

Annual Ryegrass or Cereal Rye Cover Crops — What's Best for You?

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There are many types of winter cover crops available to plant after corn or soybean harvest. Two of these are cereal rye and annual ryegrass. While they both contain “rye” in their names, they are very different plants with roles to play in different cropping systems. As always, selecting a type of cover crop to use depends on the producers' goals. Selection tools and fact sheets available through the Southern Cover Crops Council (<http://southerncovercrops.org/cover-crop-resource-guide/row-crops/>) and the Midwest Cover Crops Council (<http://mccc.msu.edu/covercroptool/covercroptool.php>) can help inform these decisions by providing more detail about the use of these species. This article is meant to provide basic information about cereal rye and annual ryegrass to better distinguish between the two.

Cereal rye, or *Secale cereale*, is a small grain like wheat or barley (Figure 1). It can be planted in the fall and grows well over the winter. Cereal rye can grow quickly in the spring, going from < 6” tall in mid-March to > 5’ by early May. Cereal rye can be chemically terminated with glyphosate. While there are reports that cereal rye can be difficult to kill with glyphosate, particularly once it starts to reproduce, we have not experienced this in our research projects. University of Kentucky research has demonstrated deep rooting from cereal rye (~1.5 meters), weed suppression (particularly of marehail that emerges in fall and early spring), and ability to take up excess soil nitrogen. A previous article (https://wheatscience.ca.uky.edu/files/february_2019_-_wheat_newsletter_0.pdf) compared the use of cereal rye to wheat as a cover crop.

Annual ryegrass, or *Lolium multiflorum*, is a cool-season grass, with a bunchgrass form and extensive and deep fibrous roots (Figure 2). It is prized as a forage crop, and has a lot of advantages in that system. Not all annual ryegrass varieties will over-winter in Kentucky. University of Kentucky researchers are also investigating its use for potential fragipan remediation. (Note that fragipans are different than plow pans or compaction; for more information about fragipans vs. these other restricted layers, scroll through this website glossary: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.)

However, annual ryegrass as a cover crop needs special attention! There are three very important reasons that we caution against the widespread use of annual ryegrass in annual cropping systems, particularly those that include wheat.

1. Annual ryegrass is very difficult to kill with herbicide applications. Successful termination requires that herbicides be applied at the right growth stage and when environmental conditions are favorable. It is essential that annual ryegrass be sprayed before reproductive stages, and best herbicidal activity occurs when night temperatures are > 50F for a few consecutive nights. These temperature conditions rarely occur at the ideal growth stages, and when they do soil conditions are often too wet for equipment to travel across the field. Thus herbicide applications are often very difficult to apply correctly for optimal termination of ryegrass. If annual ryegrass is not terminated and reproduces, there is the potential for cross-pollination with weedy relatives.

2. There is a weedy ryegrass plant that is a major problem in wheat production areas. It has confirmed resistance to the following herbicide sites of action: Group 1 - ACCase inhibitors (diclofop-methyl [e.g. Hoelon] and pinoxaden [e.g. Axial]), Group 2 - ALS inhibitors (mesosulfuron-methyl [e.g. Osprey] and pyroxsulam [e.g. PowerFlex]), and Group 9 - EPSPS inhibitors (glyphosate [e.g. Roundup products]). This plant and the cover crop annual ryegrass can cross-pollinate, leading to potential for dispersal of these resistance traits.

3. Lastly, many of the traits that make annual ryegrass attractive as a cover crop and a forage planting also make it weedy if it escapes cultivation and becomes naturalized in an area.

We recommend that those producers trying cover crops for the first time or lacking experience with cover crops should avoid annual ryegrass. We only recommend that annual ryegrass be planted by producers who have experience with other cover crop species, and that small acreages be adopted first that are manageable during the very narrow termination window in the spring. Cereal rye is best suited for beginning cover crop producers looking for an easy to terminate cover crop with consistent winter annual weed suppression and other benefits.



Figure 1. Cereal rye cover crops in Lexington, KY, on March 12 (top left), April 8 (top right), and May 5 (bottom left). Photos by Erin Haramoto.



Figure 2. Annual ryegrass plant (left) and as a cover crop with strip tillage (right). Photos courtesy of Jimmy Henning (left) and Sarah Seehaver Eagen (right).