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Planting Date Effects on Winter Triticale Grain Yield

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Abstract

Triticale (trit-ah-kay-lee) is a close relative of wheat resulting from pollinating durum wheat with rye pollen and using the cross in a breeding program to produce stable, self-replicating varieties. Yield, stress tolerance, and disease resistance are typically greater in triticale than in wheat. Triticale doesn't currently possess the grain traits of bread wheat, so its greatest market potential is as animal feed.

Keywords

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Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Planting Date Effects on Winter Triticale Grain Yield

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Introduction

Triticale (trit-ah-kay-lee) is a close relative of wheat resulting from pollinating durum wheat with rye pollen and using the cross in a breeding program to produce stable, self-replicating varieties. Yield, stress tolerance, and disease resistance are typically greater in triticale than in wheat. Triticale doesn't currently possess the grain traits of bread wheat, so its greatest market potential is as animal feed.

Past research in Florida, Canada, Europe, and Australia and ongoing research at Iowa State University suggest that triticale is a high-quality feed for swine because of its superior lysine content and high relative feed value compared with other cereal grains. Swine on triticale-based diets have had rates of gain similar to those of pigs fed corn-based diets. Triticale can also be used as a forage or grain for ruminants and as a cover crop. ISU research found a similar performance for triticale grain and corn in finishing rations for long-yearling heifers.

When added to a rotation, triticale may reduce costs, improve distribution of labor and equipment use, provide better cash flow, reduce weather risk, and increase yields of other crops in the rotation. Additionally, production of triticale may provide environmental benefits, such as erosion control and improved nutrient cycling. Triticale is an ideal crop for producers using sustainable agriculture practices and organic farming techniques. Nitrogen and energy use efficiencies favor triticale when compared with other grains. Phosphorus

excretion from pigs fed triticale can be 29% less than from pigs fed corn.

Iowa State University investigators started a multidisciplinary, multisite research project on triticale in 2001. This research has included variety trials, management research, cropping system evaluations, soil quality assessments, and livestock feeding trials. A four-year winter triticale planting date study was performed at the Northeast Research and Demonstration Farm as a part of these efforts.

Materials and Methods

Winter triticale was seeded at 30 seeds/ft² using a Tye® model 2007 drill with 10 rows spaced 8 in. apart. Details on previous crop, varieties grown, field preparation, N fertilization, and planting dates are contained in Table 1. Targeted planting dates were September 15, September 25, October 5, and October 15. Final grain yields were adjusted to 13.5% moisture and 56-lb/bushel test weight. The experimental layout was a randomized complete block with four replications.

Results and Discussion

The optimum planting window for triticale grain yield was September 25 to October 5 (Figure 1). Planting on September 15 resulted in grain yields about 90% of those achieved from the optimum planting dates. Delaying planting to October 15 reduced grain yields to 85% of maximum. Winter injury was not observed in any of the four growing seasons. While not tested in this study, planting after October 15 may make triticale more susceptible to winter injury at this location. Grain yield from optimum planting dates are found in Table 2.

NE426GT was the variety best adapted for this location. It had grain yields 16% greater than Trical 815 in 2005. Trical 815 and DANKO Presto were similar in their performance. Pika

was considered too tall and prone to lodging for continued testing as a grain type. However, its characteristics make it a good candidate for forage.

Average ergot levels ranged from a low of 0.002% in 2003 to a high of 0.029% in 2004. These levels are considerably less than the 0.1% threshold for animal feed. Ergot has been a concern with triticale in the past, especially with wet weather. Breeding efforts have greatly reduced the potential for ergot in modern grain triticale varieties, and all ergot varieties used in this study demonstrated more than adequate ergot tolerance.

Similar to wheat and barley, triticale is susceptible to infection by Fusarium Head Blight (FHB or scab). Heavily scab-infested grain cannot be sold for human consumption and can cause feed refusal in swine. Nonbreeding cattle and poultry are tolerant to

scab-infested grain. Past experience suggests extensive FHB infection occurs in one out of four to six years in Iowa. FHB infection is most likely to occur with extended periods of plant tissue wetting.

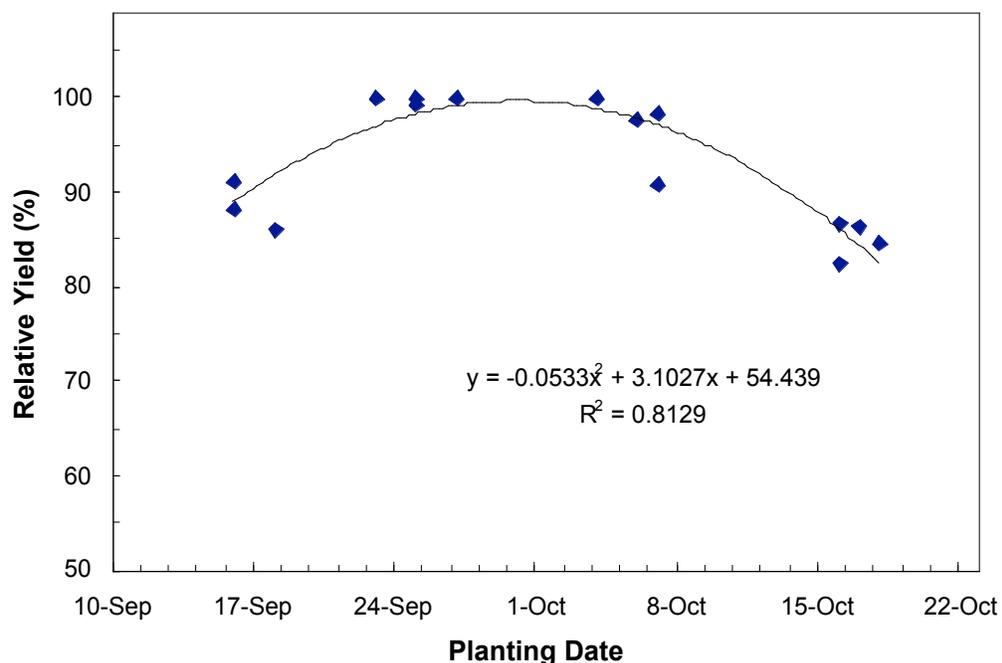
The results of this research combined with other studies at Iowa State University suggest that triticale fits into grain and livestock systems of the region. Triticale can be planted at 30 seeds/ft² in recently harvested soybean fields and harvested as a grain crop in mid-July. Red clover can be frost-seeded into the standing triticale crop at 5 to 10 lb/acre in March and used as a forage, green manure, or soil-building crop. Triticale grain can be used in finishing livestock rations with a performance similar to that of corn. Producers interested in feeding triticale to swine can consult ISU Extension Publication PM-1994 "Feeding Small Grains to Swine."

Table 1. Management for triticale date of planting research at the ISU Northeast Iowa Research and Demonstration Farm.

| Growing season | Previous crop | Varieties | Field preparation | N fertilizer | Planting dates |
|----------------|---------------|----------------------------|-------------------|--------------|--|
| 2004-05 | Soybean | NE426GT Trical 815 | No-till | 30 lb | Sept. 16, Sept. 27, Oct. 7, Oct. 18 |
| 2003-04 | Soybean | Trical 815 DANKO Presto | No-till | None | Sept. 15, Sept. 25, Oct. 6, Oct. 16 |
| 2002-03 | Soybean | Trical 815 DANKO Presto | No-till | None | Sept. 23, Oct. 7, Oct. 16 |
| 2001-02 | Oat | Pika | Field cultivation | 50 lb | Sept. 18, Sept. 25, Oct. 4, Oct. 17 |

Table 2. Winter triticale grain yield from optimum planting dates at Nashua, Iowa.

| Growing season | Grain yield (bu/acre) |
|----------------|-----------------------|
| 2004-05 | 67 |
| 2003-04 | 51 |
| 2002-03 | 60 |
| 2001-02 | 47 |

**Figure 1. Effect of planting date on relative yield of winter triticale grown in northeast Iowa. Relative yields are based on mean grain yield of the highest-yielding planting date in each growing season.**