SOLUTIONS IN THE LAND

CROP PROFILE

BUCKWHEAT

Fagopyrum esculentum
Member of the Polygonaceae family

History

Buckwheat is one of the world's first domesticated crops, originating in Southeast Asia 5,000 to 6,000 years ago. It later spread to Central Asia, the Middle East, Europe, and, in the 1600s, was introduced to North America.

Climate Needs

Buckwheat thrives in cool, moist climates but is sensitive to frost and high temperatures, which can inhibit seed formation. Its shallow root system makes it susceptible to drought. In hot, dry conditions, buckwheat wilts during the afternoon but typically recovers by morning, reducing water loss through transpiration.

Buckwheat Description

Buckwheat is not related to wheat but produces three-sided grain-like seeds. The plants grow 2 to 4 feet tall and mature quickly, typically within 30 days. They bear white flowers for 2 to 3 weeks before producing hundreds of small brown seeds protected by hard outer hulls.

Soil

Buckwheat thrives in soil temperatures of 70°F or above but struggles in compacted or sandy soils prone to moisture deficiency. It performs best in fields with adequate moisture and a soil pH below 7.0. Buckwheat can be planted in tilled or no-till fields, with the latter helping conserve moisture and control weeds. On sloping fields, it can reduce erosion but should be followed by a winter cover crop for continued soil protection.

Seeding

Buckwheat is a warm-season annual that can be planted from late spring to mid-August. It is often used as a cover crop to suppress weeds before fall planting. For grain production, seed at 50–55 lbs/acre. For cover crops, drill at 55–65 lbs/acre or broadcast at 70–80 lbs/acre. Higher seeding rates are ideal for achieving a dense stand that suppresses weeds. Optimal flowering for grain occurs when nights start to cool, while late-summer planting produces shorter crops with reduced flowering.

Risk

One of the primary concerns is its susceptibility to frost, as it is highly sensitive to cold temperatures and can be killed quickly by even a light frost. If allowed to go to seed, buckwheat can also become a weed itself, with volunteer plants appearing in subsequent seasons.

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Weed Control

Buckwheat's rapid growth and dense canopy can suppress most weeds for several weeks. However, as the crop matures and the canopy opens, late-season weeds may emerge if rainfall occurs. Weeds should be controlled before planting to ensure a thick stand. Volunteer buckwheat plants may appear in subsequent seasons but are easily managed with tillage, mowing, or herbicides. Buckwheat does not have hard seed and normally, just one flush of volunteer plants will occur.

Highlights

Buckwheat is highly effective at capturing and utilizing soil nutrients, particularly phosphorus and calcium. It will germinate in soils with low phosphorus availability by excreting organic acids that solubilize bound phosphorus, making it more accessible for plant uptake. This ability not only supports its own growth but also leaves behind more bioavailable phosphorus for subsequent crops when used in rotation.

Pest & Disease Managment

Buckwheat requires little to no pesticide use. It faces minimal pest pressure from insects or diseases, though some generalist insects like grasshoppers may nibble on the crop without significant damage. Diseases are rare but may occur under stressed conditions. Buckwheat is more commonly known for attracting pollinators and beneficial insects.

Fertility

Buckwheat requires minimal fertilizer. Excess nitrogen can lead to excessive growth, causing plants to fall over before harvest. It is responsive to rock phosphate but not to superphosphate fertilizers.

Harvest

Buckwheat can be harvested using a combine or by swathing. Swathing allows green seeds to mature in the windrow, reducing shattering. This should be done when 75% of seeds are brown. Direct combining can start when 80–90% of seeds are brown, though some green leaves and stems may still be present. Delayed harvest increases the risk of seed loss due to shattering. Care should be taken to ensure seeds are not de-hulled during harvest by adjusting the combine's cylinder speed or concave settings.

During the first hours of harvest, make sure the buckwheat seeds are not being accidentally de-hulled by the combine; if that is occurring, slow down cylinder speed or try opening up the concaves. Using the combine's manual settings for barley can be an alternative to the guidelines above, then adjusting as needed.

Cleaning & Storage

After harvest, store buckwheat grain at no more than 16% moisture to prevent spoilage. For food-grade buckwheat, maintain moisture between 13–16%, with long-term storage below 15%. Periodic aeration using a bin's forced air dryer may be necessary, but additional heat is typically not required, as buckwheat usually field dries well. The U.S. standard bushel weight for buckwheat is 52 pounds.

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Rating any crop's production opportunity or risk is subjective and depends on the region where the crop is to be raised. Genetic advancement for pathogen tolerance and adverse weather condition has been more significant for popular, high seed sales crops such as corn and soybeans. The below table lists some of the issues of producing specific crops and helps guide your process of selecting your cropping choice.

Average rating: 3.92

Issue	1	2	3	4	5
Seed availability					X
Scouting requirements				X	
Drought tolerance		X			
Waterlogged soil tolerance				X	
Disease pressure				X	
Wildlife concerns				X	
Yield swings				X	
Harvest ability				X	
Field loss				X	
Market demand			X		
Soil regeneration					X
Residue value			X		
Storability				X	
Benefit for following crop					X

1- very low 2- low 3- average 4- moderately high 5- very high

Seed availability – Price, lead time, and required lot size are consideration for these issues
Scouting requirements – What frequency does someone need to look at the crop?
Drought tolerance – Rainfall patterns are requiring crops go longer between rainfall events.
Waterlogged soil tolerance – Rainfall events tend to produce higher volumes than historical averages.
Disease pressure – Plant stress has increased with the rise of daytime temperatures
Wildlife concerns – Deer, rabbits, voles, resident geese, and others can destroy fragile crops.
Yield swings – How predictable will the income be when this crop goes to market?
Harvest ability – Do we need plans B & C if adverse conditions affect the harvest?
Field loss – How much will be left in the field and can we monetize field loss?
Market demand – Does this crop have an elastic delivery window and are there timing penalties?
Profitability – Is there potential for higher margins needed for a shrinking land base?
Soil regeneration – Does this crop support the next crop?
Residue value – What remains after the target crop? Can we monetize the residue?
Storability – How long can we hold this crop? Will quality be challenging to maintain?

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