GROWER EXPERIENCES WITH BUCKWHEAT IN EASTERN WASHINGTON, 1997–2000

By Norm Herdrich, Agricultural Writer

The information for this bulletin was gathered from a seminar on buckwheat held in Washington State in February 2000. Speakers included Don Sloan and Brian Van Pelt, McKay Seed Company; and Ed Warner, producer.

Pros for Buckwheat in Washington

- Low cost of production — $1–$13/acre
- Low fertility requirements
- Has crop rotational benefit
- Very competitive crop if weeds don’t germinate first
- Allows income diversification
- No known pests

Cons for Buckwheat in Washington

- Environmentally sensitive
- Requires swathing
- One of the weakest plants in terms of frost
- Little or no residue left in field after harvest

Buckwheat, a grain crop grown for flour, originated in China. First grown during colonial times in the United States, the colonists liked it because of its wide adaptability to different types of soils, and the fact that it would grow well on newly cleared land.

Buckwheat is a short-season, broadleaf crop that matures 75 to 80 days after planting. In the Columbia Basin, it has done well as a second crop under irrigation following beets or peas. It is also a good green manure crop, according to Brian Van Pelt, an agronomist with McKay Seed Company, which contracts production of buckwheat.
Buckwheat will grow under a wide range of soil conditions; however, it is sensitive to spring and fall frosts. An early frost in the fall will interfere with seed filling and maturation. It is also sensitive to high temperatures, wind, and drought—especially at bloom time.

The flowers are self-incompatible requiring cross-pollination. Winds or insects pollinate the crop. Flies seem to do the best job. Honeybees can pollinate the crop, but buckwheat pollen and nectar can result in honey with an odd and, to some, disagreeable smell.

The plant has a small taproot system and the underground portion of the plant makes up only about 3% of the total biomass of the crop. Buckwheat uses only the top two to three feet of the soil profile.

In buckwheat production, fertilizer placement is very important. The nutrients must be in place at the time of seeding or just before to help keep weed competition to a minimum. Also, weed control just prior to seeding, or a pre-emergence treatment can help in controlling weeds. One good thing about buckwheat is that it will emerge and produce a canopy very quickly.

Growers must wait until all danger of frost is past before seeding. Buckwheat will germinate at soil temperatures ranging from 45° to 105°F. Plant buckwheat one to two inches deep into a
firm moist seedbed. McKay Seed Company has recently started investigating buckwheat production under dryland conditions and recommends the following seeding rates: 50 pounds per acre for dryland conditions, 70 pounds per acre for irrigated conditions.

McKay Seed Company planted buckwheat early in May 1999 and again in early June. Both plantings froze. This suggests that buckwheat may not be a viable crop in Lincoln County, Washington. It may be limited in its adaptation to areas well south of Lincoln County.

**FERTILITY**

Buckwheat needs sulfur; however, Van Pelt says it is not as responsive to fertilizer applications as are small grains. The crop requires 45 to 50 pounds of available nitrogen, both soil and applied, for dryland conditions. Add phosphorus if the soil test is below 20 ppm. The other nutrient requirements are similar to cereal grains.

**PESTS**

There are no identified weed or insect pests of buckwheat at this time. The crop is susceptible to Rhizoctonia, but McKay Seed Company has never seen a problem with this disease, Van Pelt says.

**HARVEST**

Van Pelt explains that buckwheat is an indeterminate crop that usually requires swathing, although a few growers have tried harvesting without swathing. Because it is an indeterminate crop, swathing will stop growth of the plant and allow it to mature. In addition, buckwheat shatters easily, so swathing will minimize losses due to shatter. Start swathing when about 70% of the seeds are black or brown.
Recommended cylinder speed is 600 to 800 rpm. A minimum of 13% moisture is required for harvest. Anything less than this will result in unacceptably high shatter losses. The preferred moisture is 15 to 16%. A pickup header works best, Van Pelt says.

**YIELDS**

McKay Seed Company has seen yields of about 900 pounds per acre in Lapwai, Idaho, in the 14- to 18-inch rainfall zone. In an exceptional year, they have seen a yield of 1,100 pounds per acre at Karl Kupers’ farm near Harrington. Average yields for irrigated buckwheat are in the neighborhood of 2,200 pounds per acre with 3,400 the highest yield they have seen. In 1999, the average was 1,400 pounds (irrigated) per acre due to frost damage.

**MARKETING**

McKay Seed Company at Moses Lake is currently the only organization involved in growing buckwheat in the Inland Northwest. The crop is currently grown under contract, and the seed stocks are controlled.

According to Don Sloan, McKay Seed Company is currently a leader in marketing buckwheat as an identity preserved crop. There are two processing facilities available, one at Almira and one at Moses Lake. Identity preservation benefits the end user making the crop a known entity and allowing a more efficient use of facilities, thus allowing them to pay the growers a higher price. Marketers benefit from being able to buy a known high quality crop that is sold easily. The producer benefits by gaining a slightly higher price for a little more work.

McKay Seed Company has an in-house research and development organization, and is involved in variety development. It has retail outlets at five locations in the Inland Northwest. In Canada, there is a fairly extensive buckwheat breeding program.

There is a viable international market for buckwheat. That market requires larger kernels, higher test weight, and a darker
color. Seven to 10 days after dehulling the grain, buckwheat seed oxidizes leaving a white kernel, which is then shipped whole.

McKay Seed Company takes delivery immediately after harvest. Sloan says there is very little domestic demand for buckwheat flour. Northwood Farms in Mead, Washington, is a good local birdseed market.

Japan is a strong market for buckwheat. The Japanese use the flour for noodle production. Exporters include China, which is increasing production and tends to sell cheaper in the world market; the United States, which has declining production; and Canada, where production is staying about level. Sloan says China will often offer a discount to buyers of as much as $150 per metric ton.

**ECONOMICS**

The economics of dryland buckwheat production are very similar to dryland grain economics. Sloan provided an analysis that shows per-acre buckwheat production costs of $10 for seed, $10 for fertilizer, $20 for swathing and $30 for combining, for a total of $70 per acre. For dryland wheat, the costs he used are $7 for seed, $20 for fertilizer, $20 for chemicals, and $30 for combining, for a total of $77 per acre. On the income side, Sloan used a buckwheat yield of 900 pounds per acre at a price of $13.50 per cwt., which was McKay Seed Company’s 1999 contract price. For the dryland wheat, he figured a yield of 45 bushels per acre and a price of $3 per bushel. The gross per acre for the buckwheat would be $121.50 and the net would be $51.50 per acre. For the wheat, the gross would be $135 per acre, and the net would be $58 per acre.

**GROWER EXPERIENCE**

Karl Kupers, who farms west of Harrington, grew buckwheat in 1999. Ed Warner, who worked for Karl Kupers, says growing buckwheat is a real challenge. He says it is a summer annual with a polygon-shaped stem and belongs to the Polygonaceae
family, which also includes dock and sorrel. It has an indeterminate growth habit.

Warner said they seeded into warm soil and the first bloom occurred about 40 days after seeding. The first mature seed was seen about 35 days after the first bloom. They swathed the crop when a significant portion (70%) of the seed was ripe. Buckwheat requires a long drying period before threshing, and the stems do not dry completely.

Kupers grew 110 acres of buckwheat in 1999. In 1997, these acres were in summer fallow. In 1998, the acres were in Rely Club winter wheat. They used a skewtreader on the winter wheat stubble the previous fall to encourage germination of volunteer wheat and cheatgrass. Kupers applied Roundup in the fall to control cheatgrass, followed by two more applications in early April and late May. The next step involved burning the straw to eliminate cheatgrass seed, fertilizing using a Blu-Jet fertilizer applicator, and applying 30 pounds of nitrogen in late May. The first two days of June, 16-20-0-14 in 100 pounds starter fertilizer was put down with the seed.

The weather did not cooperate and the draws froze on July 2. This turned the plants in the draws brown and burned the tops of the plants down. There was another freeze in the draws in early September and it essentially stopped the growth of the plants in the draws. The crop, swathed on September 11 using a 25-foot Versatile swather and threshered on September 20–21, yielded 1,100 pounds per acre.

Warner says to plan on swathing the crop and do not try to direct-combine it. Direct combining will not work for two reasons. One is that the stems will never dry out, making getting the crop through the combine very difficult. The other is that there will be a heavy loss of seed on the ground due to shattering of the crop by the combine reel.

As for machine settings, Warner says to use less aggressive combine settings than are used for barley. It is important not to damage the seeds, as the percentage of intact hulls is one measure of quality.
Warner noted that buckwheat seeded into warm soil will emerge rapidly and compete aggressively. Use crop rotations to take care of weed problems. Growing buckwheat offers a grower a good opportunity to clean up fall and spring annual weeds. In addition, it is difficult for broadleaf weeds to compete with the buckwheat.

Warner says maintaining good seedbed moisture in June is important to getting a good buckwheat crop under dryland conditions. Residue from past crops can help do this.

As for markets, Warner says the birdseed market is one option. Others markets include livestock feed and human food in the form of buckwheat flour. Buckwheat hulls are also used as a stuffing in some pillows.