UF IFAS Extension UNIVERSITY of FLORIDA

SS-AGR-42

# Rye and Triticale Breeding in the South[1]

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## Rye

Rye is an excellent temporary winter forage crop widely used by livestock producers. It is also the most dependable cereal species for winter grazing. Rye has greater cold tolerance, quicker growth at low temperatures, and more uniform seasonal forage production compared to wheat, oats, barley, or triticale (Bruckner and Raymer 1990). Rye is a relatively poor grain producer, and the grain is not used as extensively as the other cereals. Rye is primarily used as a forage crop in the South, but it is also planted as a windbreak for vegetable production and as a cover crop. Rye is not as well suited as a hay or silage crop because it has a tendency to have a low leaf-to-stem ratio after jointing. It is poorer in quality than oats, wheat, or triticale. Rye does have the desirable features of an extensive fibrous root system and good adaptation to acid, sandy soils. It generally sustains less damage from fungal leaf diseases than the other small grains, and is highly resistant to Hessian fly (Buntin and Chapin 1990).

Rye has not received much attention from small grain breeders in the South in recent years. It has received a lack of attention from plant improvement programs because it is a forage crop, is an obligate cross-pollinated species (Morey and Barnett 1980), grows tall and rank, and is a poor seed producer. Two of the more recent new varieties are Bates, developed by the Samuel Roberts Noble Foundation, Inc., and jointly released with the Texas Agricultural Experiment Station in 1995, and Wrens 96, released by the Georgia and Florida Experiment Stations in 1996 (Bruckner et al. 1999). Both are productive varieties well adapted to the southeastern United States.

The most active rye-breeding program in the southeastern United States is the extensive program being conducted by the joint Georgia-Florida breeding program. There is also a continuing small effort by the Noble Foundation in Oklahoma.

## Triticale

Triticale has considerable grain and forage potential for the southeastern United States. Triticale has not been included in the government price support programs and, as a feed grain, has faced stiff competition from low-priced corn. Livestock producers have found it much easier to purchase cheap corn than resort to growing triticale.

Triticale has been used as a winter grazing crop, as a feed grain among swine producers, and as a silage crop among dairy producers. The most active breeding programs are the Georgia-Florida program, North Carolina State University, Texas A&M University, and the private breeding program

1. This document is SS-AGR-42, one of a series of the Agronomy Department, UF/IFAS Extension. Original publication date May 2002. Revised October 2013. Reviewed January 2017. Visit the EDIS website at http://edis.ifas.ufl.edu.

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conducted by Resource Seeds, Inc., in California. Triticale lines most adapted to the southeastern United States were developed by crossing durum wheat with adapted cultivars of spring rye. The resulting triticale does not possess the grain, milling, and flour characteristics of common bread wheat, and has not been widely grown for human food, only for animal use.

Triticale is an excellent energy source and has a better amino acid profile than corn, wheat, and sorghum. Therefore, triticale has potential as a superior energy source and protein supplement in animal rations. It has been used to some extent by livestock producers, and has been particularly popular with swine producers. Since the early 1970s, University of Florida has conducted a triticale-breeding program. Three spring-type cultivars that were selected from the CIMMYT (International Maize and Wheat Improvement Center) nurseries have been released (Barnett et al. 1999). Beagle 82 was released by the University of Florida in 1982. Sunland and Florida 201 resulted from the efforts of the University of Florida and University of Georgia programs. Considerable improvements in increasing grain yield and test weight have been made. The protein content of the three released cultivars is about 12% with 0.45% lysine on a dry matter basis. A number of feeding trials with both swine and poultry have been conducted. The trials have shown that triticale can replace corn in diets with little effect on swine and poultry performance (Myer et al. 1990; Ruiz et al. 1987).

Triticale also has considerable potential as a forage crop, but the spring types developed up to this time are unsatisfactory for use in winter grazing programs. Cultivars developed for forage production must exhibit more cold tolerance, Hessian fly resistance, and the capacity for rapid regrowth after grazing. Awnless types, relatively rare in the triticale germplasm, would be more desirable in a forage cultivar. Progress has been made in selecting types with improved disease and insect resistance. Triticale cultivars, Florida 201 and Sunland, released from the Florida-Georgia program, are resistant to the L biotype of Hessian fly (Martens et al., 1995). Two newer releases, Trical 342 and Monarch, were released from the Florida-Georgia program, and seed of both are available on the market. With increased efforts on the part of plant breeders at the Universities of Georgia and Florida, better forage and grain types of triticale will be developed for the southeastern United States.

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