

# The Ryegrass Confusion

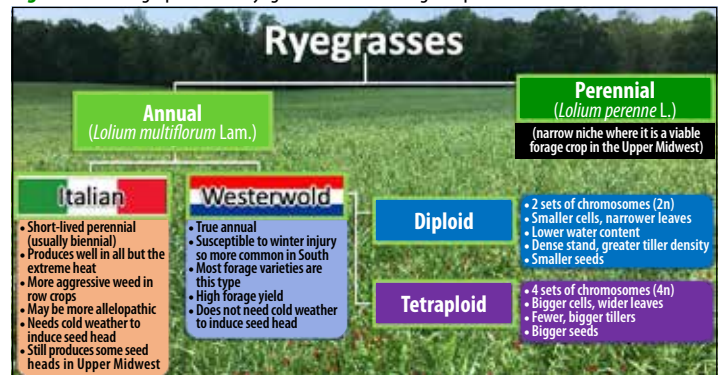
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**R**yegrass is one of the most important forage crops used in the U.S., and annual ryegrass (*Lolium multiflorum* Lam.) has become a common addition in forage mixtures in the Upper Midwest. Despite its popularity and widespread use, there is a lot of confusion on some of the terminology we use regarding ryegrass.

**Ryegrass, not Rye.** From the outset, to be clear, we are NOT talking about rye. Rye (*Secale cereale*) is a small grain species usually more blue-green in color with dull and sometimes slightly waxy leaves. Though many refer to annual ryegrass simply as rye, these are two very different species. Annual ryegrass, often called Italian ryegrass, is dark green with shiny leaves that have smooth edges. Both annual ryegrass and rye are often used in forage and cover crop mixtures around the country, so they are frequently confused. The “annual” vs. “Italian” label also adds to the confusion.

We are also NOT talking about perennial ryegrass (*Lolium perenne* L.), the other major ryegrass forage species (Figure 1). Perennial ryegrass is usually grown in cool, mild climates. Of the ~300,000 acres of perennial ryegrass grown for forage in the U.S., the vast majority is in the northeast and along the Pacific Coast in Oregon and Washington. It is sort of the “Goldilocks” grass, as it prefers places where it doesn’t get too hot or too cold, because it likes it just right. Perennial ryegrass can survive in the northern U.S. and Canada, but it is very susceptible to winter kill in areas where there isn’t good snow cover throughout the winter.

Figure 1. An infographic of the ryegrasses used for forage crops.



**Origins of Annual Ryegrass.** Scientists have traced the origins of annual ryegrass to southern Europe. In fact, annual ryegrass is commonly called Italian ryegrass. First reports of its forage crop use date to the 13<sup>th</sup> century in northern Italy (approximately the same latitude as Minneapolis and central Wisconsin). Annual ryegrass was introduced into the U.S. during colonial times using mostly landrace varieties brought from Europe. Many of the annual ryegrass varieties that we grow in the Upper Midwest are Italian types.

In the early 1930s, seed companies in the Netherlands began selecting and breeding new ryegrass lines. Now, the vast majority of U.S. annual ryegrass varieties trace their origins to that breeding effort in the Westerwolde region of northeastern Netherlands. Known as Westerwold varieties, they make up most of the nearly 2 million acres planted each year in the Southern U.S. for fall, winter, and spring forage. Italian and Westerwold ryegrasses are the same species and can readily cross but have considerable differences.

**Is it Italian or Westerwold?** Westerwold-type ryegrasses are true annuals, and do not need cold weather to induce seed head production. They have also been selected over time to be most productive for fall, winter, and spring growth in the South. There, they grow earlier in the spring and mature faster than Italian types. Italian ryegrasses usually acts more like short-lived perennials (typically a biennial) and have a vernalization requirement (i.e., it needs cold weather to induce seed heads). They grow well in the Upper Midwest and maintain relatively high quality because they produce fewer seed heads per plant.

These characteristics have generally caused the Italian-types to be more commonly used in northern states where they can be planted in spring and taken as a hay or silage crop all summer with less worry about declining quality. But, Italian-types can be more perennial in nature and are often problematic as a weed. In addition to their competition as a weed, Italian ryegrasses tend to be more allelopathic, meaning they produce a chemical that interferes with the growth and development of other plant species. While generally not a major issue in a forage context, volunteer Italian ryegrass is a significant problem in wheat fields and can be challenging in hay fields.

**Diploid vs. Tetraploid.** Annual ryegrass is naturally a diploid species, meaning it carries two sets of chromosomes (2n). American scientists in the 1930s began experimenting with ryegrass hybrids and discovered mutants that had four sets of chromosomes (4n) but were substantially larger with wider leaves and stems. Researchers in the Netherlands expanded upon this early work, and ultimately, German plant breeders introduced the first tetraploid varieties into the U.S. in the early 1960s. Plant breeders have since developed many diploid and tetraploid varieties, with most of these being Westerwold-types.

One practical consideration, however, is tetraploid seed is usually 50-100% larger than diploid seed (Figure 2). Though seeding rate recommendations specify the same pounds of seed per acre for the diploid versus tetraploid varieties, it likely will require drill adjustment to account for these differences in seed size.

**Figure 2.** Varieties of annual ryegrass differ in seed size, likely requiring drill adjustments to maintain the same seeding rate. Each of these beakers contains 20,000 seeds of their respective varieties, but tetraploid seed varieties take up ~50% more volume than the diploid varieties.



**Hybrids.** To add to the confusion, ryegrass species can readily cross and hybrids are relatively common. Two common crosses are intermediate ryegrass (*Lolium hybridum* Hausska) and festuloliums (*Festulolium braunii* K.A.). Intermediate ryegrass is a cross between annual and perennial ryegrass and is a short-lived perennial with intermediate traits between the two species. Festuloliums can be a cross between either annual or perennial ryegrass and either meadow fescue [*Schedonorus pratensis* (Huds.) P. Beauv.] or tall fescue [*Schedonorus arundinaceus* (Schreb.) Dumort.]. Since intermediate ryegrass and festuloliums are less widely used, we will merely acknowledge them here.

**Summary.** There has been a lot of interest in ryegrass as forage in the Upper Midwest. Ryegrasses are certainly deserving of this attention since they are high-yielding, high-quality forage crops that establish quickly and easily when following recommendations. However, there is a lot of confusion about the terms used when talking about ryegrass. Hopefully, this article helps clear up some of the confusion about ryegrass and provides more context for Extension recommendations, the diversity of annual ryegrass varieties available on the market, as well as how they fit in Upper Midwestern forage programs.