

ROUGHSTALK BLUEGRASS CONTROL IN PERENNIAL RYEGRASS FROM GLUFOSINATE APPLIED IN EARLY SPRING

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Previous research identified late March to early April as the latest safe timing to apply Rely (glufosinate) in perennial ryegrass for suppression of grassy weeds. Later applications were associated with lower crop yields, especially when higher rates were used. Little or no rate response existed between 0.3 and 0.5 lb ai/acre when Rely was applied in late March. However, a strong rate response occurred with later applications, especially when Rely was applied in mid to late April. The position of the apical meristem or growing point when Rely was applied served as a good indicator of ryegrass tolerance. Applications made when the growing point was less than 0.25 inches above the ground were safest, whereas yields were clearly reduced when the growing point exceeded 1.0 inch above the ground at herbicide application. Treatments were repeated in 2000 in an attempt to verify crop growth stage at application as an indicator of safety, and to more precisely evaluate the control of roughstalk bluegrass with Rely.

Test sites in the 1999-2000 growing season at the Hyslop Field Laboratory and near Tangent, OR were treated uniformly with 2.0 lb a.i./acre Prowl plus 0.38 lb a.i./acre Axiom in early fall (October 12 at Hyslop and October 7 at Tangent) followed by 0.12 lb a.i./acre Goal plus 0.38 lb a.i./acre metribuzin in mid-fall (November 18 at Hyslop and November 17 at Tangent). This treatment combination was selected to provide excellent control of volunteer perennial ryegrass along with good suppression of seedling annual bluegrass and roughstalk bluegrass. The tests were conducted under weed-free conditions at Hyslop and in a natural infestation of annual and roughstalk bluegrass at Tangent. At Hyslop, perennial ryegrass exhibited slightly greater injury than had been seen in 1999 (Table 1). The highest rate (0.5 lb a.i./acre) reduced seed yield compared to the two lower rates at all four application dates, March 29, April 10, April 17, and April 24. Greatest injury occurred with the April 17 applications, and yield for the highest rate applied at that date was only 44% of the untreated check. April 24 applications were somewhat less injurious than the April 17 applications, perhaps due to cool, wet weather in the first week after April 24. Shortage of rainfall during May and June restricted growth by perennial ryegrass, and may have limited its ability to fully recover from the tissue destruction caused by Rely.

Injury was less severe at Tangent than it had been at Hyslop, perhaps due to the less advanced growth stage at Tangent (Table 2). The test at Tangent was located on the field edge adjacent to a drainage ditch, and crop growth in the spring was visibly delayed compared to growth of plants located at higher elevations in the same field or at Hyslop. No yield reduction occurred at any rates for the March 29 applications at Tangent,

unlike the results at Hyslop. Yield was reduced by 0.5 lb a.i./acre Rely applied on April 10, but not the two lower rates. April 17 was the most damaging application date, and the highest rate reduced yield to 66% of the untreated check. Damage from the April 24 applications was less severe than the April 17 applications, similar to what occurred at Hyslop. All three rates of Rely provided excellent control of roughstalk bluegrass when applied on March 29, April 10, or April 17 (Table 3). Control for these application dates ranged from 96.5 to 99.9%, and the rate response was minimal. In contrast, there was a strong rate response for the April 24 applications, with only the 0.5 lb a.i./acre rate achieving excellent control of roughstalk bluegrass. Control of roughstalk bluegrass by Rely exceeded the control usually achieved by Horizon (fenoxaprop), and Rely would provide an excellent alternative to Horizon for control of roughstalk bluegrass in perennial ryegrass if Horizon were withdrawn from market. However, the situation would be much more problematic in tall fescue if Horizon were withdrawn because of tall fescue's poorer tolerance to Rely.

Table 3. Roughstalk bluegrass response to rate and application timing of Rely in 2000 at Tangent.

Application date	Rely rate (lb a.i./acre)		
	0.3	0.375	0.5
	----- (% control)-----		
March 29	98.2 a	99.5 a	99.9 a
April 10	96.5 a	98.1 a	99.8 a
April 17	96.8 a	98.0 a	99.8 a
April 24	74.2 b	80.0 b	98.3 a

*Means followed by the same letter within a group of letters do not differ at the $P = 0.05$ level. Interaction of rate by application timing was significant.

Growing point position can be used to predict the general impact of Rely on perennial ryegrass seed yield. If the growing point is within 0.25 inches of the soil, applications up to 0.375 lb a.i./acre should cause little or no yield loss. If the growing point exceeds 1.0 inch above the soil, substantial yield loss is likely, especially at rates above 0.375 lb a.i./acre. Exact severity of loss probably depends on rainfall and temperature patterns during the first two months after application, but can exceed 50%.

Table 1. Perennial ryegrass seed yield response to rate and application timing of Rely in 2000 under nearly weed-free conditions at Hyslop.

Application date	Growing point position (inches above soil)	Crop height (inches)	Rely rate (lb a.i./acre)			Average
			0.3	0.375	0.5	
March 29	0.1	4.5	1005 a*	968 ab	807 cd	927 X*
April 10	0.6	7	1001 a	932 ab	757 d	897 X
April 17	1.2	9	879 bc	714 d	484 e	692 Y
April 24	5.5	13	990 a	879 bc	701 d	857 X
Average			969 A*	874 B	687 C	

*Means followed by the same letter within a group of letters do not differ at the $P = 0.05$ level. Interaction of rate by application timing was significant. Seed yield of untreated check = 1113 lb/a.

Table 2. Perennial ryegrass seed yield response to rate and application timing of Rely in 2000 under moderately weedy conditions in Tangent.

Application date	Growing point position (inches above soil)	Crop height (inches)	Rely rate (lb a.i./acre)			Average
			0.3	0.375	0.5	
March 29	0.1	3.5	1270 ab	1274 ab	1271 ab	1272 X*
April 10	0.3	4	1342 a	1340 a	1185 bc	1289 X
April 17	0.4 (1.1)†	6	1154 bcd	1056 d	874 e	1028 Z
April 24	1.3 (2.6)	9	1267 ab	1124 cd	1070 d	1154 Y
Average			1258 A	1198 B	1100 C	

*Means followed by the same letter within a group of letters do not differ at the $P = 0.05$ level. Interaction of rate by application timing was significant. Seed yield of untreated check = 1328 lb/a.

†Growing point position in plants located immediately west of test at slightly higher elevation.