Identification and Control of Annual Ryegrass (*Lolium multiflorum*) in No-Till Corn in Virginia

Steve King, Graduate Research Assistant, VPI and SU
Edward S. Hagood, Jr., Extension Weed Scientist, VPI and SU
Kevin W. Bradley, Post-Doctoral Research Associate, VPI and SU

Identification

Annual ryegrass is a winter annual grass found throughout the United States that may reach 3 ft in height. Stems are often tinged red at the base, and leaves are rolled in the bud with claw-like auricles in the collar region. Leaf blades are 2.5-8 in. long, 1/8-1/4 in. wide and have a membranous ligule. The seedhead is a 4-16 in. long spike with spikelets that have long awns arranged alternately up the stem. The plant has a fibrous root system.

Objectives

In Virginia, annual ryegrass has become one of the most troublesome and difficult to control weeds in small grains, as well as in corn and soybeans grown in rotation with small grains. Annual ryegrass control has declined due to the development of resistance to Hoelon, which has been the only treatment available for control in wheat and barley. Lack of control in small grains has allowed annual ryegrass to proliferate and become problematic in no-till corn establishment where high triazine herbicide rates or sequential applications of nonselective herbicides are frequently required for acceptable control. The use of Bladex has proven effective for annual ryegrass control in no-till corn establishment, and loss of registration of this compound severely limits control options in this crop. Experiments were initiated in 2000 to evaluate herbicide programs using transgenic corn hybrids for control of annual ryegrass in no-till establishment in comparison to traditional herbicide programs typically utilized in Virginia. Transgenic corn hybrids utilized included those with tolerance to Roundup, Liberty, Lightning, and Poast Plus.

Table 1. Effect of Sequential Herbicide Applications on Annual Ryegrass Control in No-till Corn in Virginia.

		Control of Annual Ryegrass[1]	
Herbicide	Rate/Acre	2 WAT[2]	8 WAT[3]
		---------- % ----------	
Roundup	1.5 pts	68	87
Roundup	3.0 pts	84	98
Roundup	1.5 pts + 1.5 pts	76	99
Liberty	20 ozs	8	8
Liberty	34 ozs	6	0
Liberty	20 ozs + 20 ozs	10	50
Poast Plus	1.5 pts	11	65
Poast Plus	2.25 pts	20	69
Poast Plus	1.5 pts + 1.5 pts	13	68
Lightning	1.28 ozs	4	49
Lightning	1.28 ozs + 1.28 ozs	4	35
Gramoxone	1.5 pts	83	47
Gramoxone	2.5 pts	88	55

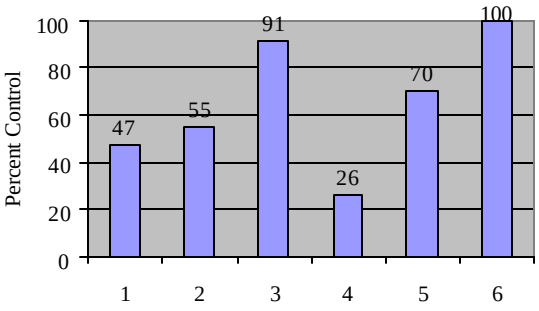
[1] Indicates visual ryegrass control (0-100%).
[2] WAT = weeks after treatment.
[3] Sequential treatment applied 6 weeks after initial treatment.

*The use of trade names in this publication does not imply endorsement of the product named or imply criticism of similar ones not mentioned.

Results

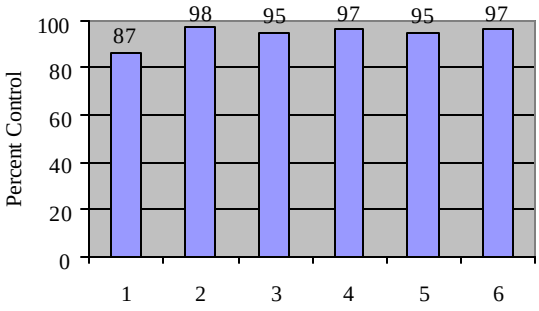
Evaluation of annual ryegrass control indicated that there was no advantage associated with the use of the Liberty, Lightning or Poast-Plus. Roundup applied alone at either 1.5 pints or 3.0 pints provided significantly higher levels of annual ryegrass control 8 weeks after treatment (WAT) than any of the other postemergence treatments applied alone, and provided excellent control with sequential early postemergence applications after corn emergence. The use of Gramoxone alone provided rapid desiccation of the above ground portion of the plant and adequate control levels 2 WAT. Due to lack of effects on roots, however, annual ryegrass regrowth occurred in subsequent weeks (Table 1). Gramoxone treatments applied in combination with atrazine with or without Bladex resulted in acceptable control 8 WAT (Figure 1). Gramoxone applied in combination with 1/2 oz Basis resulted in significantly decreased levels of control. Roundup applied alone at 3.0 pints or 1.5 pints in combination with atrazine with or without Bladex provided excellent ryegrass control. Roundup applied at 1.5 pints in combination with Basis also provided excellent ryegrass control (Figure 2). Results indicate that standard Roundup and Gramoxone treatments containing atrazine and Bladex continue to be very efficacious.

Figure 1. Annual Ryegrass Control 8 WAT with Gramoxone Treatments



1 = 1.5 pts Gramoxone
2 = 2.5 pts Gramoxone
3 = 1.5 pts Gramoxone + 3.0 pts Atrazine
4 = 1.5 pts Gramoxone + 1/2 oz Basis
5 = 1.5 pts Gramoxone + 3.0 pts Atrazine + 1/2 oz Basis
6 = 1.5 pts Gramoxone + 3.0 pts Atrazine + 2.0 pts Bladex

Figure 2. Annual Ryegrass Control 8 WAT with Roundup Treatments



1 = 1.5 pts Roundup
2 = 3.0 pts Roundup
3 = 1.5 pts Roundup + 3.0 pts Atrazine
4 = 1.5 pts Roundup + 1/2 oz Basis
5 = 1.5 pts Roundup + 3.0 pts Atrazine + 1/2 oz Basis
6 = 1.5 pts Roundup + 3.0 pts Atrazine + 2.0 pts Bladex

Conclusions

Results indicated that levels of annual ryegrass control similar to standard treatments containing Bladex can be realized through the use of Gramoxone + Atrazine or Roundup applied alone at 3.0 or 1.5 pints in combination with either atrazine or Basis. Gramoxone treatments in combination with Basis are not advisable. Initial annual ryegrass control (1 WAT, data not shown) was much lower in Roundup treatments compared to Gramoxone treatments, due to their respective modes of action. Therefore, chemical choice depends upon the growers anticipated time of planting. The use of Roundup-ready corn hybrids does appear to be advantageous due to the ability to apply postemergence treatments of Roundup after corn emergence for the control of annual ryegrass. The use of the other transgenic hybrids, however, does not seem to provide any potential benefit.

This research was conducted in cooperation with Randolph Aigner, Henrico Co. Va.; and Rueben L. Blaunton, Amelia Co. Va.