Ecology and Management of Sericea Lespedeza

Lance T. Vermeire
Rangeland Research Associate

Terrence G. Bidwell
Professor and
Extension Rangeland Specialist

Jim Stritzke
Professor and
Extension Weed and Bush Control Specialist

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
http://www.osuextra.com

Sericea lespedeza (*Lespedeza cuneata*) (Figure 1) is an introduced perennial legume, relatively free of insect and disease problems. It is very competitive and highly tolerant of a variety of conditions, which are among the reasons it has become an invasive and noxious weed in Oklahoma. Sericea was planted in the past to control soil erosion and provide forage for livestock and wildlife. From these plantings, it has been spread by animals and movement of hay contaminated with sericea seed to native prairies, shrublands, forests and introduced pastures. Normal management practices such as grazing, burning and applying 2,4-D herbicide do not control sericea lespedeza. Sericea lespedeza should be officially classified as a noxious weed in Oklahoma.

Sericea has been found growing in all parts of Oklahoma, except the Panhandle, and has been designated a noxious weed in southeastern Kansas because of its ability to invade and decrease grass production on rangelands and introduced pastures. It has had a negative impact on forage production for livestock, food and cover for wildlife and biological diversity.

Mature sericea plants are 18 to 40 inches tall with coarse stems and leaves composed of three spatula-shaped leaflets with squared-off ends (Figure 2). Sericea often is confused with desirable native legumes, especially slender lespedeza, which looks very similar to sericea lespedeza. Note the tips of slender lespedeza (*Lespedeza virginica*) leaflets are more rounded and do not have a conspicuous point at the end of the leaf (Figure 3). Pure stands of sericea may produce 430 to 850 pounds of seed per acre per year with about 350,000 seeds in each pound. Seedlings are not very competitive, but, once established, are long-lived.

Sericea will tolerate soils ranging from very acidic to slightly alkaline, but prefers a pH of 6.0 to 6.5. It does best on clayey and loamy soils that are deep, fertile, and well-drained, but will also grow on poor sites. Sericea uses water less efficiently than many other warm-season plants and does best when annual precipitation is 30 inches or more, which explains why it is a greater problem in eastern Oklahoma. However, sericea occurrence has been reported on Conservation Reserve Program (CRP) lands and rangelands in western Oklahoma.

Figure 1. Sericea lespedeza.

History in the United States

Sericea lespedeza was first brought to the United States from Japan in the 1890s. Agronomists soon learned it was tolerant of drought, acidity and shallow soils of low fertility. Because of this, sericea first was used as a protective cover for poor sites. Two varieties of sericea were developed for improved quality and to resist nematodes. These varieties were used on strip mines, highway right-of-ways, dams and waterways. Sericea also was promoted for use in wildlife food plots during the 1950s.

Forage Quality

Sericea lespedeza has high levels of crude protein, negated by high concentrations of a class of chemical compounds called tannins. Tannins bind proteins, leaving them unavailable for digestion. They also reduce the palatability and digestibility of forages. The level of tannins in sericea increases with maturity of the plant, high air temperatures, and low rainfall. New varieties of sericea have been developed with lower tannin concentrations, but tannin levels are still high and forage production is 15 percent lower than that of high tannin varieties.

Animal performance of goats and sheep grazing sericea is variable, but grazing trials with steers and heifers in Alabama suggest higher daily gains can be achieved on native grasses in Oklahoma with much less intensive management.

Competitive Effects

Once established, sericea lespedeza will reduce or eliminate competing vegetation. Sericea restricts the amount of light other plants can use because it is tall and produces multiple branches with dense foliage. More water also is used to produce each pound of sericea forage because it is less efficient in water use than most warm-season plants. In addition to competing for light, water, and nutrients, sericea produces allelopathic chemicals (toxins) that inhibit seed germination and growth of other plants. Some of these toxins are produced by the roots, while others come from plant residues, mainly 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, seven, 11 and 15 percent, respectively. Reports of influences of sericea root exudates are variable for germination and production of forage species.

Sericea is a legume, but furnishes very little nitrogen to surrounding plants, and is negated by the effects of the toxins it produces. Rather than providing nitrogen for other plants, sericea actually makes it necessary to add nitrogen fertilizer 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.

Much of the research on the competitiveness of sericea lespedeza has been conducted with introduced forages in greenhouses. Because studies involving introduced forages often occur in controlled environments and focus on individual factors of competition, the combined negative effects on native plants in the uncontrolled environment of native prairies and forests are probably much greater. For example, in one study, sericea seeded with switchgrass quickly dominated the area and switchgrass was eliminated by the third year.

Wildlife and Plant Community Diversity

Sericea lespedeza has been promoted for use in wildlife food plots and revegetation of roadsides and bare ground, but its value for these purposes is not supported by research or practical experience. Deer will not utilize sericea unless it is kept short by mowing or grazing. Quail occasionally consume the seeds and some wildlife species will use sericea for thermal cover during the summer. Cover, however, is lacking when sericea is dormant because it reduces many desirable native plants. The exclusion of other plant species by sericea also reduces the diversity of plant foods needed to support wildlife. Wildlife are adapted to the native plants of an area and are much better served by them for food and cover.

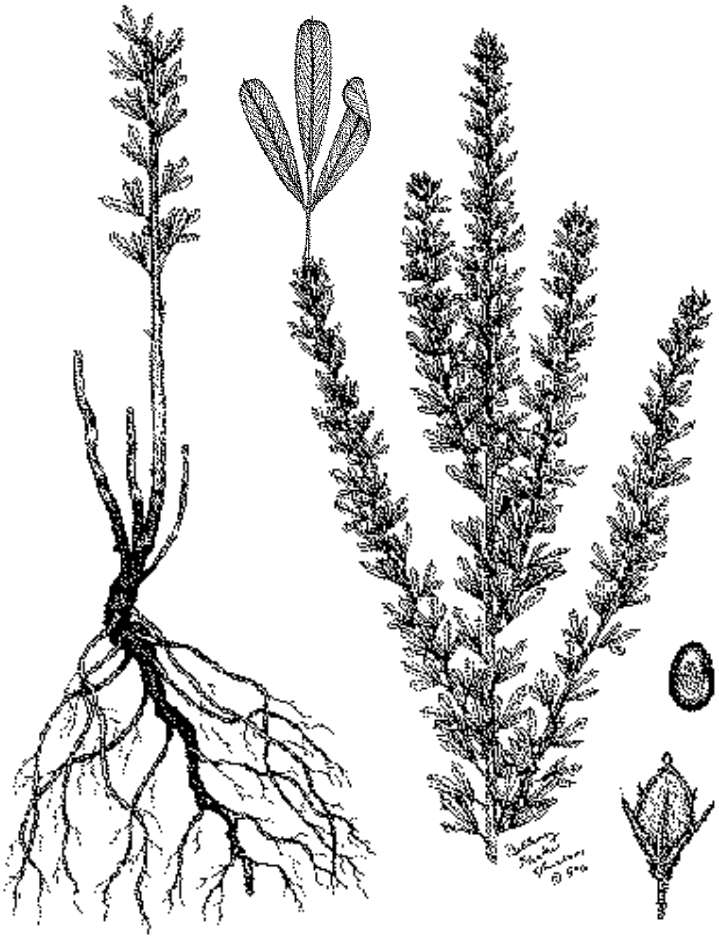

Figure 2. Sericea lespedeza.

Control

The best control approach is early detection, isolation of infested areas and control of individual plants with herbicides like Remedy and Ally. Once established, an integrated approach to control will be necessary to minimize the damage. Conventional management practices of prescribed grazing and prescribed fire have not been effective in preventing the spread of sericea in rangelands, introduced pastures and forests.

It is difficult to give grasses a competitive edge with season-long and rotational grazing because cattle will select grasses and leave the sericea plants because of low palatability. If grasses are over-utilized, the invasion of sericea will be hastened. Some suppression of sericea has been observed after mowing or burning followed by intensive early stocking (IES) with stocker cattle. Livestock will consume the seeds and deposit them elsewhere in manure, so it is advisable to temporarily fence these infested areas to exclude livestock until the sericea has been controlled. This is particularly important during late summer and fall when the plants are flowering and producing seed. Goats may provide control, since they have been known to eat sericea.

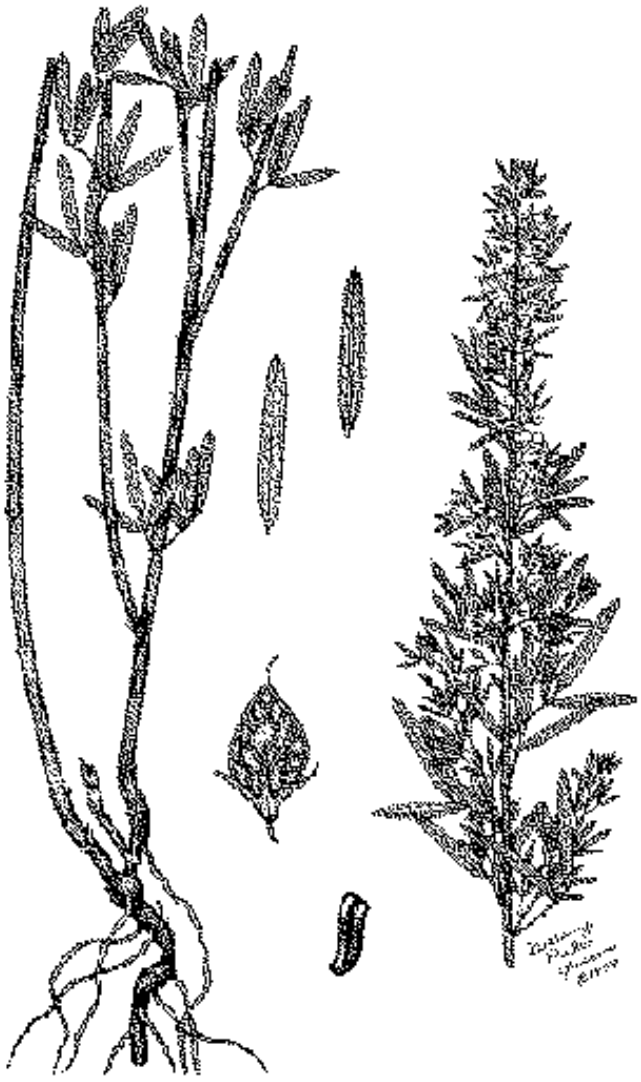

Figure 3. Slender lespedeza.

Spring burning removes the old dead growth of sericea, but has no negative effect on established plants. In fact, fire probably increases seed germination by scarifiying the seed and thus promote the establishment of new plants. Seeds of sericea germinate in early April through June. Seedlings establish when moisture conditions are favorable; thus, burning most likely will result in a denser stand of sericea if control measures are not implemented. However, the increased seed germination following fire should improve the effectiveness of a control program that involves spraying in July with Remedy or spraying in September with Ally.

Mowing will reduce the vigor of sericea plants if they are cut closely multiple times each year. 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 for the next year's growth. However, mowing will not kill sericea and may damage desirable grasses, depending on the timing and frequency of cutting. In addition, a large sericea seed bank will remain in the soil, ready to germinate when conditions are suitable.

None of the commonly used herbicides for broad-leaved weed control have provided good control of sericea lespedeza. Amber, 2,4-D, Grazon P+D, and Weedmaster have been ineffective on established stands of sericea. In studies conducted at three locations in 1988 and 1989, sericea was not controlled by 2,4-D at rates up to 2 lb/acre and minimal kill was achieved with 1 quart/acre of Grazon P+D or Weedmaster. Sericea was, however, adequately controlled with 1 pt/ac of Remedy (better than 93 percent in five of the studies and 79 percent in the sixth study). In additional studies in 1995, excellent control of sericea was obtained with 1 pt/ac of Remedy applied in June and July and Ally applied in September (Table 1). Currently, the maximum labeled rate for Ally is 0.3 oz/acre. Broad-leaved plants like western ragweed also are controlled with a June application of Remedy. It is critical the sericea plants be actively growing at the time of herbicide application or the treatment will not be effective.

Table 1. Chemical costs and average control (stem reduction) of sericea lespedeza using two herbicides applied at different times and rates at four sites in 1995.

Herbicide	Rate/Acre	Cost $/Acre[1]	Month of Application		
			June	July	Sept.
			Reduction (%)		
Remedy	1.0 pt.	10.50	100	100	88
Remedy	1.5 pt.	15.75	100	100	92
Ally	0.3 oz.	6.15	68	92	94
Ally	0.5 oz.[2]	10.25	85	97	99

1 Chemical costs as of March 1997. Cost of application or surfactants not included.
2 Currently, the maximum labeled rate of Ally is 0.3 oz/acre.

Since areas infested with sericea often have an enormous supply of seed in the soil, follow-up treatments will be required. Seedlings emerge after the mature plants are killed and by the third or fourth year, sericea will dominate the area again.

Preliminary results indicate mowing before application of Ally or Remedy can increase the level of control. Combining a single mowing in June or July with a herbicide treatment in July or September provided 100 percent control of sericea seedlings. Using fire to encourage seed germination before spraying may be helpful in diminishing the seed supply in the soil, reducing the amount of follow-up treatment needed.

A combination of grazing management, fire, mowing and herbicide offers the most effective control of sericea lespedeza. An example of how these techniques may be used together is as follows:

1) Use light or moderate stocking, allowing fuel to accumulate for a prescribed burn.
2) Burn in spring to encourage germination of sericea seed and remove old growth.
3) After fire, intensively early stock (IES) areas until mid-June.
4) Apply Remedy at 1 pt/acre in mid-July.
5) Apply Ally in September to areas missed by Remedy.
6) During September and October, exclude livestock from areas with sericea stands.
7) Thereafter, spot treat sericea with Remedy or Ally as needed.

Summary

While sericea lespedeza unfortunately has been promoted as an “improved” forage and a protective cover, it is currently a major weed problem in Oklahoma’s rangelands, forests, and introduced pastures. It is a noxious weed and requires aggressive control. Its adaptability, high seed yield, production of toxic chemicals and general competitiveness combine to make sericea lespedeza a serious threat to native plant communities, introduced forages, wildlife habitat and livestock production. An integrated approach to control, using grazing management, prescribed fire, mowing and herbicide, may offer the greatest success. Control of sericea can be expensive, so treatment costs and production losses are minimized by early detection and control.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 62 cents per copy. 0702