

COVER CROPS

Cover crops may be considered an integral part of any cropping system that seeks to become more sustainable and supportive of conservation agriculture. Cover crops are grown in most cropping systems to provide environmental and soil productivity benefits. Thus, integrating cover crops into a crop production system should be considered a long-term investment for conserving and/or improving soil and water resources. The benefits arise from:

- Providing soil cover to prevent erosion in the off-season;
- Increasing water infiltration into the soil;
- Providing plant residues to increase soil organic matter;
- Reducing nutrient loss and leaching from the soil profile and/or lowering residual soil nitrogen (N);
- Reducing herbicide runoff in a corn–soybean rotation;
- Suppressing or reducing early-season weeds and weed biomass; and
- In the case of legumes, increasing N supply for the following summer grain crop.

For row crop producers in the Midsouth, the major categories of winter cover crops to consider are either grasses (wheat, rye, oats), legumes (vetches, peas, clovers), or a mixture of the two. The grasses will generally require N fertilizer to produce the desired biomass. The legumes will not require any fertilization since they have the ability to “fix” N; however, they will require the appropriate N-fixing bacteria. Some of the N that is “fixed” by the legumes will be available to the following summer crop, and this makes planting a legume cover crop more economical.

A cover crop can consist of a single species or a mixture of species. Current dogma is that successful establishment of a non-volunteer cover crop is best accomplished with the seeding of a mixture of diverse species, specifically grasses and legumes. However, this approach will create [potential seeding and management problems](#) because of the diversity of species in the mixture.

The [CTIC](#) published results from a cover crops survey that was conducted during early 2015 in the Midwest. Even though the results from this survey likely are not applicable to Midsouth producers, they do give some insight into practices that can be considered by producers in the southern US.

Planting date is critical for the success of winter cover crops. Cover crops should be planted early enough to:

- Establish adequate stands, achieve ground cover, and attain some growth before the onset of low temperatures;
- Achieve the desired growth for biomass production;
- Achieve adequate growth for significant nitrogen fixation (legumes); and
- Achieve growth that is sufficient to suppress winter weeds.

Cover crops may be planted preceding harvest (overseeding or interseeding) or immediately following harvest of a summer crop. It is projected that interseeding some cover crop species before harvest can result in the production of more dry matter in the fall than those planted after harvest. For instance, overseeding cereal rye into soybeans at leaf drop will result in more biomass yield than if seeding is delayed until after harvest.

[Gandy](#) has several types of [seeders](#) that attach to the head of a grain harvester so that seeding is done with the harvest operation. An [article](#) in No-Till Farmer describes other equipment that has been built or modified to spread cover crop seed.

Seeding rate will vary for planting method (drilled or broadcast) and whether or not each species is planted alone or in a mixture; e.g. grass and legume mix.

Seed prices represent a major portion of the costs associated with establishing legume cover crops. However, the above-mentioned N contribution of the legume cover crop to a following grain crop will somewhat offset the high cost of the seed.

When pricing cover crop seed from suppliers, be sure to calculate the cost on a unit of live seed rather than on just a unit of seed *per se*.

N requirement (fall-applied) of cereal cover crops such as wheat and cereal rye will depend on whether or not they follow a legume (e.g. soybeans) or grain crop (e.g. corn, grain sorghum) and the desired fall growth. Also, when grass cover crop species are planted in a mix with legume species, fall-applied N may not be necessary.

Kill date or stage will vary if preceding an early-planted summer crop such as corn since the cover crop should be killed at least 2 weeks prior to planting the summer crop. Also, the kill date should match the desired N contribution with maximum growth and the manageable residue amount from the cover crop, and should be 2 weeks prior to planting the intended summer crop.

Cover crops usually are destroyed by tillage or herbicides prior to planting of a following summer row crop. They can also be destroyed mechanically by a crimper/roller designed for this purpose. See the [video](#) with rolling of the cover crop and planting of the summer crop in one operation and the [video](#) of various kinds of crimper/rollers. An implement that is commonly referred to as a pulverizer or cultipacker made by [Brillion](#) may also be used. The best results are likely achieved when the crimping/rolling and planting are done in one operation as shown in the first video because this dictates that the planter drill is running parallel to the downed cover crop.

Additional information about cover crops has been produced by [Pioneer](#). The [USDA-ARS Conservation Systems Research Team](#) at Auburn, AL has produced fact sheets, publications, slide presentations, and videos that provide complete details on most aspects of cover crop use and management specifically for the southeastern US. [Center Seeds](#) of Minster Ohio has a publication that provides details about the various cover crop species that may be used in

diverse situations. A 2015 Ph.D. Dissertation entitled "[Effect of fall-seeded cereal cover crops for use in soybeans for control of Palmer amaranth in Mississippi](#)" by Dr. Ryan Edwards (MSPB Bufkin Fellow—Project No. 51-2014) provides results that essentially confirm above points and results from previous cover crops research.

Additional details about cover crops and their utility in Midsouth soybean and corn production systems is contained in the [article](#) on this website.

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