

Sericea lespedeza (*Lespedeza cuneata*), a perennial legume native to Asia, was originally introduced into the United States in 1896 for use as forage for livestock and as an erosion control plant. While *sericea lespedeza* remains an important forage crop in several southeastern states, it has become an invasive weed in the tallgrass prairie region.

Sericea lespedeza aggressively competes with native prairie plants of the tallgrass prairie region, and can result in a substantial reduction of native grasses and broadleaf plants (forbs). Researchers at Emporia State University found that the number of grass and forb species in severely infested fields in east-central Kansas declined by 66% and 74%, respectively. In a Kansas State University study, native grass production was reduced by as much as 80% when compared to non-infested areas.

An effective method of controlling *sericea lespedeza* is the application of triclopyr (Remedy Ultra® & generic triclopyr), metsulfuron (Escort XP® & generic metsulfuron) or

Table 1. Small quantity herbicide mixtures for spot spraying *sericea lespedeza*.

Volume	tri-clopyr ¹ 'remedy'	metsulfuron ² 'escort'	Pasture-Gard ^{®3}	NIS ⁴	Dye ⁵
1 gal	0.66 fl. oz.	0.3 gm.	1 fl. oz.	0.3 oz. (2 tsp.)	0.25 oz. (1.5 tsp.)
5 gal	3.25 fl. oz.	1.5 gm.	5 fl. oz.	1.5 oz. (3 tbsp.)	1.25 oz. (2.5 tbsp.)
15 gal	9.75 fl. oz.	4.5 gm.	15 fl. oz.	4.5 oz. (9 tbsp.)	4 oz. (0.5 cup)
25 gal	1 pt.	7.5 gm.	1.5 pt.	7.5 oz. (1 cup)	7 oz. (~1 cup)

¹Equal to 0.66% solution (1 pt. per ac.)

²Equal to 1.0 ounce per 100 gallons of water, or equivalent to applying 100 to 200 gallons per acre.

³Equal to 1.0 fl. oz. per gal of water

⁴Non-Ionic Surfactant (NIS) equal to 0.25% volume to volume, or 1 qt./100 gallons of solution. Use only with metsulfuron.

⁵The use of water soluble dye is optional.

Table 2. Herbicide rates to control *sericea lespedeza* using broadcast application methods.

acres	gallons ground/aerial	tri-clopyr	Metsulfuron	Pasture-Gard [®]	NIS ¹ ground/aerial
1	20/5	1.5 pt.	0.5 oz.	3 pt.	1 cup/3 tbsp.

¹Non-Ionic Surfactant (NIS) is required for metsulfuron only. NIS should be mixed at a rate of 1.0 quart per 100 gallons of spray solution for ground-rig applications.

PastureGard[®] (refer to Tables 1 & 2 for recommended application rates, based on research by Kansas State and Oklahoma State universities). When used at the proper rate, herbicides can provide effective control. K-State research has shown up to a 97 percent kill rate for triclopyr and metsulfuron after three years of treatment (Kilgore, unpub. data). However, new seedlings may be problematic, requiring repeat applications.

Unfortunately, these herbicides can be injurious to non-target, broadleaf plant species. A native prairie meadow in the tallgrass prairie region may hold over 150 native plant species, many of which are very sensitive to herbicides. Besides their aesthetic and ecological values (e.g., nectar for insects and sources of seeds for birds and small mammals), deep-rooted forbs perform a valuable agricultural service by recycling minerals and nutrients back to the surface where they can be utilized by grasses and other prairie plants. A number of these plants are also palatable and highly nutritious to livestock.

Metsulfuron ('escort') is believed to be less damaging to native forbs than triclopyr ('remedy') and PastureGard[®] because many forb species are not actively growing during the recommended application date for metsulfuron; i.e., mid-September vs. mid-June for triclopyr and PastureGard[®]. Nevertheless, about half of the prairie's native forbs

have at least a portion of their reported flowering dates going into September. Therefore, applications of metsulfuron ('escort') should be delayed, if possible, until mid-September to early October, as long as there are open flowers on the *sericea* plants. Otherwise, a significant forb component could still be affected, especially from the cumulative effect of repeated treatments. On the other hand, an application date too late in the season may allow *sericea* to set viable seed.

Spot spraying individual *sericea* plants with the above mentioned herbicides is environmentally responsible. It reduces damage to desirable plants, the potential of off-site drift, and the amount of herbicide that could enter streams and ponds.

Spot spaying is also cost effective. For example, the cost using contract labor to spot spray 640 acres with a scattered infestation of *sericea* would be about \$2,000 (Table 3), whereas the cost to aerially treat the same acreage could well exceed \$10,000 (Table 4). Actual chemical costs will vary depending on source of supply; land managers should contact their county noxious weed director to find out what cost share programs are available; many Kansas counties provide cost assistance to control noxious weeds.

It is not realistic to consider spot spraying as the only method of applying herbicides to control *sericea*. In severely infested habitats, especially if they lack a diversity of native forbs, broadcast applications are recommended. Broadcast applications with a ground sprayer are generally less expensive than aerial applications, and reduce the potential of off-site drift. However, rough terrain may require aerial applications.

Chemical control may be enhanced by management methods that reduce both the

competitive advantage of *sericea* and the setting of seed. These methods may include using goats as a complimentary grazing animal and altering season of burn.

Spot spraying applications

Triclopyr ('remedy') and PastureGard[®] are best applied in early summer when *sericea* plants are actively growing and 12-15 inches tall. Metsulfuron ('escort') is most effective from early September and later, provided open flowers are present on *sericea* plants. Because the optimal application dates for these herbicides differ, a land manager may want to utilize a combination to provide added flexibility. An initial spot spraying application with triclopyr and PastureGard[®] in the early summer followed by a second treatment with metsulfuron in the fall will result in a more effective control. A June treatment with either triclopyr or PastureGard[®] is recommended in CRP fields and ungrazed pastures, because of the difficulty of locating *sericea* plants in tall vegetation later in the season.

Metsulfuron ('escort') should be applied with a non-ionic surfactant (e.g., Activator 90[®] or X-77[®], but not crop oil) at the rate of one quart per 100 gallons of water. A surfactant is not necessary for triclopyr ('remedy') or PastureGard[®]. Avoid applying any of these herbicides when temperatures exceed 90°. When mixing small quantities of metsulfuron (<25 gal.; Table 1), a gram-scale measurement tube is highly recommended to ensure accurate herbicide rates. It is also recommended that a spray marker or water soluble dye (preferably blue) be included in spot spraying solutions to minimize the skipping of plants or overspray.

If control methods are to be successful, spot spraying efforts should begin before the level of infestation becomes heavy. Repeated applications will be necessary, whether broad-

Table 3. Cost analysis of spot spraying (using a contractor @ \$40/hr.) to control sericea lespedeza in native rangeland using metsulfuron, triclopyr and PastureGard®. Actual application rates may vary depending on the level of infestation. See Table 1 for proper mixing rates. Cost estimates are based on local dealer prices of non-generic herbicides; be sure to contact your county noxious weed director to find out if any herbicide cost share programs are available in your county¹.

Level of Infestation	Area per hr	Labor ²	Solution	Escort XP® metsulfuron	Remedy Ultra® triclopyr	Pasture-Gard®	NIS ³	Dye	Total cost per acre:	
									Escort XP®	Remedy® /PastureGard®
Sparse	20 ac.	\$2.00/ac.	1 qt.	4¢/ac.	14¢/ac.	14¢/ac.	1¢/ac.	3¢/ac.	\$2.08	\$2.17
Scattered	15 ac.	\$2.67/ac.	1 gal.	14¢/ac.	55¢/ac.	55¢/ac.	4¢/ac.	11¢/ac.	\$2.96	\$3.33
Light	10 ac.	\$4.00/ac.	2.5 gal.	36¢/ac.	\$1.38/ac.	\$1.38/ac.	10¢/ac.	28¢/ac.	\$4.74	\$5.66
Moderate	5 ac.	\$8.00/ac.	5 gal.	72¢/ac.	\$2.75/ac.	\$2.75/ac.	20¢/ac.	55¢/ac.	\$9.47	\$11.30
Heavy	2.5 ac.	\$16.00/ac.	7.5 gal.	\$1.07/ac.	\$4.13/ac.	\$4.13/ac.	30¢/ac.	83¢/ac.	\$18.20	\$20.96
Severe ⁴	...	...	...	...	...	...	...	...	...	...

¹ Escort XP® @ \$13.50/oz. (48¢/gm.); Remedy Ultra® @ \$105.00/gal. (82¢/oz.); PastureGard® @ \$70.00/gal. (55¢/oz.); Activator 90® (Non-ionic surfactant) @ \$17.60/gal. (14¢/oz.); Dye @ \$54.00/gal. (42¢/oz.). County subsidized and/or generic herbicide products will significantly reduce the cost per acre.

² Based on an hourly rate of \$40.

³ NIS = non-ionic surfactant is required for metsulfuron; optional for triclopyr and PastureGard®.

⁴ It may not be practical to spot spray sericea lespedeza when the level of infestation is severe.

cast or spot applied. Poor growing conditions, such as extended dry periods and high temperatures, will stress sericea and reduce the effectiveness of herbicides. An early frost may make herbicide applications ineffective as well. Spot spraying following a broadcast application will substantially reduce the need for additional broadcast applications.

Broadcast applications

Broadcast applications should only be made when there is little or no risk of spray drift. Winds speeds should be less than 10 mph, and avoid calm conditions as they may be conducive to air inversions. Twenty gallon per acre (GPA) spray solutions give the best results for ground broadcast applications,

whereas a 5 GPA spray solution is recommended for aerial applications. Be sure to use flat-tip nozzles tips (instead of flood nozzles). If one must apply herbicides in hot and dry conditions, set spray equipment to produce larger droplets. Use a non-ionic surfactant with

Table 4. Cost (per acre) for broadcast applications of herbicides to control sericea lespedeza.

	Escort XP® metsulfuron	Remedy Ultra® triclopyr	PastureGard®
Ground	\$11.96	\$24.70	\$31.25
Aerial	\$14.46	\$27.20	\$33.75

Based on equipment/labor cost estimate of \$5.00/ac. for ground applications and \$7.50/ac. to spray aerially. See Table 2 for chemical application rates, and Table 3 (footnote) for estimated herbicide and surfactant costs.

No endorsement is intended for chemical product names, and criticism is not implied for chemical products not mentioned.

metsulfuron (‘escort’) at the rate of one quart per 100 gallons of water (Table 2). Also, be sure to use the volumetric measurement cone (ounce-scale version) to ensure accurate herbicide measurements. As with all herbicides, be sure to read and follow label directions for application directions and haying and grazing restrictions.

Concluding remarks

The control of sericea will require a long term effort by land managers. Sericea lespedeza seed can remain viable for many years, and can be spread by water, wildlife, and livestock, making the eradication of sericea lespedeza next to impossible. Therefore, it is important that land managers learn how to manage this plant to prevent bankrupting themselves or the biodiversity of the prairie. It is imperative to begin control measures as soon as the first sericea lespedeza plants are detected. Sericea can be controlled at a minimal cost if detected early and promptly treated by spot spraying. However, yearly inspections and treatments will be required to maintain control of sericea.

For additional information, refer to these publications:

- Ecology and management of Sericea Lespedeza, F-2874 (Oklahoma Cooperative Extension Service)
- Sericea Lespedeza: history, characteristics, and identification, MF-2022 (Kansas State Cooperative Extension Service)

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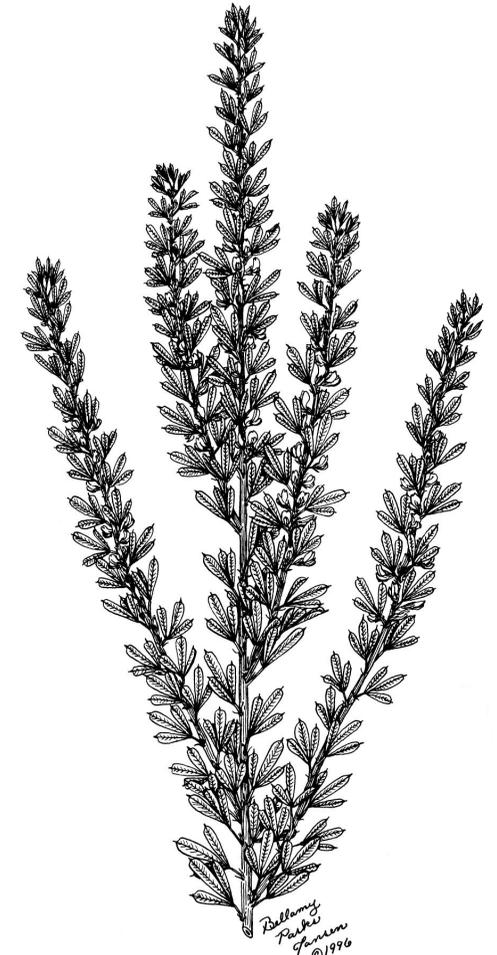
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Spot spraying Sericea Lespedeza

A cost effective control

A publication of the
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