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Spring triticale breeding program at EMBRAPA, Brazil.

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Although triticale production costs through the years were slightly lower than wheat, mainly due to a superior resistance to foliar diseases, the rainy environment associated with a no-till system with more humidity and stubble on the soil surface resulted in an increase in disease selection pressure. Many released cultivars previously characterized as resistant to foliar diseases are now moderately susceptible to susceptible. For more than a century, rye and wheat have been bred and grown in Brazil, contributing to the accumulation of favorable genes through natural selection. The adaptive value of these genes and genetic variability should be brought into national triticale-breeding programs. Developing new hexaploid triticales will certainly need improved octoploid types. Crosses among these improved octoploid and hexaploid triticales, rye, or wheat genotypes by backcrosses to hexaploid triticale cultivars need to be made continuously in order to guarantee better selection efficiency. The major challenges for Brazilian triticale-breeding programs are increasing grain yield potential, disease resistance, and nutritional value; reducing preharvest sprouting; and improving or maintaining the adaptation to acid soils.

Each year we make 250–300 crosses between hexaploid triticales. Germ plasm introduction is important for increasing the genetic variability and used to be the main source for developing new cultivars in Brazil but, currently, the genetic basis is increased and new triticale genotypes are developed by crossing wheat and rye cultivars adapted to Brazilian conditions. Field selection for plant type and disease resistance is carried out from the F_2 onwards, followed by severe screening for grain formation. Due to the great environment pressure, selection for disease resistance is possible under natural conditions in early generations. In advanced stages (F_6 or greater), all lines selected are artificially inoculated for evaluation to scab, spot blotch, tan spot, and blast, and for agronomic evaluations and characterizations parallel to the yield and official trials.

The cultivars Embrapa 53 (LT1117.82/Civet/Tatu), BRS 148 (Yogui/Tatu), and BRS 203 (LT-1/Rhino) developed by Embrapa Trigo with CIMMYT's cooperation, represented more than 70% of the available triticale seed in Brazil in 2004. In 2005, BRS Minotauro, the first truly Brazilian triticale cultivar, was registered.

New lines have been improved by crosses and selections to fulfil the requirements of cereal growers aiming at resistance or tolerance to the most important diseases, grain quality, and broad adaptation. The genetic gain of the breeding program for grain yield, since 2000, was 124.6 kg/ha/year.

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BRS Minotauro, the first truly Brazilian triticale cultivar.

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Triticale (*X Triticosecale* Wittmack) is an important crop for the winter growing season in Southern Brazil. The total triticale area in 2005 was approximately 131,000 ha and the same area is estimated for 2006 in Brazil. The average grain yield was 2,200 kg/ha in 2005, without irrigation. Despite this, due to the seed availability, four very similar cultivars are responsible for more than 95% of growing area. Cereal growers have a few cultivars to choose and cultivate annually.