of corn per acre was produced on many plots with stands of 10 to 11 thousand plants.

Table VII. — Average quantity of nitrogen (from fertilizer) required to produce one bushel of corn and cost* of the nitrogen, for various rates of application.**

Location	Quantity and cost of nitrogen per bushel of corn when rate of application per acre was—									
	60 lbs.		90 lbs.		120 lbs.		150 lbs.		180 lbs.	
	Quantity (lbs.)	Cost (¢)	Quantity (lbs.)	Cost (¢)	Quantity (lbs.)	Cost (¢)	Quantity (lbs.)	Cost (¢)	Quantity (lbs.)	Cost (¢)
Davis Farm, Seminole County	1.5	18.3	2.1	25.6	2.8	34.1	3.3	40.2	--	--
Brensing Farm, Pawnee County	1.4	17.1	1.7	20.7	2.4	29.3	2.9	35.4	3.9	47.6
Fite Farm, Muskogee County	1.8	22.0	2.0	24.4	2.8	34.1	3.1	37.3	3.9	47.6
Steakley Farm, Bryan County	1.7	20.7	2.2	26.8	2.7	32.9	3.0	36.6	3.8	46.3
Jeffrey Farm, Wagoner County	2.1	25.6	2.9	35.4	3.7	45.1	4.6	56.1	4.6	56.1
Average	1.7	20.7	2.2	26.6	2.9	35.1	3.4	41.2	4.1	49.4

* Based on average nitrogen cost of 12.2 cents per pound, 1947-1952.
** Includes data from the preliminary trials in 1947 on Davis and Brensing farms, and excludes corn following alfalfa on the Brensing farm.

The lowest number of stalks per acre in these experiments occurred on the Mont Davis farm in 1951. However, these stalks produced a high percentage of double ears; and plots fertilized with 90 pounds of nitrogen per acre produced 10,800 ears for a yield of 91.3 bushels.

Small ears produced in the presence of an abundant supply of nitrogen on the Brensing farm in 1951 and 1952 may be accounted for by average June temperatures that were several degrees above normal during those two years.

Corn Belt studies show that average ear weight should be about one-half pound to produce a maximum yield.[4] Ears of this size are shown in Figure 3, which also illustrates the 9-inch plant spacing considered very favorable for the production of a high yield in this study.

Funk G-711, U.S. 13 and Dekalb hybrids usually produced one ear per stalk in these experiments. Texas 26 will produce two ears per plant on a fertile soil under favorable conditions.

[4] Missouri Agri. Exp. Sta. Bul. 160 (1956).

Table VIII. — Relation of three rates of nitrogen sidedressing on corn to stalks per acre, percent barren stalks, ear weight and yield; with starter fertilizer* and supplemental irrigation; five Oklahoma locations, 1947-1952.

	Stalks per acre** (number)			Barren stalks (percent)			Ear weight (lbs.)†			Yield (bu. per A.)		
	No nitrogen	60 lbs. N	90 lbs. N	No nitrogen	60 lbs. N	90 lbs. N	No nitrogen	60 lbs. N	90 lbs. N	No nitrogen	60 lbs. N	90 lbs. N
Mont Davis Farm; Seminole County												
1947††	10,460	9,900	10,400	8.8	1.7	1.9	.34	.40	.43	48.4	62.9	74.0
1948	10,790	11,020	11,870	10.8	19.8	9.4	.55	.51	.55	91.9	91.9	96.9
1949	10,010	9,780	9,520	11.9	6.0	5.2	.38	.44	.46	44.8	61.4	57.7
1950	9,750	9,490	9,635	9.1	5.5	4.5	.49	.67	.73	61.9	86.4	95.2
1951	5,100	5,300	6,100	2.0	1.9	3.4	.46	.50	.59	48.0	60.5	91.3
Nelson Brensing Farm; Pawnee County												
1947††	8,500		9,120	38.4		7.5	.46		.61	41.4		90.6
1948	13,220	14,455	13,932	14.3	5.5	4.9	.54	.56	.59	87.1	98.8	115.9
1949	17,050	16,740	16,860	26.9	31.2	26.5	.62	.62	.62	114.5	115.8	110.7
1950	12,990	14,560	14,570	18.4	22.4	20.9	.64	.64	.63	101.4	106.6	104.5
1951	11,570	10,970	12,500	23.9	23.4	18.8	.47	.51	.41	72.8	75.2	74.6
1952	13,460	11,600	12,830	17.1	15.2	20.2	.40	.44	.41	63.8	61.5	62.0
Pat Fite Farm; Muskogee County												
1949	13,430	13,700	14,150	35.4	18.1	13.9	.46	.52	.56	59.2	82.4	103.8
1950	11,900	12,200	12,950	10.3	7.6	8.3	.42	.56	.57	68.2	97.2	107.7
1951	10,900		11,150	25.2		2.2	.30		.42	36.4		82.6
Richard Steakley Farm; Bryan County												
1949	12,840	13,440	13,860	31.4	15.9	15.9	.36	.47	.33	47.5	74.3	71.5
1950	9,630	11,250	11,270	11.7	9.3	10.4	.44	.53	.57	54.7	84.2	87.3
1951	11,440	14,400	15,000	23.5	8.9	10.0	.27	.39	.44	39.9	86.2	99.0
1952	11,440	11,700	12,790	68.2	8.9	11.3	.10	.39	.43	4.9	62.8	71.0
Bob Jeffrey Farm; Wagoner County												
1948	10,560	10,680	10,350	7.5	6.9	6.0	.62	.67	.63	91.6	101.4	102.1
1949	11,600	13,530	13,300	34.9	15.2	6.9	.29	.51	.62	32.8	76.0	81.6

* Starter applications are shown in Table I.
** The planting rate used would have produced about 16,000 stalks per acre if each kernel had produced a stalk.
† Data on ear size are influenced by differences among hybrid strains in the number of ears per stalk.
†† In 1947, the application was 125 pounds per acre instead of 90 pounds.

Fig. 3.—The ears of corn in this photograph are about the weight (one half pound) shown by Corn Belt studies as being the best average weight for maximum yield. The stalks are spaced 9 inches in the row.

6-60/2½M