Japanese Stiltgrass Control Trial at Fort Knox

Introduction

Japanese stiltgrass (*Microstegium vimineum*) is an invasive sprawling, dense, mat-forming annual grass, native to Asia. It is very shade tolerant but will quickly take advantage of extra sunlight and is common in forest edges, roadsides, trailsides, and disturbed areas such as skid trails (timber harvest). It's a prolific seed producer and humans and machinery readily spread the seed. The seed remains viable in the soil for 3 years. Successful management of stiltgrass requires a combination of control of existing plants before they produce seed and new plants coming up from the seedbank. This trial examined the efficacy of some selective herbicide control options for stiltgrass.

Materials and Methods

The trial was established September 24, 2013 on a skid trail within the forested Hunt Area 19 on Fort Knox. The trial had 9 treatments with 3 replications arranged in a randomized complete block design with 5 ft by 20 ft plots. Application was at 20 gallons /acre. The height of the stiltgrass plants was 16 to 27 inches, with some seedheads emerged in the areas receiving more sunshine. The early summer application was on July 15, 2014 when the stiltgrass plants were 10 to 20 inches tall. Stiltgrass control was assessed 14 (10/8/2013), 294 (7/15/2014), and 393 (10/22/2014) days after treatment (DAT). The last assessment was 99 DAT for the early summer application. Data on green vegetative cover (0-100%) were collected 294 and 393 (99) DAT. Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at $p = 0.05$.

Table 1 lists the treatments, active ingredients and application rates. Treatments 1 to 7 were applied in fall 2013, while Trt. 8 was applied in early summer 2014. All the treatments included products that had post-emerge and pre-emerge activity to control emerged stiltgrass and germinating seeds. The Fusilade II treatments would be the most selective with little damage to non-target broadleaf species. The expected period of pre-emerge activity varied among the treatments. The Pendulum AquaCap treatment (Trt. 8) was applied in early summer as its period of effectiveness is not as long as ProClipse (Trts. 5 and 7).

Results and Discussion

Most of the treatments, except for Plateau (Trt. 1), controlled stiltgrass greater than 96% 294 DAT (Table 2). However, the Plateau and Fusilade II (Trts. 4 and 5) treated plots had the most green vegetative cover 294 DAT. The OustExtra (Trt. 2), Fusilade II (Trt. 4, 5, and 8), and ProClipse (Trt. 5 and 7) treatments still had the greatest control (89 – 97%) 393 DAT. However, there was no difference in green vegetative cover between the Plateau and Milestone treatments and the control plots 393 DAT. The lowest vegetative cover was with the OustExtra (Trt. 2), ProClipse (Trt 5 and 7), and Pendulum AquaCap (Trt. 8 at 99 DAT) treatments. Final assessments will be done in 2015. There are a number of herbicide options which are effective for stiltgrass control and which would be selective for desired vegetation.

Table 1. Treatments and Active Ingredients for Japanese Stiltgrass Control Trial

Trt. No.	Product Name	Rate	Rate Unit	Active Ingredient(s)	AI Rate (per acre)
1	Plateau Activator 90	4 0.25	FL OZ/A % V/V	imazapic	1 oz ae
2	OustExtra Activator 90	3 0.25	OZ/A % V/V	sulfometuron + metsulfuron	1.69 oz + 0.45 oz
3	Milestone VM Activator 90	6 0.25	FL OZ/A % V/V	aminopyralid	1.5 oz ae
4	Fusilade II Activator 90	24 0.25	FL OZ/A % V/V	fluazifop	6 oz
5	Fusilade II ProClipse Activator 90	24 2 0.25	FL OZ/A LB/A % V/V	fluazifop prodiamine	6 oz 20.8 oz
6	Streamline Activator 90	4.75 0.25	OZ/A % V/V	aminocyclopyrachlor + metsulfuron	1.88 oz + 0.60 0z
7	Roundup ProMax ProClipse Activator 90	22 2 0.25	FL OZ/A LB/A % V/V	glyphosate prodiamine	12.38 oz ae 20.8 oz
8	Fusilade II Pendulum AquaCap Activator 90	24 4.2 0.25	OZ/A QT/A % V/V	fluazifop pendimethalin	6 oz 63.8 oz
9	Nontreated Check				

Table 2. Treatments and Results for Japanese Stiltgrass Control Trial

Trt. No.	Product Name	Rate	Rate Unit	Application Timing	% Control			% Green Veg.	
					14 DAT	294 DAT	393 DAT	294 DAT	393 DAT
1	Plateau Activator 90	4 0.25	FL OZ/A % V/V	Fall	13 *de*	72 *b*	40 *d*	57 *b*	75 *ab*
2	OustExtra Activator 90	3 0.25	OZ/A % V/V	Fall	13 *de*	99 *a*	94 *abc*	23 *c*	28 *e*
3	Milestone VM Activator 90	6 0.25	FL OZ/A % V/V	Fall	33 *cd*	97 *a*	78 *c*	35 *c*	63 *abc*
4	Fusilade II Activator 90	24 0.25	FL OZ/A % V/V	Fall	40 *bc*	97 *a*	89 *abc*	60 *b*	57 *bcd*
5	Fusilade II ProClipse Activator 90	24 2 0.25	FL OZ/A LB/A % V/V	Fall	25 *cd*	99 *a*	99 *a*	57 *b*	43 *cde*
6	Streamline Activator 90	4.75 0.25	OZ/A % V/V	Fall	60 *b*	97 *a*	81 *bc*	35 *c*	57 *bcd*
7	Roundup ProMax ProClipse Activator 90	22 2 0.25	FL OZ/A LB/A % V/V	Fall	98 *a*	99 *a*	97 *ab*	22 *c*	30 *e*
8*	Fusilade II Pendulum AquaCap Activator 90	24 4.2 0.25	OZ/A QT/A % V/V	Summer	0 *e*	0 *c*	97 *ab*	85 *a*	37 *de*
9	Nontreated Check				0 *e*	0 *c*	0 *e*	82 *a*	83 *a*

Means within a column followed by the same letter are not different according to Fisher's Protected LSD at P < 0.05.
** Treatment 8 was unsprayed at 14 and 294 DAT. Assessment at 393 DAT was 99 days after application for this treatment.*