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To me, one of the most interesting grass species that we grow is annual ryegrass. It provides winter grazing, high yields, and some of the best nutritional value of any forage we grow. In the South, annual ryegrass is interseeded into over 2 million acres of bermudagrass or bahiagrass every year and is grown on as much as a million more acres as an annual forage or cover crop (Fig. 1). 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, let us be clear that we are talking about annual ryegrass and not rye. Though a lot of folks refer to annual ryegrass simply as rye, these are two distinct species. Annual ryegrass (*Lolium multiflorum*

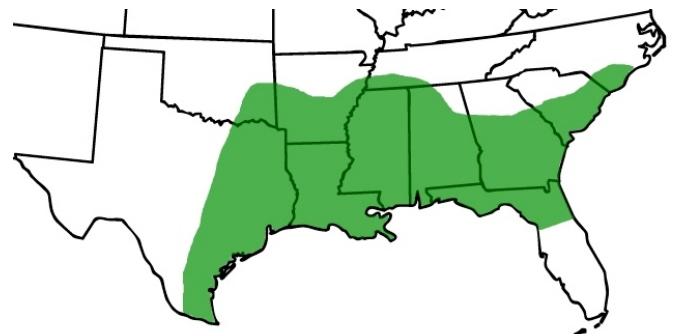


Figure 1. Annual ryegrass is frequently interseeded into bermudagrass and bahiagrass throughout the Southeast, as well as used as an annual forage or cover crop in other areas beyond the green-shaded areas.

Lam.) is dark green with shiny leaves that have smooth edges. Rye (*Secale cereale*) is a small grain species that is usually more blue-green in color with dull and sometimes waxy leaves. When I talk about them in Extension meetings or courses, I usually will call the small grain “cereal rye” to make clear the distinction. Many parts of the world call it “rye corn” instead.

The ryegrass that we grow is annual ryegrass. One will often read stories on the internet or in national ag media news articles about perennial ryegrass (*Lolium perenne* L.), which is the other major ryegrass forage species (Fig. 2). Perennial ryegrass is usually grown in cooler, milder climates. 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. Don’t we all?

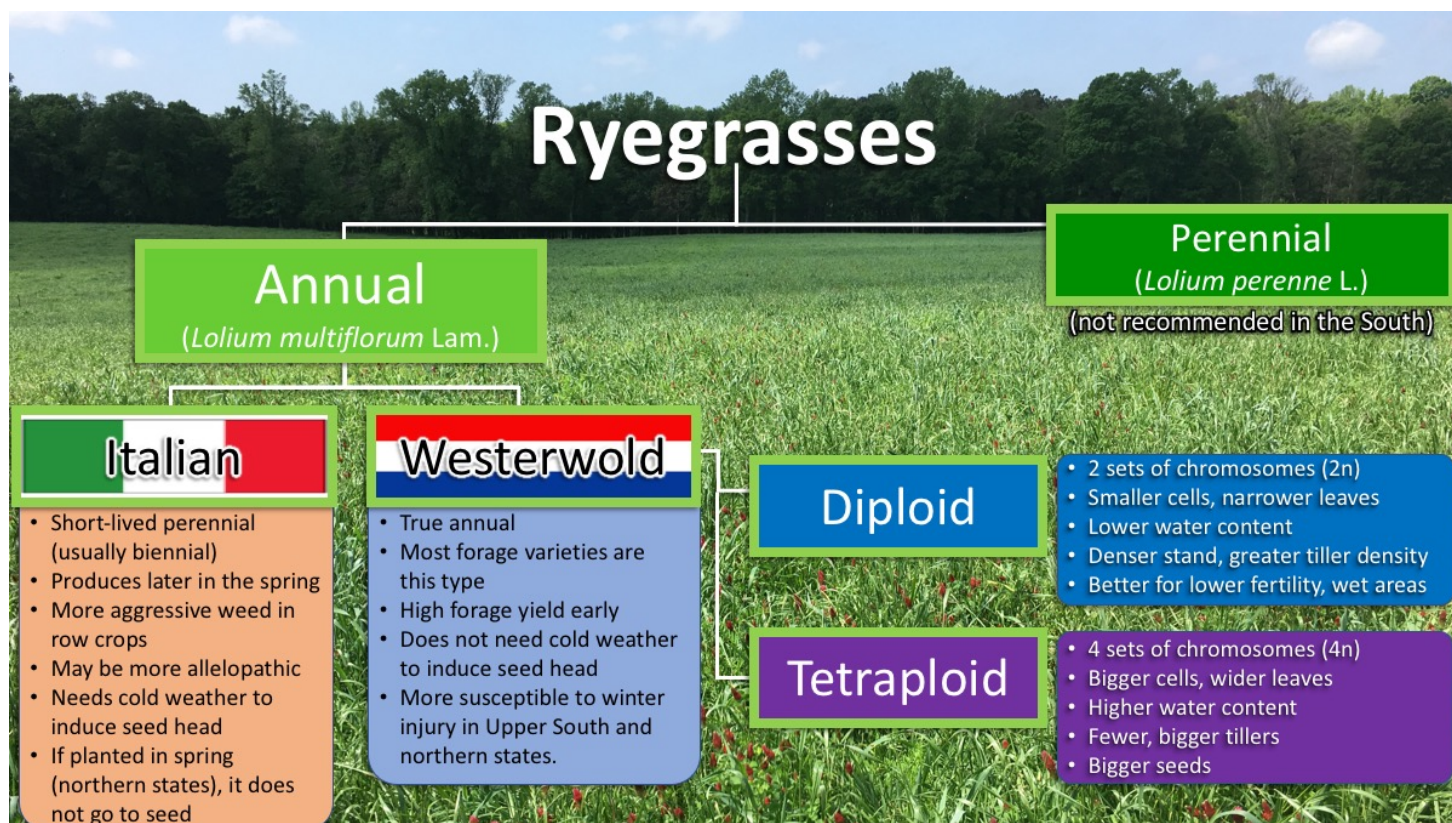


Figure 2. An infographic of the ryegrasses used for forage crops with specific attention to the Westerwold types of annual ryegrass, which includes the diploid and tetraploid varieties commonly used in Georgia.

Like it’s cousin, annual ryegrass doesn’t like it when it gets hot or if it gets extremely cold, but it does tolerate our relatively mild Georgia winters. Here in the Deep South, we don’t worry that much about winter injury, but as we get into the northern reaches of where annual ryegrass is planted in the fall (i.e., Kentucky, Tennessee, Virginia, etc.), producers can lose entire fields in severe winters. Variety trials at the University of Kentucky, for example, collect great data on winter hardiness. Though we plant annual ryegrass in the fall, producers in northern areas (e.g., Pennsylvania, New York, Wisconsin, etc.) will often plant it in early spring for early grazing, hay, or baleage 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. The first reports of its use as a forage crop date to the 13th century in northern Italy, but it has been commonly grown throughout Europe for over 200 years. Annual ryegrass was introduced into the US during colonial times using mostly landrace varieties brought to the New World from Europe. In the early 1930s, seed companies in the Netherlands began selecting and breeding new lines of ryegrass. Most of the

annual ryegrass varieties that we currently grow have their origins in these Westerwold varieties. They are so named because they originated from the Westerwolde region of northeastern Netherlands. Though Italian and Westerwold ryegrasses are the same species and can readily cross, they have considerably different traits.

Is it Italian or Westerwold?

Westerwold type ryegrasses are true annuals, and they do not need cold weather to induce seed head production. They have also been selected over time to grow earlier in the spring and mature faster. In contrast, Italian ryegrass usually acts more like a short-lived perennial (typically a biennial), produces later in the spring, and has a vernalization requirement (i.e., it needs cold weather to induce seed heads). These characteristics have 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 without the worry of it going to head. But, this is also why wild Italian-types are so problematic as a weed. Volunteer Italian ryegrass is a huge problem in wheat and hay fields. In addition to its competition as a weed, Italian ryegrass tends to be more allelopathic, meaning that it produces a chemical that interferes with the growth and development of other plant species. This allelopathy is made worse by stress from heat, drought, and disease, all of which are common problems when annual ryegrass is allowed to linger too long into a Georgia spring.

Diploid vs. Tetraploid

Annual ryegrass is naturally a diploid species, meaning it carries 2 sets of chromosomes (2n). American scientists in the 1930s began experimenting with ryegrass hybrids and discovered mutants that had 4 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.

Because the tetraploid varieties have larger tillers, wider leaves, and are simply bigger in general, they are impressive to look at compared to the diploid varieties (Fig. 3). Apparently, cattle think so, too. A grazing preference trial in Mississippi showed that forage provided by tetraploid variety plots was consumed 54% faster than diploid varieties. Yet, when researchers there looked at long-term yield data from their variety trial program, the yields of diploid and tetraploid annual ryegrasses were not different in most locations and only tended to give slightly more yield (less than 10%) in their southernmost location (Poplarville, MS). Further, when they conducted a grazing trial comparing diploid and tetraploid varieties, their stocker steers showed no difference in ADG or gain per acre. Their conclusion from all this research is that there is more difference within diploid and within tetraploid varieties than there is between them. So, look for a high yielding variety that is recommended for your area and disregard the ploidy level.

One practical consideration, however, is that tetraploid seed is usually 50 to 100% larger than diploid seed (Fig. 4). Though there is no difference in the seeding rate recommendations for the diploid versus tetraploid varieties (20-25 lbs/acre if drilled; 25-30 lbs/acre if broadcasted), it is important to calibrate, check, and adjust the drill to account for these differences in seed size.

Recommended Varieties

Variety recommendations at UGA are distinguished on the basis of whether they produce the highest yields in the region, without respect to whether or not they are diploid or tetraploid. At UGA, annual ryegrass recommendations are provided for their growth potential in the early season, in the late season, and for season long yield totals. The variety recommendations for annual ryegrass and all of our cool season annual grasses are available on our website at www.georgiaforages.com or at this direct link: <http://bit.ly/RyegrassRecs>.

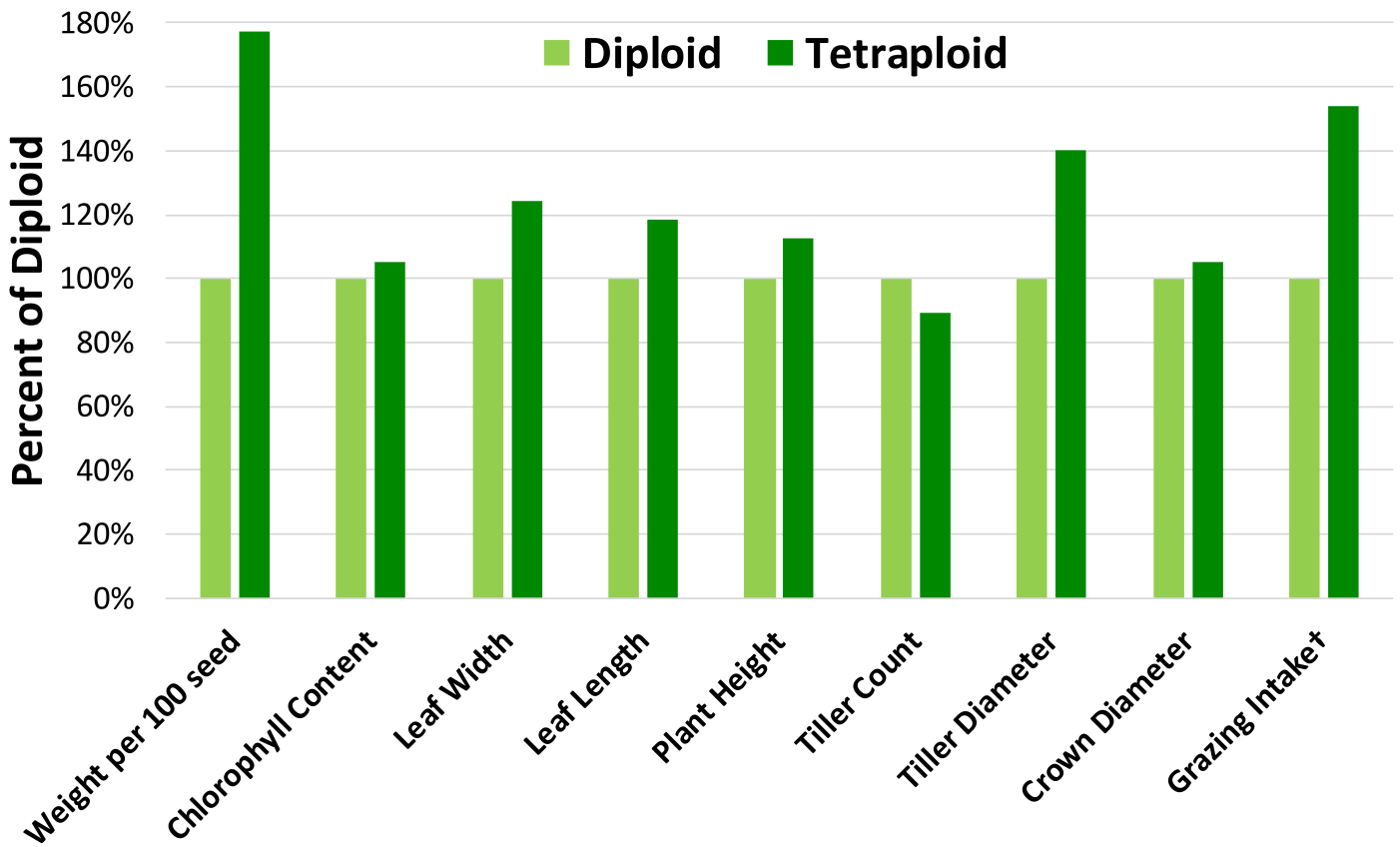


Figure 3. Differences in seed, leaf, and plant characteristics between diploid and tetraploid varieties of annual ryegrass (Rios et al, 2015. *Crop Science* 55: 2078-2090) and relative forage intake when beef cattle were provided a choice between diploid and tetraploid varieties (†Solomon et al., 2014. *Crop Science* 54: 430-438).

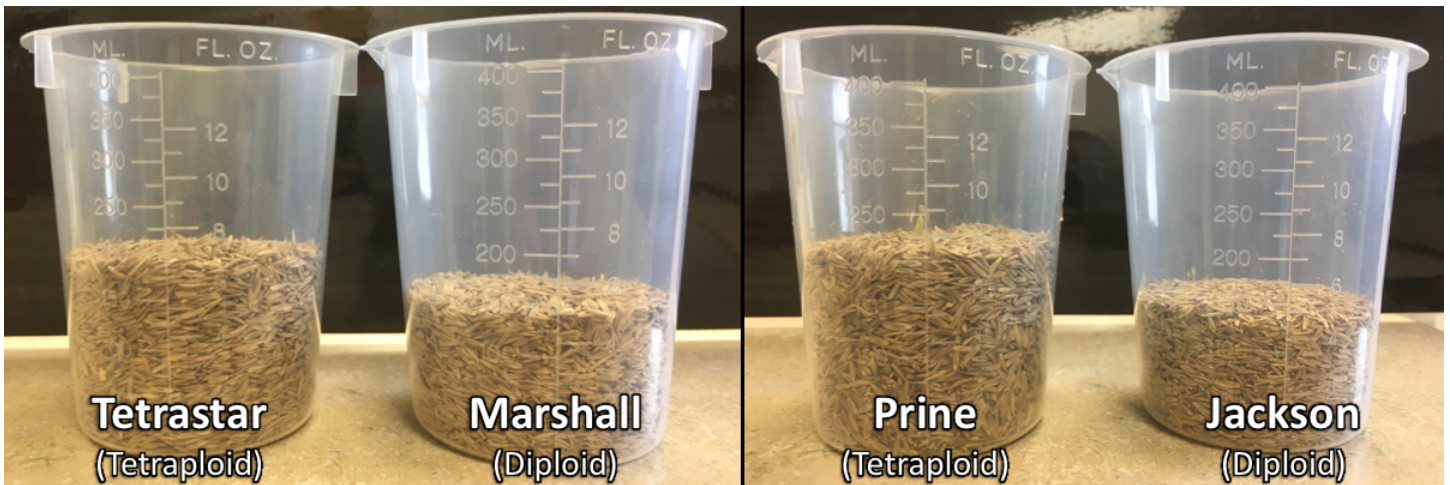


Figure 4. Varieties of annual ryegrass differ in seed size, which will likely require adjustments to conventional and no-till grain drills to maintain the same seeding rate. Each of these beakers contains 20,000 seed of their respective varieties. Note that the seed of tetraploid varieties takes up approximately 50% more volume than the diploid varieties. Photo credit: Henry Jordan, UGA Statewide Variety Testing Program.

More Information

More information about annual ryegrass and the other cool season forages we use for winter grazing can be found in our Extension publication entitled “Georgia Forages: Grass Species,” which is available on our website (www.georgiaforages.com).