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

Current Information Series No. 376
February 1977

Idaho Fertilizer Guide

Sweet Corn for Seed and Processing

The following fertilizer guidelines are based on relationships established between University of Idaho soil test 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 use of good crop management practices.

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: previous crop, past fertilizer use, soil type and leaching hazard and a realistic yield goal for the grower and the area.

Nitrogen fertilizer should be applied pre-plant and incorporated into the soil. Late side dressing will encourage stalk rot which is more prevalent in seed than processed corn. If side dressing is necessary; for seed, apply no later than early emergence. For processing, apply at time of last cultivation. The ammonium (NH_4) source of nitrogen will increase stalk rot when compared with the nitrate (NO_3) source. Nitrogen rates suggested for optimum sweet corn production as influenced by previous crop are shown in Table 1.

Table 1. Nitrogen fertilizer rates based on previous crops.

Previous crops	Lb. N/acre*
Grain or corn (residue returned)	200
Grain or corn (residue removed)	160
Row crop	140
Beans, peas, alfalfa stubble	100
Green manure legumes	80

*Reduce rates 20 pounds per acre for seed corn.

Nitrogen Soil Test

A nitrogen soil test can evaluate the carryover from heavily fertilized row crops such as onions, beets or potatoes. Since nitrate nitrogen (NO_3-N) is mobile, the soil samples should represent soil depths of 0 to 12 and 12 to 24 inches, or the effective root zone. (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 in the top 2 feet of soil by 1 foot increments.

Table 2. Nitrogen fertilizer rates based on soil test.

0-24 inch depth or effective root zone N (ppm)*	Nitrogen application Lb./acre**
0	160
10	120
20	80
30	40
40 plus	0

* ppm x 4 = pounds nitrogen per acre

** reduce rates 20 pounds per acre for seed corn. Add 15 pounds nitrogen for each ton of grain straw or non-legume residue plowed under up to 50 pounds nitrogen per acre. Straw yields are normally 3 to 4 tons per 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 shows soil test levels and rates of phosphorus to apply. Since soil samples are being taken both at plow depth (0 to 9 inches) and at 0- to 12-inch depth, levels for both depths are shown.

Table 3. Phosphorus fertilizer rate based on soil test.

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

* Phosphorus (P) is by $NaHCO_3$ extraction.

** Phosphorus is expressed as both the oxide and elemental forms: $P_2O_5 \times 0.44 = P$ or $P \times 2.29 = P_2O_5$.

POTASSIUM (K)

Corn has a moderate requirement for potassium. Fertilizer should be applied in fall or early spring and worked into seed bed. Table 4 shows soil test levels and rates of potassium to apply. Since soil samples are taken at both plow depth and the 0- to 12-inch soil depth, K levels for both depths are given.

Table 4. Potassium fertilizer rate based on soil test.

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

* Potassium (K) is by $NaHCO_3$ extractant.

** Potassium is expressed as both the oxide and elemental forms: $K_2O \times 0.83 = K$ or $K \times 1.20 = K_2O$.

MICRONUTRIENTS

Zinc (Zn) — 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 if sub-soils 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 and "shotgun" application 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. Soil testing less than 8 ppm SO_4-S 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)

Some sweet corn inbred lines have a low tolerance to salty soils. Soils over 3 to 4 mmhos/cm may be too salty for salt sensitive inbreds. Field corn varieties will normally tolerate more salt than sweet corn varieties.

GENERAL COMMENTS

1. Results from fertilizer research trials are available in Idaho Experiment Station Bulletin 501, *Fertilizing Sweet Corn for Seed Production*, by C. G. Painter and W. R. Simpson.

2. Side-dressing may cause root pruning depending upon plant size, distance of shank from the row, and depth. Stalk rot incidence is also increased by this practice.

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.

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

Prepared by C.G. Painter in cooperation with W.R. Simpson and J.P. Jones Department of Plant and Soil Sciences, University of Idaho College of Agriculture.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, James L. Graves, Director of Cooperative Extension Service, University of Idaho, Moscow, Idaho 83843. We offer our programs and facilities to all people without regard to race, creed, color, sex, or national origin.

3M 2-77