

Buckwheat can be used as an emergency short-season summer crop. It is a herbaceous, erect annual that grows 2-3 feet tall. It has a predominant stem that usually has branches. The stem is succulent and turns hollow with a reddish-brown color near maturity. The flowers are white and must be cross pollinated by wind or bees ("Agricultural Guide," 1987).

The grain is used for human and livestock consumption. Buckwheat, originating in China, is especially useful as a green manure crop and soil renovator ("Specialty and Non-Traditional Crops," 1987). Wild buckwheat is an annual weed that resembles buckwheat except for its smaller seed and vining stem ("Some Specialty Crops in Kansas," 1982).

Seed Harvest

Buckwheat is not a true cereal crop. Buckwheat is related to smartweed, dock and sorrel. Buckwheat will continue to set seed while the first set of seeds are drying. Seed shattering is a problem. Swathe, windrow, and harvest seeds when 80% of the seeds on the stem are a mature dark-brown to black color. Otherwise, 90% of seeds should have turned color for a direct combine harvest. Seeds must be dried with 110 degree heat or they will mold or heat in storage. Seeds can be safely stored at 16% moisture. A harvest of 500-1,300 pounds per acre can be expected.

Buckwheat was a common livestock feed in the United States in the mid-1800's. The grain has one of the highest biological values of protein in the plant kingdom. The protein quality of buckwheat is similar to nonfat milk solids and dried whole eggs. It is especially high in the amino acid lysine. The high fiber content of hulls reduces its feeding value. It has 90-95% feeding value of oats ("Agricultural Guide," 1987).

Soil Requirements

Buckwheat grows well under poor soil conditions and should make the soil more friable. It has an excellent ability to scavenge nutrients from the soil. Heavy

use of manures often causes serious lodging ("Agricultural Guide," 1987). Buckwheat is known as a "phosphorus pump" because it is assumed the roots solubilize phosphorus from phosphate precipitates in the soil profile and subsoil. The following characteristics make it outstanding for its phosphorus efficiency: 1) a finely divided root system with a high ratio of root surface to root or shoot length; 2) a high storage capacity for inorganic phosphorus; 3) an increased release of protons and solubilizing substances by phosphorus-deficient plants; 4) a favorable ratio of phosphorus uptake to root mass growth, especially at a low phosphorus supply; 5) a high activity of acid phosphatase in the rhizosphere and the capability to use phosphorus from organic sources (Gardner and Boundy, 1983). Buckwheat has poor response to nitrogen fertilizer due to its short growing season ("Crops of Other Plant Families"). It has a higher tolerance to soil acidity than any other grain crop ("Alternative Field Crops Manual," 1989).

Root Growth

Buckwheat has a short tap root with branched lateral roots. The root system is small and represents less than 5% of the total dry weight of the plant. This makes the plant susceptible to drought and lodging ("Agricultural Guide," 1987).

Growing Conditions

Buckwheat will give fair yields on soils too poor or too badly tilled to produce most other crops and seems to be more affected by season than soil conditions. A moist, cool climate is most favorable for buckwheat, although seeds will germinate in a very dry soil. Considerable heat during the early stages of growth can be a benefit ("Buckwheat," 1907). Buckwheat is quickly killed with freezing temperatures, and it is also susceptible to drought. Buckwheat is especially sensitive to high temperatures and dry weather when the plants are in blossom (Gardner and Boundy, 1983).

Establishment

Prepare the seedbed similar to small grains ("Crops of Other Plant Families"). The seeding rate should be 40-50 pounds per acre live seed. Seed older than one year loses viability quickly ("Agricultural Guide," 1987). Plant with a grain drill or broadcast the seed followed with a spike harrow ("Some Specialty Crops in Kansas," 1982). Buckwheat matures in 8-10 weeks, so plant two months before expected frost. Seeding earlier would normally expose buckwheat to heat and drought making it a more risky crop ("Agricultural Guide," 1987). A second option would be to plant it in May before the heat of the summer. Plant at a depth of ½-2 inches ("Specialty and Non-Traditional Crops," 1987). Buckwheat is a very poor competitor against weeds when planted early ("Some Specialty Crops in Kansas," 1982). Buckwheat's quick growth in warmer soils smothers out weeds. It is sensitive to most herbicides ("Agricultural Guide," 1987).

Miscellaneous

Buckwheat is one of the best temporary honey crops since it blossoms for 30 days and 4-6 weeks after planting (Gardner and Boundy, 1983). It is a good food source and a habitat for wildlife ("Agricultural Guide," 1987). Buckwheat stubble is more prone to erosion than small grain fields due to the loose friable conditions of the soil it helps create (Gardner and Boundy, 1983).

REFERENCES

"Agricultural Guide." 1987. University of Missouri. Columbia Extension Division.

"Specialty and Non-Traditional Crops." 1987. KSU Cooperative Extension Service.

"Some Specialty Crops in Kansas." 1982. KSU Cooperative Extension Service.

Gardner and Boundy. 1983. "The Acquisition of Phosphorous by *Lupinus albus*." Plant and Soil. Vol. 70, pp. 391-402.

"Crops of Other Plant Families."

"Alternative Field Crops Manual." 1989. University of Minnesota & University of Wisconsin-Madison.

"Buckwheat." 1907. Cyclopedia of American Agriculture.

CREDITS

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