Triticale in Kansas

Department of Agronomy MF-2227 Crop Management

Triticale is a small grain cereal that is used primarily as a forage crop. When triticale was first introduced into Kansas, the varieties produced excellent forage yields, but they could not withstand the winters. Triticale is the cross of wheat and rye. The first varieties had spring wheats as parents and would winterkill easily. Now, winter wheats are being used as parents, which has resulted in varieties being available that have good winter hardiness, and some varieties have grain yields similar to wheat.

Triticale generally has higher forage yields, but lower quality than wheat, especially when harvested as hay or silage. Its large stems make it difficult to consistently ensile successfully. It has similar crude protein values (20 to 25 percent) as wheat when grazed in the fall and spring, thus making it better suited as pasture than for hay or silage. A comparison of forage quality for the different small grain cereals is presented in Table 1. There is little market for the grain. In terms of quality, triticale grain has less gluten than wheat, making it undesirable for breadmaking. Acceptable quality has been achieved by blending up to 50 percent triticale with wheat. For unleavened breads and specialty pastries, triticale is a good source of flour. Earlier varieties had higher protein levels (about 17 percent) than wheat due to shriveled grain, but current varieties have plumper kernels and similar protein levels. In terms of protein quality, triticale generally has higher percentages of two essential amino acids, lysine and threonine. Animal-based trials have shown protein digestibility and feeding values similar to wheat.

Seedbed Preparation

Preparing a seedbed for triticale is like that for wheat. Triticale should be planted 1 to 2 inches deep. The use of press wheels on the drill is encouraged for better seed-to-soil contact, which results in quicker and more uniform emergence.

Planting Date

Triticale planted as a forage has similar planting dates as wheat for forage. Like wheat, to maximize fall forage production, triticale should be planted 2 to 3 weeks earlier than wheat-for-grain planting dates. If planted too early, the excessive fall growth may deplete soil moisture and show drought-stress symptoms. Light grazing will eliminate some forage and reduce the water demand of the crop. In northwest Kansas, triticale should be planted August 20 to September 15 (Figure 1). In southwest to north central Kansas, August 20 to September 25 are appropriate planting dates. In south central to east central Kansas, triticale should be planted from September 1 to September 25, and in southeast Kansas, from September 1 to October 1. Triticale can be planted conventionally or no-till after row crop harvest in the fall, but seeding rates will need to be higher than those used for more optimum planting dates to compensate for the lack of tillering. Grazing can begin 4 to 6 weeks after planting when there is 6 to 12 inches of growth.

Planting Rate

Triticale seeding rates vary across the state due to soil types and available soil moisture, but they are similar to wheat-for-grazing planting rates. In western Kansas, the dryland seeding rate should be 45 to 75 pounds per acre, while irrigated rates should be 75 to 100 pounds per acre (Figure 1). In central Kansas, the planting rate ranges from 60 to 90 pounds per acre. In eastern Kansas, planting rates range from 75 to 100 pounds per acre. Higher seeding rates in the recommended ranges will provide forage earlier in the fall.

Variety Selection

Triticale varieties are noted for excellent fall and spring growth. Most of the varieties available are tall and late maturing, which allows them to produce more

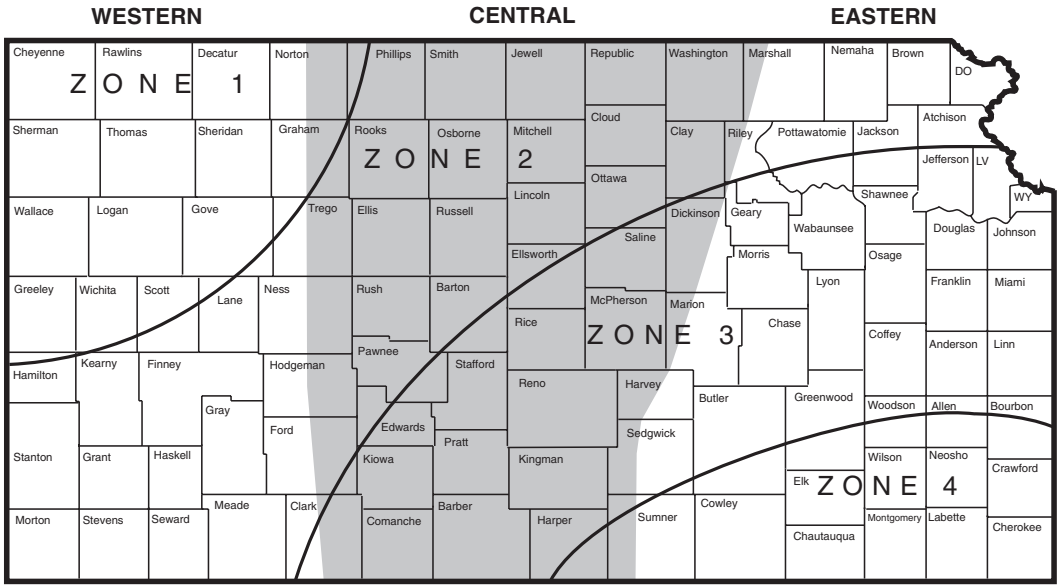
Table 1. *Hay Quality of Small Grain Cereals Harvested at Dough Stage*[1]

Crop	% TDN (dry basis)	% Crude Protein (dry basis)
Barley[2]	62-66	9-11
Wheat	55-60	8-10
Oats	54-58	10-12
Triticale[2]	52-54	8-10
Rye[2]	48-52	7-9

[1] KSU Extension publication L-884, *Nutritional Composition of Feedstuffs for Beef Cattle*, and F.B. Morrison, *Feeds and Feeding* (22nd ed.)

[2] Estimated.

Figure 1. *Suggested Planting Dates and Seeding Rates for Triticale.*



Planting Dates —

Zone 1:
8/20 to 9/15

Zone 2:
8/20 to 9/25

Zone 3:
9/1 to 9/25

Zone 4:
9/1 to 10/1

Seeding Rates — Western Kansas: 45 to 75 lbs/acre (dryland) or 75 to 100 lbs/acre (irrigated)
Central Kansas: 60 to 90 lbs/acre
Eastern Kansas: 75 to 100 lbs/acre

forage later in the season. However, if they are allowed to go to grain harvest or cut as silage at the dough stage, they may lodge. There are many varieties available, such as Jenkins, Tricale 102, Roughrider, Tallman, Cowhand, GroGreen, Enduro, Blizzard, Pika, Newcale, and Hartman. There also are blends of several varieties available that have excellent forage potential. Presto is a shorter, earlier maturing variety that has excellent forage and grain yields.

Forage yields are quite variable across years and among varieties. In a recent forage study at Hays, triticale yields ranged from less than 2,000 pounds per acre to more than 10,000 pounds per acre with considerable yearly variation. Table 2 shows the average forage yields of triticale and winter wheat varieties and the ranges of yields within each cereal type. In this study, there were seven to 11 triticale varieties and two to four wheat varieties.

Nutrient Management

Nitrogen is the nutrient most frequently lacking for optimum triticale production in Kansas. As with other crops, nitrogen recommendations are based on yield goal, cropping systems, and residual soil nitrogen levels.

$$N\ Rec = (YG \times CF) \times STA - PCA - PYM - PNST$$

where:

YG = a realistic yield goal (bushels per acre for grain, pounds per acre for forage)

CF = crop factor (1.75 pounds per bushel for grain, 0.04 pounds per pound for forage)

STA = soil texture adjustment, 1.1 for sandy soils, 1.0 for other soils

PCA = previous crop adjustment, nitrogen credit for legumes

PYM = previous year's manure (50 pounds for last year, 20 pounds for 2 years ago, zero for no manure)

PSNT = profile nitrogen soil test results

Example:

Expected yield: 4,000 pounds per acre forage Soil test results: 0 to 24 inches, 55 pounds of nitrogen per acre

Soil texture: silt loam

Previous crop: corn

Previous manure: none

$N\ Rec = (4{,}000 \times 0.04) \times 1.0 - 0 - 0 - 55$

$= 105$ *pounds per acre*

Since most triticale is used for forage or grazing, nitrogen management is particularly critical. Crude protein content of triticale pasture is often 20 to 25 percent (4 percent nitrogen).

It is assumed 10 pounds of forage (dry-weight basis) is required to produce 1 pound of beef. Each pound of beef produced from triticale pasture removes 0.4 pounds of nitrogen (or 40 pounds of nitrogen per 100 pounds of beef). For profitable production, nitrogen fertilizer rates should be adjusted accordingly.

The previous nitrogen recommendation example illustrates a situation for triticale forage production.

Nitrogen applications should be timed so nitrogen is available when needed for rapid growth in the fall or early spring before the jointing stage. Field comparisons indicate little agronomic difference between nitrogen sources when properly applied. Excess nitrogen can result in increased lodging potential.

Lime, phosphorus, and potassium should be applied according to soil tests, and requirements will be similar to wheat. On sandy soils, applying 10 to 15 pounds of sulfur per acre is recommended. Most Kansas soils should supply adequate amounts of other secondary and micronutrients for optimum triticale production.

Weed Management

The most common weed problems in triticale are likely to be the same weeds that infest winter wheat, including the winter annual weeds such as tansy mustard, flixweed, field pennycress, cheat, and downy brome. Triticale tends to be more robust and vigorous than wheat, so it should be more competitive with weeds.

Early weed pressure can reduce triticale grain and forage production. Weeds are most likely to cause problems in triticale fields with poor growth or thin stands. Production practices that encourage quick establishment and a healthy, uniform stand of triticale will result in early canopy development and may eliminate the need for any additional weed-control practices.

Most herbicides labeled for use on both wheat and rye are not specifically labeled for triticale. Buctril and Peak are the only herbicides specifically labeled for broadleaf weed control in triticale. Buctril can be applied to triticale from emergence until the boot stage of growth for control of small broadleaf weeds, including field pennycress, kochia, wild buckwheat, and Russian thistle. Peak can be applied to triticale from the 3-leaf to early jointing growth stages for control of small broadleaf weeds such as mustards and wild buckwheat.

Diseases

Triticale shares many diseases with wheat and rye. Luckily, triticale tends to be healthier than wheat so only a few triticale diseases are considered important. Like wheat, triticale varieties exhibit a wide range of genetic resistance to different diseases. Unfortunately, detailed information on variety resistance is not yet available.

One of the most significant diseases of triticale is ergot. Ergot attacks the heads and produces purplish-black, horn-shaped, hard sclerotia in place of the developing kernels. The ergot sclerotia are whitish inside and range from 1/4 to 3/4 inches in length. Ergot sclerotia contain mycotoxins that are toxic to livestock. If grain contains more than 0.3 percent ergot by weight, it should not be used for feed.

Several viral diseases can cause yellowing or stunting of triticale. Wheat streak mosaic virus is a potential threat if triticale is planted next to volunteer cereals. Control wheat streak mosaic by destroying volunteer 2 to 3 weeks prior to planting. Barley yellow dwarf virus is carried by aphids and may cause leaf tips to turn yellow or purple. Delayed planting is a good control for barley yellow dwarf and wheat streak mosaic, but it is not practical when early fall pasture is desired. Soilborne mosaic virus may affect triticale in the lower, wetter areas of infested fields. Avoid planting triticale in fields known to be infested with soilborne mosaic virus.

Triticale is susceptible to several leaf spots including Septoria tritici blotch, Stagonospora nodorum blotch, and spot blotch. In addition, some triticales are susceptible to leaf rust, stem rust, stripe

Table 2. *Small Grain Cereal Forage Study — Hays*

	Triticale — Boot Stage					
	---------- Upland Site ----------			-------- Bottomland Site --------		
	1993	1994	1995	1993	1994	1995
Avg Yield	6313	2733	5631	9228	5772	8966
Range	4642-8731	1961-3562	4819-7439	5781-13253	4803-7214	7038-10430

	Wheat — Boot Stage					
	---------- Upland Site ----------			-------- Bottomland Site --------		
	1993	1994	1995	1993	1994	1995
Avg Yield	5634	2207	4142	9451	5286	8589
Range	5085-6081	1980-2377	4039-4246	9295-10410	4462-5826	8238-8940

Source: Carlyle Thompson

rust, or powdery mildew. On average, triticale has better resistance to all these diseases than wheat, and no special controls are recommended.

Triticale is susceptible to common root rot when planted in warm soils. It is considered less susceptible than wheat to take-all root rot. Some varieties are susceptible to sharp eyespot and others to Cephalosporium stripe. If any of these diseases become limiting, the recommended control is rotation away from small grains for 1 to 2 years.

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