

The Ryegrasses in U.S. Agriculture

The ryegrasses are probably the most studied of the grasses used worldwide for forage and turf. This group seems still to be evolving (arising some 6, 000 years ago) and it has been classified and reclassified many times. The ryegrasses are closely related to the more diverse fescues. In fact, in the last few years the subgenus *Schedonorus* of the fescues that include tall fescue and meadow fescue have been placed in the ryegrass taxonomic grouping (for a discussion of these relationships see URL <http://forages.oregonstate.edu/is/tfis/enmain.cfm?PageID=342>). The present taxonomically accepted grouping is

Lolium arundinaceum (Schreb.) S.J. Darbyshire -- tall fescue
Lolium Xfestucaceum Link --
Lolium giganteum (L.) S.J. Darbyshire -- giant fescue
Lolium perenne L. -- perennial ryegrass
 Lolium perenne L. ssp. *multiflorum* (Lam.) Husnot -- Italian ryegrass
 Lolium perenne L. ssp. *multiflorum* var. *italicum*
 Lolium perenne L. ssp. *multiflorum* var. *westerwoldicum* -- Westerwolds
 Lolium perenne L. ssp. *perenne* -- perennial ryegrass
Lolium persicum Boiss. & Hohen. ex Boiss. -- Persian ryegrass
Lolium pratense (Huds.) S.J. Darbyshire -- meadow ryegrass
Lolium rigidum Gaudin -- Wimmera ryegrass
Lolium temulentum L. -- Darnel ryegrass

(USDA, NRCS. 2004. The PLANTS Database, Version 3.5 <<http://plants.usda.gov>>. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.)

Of the traditional species classified as ryegrass, four are of importance in the U.S. They are perennial ryegrass, Italian ryegrass (includes the Westerwolds), and Wimmera ryegrass. These three out-crossing grasses are self-incompatible and readily interbreed. Because of this intermixing, there is continuous variation among these three ryegrasses and their growth types overlap (Figure 1). The fourth species of concern is Darnel ryegrass, which is a mimic weed in wheat and flax.

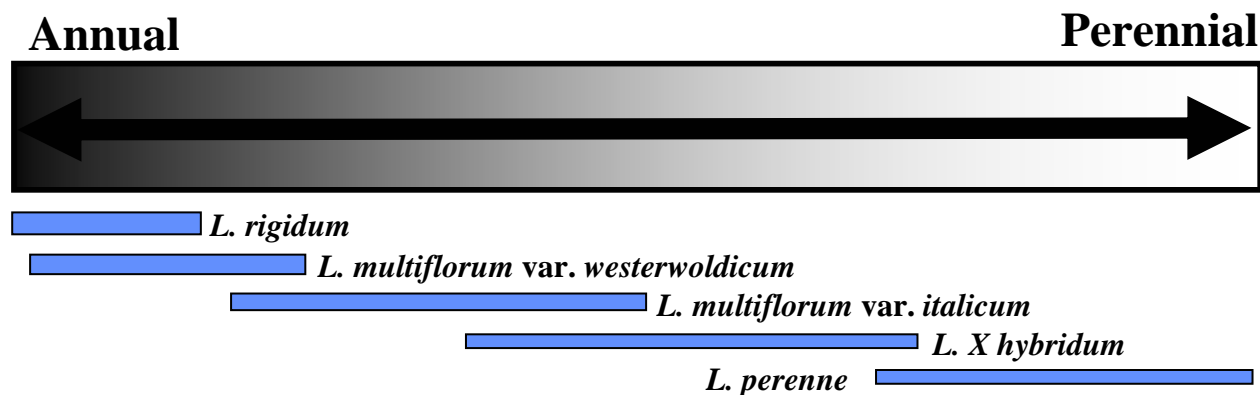


Figure 1. Diagrammatic representation of growth type among the main out-breeding ryegrasses. Types range from truly annual to fully perennial. This relationship is based on reported intercrossing, plant morphology, and molecular

Descriptions of the four main ryegrasses:

1. Perennial ryegrass (*L. perenne* ssp. *perenne*) is widely used as a turf and as a high quality forage grass (Figure 2). The inflorescence is a spike with alternately arranged spikelets attached edgewise directly to the central axis. Leaves of perennial ryegrass are usually folded in the bud with blades that are bright green, prominently ridged on the upper surface, and sharply taper-pointed.



Figure 2. Perennial ryegrass on left and Italian ryegrass on right. From: Prof. Dr. Otto Wilhelm Thomé, Flora von Deutschland Österreich und der Schweiz., 1885, Gera, Germany <http://caliban.mpiz-koeln.mpg.de/~stueber/thome/band1/tafel_047.html>

2. Italian ryegrass (*L. perenne* ssp. *multiflorum*) is also known as annual ryegrass in the U.S. (Figure 2). It should not be confused with the true annual, Wimmera ryegrass (*L. rigidum*). There are two types of Italian ryegrass that are botanically the same. The wide spread Italian type is a short-lived perennial (can survive two to three years in some environments), and the Westerwolds with a growth type more closely that of an annual. The Westerwolds came from the Westerwolde area in the Province of Groningen, Netherlands as an ecotype selected for earliness. The Italian type was reported in France in 1818 and is the most common of the two types grown in the U.S. It is a fast-growing, competitive winter annual cool-season grass (thus being commonly recognized as annual). It is used as a cover crop, as a forage, and as a winter pasture and golf course overseeder in Southern U.S. climates. The inflorescence is a solitary spike with alternately arranged spikelets attached edgewise directly to the central axis. Leaf blades are bright green, rolled in the bud, and sharply taper-pointed.

used as a forage crop in Australia, is considered a weed in many places in the world. In the U.S., it is primarily found in waste places in west coast states. It is a true annual that has a dominant upright growth habit with rigid stems, sprawling after maturity. Leaves are shiny below and evenly ribbed above,



Figure 4. Darnel ryegrass on left and *Leymus arenarius* on right. From: Prof. Dr. Otto Wilhelm Thomé, Flora von Deutschland Österreich und der Schweiz., 1885, Gera, Germany <http://caliban.mpiz-koeln.mpg.de/~stueber/thome/band1/tafel_048.html>

3. Wimmera, annual, or rigid ryegrass (*L. rigidum*), while used as a forage crop in Australia, is considered a weed in many places in the world. In the U.S., it is primarily found in waste places in west coast states. It is a true annual that has a dominant upright growth habit with rigid stems, sprawling after maturity. Leaves are shiny below and evenly ribbed above, broader than perennial ryegrass, rolled in bud on young plants. Plants have a general purplish tinge with a reddish coloration common at the base of the stem. The inflorescence is a spike similar to perennial ryegrass but usually longer and a lower number of spikelets more widely spaced. Spikelets are 6-8 flowered, generally longer and narrower than perennial ryegrass with only one outer glume much shorter than the spikelet, but longer than the lemma above it; lemma long, rigid, and awnless but occasionally awned.



Figure 3. Morphological characteristics of Wimmera ryegrass. Photo from <http://weedman.horsham.net.au/weeds/lolium_rigidum/lolium_rigidum.htm>

4. Darnel or poison ryegrass (*L. temulentum*) is a mimic weed (thought to be the tare of the Bible) and is reputed to be poisonous. The species grows in grain fields and waste places in most areas of the U.S. and is listed as a noxious weed in 43 states. It usually has long awns, is self-pollinated and does not naturally cross with other ryegrasses.