AGRI-FACTS
Practical Information for Alberta's Agriculture Industry

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Triticale

Triticale (*X Triticosecale* Wittmack) is a man-made crop developed by crossing wheat (*Triticum turgidum or Triticum aestivum*) with rye (*Secale cereale*).

Early attempts to cross wheat and rye produced only sterile offspring. It was not until the 1930s that techniques were available to produce fertile hybrids. Once this step was accomplished, it was possible to develop new combinations between wheat and rye as well as direct combinations between triticales with differing wheat and rye parents. Consequently, new varieties of winter or spring triticale can be developed with the same methods used for breeding other cereal crops.

In 1953, the University of Manitoba began the first North American triticale breeding program. Early breeding efforts concentrated on developing a high yielding, drought tolerant human food crop species suitable for marginal wheat producing areas. In contrast, more recent programs concentrate on developing improved animal feed and fodder varieties for production under a number of diverse environmental conditions. Table 1 shows a historical list of spring and winter triticale cultivars.

Spring triticale

Drought tolerance is the primary advantage that spring triticales have over other spring cereal crops. Under dryland conditions, spring triticales are a valuable alternative to feed barley and oats. Spring triticale has a 5 to 19 per cent yield advantage over Spring wheat (CPS), see Table 2. This advantage is most apparent in areas with longer growing seasons.

Table 1. A list of past and present triticale cultivars evaluated in western Canada, 1969-1999

Variety	Type	Year	Institution	Status
Rosner	Spring	1969	University of Manitoba	Deregistered
Welsh	Spring	1977	University of Manitoba	Deregistered
Carman	Spring	1980	University of Manitoba	Deregistered
OAC Triwell	Spring	1980	Ontario Agriculture College	Deregistered
OAC Wintir	Winter	1980	Ontario Agriculture College	Registered
OAC Decade	Winter	1984	Ontario Agriculture College	Deregistered
Wapiti	Spring	1987	Alberta Agriculture	Registered
OAC Trillium	Winter	1988	Ontario Agriculture College	Registered
Frank	Spring	1988	Agriculture Canada	Registered
Pika	Winter	1990	Alberta Agriculture	Registered
Banjo	Spring	1991	University of Manitoba	Registered
AC Copia	Spring	1993	Agriculture Canada	Registered
AC Alta	Spring	1994	Agriculture Canada	Registered
Ac Certa	Spring	1995	Agriculture Canada	Registered
Pronghorn	Spring	1995	Alberta Agriculture	Registered
Sandro	Spring	1998	Swiss Federation of Ag Res.	Registered
AC Ultima	Spring	1999	Agriculture Canada	Registered
Bobcat	Winter	1999	Alberta Agriculture	Registered

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Spring triticale cultivars need a longer growing season because they mature more slowly than CPS wheat (Table 3). Triticale is best adapted to the Brown soil zones of Alberta, Saskatchewan and southern Manitoba.

Table 2. Grain yield of spring triticale compared to CPS wheat, (1995-2000)*

	Soil Zones				
		Black		Brown	Irrigation
Variety	MB	SK	AB		
Pronghorn	136	112	119	110	114
AC Alta	135	106	119	105	121
AC Ultima	146+	120+	145+	107+	115+
CPS Wheat	100	100	100	100	100

* Yields are expressed as percentage of the yield of the CPS wheats AC Taber and AC Crystal. Data based on registration trials and Alberta Cereals and Oilseeds regional trials. Black soil locations: Winnipeg, Glenlea, Portage La Prairie, Morden, (Indian Head and Saskatoon – Dark Brown), Lacombe, Ellerslie and Vegreville. Brown soil locations: Regina, Swift Current, Stewart Valley, Stettler, Trochu, Lethbridge and Oyen. Irrigation locations: Brooks and Lethbridge Irrigation.

\+ limited data

Table 3. Days to maturity of spring triticale compared to CPS wheat, (1995-2000)

	Soil Zones				
		Black		Brown	Irrigation
Variety	MB	SK	AB		
Pronghorn	97	107	123	109	102
AC Alta	103	111	132	114	105
AC Ultima	97	107	126	109	102
CPS Wheat	95	104	116	104	98

Data based on registration trials and Alberta Cereals and Oilseeds Regional trials. Black soil locations: Winnipeg, Glenlea, Portage la Prairie, (Indian Head and Saskatoon – Dark Brown), Lacombe, Ellerslie and Vegreville. Brown soil locations: Regina, Swift Current, Stettler, Trochu, Lethbridge and Oyen. Irrigation locations: Brooks, Lethbridge Irrigation.

Spring triticale also provides an excellent high yielding alternative to barley and spring oat forage (Table 4). In particular, a silage yield advantage of around 10 per cent over barley and oats under dryland conditions makes triticale an excellent choice for livestock producers. Triticale generally ranks between barley and oats for silage quality (Figure 1).

Table 4. Silage yields (dry matter) of spring triticale as compared to Cascade spring oat (1995-2000)*, AC Lacombe barley and CPS wheat

	Black Soil Zone	
Variety	Head/Anth Stage	Dough Stage
Pronghorn	114	109
AC Alta	113	103
AC Ultima	119	107
CPS	96	81
AC Lacombe	–	96
Cascade	100	100

* Yields are expressed as a percentage of Cascade oats. Data based on registration trials and FCDC silage evaluation trials. Black soil location: Lacombe.

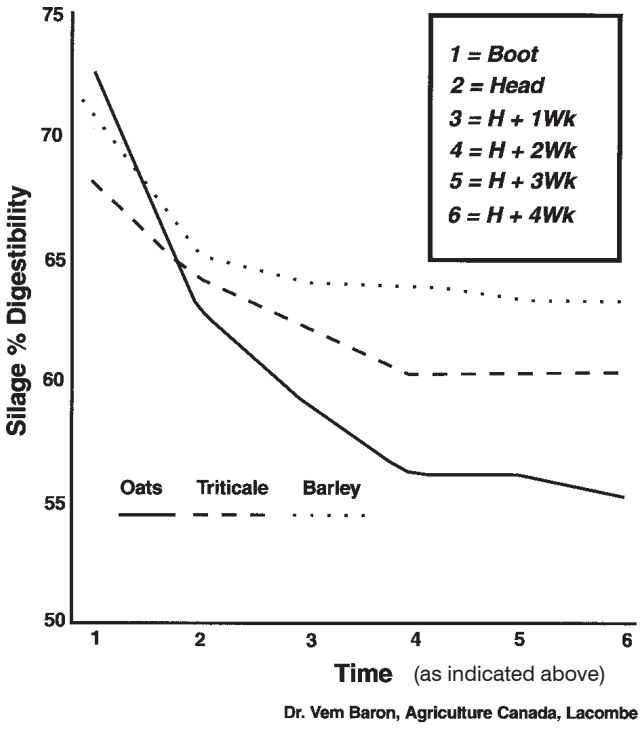

Figure 1. Silage digestibility

While the test weights and weight per 1000 kernels of wheat are very similar within classes, this is not true for triticale (Tables 5 and 6). In general, a spring triticale has a 1000 kernel weight that is 20 per cent greater than a CWRS wheat such as AC Barrie. Consequently, if the recommended seeding rate for AC Barrie is 1.5 bu/ac (90 lb/ac), the average spring triticale should be seeded at a rate of not less than 110 lb/ac.

Table 5. Test weight (lbs/bu) of spring triticale compared to CPS wheat, (1995-2000)

	Soil Zones				
		Black		Brown	Irrigation
Variety	MB	SK	AB		
Pronghorn	54	57	56	55	56
AC Alta	52	58	54	56	54
AC Ultima	54	58	56	57	57
CPS	59	63	63	63	62

Data based on registration trials, Alberta Cereals and Oilseeds trials and regional trials. Black soil locations: Winnipeg, Glenlea, Portage la Prairie, Morden, (Indian Head and Saskatoon – Dark Brown), Lacombe, Ellerslie and Vegreville. Brown soil locations: Regina, Swift Current, Stuart Valley, Stettler, Trochu, Lethbridge and Oyen. Irrigation locations: Brooks and Lethbridge Irrigation.

Table 6. 1000 Kernel weight (grams) of spring triticale compared to CPS wheat, (1995-2000)

	Soil Zones				
		Black		Brown	Irrigation
Variety	MB	SK	AB		
Pronghorn	39	44	44	42	43
AC Alta	41	52	49	48	48
AC Ultima	44	48	48	44	46
CPS	34	39	42	40	40

Data based on registration trials, Alberta Cereals and Oilseeds trials and regional trials. Black soil locations: Winnipeg, Glenlea, Portage la Prairie and Morden, (Indian Head and Saskatoon – Dark Brown) Lacombe, Ellerslie and Vegreville. Brown soil locations: Regina, Swift Current, Stuart Valley, Provost, Stettler, Drumheller, Trochu, Lethbridge and Oyen. Irrigation locations: Brooks and Lethbridge Irrigation.

The desired seeding rate plant population is 310 plants/m^2 (30 plants/ft^2). Triticale does not tiller as much as wheat. Maturity can be delayed and yields can be less when plant population is low. Triticale seeding rate should target higher plant density than CWRS wheat. Calculate your seeding rate using the seed's 1,000 kernel weight, germination and seedling mortality for a target plant population. There is a calculator on our Alberta Agriculture website <www.agric.ab.ca> that can help.

Most cultural techniques for growing wheat can be transferred directly to triticale. Consequently, the fertilization, seedbed preparation, seeding depth and seeding methods used for wheat are acceptable for triticale. Spring triticale should be planted during the first two weeks of May. Although only a limited number of pesticides have been tested on spring triticale, pesticides that are suitable for use on both wheat and rye may be considered.

One of the most serious deficiencies of spring triticale is its susceptibility to sprouting in the swath. Spring triticale is more likely to sprout than red-seeded wheat but less likely than white-seeded wheat. Because triticale resists lodging and is hard threshing, it responds well to direct combining in areas were this practice is feasible (i.e. dryland).

Winter triticale

Winter triticale provides a high yielding early maturing alternative to spring triticale for short-season areas of the prairie provinces. Varieties such as Pika and Bobcat are similar in winter hardiness (Table 7) to CDC Osprey winter wheat but are less hardy than fall rye. Pika and Bobcat are the only suitable varieties for use in Western Canada. Consequently, winter triticale is best adapted for seed production in the Brown soil zone of southern Alberta and in higher snowfall areas such as the Black soil zones of the prairies. In areas where winter triticale is well-adapted, yields exceed those of CDC Osprey winter wheat by as much as 10 to 20 per cent (Table 8).

Table 7. Winter survival (%) of winter triticale, fall rye, and winter wheat, (1995-2000)

	Soil Zones	
Variety	Black	Brown
Bobcat	86	85
Pika	91	88
Musketeer	90	91
CDC Osprey	84	80

Data based on registration trials and FCDC evaluation trials. Black soil sites: Lacombe, Olds and Ellerslie (Saskatoon – Dark Brown). Brown soil sites: Trochu, Stettler, Lethbridge and Swift Current.

Table 8. Grain yield potential of winter triticale and fall rye compared to CDC Osprey winter wheat, (1995-2000)*

	Soil Zones	
Variety	Black	Brown
Bobcat	118	119
Pika	104	137
Musketeer	100	105
CDC Osprey	100	100

* Yields expressed as percentage of CDC Osprey. Data based on registration trials and FCDC evaluation trials. Black soil sites: Lacombe, Olds and Ellerslie(Saskatoon – Dark Brown). Brown soil sites: Trochu, Stettler, Lethbridge and Swift Current.

Winter triticale can be two to three weeks earlier in maturity than spring triticale in the Black and Gray-wooded soil zones. Pronghorn spring triticale seeded on May 7 matures about September 9 (124 days), but Pika winter triticale matures on August 24 (234 days after January 1), a difference of 21 days. Winter triticale matures approximately five days later than winter wheat and two weeks later than fall rye under similar growing conditions (Table 9).

Table 9. Relative maturity of winter triticale, fall rye and winter wheat based on days after January 1, (1995-2000)

	Soil Zone	
Variety	**Black**	**Brown**
Bobcat	236	223
Pika	233	221
Musketeer	229	214
CDC Osprey	223	219

Data based on registration trails and FCDC evaluation trials. Black soil sites: Lacombe, Olds and Ellerslie (Saskatoon – Dark Brown). Brown soil sites: Trochu, Stettler, Lethbridge and Swift Current.

Fall planted winter cereals such as triticale and rye provide a valuable source of forage when spring grazed prior to harvest for silage or seed. Spring-planted winter cereals alone or in mixtures with barley or oats provide an excellent source of pasture from mid-June until late in the fall (see *Winter Cereals for Pasture*, Agdex 133/20-1). Winter triticale and fall rye may also be planted in mixtures with barley or oats to produce a high quality silage crop with late-season grazing.

The test weight (Table 10) and weight per 1000 kernels (Table 11) of winter triticale are rather variable compared to those of winter wheat. In general, a winter triticale will have a 1000 kernel weight 20 per cent greater than a CWRS wheat such as AC Barrie or a winter wheat such as CDC Osprey. Consequently, if the recommended seeding rate for CDC Osprey is 1.5 bu/ac (90 lb/ac), the average winter triticale should be seeded at a rate of not less than 110 lb/ac.

Table 10. 1000 kernel weight (gm) of winter triticale, fall rye and winter wheat

	Soil zone	
Variety	**Black**	**Brown**
Bobcat	36	35
Pika	35	42
Musketeer (rye)	34	34
CDC Osprey (wheat)	32	32

Table 11. Test weight (lbs/bu) of winter triticale, fall rye and winter wheat

	Soil zone	
Variety	**Black**	**Brown**
Bobcat	53	51
Pika	54	56
Musketeer (rye)	58	58
CDC Osprey (wheat)	63	62

There is no official test weight (pounds per bushel) for triticale, but it must be 52 lbs/bu (65 kg/hl) to make the grade of Canada No.1. However, the market place is demanding 55 lb/bu and higher.

Basic agronomic practices are similar for winter wheat, winter triticale and fall rye. Fertilizer applications should be based on soil tests. Ensure adequate levels of phosphate are applied in the fall and the nitrogen applications are split between fall and spring or if placed all in the fall, nitrogen should be placed outside the seed row.

Because few of the popular pesticides are registered for winter triticale, it may be necessary to use ones that are considered suitable for both wheat and rye.

The best time to seed winter triticale and winter wheat on black soils is between the last week of August and the end of the first week of September. Do not delay seeding winter triticale past mid-September because winter triticales hardens more slowly than winter wheat. Once developed, however, the hardiness of winter triticale equals or exceeds that of winter wheat.

The hardiest winter triticale cultivars are tall and may be subject to lodging if grown under high fertility and moisture conditions. Bobcat is an improvement on lodging susceptibility, but excessive nitrogen can still cause lodging.

Spring grazing for a short period before the end of the first week in June may reduce plant height without reducing seed yield. However, spring grazing may significantly reduce yield if it is poorly managed or timed too late. Seeding at the earliest recommended date is another way that stand height may be reduced.

When combining triticale, a kernel moisture content of 14.0 per cent or less is considered dry.

Prepared by:

D.F. Salmon
Murray McLelland
Trevor Schoff
P.E. Juskiw
Field Crop Development Centre
Alberta Agriculture, Food and Rural Development
Lacombe, Alberta
Canada T4L 1W8

V.S. Baron – Agriculture and Agri-Food Canada
Research Station
Bag #5000
Lacombe, Alberta
Canada T4L 1W1

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