

APPLICATION TIMING FOR ITALIAN RYEGRASS CONTROL IN CONVENTIONAL AND NO-TILL WHEAT

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Conventional Till



No- Till

Introduction:

Plant size and emergence pattern of Italian ryegrass are major factors that influence control of this problem weed in wheat. Ideally ryegrass should be small and most plants emerged before applying a postemergence herbicide.

Because of the increased interest in using no-tillage practices in wheat, research was conducted to determine if tillage system impacts ryegrass growth and control when a postemergence herbicide is applied in the fall or spring. Wheat was planted October 13, 2006 in a field that was previously infested with ryegrass. Prior to planting, areas were either disked twice for conventional tillage or treated with glyphosate as a burndown spray for no-

tillage. Osprey (mesosulfuron methyl) was applied either in the fall or spring. Over the course of the study, plant growth was monitored to determine if tillage system influenced density and growth of ryegrass and as well as control with Osprey.

Results:

Ryegrass Density: Ryegrass densities tended to be greater in the conventional tillage plots compared with the no-tillage plots (Figure 1). Densities in the non-treated checks reached a maximum on December 28, with 357 plants/ft² in the conventional tillage; whereas, 291 plants/ft² were observed in the no-till. Densities tended to decline during the winter and were 132 plants/ft² in conventional till and 111

plants/ft² in no-till on April 19.

Ryegrass Growth Stage: Figure 2 shows the percentage of ryegrass plants ranging from 1 leaf to 2 tillers compared with plants that exceeded 2 tillers. Data were grouped in these two categories because the maximum stage of growth of ryegrass is 2 tillers for such herbicides as Axial, Finesse Grass & Broadleaf, Hoelon and Osprey.

Regardless of tillage system, less than 10% of ryegrass exceeded the 2- tillering stage through December 28. However, by January 26 there were 19 to 27% of plants that exceeded the 2-tillering stage. Greater than 40% of ryegrass plants exceeded the 2-tillering stage by April 5. There was a slight decline in the percentage of plants in the advanced stages by April 19, possibly because of the freezing temperature during April 6-10.

The development of ryegrass was diverse in both tillage systems at all sampling times (specific data for individual growth stages not shown). Plants ranged from 1 leaf to 3 tillers in both conventional tillage and no-tillage on December 15. By April 19 the ryegrass population ranged from 1 tiller through 10 tillers. While ryegrass development was similar in both management systems, there tended to be a greater percentage of plants with more leaves or tillers in conventional tillage than in no-tillage, particularly as the season progressed through the spring.

Postemergence Ryegrass Control:

Regardless of tillage system, ryegrass control with Osprey tended to be less when applied in the fall than in the spring (Table 1). Herbicide activity was slower when Osprey was applied in the fall than in the spring for both tillage systems. Late season control ratings made prior to harvest indicated 80 and 86% control for the fall application and 91 and 95% control for the spring application for conventional and no-

till, respectively. The number of ryegrass seedheads at wheat harvest did not differ among herbicide treatments and ranged from 0 to 7heads/ft². The number of seedheads in the non-treated checks was 32 for conventional till and 15 for no-till.

Wheat Lodging and Yield: The freezing temperatures during April 6-10 injured both wheat and ryegrass. Wheat lodging or stand reduction, ranged from 14 to 89% and tended to be greater where ryegrass populations were dense (Table 1).

Wheat yielded reasonably well in spite of the freeze injury. The plots that were treated in the fall yielded 77.3 and 78.4 bu/A; whereas, the plots treated in the spring yielded 101.8 and 97.6 bu/A for conventional and no-till, respectively. The lower wheat yields observed in the fall treated plots compared with the spring treated plots may have been related to less ryegrass control and tendency for greater freeze injury.

Summary:

Results of this research showed that application timing of Osprey had a greater impact on Italian ryegrass control and wheat yield than tillage system. Ryegrass control and wheat yield were usually better when Osprey was applied in the spring than in the fall. It is unclear to what extent the freeze injury may have had on control and yield. The conventional till tended to have a greater ryegrass density and plants with more leaves or tillers compared with no-till.

The freeze injury that occurred in early April may have affected the results of this research. Furthermore, the study was conducted in a heavily infested area that was fallow during the 2006; consequently, the results may not reflect a typical rotation after corn. Further research is needed to determine the affect of tillage system and application timing of postemergence herbicides for ryegrass control in wheat.

Figure 1. The Effect of Tillage System on Ryegrass Density in Non-treated Checks Mid-December Through Mid-April (UKREC 2006-2007).

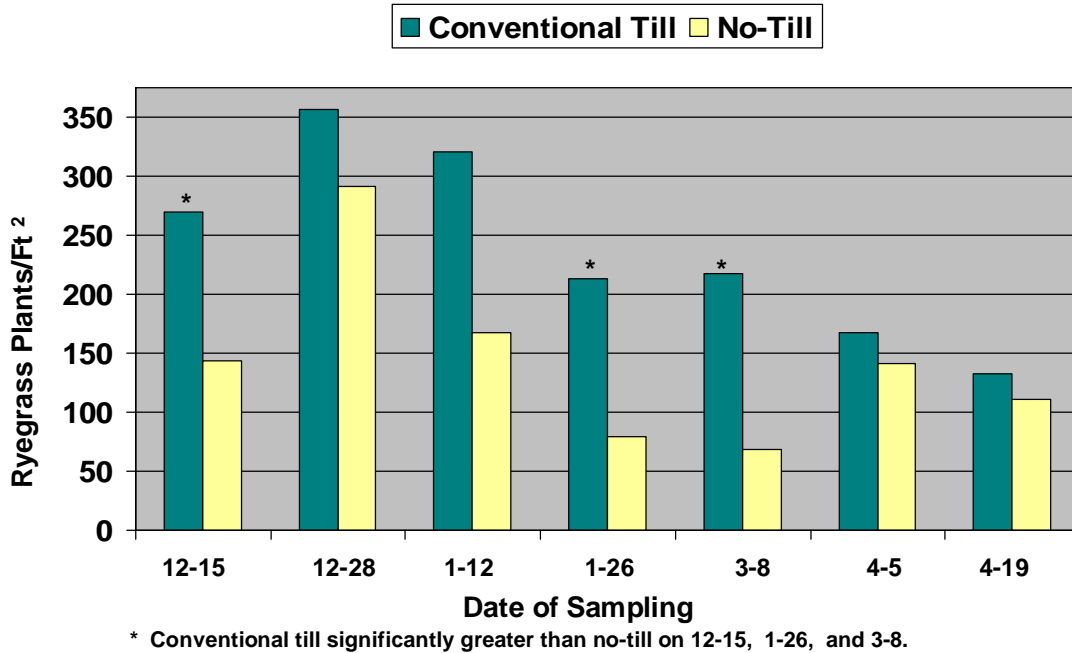
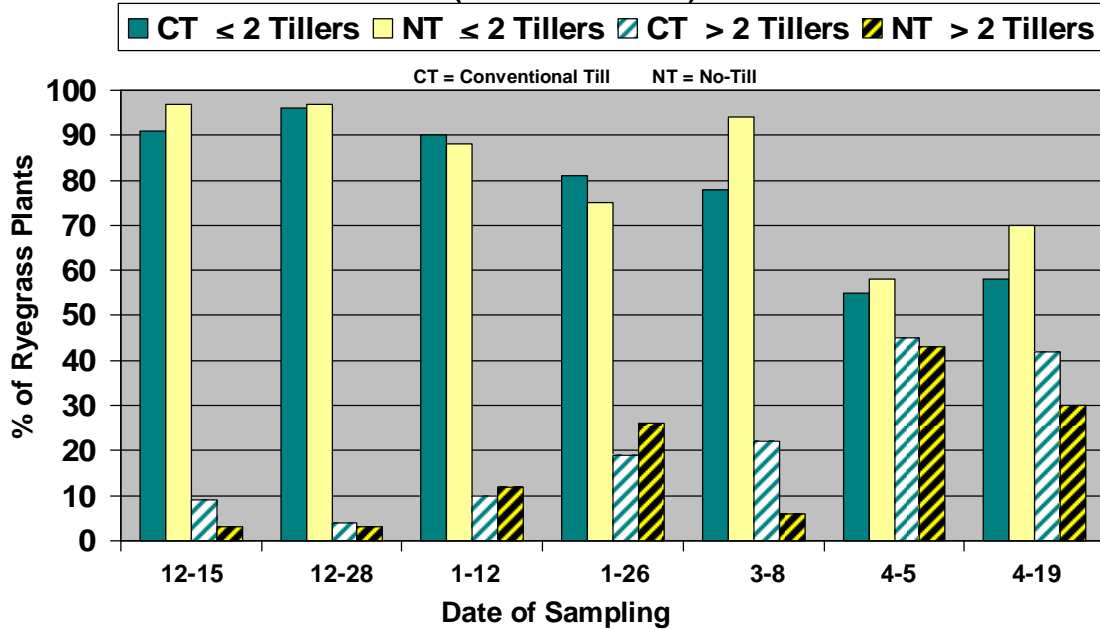


Figure 2. The Effect of Tillage System on Percent of Ryegrass Plants with 1 Leaf to 2 Tillers and Greater Than 2 Tillers From Mid-December Through Mid-April (UKREC 2006-2007)



* On March 8, NT had significantly greater % plants with 1 leaf to 2 tillers than CT whereas, CT had significantly greater % of plants with greater than 2 tillers.

Table 1. Impact of Tillage System and Timing of Postemergence Herbicide on Ryegrass Control and Seedhead Numbers and Wheat Lodging and Yield. (UKREC 2006-0007)

Timing of Osprey ¹	Tillage System ²	Ryegrass Control ³			Ryegrass Seedheads (Heads/ Ft ²) ⁴	Wheat Lodging stand loss (%) ⁵	Wheat Yield (Bu/A)
		4 WAT (%)	6 WAT (%)	Late Season (%)			
Fall (11-14-06)	CT	38	80	80	7	33	77.3
	NT	55	83	86	4	30	78.4
Spring (3-7-07)	CT	83	90	91	4	14	101.8
	NT	93	93	95	0	15	97.6
Check	CT	0	0	0	32	89	44.0
	NT	0	0	0	15	75	45.8
	LSD (.10)	9	4	6	11	19	5.4

¹ Osprey 4.75 oz/A + NIS 0.5% + Liquid N 28% 2 qt/A

Fall Post: 11-14-06.	Conv Till	No- till
Wheat Height	3-4" tall	2.5-4" tall
Wheat Stage	2-3 Leaf	2-3 leaf
Ryegrass Height	0.5 to 3" tall	0.5-3" tall
Ryegrass Stage	3 leaf	2 leaf
Spring Post: 03-07-07.	Conv Till	No- till
Wheat Height	5.2 " tall	4.3" tall
Wheat Stage	4.2 tillers	2.8 tillers
Ryegrass Height	3.5 " tall	2" tall
Ryegrass Stage	1 leaf-7 tillers avg. 2 tillers	1Leaf-4 tiller Avg. 4 leaves

² Tillage Treatments:

CT = Conventional Tillage: Two passes with disc on 10-11-06

NT = No-Tillage: Roundup WeatherMAX 1 qt/A + AMS on 10-11-06

³ Visual control ratings made at 4 & 6 weeks after treatment and late season on 6-05-07.

⁴ Seedheads counted 05-30-07.

⁵ Rating for lodging and or stand loss of wheat from freeze injury made on 6-5-07.

Field History: Fallow ryegrass in 2006. Lime 2 tons/A, P2O5 100 lb/A + K2O5 100 lb/A in fall 2006

Planted: 10-13-06, Variety Pioneer 25R35, 35 viable seeds/ft².

Nitrogen and Pest Management

Nitrogen: 41 units/A on 2-23-07 and 80 units /A on 3-23-07

Warrior 3 oz/A: 11-21-06 and 3-06-07

Tilt 4 oz/A: 5-06-07