

Identification and Control of *Serecia Lespedeza* (*Lespedeza cuneata*) (Dum. – Cours.)

Introduction

Serecia lespedeza, otherwise known as Chinese lespedeza, is a perennial leguminous forb native to Asia. Introduced in the late 1800s as a potential forage species, it was later used as a reclamation species planted on acidic and low fertility soils (Koger 2003). Government programs also supported the use of *serecia lespedeza* as a soil stabilizer and food source for wildlife plantings (mainly quail). Infestations occur across the southeastern United States from Oklahoma and Texas to Virginia, the Carolinas, to Florida.

Serecia lespedeza is an upright forb and can reach heights up to 6 feet (Miller 2004). Stems are angular, herbaceous to semi woody, and are grey-green in color with pubescence. Leaves are trifoliate, alternate in arrangement, and appear in clusters. Flowers appear from July to September in the upper leaf axils and are white in color with purple markings. Seeds occur in round single seeded legume pods October through March. Typical seed yields range from 205 to 1015 lbs / ac (Farris et al 2004) and these seeds can remain viable for decades (Miller 2004). Along with this prolific seed production, *serecia lespedeza* has the ability to reproduce vegetatively from crown bud regrowth after disturbance, further aiding in its invasibility. *Serecia lespedeza* can occur in wide array of sites including roadsides, forest openings, dry upland sites, and moist savannahs. *Serecia lespedeza* is flood tolerant and somewhat intolerant to shade.

Recommendations for control include herbicide applications of triclopyr, metsulfuron methyl, and clopyralid. Prescribed burning and mowing may increase herbicide efficacy. Miller (2004) recommends foliar sprays of triclopyr ester as a 2 % solution, metsulfuron methyl at 0.75 oz per acre, clopyralid as a 0.2 % solution, hexazinone as a 2 % solution, or glyphosate as a 2 % solution. Cargill et al (2002) found effective control 2 months after treatment (MAT) with 1 and 1.5 pts of Garlon 4 per acre (92 and 98 % control respectively). Fluroxypyr (Vista®) realized 94 % and 98 % control when tested at 1 and 1.3 pts per acre at the same evaluation interval. These levels of control were maintained at 3 MAT.

Overdrive® is a granular herbicide labeled for use in noncrop and rights-of-way areas. It is a combination of dicamba (0.5 lb ae / lb of product and diflufenzopyr (0.2 lb ae / lb of product). A study was initiated in the summer of 2005 to examine Overdrive in combination with Vista for *serecia lespedeza* control. Specifically, treatments were designed to test the ability of Overdrive to control *serecia lespedeza* in combination of low rates of Vista.

Methods and Materials

The study was located on a reclaimed coal mine on the property of Hopkins County Coal in Hopkins County, KY. *Serecia lespedeza* was the dominant species with approximately 95 % cover in the study area. Height of lespedeza ranged from 1.5' to 4' at application. The trial was installed as a randomized complete block design with three replications and 13 treatments (including an untreated control) (Table 1). Plots were 10'

by 20' with a majority of the cover (> 90%) in each plot being serecia lespedeza. Treatments included Vista at 24, 16, 12, and 8 fl oz / ac alone and in combination of either 4 or 6 oz of Overdrive per acre. Applications were made at 20 GPA using a CO₂ powered boom sprayer mounted on an ATV and all treatments included methylated seed oil (MSO) at 32 fl oz / ac. Treatments were applied on June 16, 2005 and rated at 19, 35, 53, and 89 DAT for percent control.

Results

There were no significant differences between any treatment at the first evaluation interval (19 DAT) and control levels ranged from 37 % (treatment 4) and 50 % (treatment 5) at this evaluation interval (Table 1). The highest control levels realized at the 35 DAT interval were seen with the treatments incorporating the high rate of Vista (24 fl oz) and Vista alone at 16 fl oz. This trend continued through all following evaluation dates and is shown visually in Figure 1. The highest level of control at 53 DAT came from the high rate of Vista (24 fl oz) tank mixed with the high rate of Overdrive (6 oz) although this treatment was not significantly different than any other treatment except for Vista @ 12 fl oz + Overdrive @ 6 oz. The Vista alone at 16 fl oz provide high control levels (91 %) at 89 DAT; however, was only significantly higher than the Vista @ 12 fl oz + Overdrive @ 6 oz and the Vista @ 8 fl oz + Overdrive 6 oz treatments. There was no significant difference between this treatment and either the Vista alone at 8 fl oz or the Vista at 8 fl oz + Overdrive at 4 oz at 89 DAT. This indicates the potential of Overdrive to increase the efficacy of Vista at low rates in controlling serecia lespedeza; however, the difference in control levels between the high and low rates of Vista both with and without Overdrive may be operationally unacceptable.

The study site was dominated by a dense serecia lespedeza infestation and represents a 'worse case scenario'. The treatments examined here may be more efficacious controlling less dense populations. The study will be retreated in 2006 to examine the potential of sequential applications in removing serecia lespedeza.

Literature Cited

Cargill, L.M., Montgomery, D.P., Martin, D.L., and Bell, G.E., 2002. Evaluation of herbicides for serecia lespedeza (*Lespedeza cuneata*) control along highway rights-of-way in Oklahoma. Proc. So. Weed Sci. Soc. 55: 103.

Farris, R.L., Murray, D.S., Anderson, M.P. and Yerramsetty, P., 2004. Adaptation and biology of serecia lespedeza. Proc. So. Weed Sci. Soc. 57: 234.

Koger, C.H., 2003. Serecia lespedeza (*Lespedeza cuneata*). Proc. So. Weed Sci. Soc. 56: 371.

Miller, J.H., 2003. Nonnative invasive plants of southern forests. USDA Forest Service Southern Research Station. GTR SRS-62. p.65, 84.

Table 1: Treatment list and percent control of serecia lespedeza

| Treatment | Product(s) | Rate per acre | 19 DAT | 35 DAT | 53 DAT | 89DAT |
|---------------------------|--------------------------|------------------------|---------------|---------------|---------------|--------------|
| 1 | Vista | 24 fl oz | 45a | 80a | 87ab | 80abc |
| 2 | Vista + Overdrive | 24 fl oz + 4 oz | 43a | 78a | 88ab | 87ab |
| 3 | Vista + Overdrive | 24 fl oz + 6 oz | 45a | 82a | 92a | 88ab |
| 4 | Vista | 16 fl oz | 37a | 78a | 90ab | 91a |
| 5 | Vista + Overdrive | 16 fl oz + 4 oz | 50a | 75ab | 78ab | 73abc |
| 6 | Vista + Overdrive | 16 fl oz + 6 oz | 47a | 67ab | 78ab | 72abc |
| 7 | Vista | 12 fl oz | 47a | 72ab | 78ab | 73abc |
| 8 | Vista + Overdrive | 12 fl oz + 4 oz | 47a | 75ab | 83ab | 80abc |
| 9 | Vista + Overdrive | 12 fl oz + 6 oz | 48a | 70ab | 73b | 65c |
| 10 | Vista | 8 fl oz | 42a | 62b | 75ab | 80abc |
| 11 | Vista + Overdrive | 8 fl oz + 4 oz | 43a | 77ab | 85ab | 77abc |
| 12 | Vista + Overdrive | 8 fl oz + 6 oz | 48a | 67ab | 75ab | 70bc |
| 13 | Control | | 0 | 0 | 0 | 0 |
| LSD_{0.05} | | | 16.7 | 16.1 | 17.4 | 20.2 |

Note: Treatment means followed by the same letter are not significantly different using Fisher's LSD at p = 0.05. Control treatment removed from analysis.

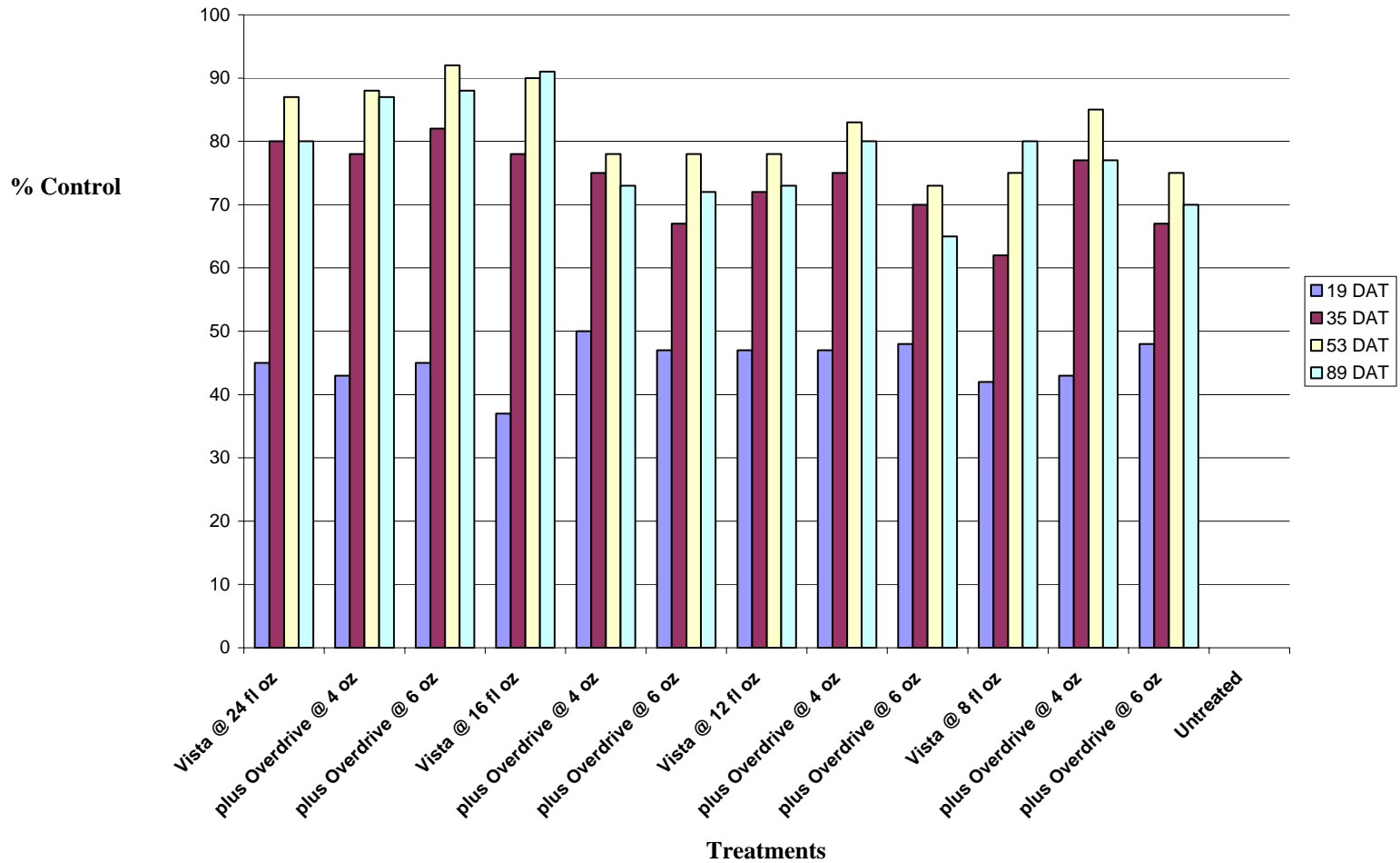


Figure 1: Control levels for *Serecia Lespedeza*