2014 Cable Barrier Trial in Louisville

Introduction

Median cable barriers are designed to protect drivers from crossover accidents on interstates and highways. However, the vegetation under and adjacent to them must be managed for safety and aesthetics. Usually, this means using herbicides to maintain a vegetation free (bare ground) zone underneath the barriers. Broad-spectrum soil applied preemergence residual herbicides, in combination with a broad-spectrum post emergence herbicide like glyphosate, are the mainstay for maintaining these bareground zones. However, there may be turf adjacent to the bare ground zone that should not be damaged. In other cases, there may be desirable turf under the cable barriers that also should not be damaged. Ideally, the residual herbicides will last all season long and not move off-site by leaching or erosion (movement of soil particles with adsorbed herbicide).

Recently, a number of new products (Perspective, Viewpoint, Esplanade) have become available for bare ground vegetation management. Perspective is a combination of aminocyclopyrachlor and chlorsulfuron. Viewpoint is a combination of aminocyclopyrachlor, imazapyr and metsulfuron. Esplanade is indaziflam. The objective of this trial was to evaluate the efficacy and desirable turf damage potential of these and other herbicides when used for vegetation management under cable barriers.

Materials and Methods

The trial was established under and beside cable barrier, with tall fescue – Kentucky bluegrass turf underneath, in the median of I-265 in Louisville, KY. The 15 treatments and 3 replications were arranged in a randomized complete block design. Treatments were applied at 25 gallons / acre onto 6.5 ft wide by 20 ft long plots on May 8, 2014. All herbicide treatments, except Roundup ProMax alone (Trt. 1), included Activator 90 at 0.25% v/v (Table 1). Roundup ProMax (glyphosate) has no residual activity so other herbicides were included in the combinations with it to provide residual and pre-emergent control. The Pyresta + Proclipse combination (Trt. 14) did not include the non-selective glyphosate and might be an option to manage existing turf. The Louisville weather station reported 1.5 inches of rain on May 10, which would have activated the soil applied preemergence herbicide treatments. Broadleaf weeds present at application included Buckhorn plantain, spotted spurge, and oxalis, which was flowering. Heights of the tall fescue and the Kentucky bluegrass were 11 and 12 inches, respectively, and the Kentucky bluegrass was flowering.

The plan was to use string to mark the down slope edge of the sprayed area in each of the plots, based on the dead turf killed by the glyphosate, 20 days after treatment (DAT). Damaged turf beyond the string later in the season would indicate movement of herbicides with water or soil particles. However, the plot area was mowed a few days before the rating and it was difficult to mark the edge of the sprayed area accurately once the standing vegetation had been removed. Better communication with the mowing crews is required for future trials.

The proportion of brown vegetation (%) was visually rated 20 DAT (5/28/2014). Ratings of the proportion (%) of bare ground, broadleaf weeds, annual grasses and perennial grasses were taken

96 (8/12/2014) and 169 (10/24/2014) DAT. The plot area had been mowed recently before the 169 DAT rating. Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at p = 0.05.

Results and Discussion

All plots treated with glyphosate had more brown vegetation than the Pyresta + ProClipse combination or the untreated plots 20 DAT (Table 2). Roundup ProMax alone (Trt. 1) and the Journey + Milestone combination (Trt. 7) had more broadleaf cover than the untreated check 96 DAT (Table 2). The season end rating (169 DAT) (Table 3) was done after the plots were mowed and much of the broadleaf cover was from spurge, which was below the mowers.

Treatments with the highest amount of bare ground at the end of the season (169 DAT) included Hyvar (Trt. 3) and Esplanade combined with Perspective (Trt. 9) or Oust (Trt. 13) (Table 3). These treatments had lower proportions of perennial grasses than other treatments too. The highest proportions of perennial grasses were found in the untreated plots and those with treatments that included prodiamine (Trts. 10 and 14) 169 DAT (Table 3). In many treatments, the removal of perennial grasses resulted in more broadleaves and annual grasses (Tables 2 and 3). The vegetation under the cable barrier in this location gave a good test of how well some of these bare ground herbicides can perform as well as one turf management herbicide mix. Future trials will evaluate more options for maintaining the turf as well as evaluating desirable turf damage from herbicide movement outside the treated zone.

Table 1. Herbicide treatments, active ingredients and application rates.

Treatment	Product Name	Rate[1]	Rate Unit	Active Ingredient(s)	ai Rate (per acre)
1	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
2	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Sahara	10	LB/A	diuron + imazapyr	6.2 lb + 12.4 oz
3	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Hyvar	10	LB/A	bromacil	8 lb
4	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Oust XP	3	OZ/A	sulfometuron	2.3 oz
5	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Payload	12	OZ/A	flumioxazin	6.1 oz
6	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Pendulum AquaCap	4	QT/A	pendimethalin	3.8 lb
	Milestone VM	7	FL OZ/A	aminopyralid	1.8 oz ae
7	Roundup ProMax	1	QT/A	glyphosate	1.1 lb ae
	Journey	1	QT/A	glyphosate + imazapic	0.4 lb ae + 3 oz ae
	Milestone VM	7	FL OZ/A	aminopyralid	1.8 oz ae
8	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Perspective	9	OZ/A	aminocyclopyrachlor + chlorsulfuron	3.6 oz + 1.4 oz
	Esplanade	3.5	FL OZ/A	indaziflam	0.7 oz
9	Razor Pro	2	QT/A	glyphosate	1.5 lb ae
	Perspective	5	OZ/A	aminocyclopyrachlor + chlorsulfuron	2 oz + 0.8 oz
	Esplanade	4	FL OZ/A	indaziflam	0.8 oz
10	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Perspective	9	OZ/A	aminocyclopyrachlor + chlorsulfuron	3.6 oz + 1.4 oz
	Endurance	2.3	LB/A	prodiamine	1.5 lb
11	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Viewpoint	18	OZ/A	aminocyclopyrachlor + imazapyr + metsulfuron	4.1 oz + 5.7 oz + 1.3 oz
12	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Polaris AC Complete	2	PT/A	imazapyr	16 oz ae
13	Roundup ProMax	1.3	QT/A	glyphosate	1.5 lb ae
	Esplanade	3.5	FL OZ/A	indaziflam	0.7 oz
	Oust XP	3	OZ/A	sulfometuron	2.3 oz
14	Pyresta	24	FL OZ/A	2,4-D + pyraflufen-ethyl	0.66 lb ae + 0.05 oz
	Proclipse	2	LB/A	prodiamine	1.3 lb
15	Untreated Check				

[1]*All herbicide treatments (except Roundup ProMax alone, Treatment 1) contained the adjuvant, Activator 90 at 0.25% v/v.*

Table 2. Herbicide treatments and results from 2014 (20 and 96 Days After Treatment (DAT)).

Trt.	Product Name	Rate[1]	Rate Unit	% Brown Vegetation	% Bare Ground	% Broadleaf Weeds	% Annual Grasses	% Perennial Grasses
				20 Days after Treatment	96 Days after Treatment			
1	Roundup ProMax	1.3	QT/A	73 *abc*[2]	12 *fg*	40 *a*	33 *ab*	15 *cd*
2	Roundup ProMax	1.3	QT/A	76 *abc*	58 *abcd*	12 *cd*	5 *fgh*	25 *cd*
	Sahara	10	LB/A					
3	Roundup ProMax	1.3	QT/A	96 *a*	88 *a*	10 *cd*	2 *h*	0 *d*
	Hyvar	10	LB/A					
4	Roundup ProMax	1.3	QT/A	75 *abc*	50 *bcde*	7 *cd*	33 *abc*	10 *cd*
	Oust XP	3	OZ/A					
5	Roundup ProMax	1.3	QT/A	97 *a*	33 *defg*	18 *bc*	43 *a*	2 *cd*
	Payload	12	OZ/A					
6	Roundup ProMax	1.3	QT/A	55 *c*	23 *efg*	19 *bc*	18 *bcdefgh*	40 *abc*
	Pendulum AquaCap	4	QT/A					
	Milestone VM	7	FL OZ/A					
7	Roundup ProMax	1	QT/A	79 *abc*	23 *efg*	32 *ab*	27 *abcdef*	18 *cd*
	Journey	1	QT/A					
	Milestone VM	7	FL OZ/A					
8	Roundup ProMax	1.3	QT/A	63 *bc*	40 *defg*	1 *d*	26 *abcdefg*	33 *bcd*
	Perspective	9	OZ/A					
	Esplanade	3.5	FL OZ/A					
9	Razor Pro	2	QT/A	96 *a*	55 *abcde*	8 *cd*	29 *abcde*	8 *cd*
	Perspective	5	OZ/A					
	Esplanade	4	FL OZ/A					
10	Roundup ProMax	1.3	QT/A	72 *abc*	45 *cdef*	8 *cd*	18 *bcdefgh*	28 *bcd*
	Perspective	9	OZ/A					
	Endurance	2.3	LB/A					
11	Roundup ProMax	1.3	QT/A	88 *ab*	53 *bcde*	13 *bc*	32 *abcd*	2 *d*
	Viewpoint	18	OZ/A					
12	Roundup ProMax	1.3	QT/A	95 *ab*	81 *ab*	6 *cd*	10 *defgh*	3 *cd*
	Polaris AC Complete	2	PT/A					
13	Roundup ProMax	1.3	QT/A	83 *abc*	78 *abc*	5 *cd*	3 *gh*	14 *cd*
	Esplanade	3.5	FL OZ/A					
	Oust XP	3	OZ/A					
14	Pyresta	24	FL OZ/A	0 *d*	7 *g*	12 *cd*	10 *cdefgh*	72 *a*
	Proclipse	2	LB/A					
15	Untreated Check			0 *d*	10 *g*	15 *cd*	8 *efgh*	63 *ab*

[1]All herbicide treatments (except Roundup ProMax alone, Treatment 1) contained the adjuvant, Activator 90 at 0.25% v/v
[2]Means within a column followed by the same letter are not different according to Fisher's Protected LSD at P < 0.05.

Table 3. Herbicide treatments and results from 2014.

Trt.	Product Name	Rate[1]	Rate Unit	% Bare Ground	% Broadleaf Weeds	% Annual Grasses	% Perennial Grasses
				169 Days after Treatment			
1	Roundup ProMax	1.3	QT/A	5 c[2]	38 ab	20 cd	36 cde
2	Roundup ProMax	1.3	QT/A	22 *bc*	35 *abc*	5 *d*	38 *cde*
	Sahara	10	LB/A				
3	Roundup ProMax	1.3	QT/A	45 *ab*	44 *a*	11 *d*	0 *e*
	Hyvar	10	LB/A				
4	Roundup ProMax	1.3	QT/A	32 *bc*	8 *cd*	24 *bcd*	35 *cde*
	Oust XP	3	OZ/A				
5	Roundup ProMax	1.3	QT/A	17 *bc*	8 *cd*	63 *a*	14 *de*
	Payload	12	OZ/A				
6	Roundup ProMax	1.3	QT/A	20 *bc*	17 *bcd*	24 *cd*	38 *cde*
	Pendulum AquaCap	4	QT/A				
	Milestone VM	7	FL OZ/A				
7	Roundup ProMax	1	QT/A	8 *c*	22 *abcd*	48 *ab*	22 *cde*
	Journey	1	QT/A				
	Milestone VM	7	FL OZ/A				
8	Roundup ProMax	1.3	QT/A	28 *bc*	0 *d*	27 *bcd*	45 *bcd*
	Perspective	9	OZ/A				
	Esplanade	3.5	FL OZ/A				
9	Razor Pro	2	QT/A	45 *ab*	8 *cd*	26 *bcd*	21 *cde*
	Perspective	5	OZ/A				
	Esplanade	4	FL OZ/A				
10	Roundup ProMax	1.3	QT/A	23 *bc*	3 *d*	13 *d*	60 *abc*
	Perspective	9	OZ/A				
	Endurance	2.3	LB/A				
11	Roundup ProMax	1.3	QT/A	20 *bc*	35 *abc*	45 *abc*	0 *e*
	Viewpoint	18	OZ/A				
12	Roundup ProMax	1.3	QT/A	23 *bc*	45 *a*	31 *bcd*	1 *e*
	Polaris AC Complete	2	PT/A				
13	Roundup ProMax	1.3	QT/A	70 *a*	1 *d*	11 *d*	18 *cde*
	Esplanade	3.5	FL OZ/A				
	Oust XP	3	OZ/A				
14	Pyresta	24	FL OZ/A	2 *c*	0 *d*	5 *d*	93 *a*
	Proclipse	2	LB/A				
15	Untreated Check			8 *c*	0 *d*	7 *d*	85 *ab*

[1]All herbicide treatments (except Roundup ProMax alone, Treatment 1) contained the adjuvant, Activator 90 at 0.25% v/v.
[2]Means within a column followed by the same letter are not different according to Fisher's Protected LSD at P < 0.05.