



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

Current Information Series No. 270
February 1975

LIBRARY

APR 17 1975

UNIVERSITY OF IDAHO

**Idaho
Fertilizer
Guide**

MALTING BARLEY

The following fertilizer guidelines are based on relationships 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 good management.

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

NITROGEN (N)

Nitrogen rates depend upon previous crops, previous fertilizer application, release of N from organic matter, soil type, irrigation management and length of growing season. Enough nitrogen fertilizer should be applied to obtain maximum yield without increasing percent of protein.

Nitrogen soil test

A nitrogen soil test can evaluate nitrogen carryover from heavily fertilized row crops such as potatoes, sugar beets or onion.

Soil samples should represent the 0- to 12-inch and 12- to 24-inch soil depths or the effective root zone since nitrate nitrogen (NO_3N) is mobile in the soil.

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

Table 1. Nitrogen fertilizer rates based on soil test.

0 to 24" depth or effective root zone	Nitrogen application
N ppm*	(lb. N/acre)**
0 - 10	120 - 80
11 - 20	79 - 40
21 - 30	39 - 20
31 - 40	19 - 0
Over 40	0

* ppm x 4 = pounds per acre

** Add 15 pounds available N for each ton of grain straw or non-legume residue plowed under up to 50 pounds N/acre. Straw yields are normally 3 to 4 tons per acre.

Table 2. Nitrogen fertilizer rates based on previous crop.

Previous crop	Nitrogen application
	(lb. N/acre)
Grain or corn (residue returned)	120*
Grain or corn	80
Sugar beets or potatoes	40
Beans, peas	20
Alfalfa, green manures (legumes)	0

* When only a light grain or corn residue is returned to the soil, 80 lb. N/acre should be sufficient. Where heavy residue is returned to the soil, 120 lb. N/acre should be sufficient.

PHOSPHORUS (P)

Though cereals are not as responsive to applied phosphorus as most row crops, they will respond to applied phosphorus if soil levels are low. Table 3 shows soil test levels and rates of phosphorus to apply. Since soil samples are taken both at plow depth (0 to 9 inches) and at the 0- to 12-inch depth, levels for both depths are shown.

POTASSIUM (K)

Cereal crops have a lower demand for soil potassium when compared to other crops such as alfalfa and potatoes. Table 4 shows soil test levels and rates of potassium to apply.

SULFUR (S)

Sulfur requirements for cereal will vary depending on soil texture, soil organic matter levels, leaching losses and sulfur content of irrigation water.

Areas irrigated with Snake River water should not experience a shortage of sulfur. Higher rainfall areas of southern Idaho, mountain valleys and foothill areas are likely areas for sulfur deficient soils.

A soil testing less than 10 ppm SO_4S in the plow layer or 8 ppm in the 0- to 12-inch soil depth or in areas known to be deficient in sulfur should receive 20 to 40 pounds of sulfur per acre.

Sulfur deficiency appears as a yellowing of the plant early in the growing season and looks much like nitrogen deficiency.

S
53
E322

MICRONUTRIENTS

Deficiencies of micronutrients on cereals have not been observed in Idaho. Responses from micronutrient applications would not be experienced unless on severely scraped soils.

GENERAL COMMENTS

1. Nitrogen fertilizers may be applied in fall on medium-textured soils if leaching and soil erosion are not hazards.
2. Nitrogen applied in spring will be used more efficiently and is recommended, especially on sandy soils in areas having heavy winter precipitation.
3. Nitrogen applied to the crop after the boot stage or application of excessive rates can result in undesirable high protein levels and is a lodging hazard.
4. Phosphorus and potassium fertilizer should be applied in the fall and mixed with the soil.
5. Over-irrigation and nitrogen leaching are a hazard on all soils, particularly sandy-textured soils.
6. Irrigation, weed and disease control can influence the effectiveness of your fertilizer applications.
7. Avoid a heavy first irrigation on spring cereals to prevent water-logging, reduced tillering and nitrogen leaching.

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

Table 3. Phosphorus fertilizer rates based on soil test.

Soil test inches soil depth		Apply pounds per acre	
0-9	0-12	P ₂ O ₅	(P)**
Phosphorus (P) ppm*			
0-4	0-3	160	70
5-8	4-6	120	53
9-12	7-10	60	26
Over 12	Over 10	0	0

* P test is by NaHCO₃ extraction.

** Phosphorus is expressed as both the oxide and elemental forms: P₂O₅ x 0.44 = P or P x 2.29 = P₂O₅

Table 4. Potassium fertilizer rate based on soil tests.

Soil test inches soil depth		Apply pounds per acre	
0-9	0-12	K ₂ O	(K)**
Potassium (K) ppm*			
0-30	0-22	240	200
31-60	23-45	160	133
61-90	46-68	80	66
Over 90	Over 68	0	0

* K test is by NaHCO₃ extraction.

** Potassium is expressed as both the oxide and elemental forms: K₂O x 0.83 = K or K x 1.20 = K₂O

Prepared by Charles G. Painter, Hugh McKay, Howard Roylance, J. P. Jones and Richard Johnson, 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.