

Cover Crops for Alabama

► Learn about cover crops that are grown to benefit the following crop or benefit the soil, and learn how to choose the right ones.

Cover crops are planted in the off-season and usually are not intended for harvest. Cover crops are grown to benefit the following crop and improve the soil. “Green manure” is another term often used for soil-building cover crops. Cover crops can protect the soil, feed the soil ecosystem, increase soil organic matter, and supply nutrients to following crops. Selecting the right cover crops allows growers to improve yields while providing soil and water conservation benefits.

Properly managed cover crops protect the soil surface from water and wind erosion and remediate soil compaction. Growing cover crops feeds the soil ecosystem by exuding compounds from their roots—sugars, organic acids, amino acids, and more. These materials glue soil particles together into aggregates, improving soil structure. After termination, decomposed plant residue becomes soil organic matter that provides food for soil organisms—bacteria, fungi, arthropods, and others—and increases the soil’s water storage capacity. Cover crops can also improve soil fertility in several ways. Legumes and their associated bacteria produce nitrogen that can serve as fertilizer for following crops. Similarly, the cover crop takes unused nutrients from the previous crop, reducing leaching losses and cycling nutrients in the cropping system. Deep-rooted cover crops scavenge nutrients from deep in the soil. These nutrients may become available to following crops as the residue decomposes.

In addition to the effects on soil properties, cover crops often affect pest pressures in a cropping system. Weed growth is suppressed on the soil surface by thick plant residue that blocks sunlight and slows weed seedling growth. Some cover crops produce allelopathic chemicals that inhibit the growth of weed seedlings. Others suppress parasitic nematodes or insect pests by repelling, confusing, or starving them. However, some cover crops can support insects and diseases harmful to following crops, so take care to select the right cover crop for the cropping system.



Cover crops can make an economic difference to a grower operation, by reducing production costs and risks. Improved water infiltration and storage can reduce the effects of short-term droughts and irrigation costs. Production of nitrogen and scavenging of nutrients can reduce fertilizer needs. Cover crops can reduce pesticide and application costs by suppressing weeds and pests. Reduction of erosion and soil compaction means less land preparation and tillage expense.

Choosing the Right Cover Crops

Several cover crops are suited for Alabama cropping systems; thus, growers must properly choose cover crops based on the cropping system. A producer may consider questions before selecting a cover crop: What benefits would you like to get from the cover crop? What is your growing period between cash crops? Can this cover crop fit the growing period of the cover crop?

Generally, growers must choose a cover crop of an opposite type to the following crop (broadleaf versus grass, etc.):

- **Peanuts or soybeans.** Use any winter small grain (rye is usually best).
- **Corn.** Small grains, legumes, or both.
- **Cotton.** Small grains, legumes, or both.

- **Vegetables.** Most cover crops, including winter and summer cereals, legumes, brassicas, and others. But don't use a legume cover before legume vegetables.
- **Brassicas.** Can be added as winter covers to any of the above. They can help in several ways, but don't use a brassica cover before brassica cash crops, such as cabbage or broccoli.

Farmers can grow one cover crop species or a mix of two or more. There are a variety of mixtures to serve a variety of needs; however, research in Alabama shows limited benefits to planting mixtures compared to planting monocultures of small grains or legumes. Mixing many cover crops may dilute the benefits of each component, but if a mixture is used, covers with similar maturities will be easier to terminate at the same time.

Know how and when you will terminate the cover crops before you plant. A cover that does not die when it is supposed to can be a problem. Green or half-dead covers can pull moisture from deep in the soil, interfere with planting, and provide a "green bridge" for pests to move directly to following crops. Generally, allow at least 2 to 3 weeks after termination before planting another crop. Cover crops that have entered bloom or seed development are generally much easier to kill.

Nitrogen

Growers can increase the soil nitrogen content for the cash crop with legume cover crops. Research (2016–2020) across south Alabama showed legume cover crops (i.e., hairy vetch) supplied 50 to 60 pounds N/A to cotton in 4 out of 6 site years. It is more difficult to obtain a nitrogen credit for corn due to earlier planting dates compared to planting dates for cotton. Early termination of the cover crop may limit cover crop growth before corn planting. Some cereals, especially rye, are good at scavenging unused nitrogen from the soil. Many cover crops, including buckwheat, mustards, radish, and rye, can scavenge unused nutrients deep in the soil and move them closer to the surface.

Weed Control

Covers that produce a lot of biomass can help with weed control. Rye, black oat, sorghum-sudangrass, sunn hemp, iron clay cowpea, radish, and buckwheat can suppress weed seedlings or even produce allelopathic chemicals that inhibit weed growth. These same chemicals can also affect the cash crop germination

and growth, so a waiting period may be needed before planting. Residual herbicides applied to the main crop can affect following cover crops, so check pesticide labels carefully for planting intervals.

Breaking Up Soil Compaction

Cover crops with deep taproots, like tillage radish or canola, can break through surface-compacted layers. Other crops with dense root growth—rye, sunn hemp, sorghum-sudangrass—add organic matter to the soil and improve the soil structure, reducing compaction and slowing recompaction.

Nematode Suppression

Some cover crops repel, confuse, or starve pest nematodes—lupin, sunn hemp, velvet bean, black oat, sorghum-sudangrass, and Daikon radish. In a healthy soil ecosystem fueled by cover crops, parasitic and predatory organisms can help keep pest nematodes in check. Some cover crops can also harbor pests, so the selection of the right ones for the cropping system is essential.

Attracting Beneficials

Beneficial insects can pollinate crops and eat pests. Some covers that attract them are hairy vetch, crimson clover, lupin, sunflowers, and buckwheat.

Grazing and Harvesting for Forage

Some cover crops can provide good-quality forage or grazing early on and still recover to benefit the soil system. Clovers, rye, and oat are especially good for this. However, the removal of biomass by grazing can weaken root systems and decrease organic matter. Grazing animals during wet periods can also increase soil compaction at depths. If too much cover is removed, many benefits will be lost, such as the prevention of soil erosion, infiltration of rain, prevention of runoff, and soil shading.

Establishing & Managing a Cover Crop

Careful management is needed to ensure payback from planting a cover crop, just as it is for any crop. Plant good-quality seed at the recommended rate and depth. The planting date is also critical for good development—plant winter covers at least 2 to 4 weeks before the

average first killing frost, and plant summer covers when favorable soil temperatures and moisture are expected. See table 1 for planting date and seeding rate guidance.

Cover crops can be planted with a no-till drill or broadcast via a spreader or aerial application. The most consistent cover crop stand can be obtained by planting with a no-till drill, but many farmers broadcast cover crop seed to cover large acreages quickly during the busy harvest season. When broadcasting seed, use light surface tillage to ensure good seed-to-soil contact except in the following instances:

- After digging and before harvesting peanuts
- After peanut harvest
- Before cotton defoliation
- After cotton harvest before mowing stalks
- Before soybean leaf drop

Sources of Cover Crop Seed

Local seed suppliers and cooperatives will often have commonly used seeds for your area. Following are sources of some crops that can be hard to find:

- Alabama Crop Improvement Association
Headland, Alabama
(334) 693-3988
- Kelley Seeds
Hartford, AL
(334) 588-3821
- Petcher Seeds
Fruitdale, Alabama
(251)-827-6594
- Adams-Briscoe,
Jackson, Georgia
- Seven Springs Farm
Check, Virginia

For More Information

- Alabama Cooperative Extension System
- “Managing Cover Crops Profitably” on the Sustainable Agriculture Research and Education (SARE) website
- Southern Cover Crops Council website
- Alabama Sustainable Agriculture Network website
- Sustainable Agriculture Research and Education website
- USDA Agricultural Research Service website (Soil Dynamics Research)



Audrey Gamble, *Extension Specialist*, Assistant Professor, Crop, Soil, and Environmental Sciences, Auburn University

For more information, contact your county Extension office. Visit www.aces.edu/directory.

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Table 1. Recommended Planting Dates, Seeding Rates, and Rankings for Common Winter Annual (W), Summer Annual (S), and Perennial (P) Cover Crops

Cover Crop	Planting Date	Seeding Rate (lb/A)	Reduce Compaction	Residue Persistence	Erosion Control	Weed Control	Nematode Control	Attract Beneficials	Scavenge N	Scavenge P&K	Forage Quality
Drilled Broadcast											
Legumes											
Austrian Winter Pea (W)	September 1–December 31	50–70	90–100	F	F	VG	G	VG	F	F	VG
Crimson Clover (W)	September 1–November 30	15–18	22–30	F	G	VG	F	VG	G	G	E
Hairy Vetch (W)	September 1–November 30	15–20	25–40	F	F	G	F	E	F	G	G
Cowpea (S)	May 1–July 31	40–50	80–100	G	F	E	G	VG	F	G	G
Lupin (W)	September 15–October 31	70–120	—	G	F	G	E	E	F	G	F
Sunn Hemp (S)	May 1–July 31	20–40	—	E	G	VG	E	F	F	F	G
Velvet Bean (S)	May 1–July 31	20–40	—	G	G	VG	E	F	G	G	G
Cereals											
Oat (W)	October 1–November 30	30–60	50–90	F	G	VG	E	P	VG	F	G
Cereal Rye (W)	October 1–November 30	30–60	50–90	G	E	E	G	F	E	VG	G
Sorghum-Sudangrass (S)	May 1–August 31	30–40	40–50	E	VG	E	VG	G	E	G	VG
Triticale (W)	October 1–November 30	30–60	50–90	G	—	—	—	—	—	—	—
Winter Wheat (W)	October 1–December 31	60–120	60–150	G	VG	VG	F	F	VG	VG	VG
Brassicas											
Canola/Rapeseed (W)	September 1–October 31	5–10	8–14	G	G	VG	VG	G	VG	F	G
Mustards (W)	August 1–October 31	5–12	10–15	G	F	VG	VG	G	G	VG	G
Radish (W)	August 1–October 31	8–10	12–14	VG	F	VG	E	VG	F	E	VG
Other											
Buckwheat (S)	May 1–June 30	50–60	90–100	F	P	F	E	F	P	E	P

E = Excellent; VG = Very Good; G = Good; F = Fair; P = Poor/None

*Seeding rates provided are recommended rates for monoculture plantings. If a mixture is planted, reduced seeding rates are recommended.