Comparison of Newer and Older Herbicide Options for Guardrails

Joe Omielan and William Witt
University of Kentucky

INTRODUCTION

For highway safety guardrails need to be kept clear of visual obstructions. Usually that means maintaining a vegetation free zone underneath them. Applications of broad spectrum residual herbicides have become the mainstay for bareground maintenance operations in combination with a broad spectrum post-emergent herbicide like glyphosate. A number of new products (Perspective, Viewpoint, Esplanade) have recently been introduced to this market. How does the efficacy of these products and product combinations compare with that of older products?

OBJECTIVE

The objective of this study was to:
1) Evaluate the efficacy of different herbicide options for bareground control under guardrails

MATERIALS & METHODS

The trial was established under and beside guardrails near Paintsville, KY in 2012 and near Elizabethtown in 2013. In both years, 13 treatments and 3 replications were arranged in a randomized complete block design. Treatments were applied at 25 gallons/acre onto 6.5 ft by 12 ft plots on April 25, 2012 and May 23, 2013.

All treatments included Roundup ProMax (glyphosate) for post-emergence control (Table 1). All treatments except Roundup by itself included Activator 90 at 0.25% v/v. Treatments with older, high use rate herbicides included Sahara (diuron + imazapyr), Hyvar (bromacil), Pendulum (pendimethalin), and Endurance (prodiamine). Other herbicides used were Oust XP (sulfometuron), Payload (flumioxazin), Arsenal (imazapyr), and Journey (glyphosate + imazapic). Newer low use rate products tested included Milestone (aminopyralid), Perspective (aminocyclopyrachlor + chlorsulfuron), Viewpoint (aminocyclopyrachlor + metsulfuron + imazapyr), and Esplanade (indaziflam). Visual % bareground ratings were taken 40 (6/4), 85 (7/19), and 160 (10/2) days after treatment (DAT) in 2012 and 56 (7/18), 98 (8/29), and 138 (10/8) DAT in 2013. Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at p = 0.05.

RESULTS & DISCUSSION

The predominant species at the Paintsville location were winter annuals and annual grasses (Figure 1). There was a more diverse range of species, including johnsongrass and larger plants at spraying in Reps 1 and 2 than in Rep 3 at the Elizabethtown location (Figure 2).

All treatments had more bareground than the control at the first assessment date in both years (Table 1). In 2012 the Roundup ProMax treatment by itself was the same as the control 85 and 160 DAT. The treatment with only Oust XP as the residual (Trt. 4) was one of the least efficacious 160 DAT. This is the herbicide that has been used for many years at this location. However, this treatment was one of the best treatments at the 2013 location.

Treatments that were consistently in the top group at all assessment dates in both years included older, high use rate herbicides (Trt. 2 with Sahara and Trt. 3 with Hyvar) (Table 1). Other treatments in the top group were combinations of low and high use rate herbicides (Trt. 9 with Perspective and Endurance) as well as combinations of low use rate herbicides (Trt. 8 with Perspective and Esplanade, and Trt. 12 with Esplanade and Oust XP).

SUMMARY

Utilizing combinations of newer low use rate herbicides with each other or with some high use rate herbicides can deliver season long vegetation control. These may replace the use of older high use rate herbicides.

Table 1. Herbicide treatments, application rates, and % bareground ratings in 2012 and 2013.

				% Bareground in 2012						% Bareground in 2013					
Trt. No.	Product Name	Rate	Rate Unit	40 DAT		85 DAT		160 DAT		56 DAT		98 DAT		138 DAT	
1	Roundup ProMax	1.3	QT/A	92	*b*	47	*d*	57	*ef*	78	*b*	67	*b*	70	*bcd*
2	Roundup ProMax Sahara	1.3 10	QT/A LB/A	99	*a*	96	*a*	81	*abc*	100	*a*	97	*a*	83	*abc*
3	Roundup ProMax Hyvar	1.3 10	QT/A LB/A	98	*a*	97	*a*	90	*ab*	91	*ab*	91	*a*	89	*abc*
4	Roundup ProMax Oust XP	1.3 3	QT/A OZ/A	97	*ab*	81	*c*	68	*de*	100	*a*	99	*a*	92	*ab*
5	Roundup ProMax Payload	1.3 12	QT/A OZ/A	98	*ab*	95	*a*	83	*abc*	88	*ab*	76	*ab*	65	*bc*
6	Roundup ProMax Pendulum AquaCap Milestone VM	1.3 4 7	QT/A QT/A FL OZ/A	97	*ab*	95	*a*	86	*ab*	95	*ab*	67	*b*	56	*de*
7	Roundup ProMax Journey Milestone VM	1 1 7	QT/A QT/A FL OZ/A	96	*ab*	85	*bc*	78	*bcd*	98	*ab*	96	*a*	77	*abcd*
8	Roundup ProMax Perspective Esplanade	1.3 9 3.5	QT/A OZ/A FL OZ/A	97	*ab*	96	*a*	92	*a*	100	*a*	98	*a*	95	*ab*
9	Roundup ProMax Perspective Endurance	1.3 9 2.3	QT/A OZ/A LB/A	97	*ab*	96	*a*	90	*a*	100	*a*	89	*ab*	81	*abcd*
10	Roundup ProMax Viewpoint	1.3 18	QT/A OZ/A	97	*ab*	92	*ab*	78	*bcd*	100	*a*	91	*a*	86	*abc*
11	Roundup ProMax Arsenal	1.3 4	QT/A PT/A	98	*ab*	83	*bc*	72	*cd*	100	*a*	95	*a*	80	*abcd*
12	Roundup ProMax Esplanade Oust XP	1.3 3.5 3	QT/A FL OZ/A OZ/A	96	*ab*	93	*ab*	85	*ab*	100	*a*	99	*a*	96	*a*
13	Nontreated Check			53	*c*	47	*d*	45	*f*	38	*c*	30	*c*	32	*e*

All treatments (except Trt. 1) included Activator 90, a non-ionic surfactant, at 0.5% v/v.
Means within a column followed by the same letter are not different according to Fisher's Protected LSD at P < 0.05.

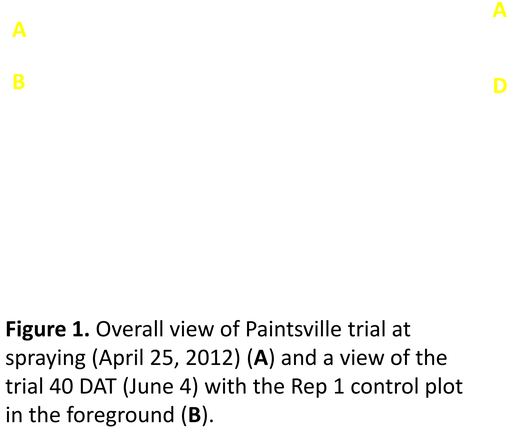

Figure 1. Overall view of Paintsville trial at spraying (April 25, 2012) (**A**) and a view of the trial 40 DAT (June 4) with the Rep 1 control plot in the foreground (**B**).

Figure 2. Overall views of Rep 1 (**A**) and Rep 3 (**B**) of Elizabethtown trial 1 week before spraying (May 16, 2013). View of sprayed plots in Rep 1 (**C**) and Rep 2 control plot **(D)** 56 DAT (July 18).