

Fertilizing Buckwheat

SF-724 (Revised), October 1992

W. C. Dahnke, Soil Testing and Soil Science Dept.

C. Fanning, Extension Soils Specialist

A. Cattanach, Extension Soils/Sugarbeet Specialist

Buckwheat is a crop that does better on low fertility soil than small grains, but on fertile soil small grains usually produce more per acre. Buckwheat grows best when conditions are moist and cool. It is also very sensitive to both spring and fall frost. It requires 10 to 12 weeks to reach maturity.

Yield Goals:

The most efficient rate of fertilizer will depend on the residual soil nutrient level as determined by a soil test and the yield goal. Yield is influenced by: 1) local climate; 2) soil type; and 3) management (timeliness of planting, plant population, variety, weed control, etc.) Yields in North Dakota range from 10 to 40 bushels (42 pounds per bushel) per acre (see Circular SF-822 for help in setting yield goals). Marketing buckwheat can be a problem. Many elevators do not handle buckwheat.

Excessive fertilizer use, especially nitrogen and phosphorus, has potential to degrade ground and surface water quality. Establishing realistic yield goals, carefully soil sampling fields and fertilizing crops according to soil tests will help preserve water quality.

Fertilizer Recommendations:

Table 1 shows the amount of soil nitrate-nitrogen in the top 2 feet of soil plus nitrogen fertilizer needed to meet crop requirements for various yield goals. These data are based on nitrate-nitrogen levels in soil samples taken after September 15. If soil samples are taken between July 1 and September 15, subtract 0.5 pound of nitrogen from the recommendation for each day that the soil was sampled prior to September 15. These adjustments are automatically included in recommendations received from the North Dakota State University Soil Testing Laboratory.

The phosphate (P_2O_5) and potash (K_2O) recommendations in Table 1 are for **broadcast application**. Drill-row applications of fertilizer should not be used because of the possibility of germination damage. If you prefer to band all the fertilizer, keep the bands at least 2 inches from the seed. To convert the broadcast rate of P and K to a band application rate reduce the broadcast rate by one third. Reduce the broadcast rate only when banding on soils testing **very low**. If the broadcast rate for medium testing soils were reduced, you would not be applying enough phosphorus and/or potassium to maintain the level in the soil. The result would then be an increasingly deficient soil, which is not conducive to high yields.

Since phosphorus and potassium move very little in the soil, it is possible to "build up" or increase the available level of these nutrients in the soil. The application of approximately 20 pounds of P_2O_5 per acre will increase the phosphorus soil test level by 1. In other words, if your phosphorus soil test level is 5 and you prefer to operate at test level of 12, the application of 140 pounds of P_2O_5 (305 pounds of 18-46-0) per acre thoroughly mixed in the top 6 inches of soil will raise the soil test level by 7. Likewise, the application of 10 pounds of K_2O per acre will increase the potassium soil test by 1. Nitrogen requirements should be applied each year as needed.

Nutrient recommendations for buckwheat.

		Soil Test Phosphorus, ppm					
Yield goal	Soil N plus fertilizer N required	Bray-I Olsen	VL 0-5 0-3	L 6-10 4-7	M 11-15 8-11	H 16-20 12-15	VH 21+ 16+
bu/a	lb/acre-2'						
25	55		30	20	15	0	0
30	65		35	25	15	0	0
35	75		40	30	20	10	0
40	90		50	35	20	10	0

		Soil Test Potassium, ppm					
Yield goal	Soil N plus fertilizer N required	Bray-I Olsen	VL 0-40	L 41-80	M 81-120	H 121-160	VH 161+
bu/a	lb/acre-2'						
25	55		40	30	15	0	0
30	65		50	35	20	0	0
35	75		55	40	25	0	0
40	90		65	45	30	0	0

Nitrogen recommendation = 2.2 YG - STN + SDA - PCC
 Bray-I P recommendation = (1.320-0.066 STP)YG
 Olsen P recommendation = (1.320-0.083 STP)YG
 Potassium recommendation = (1.8600-0.0116 STK)YG

The abbreviations used in the equations are as follows:

- YG = yield goal
- STN = soil test nitrogen
- STP = soil test phosphorus
- STK = soil test potassium
- SDA = sampling date adjustment
- PCC = previous crop credit

Methods Of Application:

The best method of nitrogen application will depend on the nitrogen source used. For example, anhydrous ammonia should be applied 4-6 inches beneath the soil surface, while nitrogen solutions, broadcast urea and other dry nitrogen fertilizer products should be worked into the soil shortly after application. Applying nitrogen fertilizer on well drained sandy soils in the fall is not recommended because of possible loss by leaching.

Crops growing on soils that test very low in P and/or K depend heavily on applied fertilizer. On soils testing medium or above the crop is much less dependent on applied fertilizer for its current needs. Fertilizer is applied on these soils to replace P and K removed by the crop. On low testing soils where the plants largely depend on fertilizer for their needs the method of application will influence the amount of fertilizer a crop can recover. **Broadcast** fertilizer is thoroughly mixed with the soil and as a result some is positionally unavailable to plant roots. **Band or drill row** fertilizer is applied closer to the seed and can be recovered by the crop more efficiently.

Broadcast applications of phosphate and potash can be made more efficient when applied before a primary tillage operation. Recent data indicates that a band application of P at a depth of 4 or 6 inches is more effective than when drill row applied. This method of application will also prevent a buildup of nutrients at the soil surface under minimum tillage.

Other Nutrients:

Sulfur deficiencies are not common in North Dakota, but may occur early in the growing season on sandy soils. If a crop appears to be deficient in nitrogen but does not respond to nitrogen applications, test for sulfur. Buckwheat responses to iron, zinc, copper, manganese in North Dakota have not been evaluated.

County Commissions, North Dakota State University and U.S. Department of Agriculture cooperating. North Dakota State University does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, disability, age, status as a U.S. veteran, sexual orientation, marital status, or public assistance status. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701) 231-7708. This publication will be made available in alternative formats for people with disabilities upon request, 701 231-7881.

INFORMATION ACADEMICS RESEARCH EXTENSION PUBLICATIONS CALENDAR WEATHER DIRECTORY

[Information for Prospective Students](#)

NDSU is an equal opportunity institution

This information may be photocopied for noncommercial, educational purposes in its entirety with no changes.
Requests to use any portion of the document should be sent to NDSU.permission@ndsu.edu.
North Dakota State University Agriculture and University Extension
Dept. 7070, Morrill 7, P.O. Box 6050, Fargo, ND 58108-6050