

Agronomy – Rabi Crops

Triticale

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TRITICALE

Botanical Name: *Triticale hexaploide* Lart.

Chromosome No:

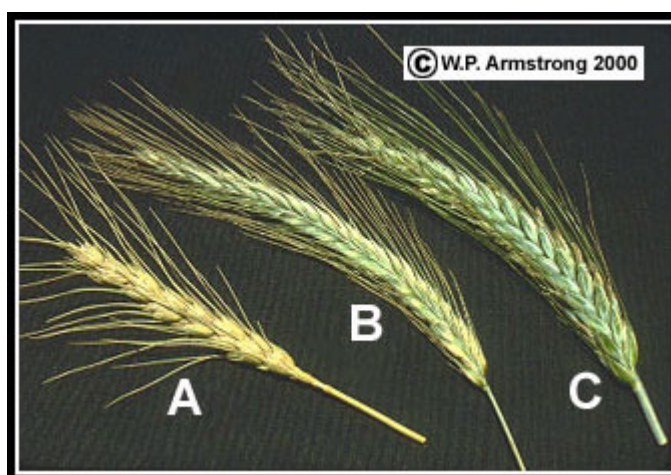
Octaploids: $2n = 8x = 56$ [*Triticum aestivum* ($2n=6x=42$) x *Secale cereale* ($2n=2x=14$)]

Hexaploids: $2n = 6x = 42$ [*Triticum durum* ($2n=4x=28$) x *Secale cereale* ($2n=2x=14$)]

Genomic constitution: Octaploid (8x) AABBDDRRR.

Hexaploid (6x) = AABBRR

Triticale is a man made cereal crop evolved by crossing wheat and rye. The term triticale was coined by combining generic names of wheat (*Triticum*) and rye (*Secale*). Rimpau (1890) in Germany successfully attempted a cross between wheat and rye. The hybrids resulting from such crosses were sterile. With the identification of 'Colchine' polyploidising effects in 1937, the evolution of fertile hybrids received impetus. The initial triticales developed were octaploids and have the problems of reduced seed set due to partial sterility. With the successful artificial culturing of embryos (12-15 days old) on nutrient media in late 1940's, the hexaploids came into existence.



A. (*Triticum aestivum*); B. (*Secale cereale*); C. (*Triticale*).

Hexaploid triticale was evolved by crossing tetraploid wheat and rye by Sanchez-Monge (Spain), O'mora (USA), Nakazima (Japan) and Kiss (Hungary). They are called primary hexaploids. These hexaploids are more vigorous, with longer spikes, grains and better floral fertility than octaploids.

Presently the hexaploids are synthesized from crosses of hexaploid triticale and/or hexaploid wheat or octaploid triticale. These are called secondary hexaploid triticale (Lukaszewski and Gustafson, 1987). In India, Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Indore has extensive triticale improvement programme.

Like wheat, triticale is self pollinating crop, however, the other parent of triticale i.e. rye is cross pollinated crop.

Utility

Triticale grain is mainly utilized for animal feeding in North America. The bread making properties of triticale were inferior to wheat owing to high ash content, low flour yields upon

milling, inferior loaf volume and texture. However, its flour blending up to 50% with wheat flour is found promising. The breads made from such blended flour were similar in quality to that of wheat (Pena and Amaya 1992). Triticale is suitable for making *chapaties* and these *chapaties* were similar to wheat in quality. It forms an important forage crop for livestock feeding. At present, majority of triticale grown in US livestock feeding only.

Triticales are rich in protein (10-20%), and lysine (0.57%) than wheat. The culms are thick, hence resistant to lodging. They are also more frost hardy than wheat and thus are suitable for cultivation at higher altitudes.



Varieties

The first commercial cultivar of triticale came from Europe. 'Rosner' was the first triticale cultivar of North America developed in Canada, where as 'Siskiyou' is the first triticale cultivar released in USA. The majority of triticale cultivars have prominent awns. The development of awnless triticales (awn<5 mm length) in recent times has increased its use as fodder crop.

In India till date only four cultivars are released of which two are by Central Varieties Release Committee and two by State Varieties Release Committee.

Triticale (70-2)

It is a late maturing variety having brownish white, bold and hard grains. It is susceptible to lodging at high levels of fertility. It is suitable for bread and biscuit making.

Triticale DTS-703

This is a one gene dwarf (110 cm) strain maturing in 135 days with moderate resistance to rusts. It is medium in tillering with a test weight of 36 g. It is less susceptible to lodging.

Triticale DTS-551

It is a medium tall (110-120 cm) strain resistant to rusts, and matures in 140 days. Grains are bold with a test weight of 50 g. It is susceptible to lodging at high fertility and has non-synchronous flowering.

TL 419

It is a derivative of the cross Aries x Kla, released in 1981 in Punjab State. Plants have thick stem and dark green leaves. The variety bears 55 grains/ear; the grains are semi hard, light reddish with a test of 48 g. It matures in 145 days and yield about 50-55 q/ha. It is resistant to yellow and brown rusts, Karnal bunt, powdery mildew and loose smut.

TL 2942

It was released in 2005-2006. It is recommended for western Himalayan region of J&K (except Jammu and Kathua Districts), Himachal Pradesh (except Una and Poanta Valley), Uttarakhand (except *tarai* area), Sikkim and hills of West Bengal and NE states both under rainfed and irrigated timely sown conditions with a yield of 24.5 and 47.2 q/ha respectively.

DT 46

Recommended for northern hills zone.

Other varieties/ cultures tested:

Other varieties / introductions tested in India in early seventies include ST-69-1, Armadillo PPV-13, Amphidiploid-1, Triticale arm, PM-312,T4, and PC-202.

Seed rate and spacing

Seed rate: The seed rate varies with the purpose for which it is grown. Accordingly, grain purpose triticale requires 75-100 kg/ha and 125-150 kg/ha of seed under unirrigated and irrigated conditions respectively. The fodder types require 80 kg/ha (low moisture dry lands) to 107 kg/ha (irrigated) seed.

Spacing: The crop is sown in rows 20-30 cm apart and the seeds are dibbled at 8-9 cm under unirrigated conditions. Irrigated crop is drilled in 15-20 cm rows at 5-8 cm depth.

Time of sowing

Time of sowing is similar to that of wheat. Unirrigated crop is sown in October, while irrigated crop is sown in mid November.

Manures and Fertilizers

Unirrigated crop is applied with 40:20 kg/ha of N:P₂O₅ by drilling at the time of sowing. Irrigated crop responds to 150:60:40 kg/ha of N:P₂O₅:K₂O. Entire P and K along with 50% N are applied as basal. The rest of N is top-dressed at 30-45 days after sowing. Triticale is more efficient in utilizing soil and applied N fertilizers than winter wheat.

Irrigation

The crop requires 5-7 irrigations. Triticale performs better than wheat under rainfed conditions and in light soils. It also performs better than wheat under wet conditions.

Pests

No major insect-pests requiring control measures have been reported. Among diseases, rust is often more yield limiting in triticale.

Harvesting

The crop matures in 120-150 days when grown for grain purpose depending on variety and time of sowing. For fodder purpose, its harvesting at late boot stage (25% heads emerged) is best.

Yield:

A well managed crop of triticale under irrigated may have a grain yield of 4.5-5.5 t/ha. These yields are reduced to half under rainfed conditions.

Further Links:

<http://www.hort.purdue.edu/newcrop/afcm/tritcale.html>

<http://www.answers.com/topic/tritcale?cat=health>