SERICEA LESPEDEZA
BIOLOGY AND CONTROL

Jeff Davidson, K-State Research & Extension, Greenwood County Agent
Gary Kilgore, K-State Research & Extension, SE Area Extension Specialist, Crops & Soil

HISTORY

Sericea lespedeza (*Lespedeza cuneata*) is an introduced perennial legume that was first recognized as a potential weed problem in Southeast Kansas in the early 1980's. Since that time it has spread profusely throughout southeast Kansas and beyond, now occurring in most counties of the State. Southeast Kansas counties began declaring it a "county option" noxious weed in the late 1980's, and in the year 2000 it became a statewide noxious weed in Kansas. This is the first time that a federally listed crop has been declared noxious

VEGETATIVE AND REPRODUCTIVE CHARACTERISTICS

Sericea lespedeza is a perennial legume with erect stems up to 5 ft. tall and small hairs laying flat along the ridges on the stem. The leaves, with 3 leaflets, are less than 1 inch to 11/2 inches long and one fourth to ½ inch wide with the larger leaflets on the lower portion of the stem. The leaves are flattened on the outer end with small flat hairs on the lower surface. The plant makes most of its vegetative growth in April through July. Flowering occurs from mid or late July to October and may be tinged with purple but always dry to yellow. It is a short-day plant with a critical photo period of less than 14 hours. It is mostly self-pollinated but 2-13% of the flowers may be open pollinated (the latter is favored by long days and high temperatures).

Sericea lespedeza reproduces primarily by seed, and typically will begin seed production in the 2nd year. Seeds move with water, infested hay, birds, livestock and wildlife. It is a prolific seeder producing as many as 1500 seeds per ramet, or stem, and is a multi-stemmed plant. Seed yields of 200 to 400 pounds per acre can be expected. Only 10 to 15% of the seed produced will germinate the following year. The remainder are "hard" and contribute to establishment of a seed bank in the soil. Dormancy of seeds may be broken by freeze/thaw cycles, ingestion by animals, or fire. Ideal germination conditions require temperatures above 70°F. Although total seed set will be reduced, plants under severe stress may still set some seed.

COMPETITIVE CHARACTERISTICS

Sericea lespedeza, once established, will reduce or eliminate competing vegetation. However, it is relatively slow to establish, having a rather weak and vulnerable seedling stage. On the other hand, it is opportunistic, and will establish itself in full sun or shade.

It perhaps establishes best where competing vegetation is very short and light is allowed to reach the germinating seedlings. Many legumes need good exposure to sunlight during the seedling stage. However, Sericea seedlings will also germinate and survive where ground cover and other plant competition is quite dense. It has established in fence rows, brushy and grassy

areas, where fire and grazing have been excluded for years.

Once established, it restricts the amount of light reaching other plants because it is tall with multiple branches and dense foliage. It requires more water to produce foliage than other warm season plants, creating a "drought" for competing vegetation. It also produces allelopathic chemicals that inhibit seed germination and growth of other plants. Some of these chemicals are produced by the roots, while others come from plant residue, chiefly leaves. Root extracts from Sericea have been shown to reduce germination of bermudagrass by 9 percent and forage production of bahiagrass, bermudagrass, rye, ryegrass and tall fescue by as much as 15, 24, 7, 11, and 15 percent respectively.

Although Sericea is a legume, it furnishes very little nitrogen to surrounding plants, and that amount is negated by the effects of the allelopathic toxins it produces. Rather than providing nitrogen for other plants, it actually makes it necessary to add nitrogen to maintain production of introduced forages. The shoots of grass exposed to the toxins of Sericea residue have lower nitrogen content, and overcoming the loss of production caused by the toxins requires nitrogen fertilization.

Sericea has a large tap root system with well-developed fibrous roots near the surface. A study of carbohydrate storage in the root/crown region showed a dramatic decrease in late summer coincident with the onset of flowering. During the early, vegetative growing season, carbohydrate accumulation varied with environmental conditions, especially moisture. With the onset of flowering, there is sustained increase in storage reserved until first frost. It is also at the late stage of the growing season that new buds are formed on the crown of the plant. These developments provide storage reserves to support new bud break from the crown the following spring. These data suggest that the mature plant may be most susceptible to a variety of treatments just before the onset of flowering.

CONTROL

As with any weed problem, early detection and treatment is paramount to controlling this biological pollutant. Investing the time to control scattered plants and isolated patches must be done. Remedy, Escort, and PastureGard are the chemicals of choice at the present time for controlling Sericea lespedeza. Once it becomes established over a wide area, an integrated approach to control is necessary. Conventional management practices such as prescribed grazing and fire have been less than effective in preventing the spread of Sericea in rangelands. However, use of fire will result in old forage removal and increase exposure of target to herbicide during a June treatment.

Some suppression of Sericea has been observed after mowing or burning followed by intensive early stocking with stocker cattle. It is advisable to not graze Sericea infested range in the fall when the plants are flowering and producing seeds, because livestock will consume the seeds and deposit them elsewhere in manure. Intensive early stocking puts grazing pressure on the plants early in the season, but cattle are not there during seed set. On the other hand, it is defoliation of Sericea in late summer or fall that will set it back. Goats will provide some control as they do eat Sericea much better than cattle. However, any grazing control program must be closely monitored and continued once begun. Grazing the Sericea plant will increase the number of tillers of each individual plant, leaving a larger, "bushier" plant if grazing is ceased.

Mowing will reduce the vigor of sericea plants if they are cut closely multiple times each year. When mowed, Sericea regrows within 7 weeks. Plants should be mowed each time they reach a height of 12-18 inches. The most damaging time to cut sericea is late in the growing season when the plants are trying to build root reserves. However, mowing will not kill Sericea, and may damage desirable grasses. Mowing should eliminate or greatly reduce seed production.

Fire is an important grassland management tool. Burning native bluestem grass increases cattle gains, and maintains the desirable, fire tolerant plants, while eliminating many of the unwanted, non-native plant species. Sericea, however, is not affected by fire and germination of Sericea seed and seedling establishment is actually enhanced by fire. However, timing of the burn is apparently most critical on pastures infested with Sericea. Preliminary study indicates that late spring burning, May 1 to May 5, will retard the growth and seeding rate of Sericea, while maintaining good grass production. Late spring burn will also kill early emerged Sericea seedlings. This management practice, of simply burning Sericea infested pastures late, pushing the May 1 date as much as possible, may reduce the vigor and seed production of Sericea.

Chemical control includes three options.

* metsulfuron methyl (common name is Escort XP, but generic formulations of metsulfuron are available) applied in the fall when sericea is in bloom at the rate of ½ ounce per acre.
* trichlopyr (common name is Remedy) applied in June or early July at the rate of 11/2 pint per acre.
* Pasturegard (trichlopyr + fluroxypyr) apply at rate of 2 pint per acre.

Soil moisture should be adequate to allow for good growth of Sericea plants at time of application. The decision of which chemical to use should include the following factors:

A. **Other targeted weed species.**
If other weeds are present with Sericea, Remedy or Pasturegard applied in June is more likely to reduce other weeds, such as ragweed, broomweed and goldenrod. Escort applied in late September does minimal damage to native forbs or "other weed" populations. This may be an advantage of the Escort, if you want to maintain the native forb population.

B. **Carryover seedling suppression.**
Escort applied in late September through early October could have some carryover affect the following spring to seed germination.

C. **Importance of preventing current year seed set.**
Remedy applied in June will kill the plant, preventing current year seed production. Escort applied in late September will likely prevent most seed, but some may be set by that time and remain viable. If the Sericea stand is established and been there for several years, the seed bank in the soil is large and current year seed production is of minimal importance. Conversely, if the problem is a recent infestation, eliminating current year seed is very important.

D. **Convenience of timing.**
When is it more convenient to treat, June or late September? The grazing system or season will have an influence on this decision.

CONTROL (Application)

Ground applications of either Remedy, Escort, or PastureGard - should apply a volume of at least 15 and preferably 20 gal of solution per acre. Flat fan nozzle tips are recommended. Flood nozzles distribute too large of droplet, diminishing coverage of the target weed..

Aircraft applications should be with 5 gallons of water. Applications using 3 gallons or less do not seem to get adequate coverage or penetration in thick stands of Sericea.

Chemical control should be approached with at least two applications planned, and some spot spraying in addition. The initial application may well need an additional application two or three years later. Spot treatment of skips, fence rows and under trees are needed to complete a control application.

Remedy and PastureGard applications work best when the new growth is 12 to 15 inches tall, which usually occurs in June. The broadcast application rate for Remedy is 1.5 pt/a. The rate for PastureGard is 2.0 pts/a.

Escort XP works best when applied in the fall when the sericea lespedeza plants are flowering. Depending on moisture, that could be as early as mid-August, but generally occurs in September. If fall weather is dry, delay application until flowers open. Dry weather will result in poor herbicide uptake and poor control. Apply Escort XP at the broadcast rate of 0.5 fl oz/a. Add a non-ionic surfactant to Escort XP.

Spot Treatment. The above herbicides can also be used for spot treating individual plants or scattered infestations. Timing is the same for spot treatments as broadcast treatments.

Table 3 gives mix rates for different size sprayers. Remember non-ionic surfactants need to be used with Escort XP.

Table 3. Small quantity herbicide mixtures for spot spraying sericea lespedeza.

Volume	Remedy[1]	PastureGard[2]	Escort XP[3]	NIS[4]
1 gallon	1.33 fl oz (2.66 tbsp.)	1.0 fl oz (2.0 Tbsp)	0.3 gm	0.3 oz (2 tsp.)
5 gallon	6.5 fl oz (13 tbsp)	5.0 fl oz (10 Tbsp)	1.5 gm	1.5 oz (3 tbsp)
15 gallon	19.5 fl oz (1 pt + 7 tbsp)	15.0 fl oz	4.5 gm	4.5 oz (9 tbsp)
25 gallon	1 qt	1.5 pt	7.5 gm	7.5 oz (1 cup)

[1]Equal to 1% solution of Remedy.

[2]Equal to 1.0 fl oz PastureGard per gallon

[3]Equal to 1.0 ounce per 100 gallons of water, or equivalent to applying 100 to 200 gallons per acre. Chemical supplier can supply a measuring cylinder to measure small amounts of Escort XP.

[4]Non-Ionic Surfactant (NIS) equal to 0.25% volume to volume, or 1 qt/100 gallons of solution. Use only wi Escort XP.

All chemicals are subject to label statements. Those who apply chemicals are responsible for correct use. **Always read the label before purchase and/or use.** Be sure you know how to apply, rate to apply, time o year to apply and use restrictions. **The User is Responsible.**

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