



University of Idaho
College of Agriculture
 Cooperative Extension Service
 Agricultural Experiment Station

Current Information Series No. 372
 February 1977

BRARY

APR 28 1977

Idaho
Fertilizer
Guide

UNIVERSITY OF IDAHO
Irrigated Field Corn
for Silage or Grain

The following fertilizer guidelines are based on relationships established between University of Idaho soil tests and crop yield response. The fertilizer rates suggested are based on research results and are designed to produce above average yields if other factors are not limiting production. Thus, the fertilizer guide assumes good management.

The suggested fertilizer rates will be accurate for your field provided (1) the soil samples represent the area to be fertilized, and (2) the crop history information supplied is complete and accurate.

NITROGEN (N)

Nitrogen rates depend upon some of the following factors: length of growing season, previous crop, past fertilizer use, soil type and leaching hazard and a realistic yield goal for the grower and the area (Table 1).

Nitrogen fertilizer can be applied preplant and incorporated. On sandy textured soils subject to leaching, sidedress a portion of the nitrogen at time of last cultivation.

Table 1. Nitrogen fertilizer rate based on previous crop

Previous crop	N application (lb. N/acre)		
	Western Idaho	Magic Valley	Eastern Idaho
Grain or corn (residue returned)	220	190	160
Grain or corn (residue removed)	180	150	120
Row crop	160	130	100
Beans, peas or alfalfa			
stubble	120	90	60
Green manure legumes	100	70	40

Nitrogen Soil Test

A nitrogen soil test can evaluate the carry-over from heavily fertilized row crops. Since nitrate nitrogen (NO_3N) is mobile, the soil samples should represent soil depths of 0 to 12 and 12 to 24 inches. Nitrogen soil test following alfalfa has limited value.

The soil test values in Table 2 represent the sum of the nitrate nitrogen and ammonium nitrogen (NH_4) in the top 2 feet of soil by 1 foot increments.

Table 2. Nitrogen fertilizer rate based on N soil test

Nitrogen soil test (0 - 24" depth)	N application*
N (ppm)	(lb. N/acre)
0	160
10	120
20	80
30	40
over 40	0

* Add 20 lb. N for each ton of grain straw or non-legume residue plowed under up to 50 lb. N/acre. Straw yields are normally 3 to 4 tons/acre

PHOSPHORUS (P)

Corn will respond to phosphorus fertilizer if soil levels are low. The soil test is based on available phosphorus present to the depth of plowing and the soil samples should represent this area. Phosphorus should be plowed down or banded in the seedbed. (Table 3.)

Table 3. Phosphorus fertilizer rate based on soil test.

Soil Test inches soil depth		Apply lb./acre	
0-9	0-12	P_2O_5	(P)**
Phosphorus (P) ppm*			
0	0	240	106
4	3	160	70
8	6	80	35
over 12	over 10	0	0

* P test is by NaHCO_3 extraction.

** Phosphorus is expressed as both the oxide and elemental forms:
 $\text{P}_2\text{O}_5 \times 0.44 = \text{P}$ or $\text{P} \times 2.29 = \text{P}_2\text{O}_5$.

POTASSIUM (K)

Corn has a medium requirement for available soil potassium (Table 4.)

Table 4. Potassium fertilizer rate based on soil test.

Soil Test inches soil depth		Apply lb./acre	
0-9	0-12	K_2O	(K)**
Potassium (K) ppm*			
0	0	240	200
30	22	160	133
60	45	80	66
90	68	40	33
over 120	90	0	0

* K test is by NaHCO_3 extraction.

** Potassium is expressed as both the oxide and elemental forms:
 $\text{K}_2\text{O} \times 0.83 = \text{K}$ or $\text{K} \times 1.20 = \text{K}_2\text{O}$.

MICRONUTRIENTS

Zinc (Zn) - While zinc deficiencies have not been widespread on corn, corn is sensitive to zinc deficiency particularly on leveled or exposed limey subsoil areas. When the soil test for zinc is less than 0.6 ppm in the 0- to 12-inch soil depth or when subsoils are exposed, apply zinc fertilizer to supply 10 pounds of zinc per acre or equivalent.

Other micronutrients have not been shown to be limiting corn production. "Shotgun" applications of micronutrient mixtures containing boron, manganese, iron and copper "for insurance" have not been shown to be responsive and are not suggested.

SULFUR (S)

The major corn growing regions of Idaho should not experience sulfur deficiency. Soils testing less than 8 ppm SO_4S in the 0- to 12-inch soil depth or areas known to be deficient in sulfur should receive 30 pounds sulfur per acre.

SALINITY (SALTS)

Corn has a low to moderate tolerance to salty soil. Soils over 3 or 4 mmhos/cm may be too salty for

beans or potatoes but can be utilized for corn. Corn can be grown satisfactorily on soils up to about 6 mmhos/cm.

GENERAL COMMENTS

1. Narrow rows (32 inches or less), high plant population (average 28,000) and early plantings can utilize high rates of fertilizer. If plant populations or growing season are not adequate, high rates of fertilizer will not compensate.
2. Sidedressing may cause root pruning depending upon plant size, distance of shank from the row and depth.
3. Over-irrigation and nitrogen leaching are a hazard on all soils, particularly sandy-textured soils.
4. Irrigation, weed and disease control, variety and plant population will influence the effectiveness of your fertilizer applications.
5. Select a variety that matures approximately 10 days earlier than the average first-frost in the fall in your area.

If you have any questions regarding the interpretation of this information, please contact your County Extension Agent.

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