Playing with Fire

PHOTOS BY JONATHAN ALEXANDER

Sending smoke signals may be the only answer to controlling sericea lespedeza.

*by **Shelby Mettlen,** assistant editor*

Cattle producers across Kansas, Missouri, Nebraska and Oklahoma are losing their cool with sericea lespedeza.

The notorious perennial herbaceous legume has wreaked havoc in some of the country's most economically important and efficient areas of cattle production — namely the Flint Hills of Kansas.

Sericea lespedeza's ability to grow just about anywhere and its tendency to crowd out more palatable forages has led to its classification as a noxious weed in Kansas. It's heading down the same path in Missouri, Nebraska and Oklahoma.

Why burn?

In the Flint Hills, Clenton Owensby, professor of range management at Kansas State University (K-State), says burning pasture each year can result in an additional 32 pounds (lb.) of gain per yearling steer vs. gain from pastures that remained unburned. That makes the region a particularly important place for cattle to effectively utilize palatable forages.

"You only get the increase in gain in the year that you burn," Owensby explains. "Typically, producers burn every year to maintain that gain."

Traditional spring burning removes the insulating layer over emerging forage. When pasture is burned, soil warms up more quickly in the spring and summer, increasing the rate at which the organic matter decomposes and increasing nitrogen content.

"The forage that's produced in a burned area has a much higher crude protein (CP) content and is higher in soluble carbohydrates," he says. "During the first half of the growing season those animals gain more."

He added that there are two significant problems that spring burning doesn't control: Old World Bluestem and sericea lespedeza. In fact, according to Oklahoma researchers, spring burning may accelerate seed germination of sericea.

Starting fires

K.C. Olson, professor of range beef cattle nutrition and management at K-State, is currently conducting research to explore the possibility of controlling sericea with late-summer burning.

Olson and Walt Fick, range management

►Sericea lespedeza plants following spring (left), mid-summer (right), and late-summer (middle) prescribed fires; photo taken Sept. 16, 2015.

specialist at K-State, are both involved in the study, which examines a 125-acre unit of native tallgrass prairie heavily contaminated by sericea lespedeza.

The site was divided into nine replicate units of approximately 14 acres each. Yearling cattle or cows are grazed during the winter and early spring each year and are then removed from the pasture. Following removal of the cattle, units are burned at one of three times during the year: mid-spring, mid-summer or late summer.

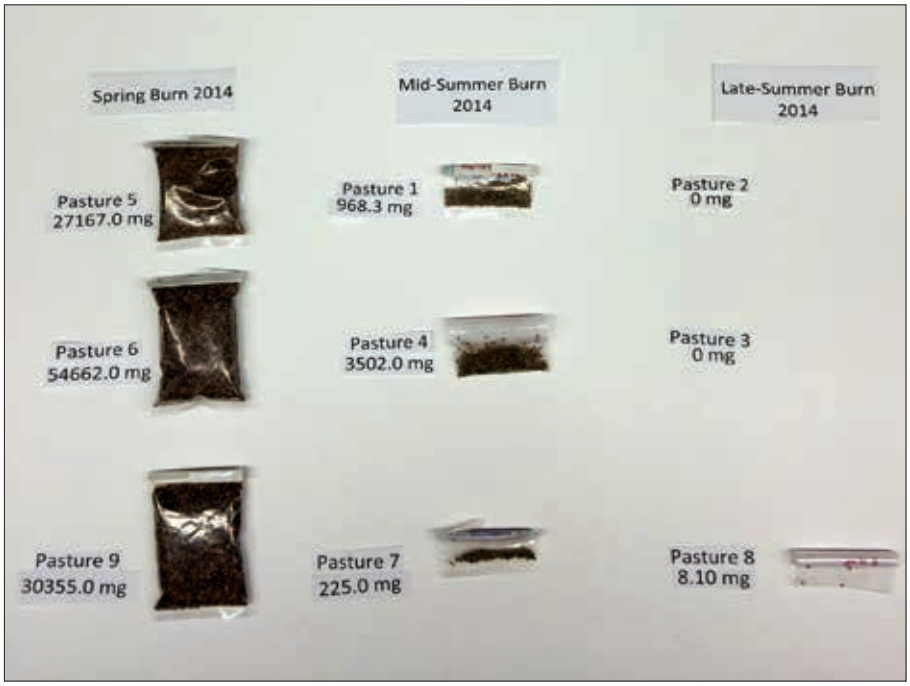
"We're two years into a four-year study," Olson explains. "The closer we get to that four-year mark, the more complete seed suppression we get. Canopy frequency of live plants is going down, crown maturity is decreasing, but seed production has been the most dramatic reduction."

If fire touches sericea lespedeza at some point near Sept. 1, the plant regrows, but doesn't have enough time to produce seed before winter dormancy occurs. Over two years, there has been a decrease from 570 seeds per plant in the conventional spring-burning treatment to less than 1 seed per plant in areas that are burned around Sept. 1.

"In my opinion, you can't get that kind of suppression with herbicides," Olson notes.

The study has, thus far, concluded that mid-summer and late-summer prescribed burning reduced canopy frequency of sericea lespedeza at dormancy. Mid-summer prescribed burning decreased seed production of the plant nearly 20-fold compared to conventionally timed burning, dropping seed count from 507 seeds per plant to just 27. Late-summer prescribed burning nearly eliminated seed production.

Traditionally, burning takes place during early March to late April. However, these dormant-season fires may stimulate sericea lespedeza growth scarifying seeds and encouraging germination.



►Effects of fire on total weight of seed produced by sericea lespedeza. Spring fires were conducted in April, mid-summer fires in July and late-summer fires in September (treatments, replication numbers and total seed weights are noted on the photo).

An uninvited guest

What makes sericea lespedeza particularly tough to deal with is that improved varieties are federally listed forage crops in the southeastern United States. It has been nearly impossible because of its status as a crop to win federal research funding to treat it as a noxious weed in Kansas, Olson says.

The eastern Asian import was first introduced to the United States in the late 19th century and caught the attention of soil-conservation specialists with its tolerance of drought, acidity and shallow soils of low fertility. Since its introduction to American soil, agronomists have used it to secure soil on roadsides, pond banks and strip mines. The plant has since been spread by animals, insects, people and agricultural equipment to areas where it was never intended to be. Olson believes it has reverted back to a wild-type variety that is much more invasive than currently cultivated varieties.

Olson and Fick agree that the variety of

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►Regrowth following fire on Aug. 30, 2014. An average of 3,500 lb. of forage dry matter per acre regrew following a late-summer prescribed burn before seasonal plant dormancy occurred in the fall. Left panel = 5 days postfire; middle panel = 20 days postfire; right panel = 27 days postfire.

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sericea lespedeza found in the Flint Hills and other problem areas, including southeast Nebraska, Missouri and Oklahoma, is likely a wild-type. Due to its desirable nutrient profile, cultivated types found in the southeastern states have been researched and bred for years by agronomists to take the place of alfalfa, a crop that doesn't grow well in the area.

The wild-type plant can contain up to 25% condensed tannins, Fick says.

"Beef cattle will avoid plants high in tannins," Olson explains. "Tannins are to protein what lignin is to carbohydrates. Those tannins bind all free protein in the rumen in a very comprehensive way. The animal's rumen becomes static, fermentation stops and beef cattle learn to avoid it."

Basically, it's a real bellyache for everyone.

"What we know about sericea lespedeza is that it's a robust canopy plant, it's allelopathic (meaning it prevents germination and tillering of more desirable plant species), and it's a prolific reproducer," he explains. "Some researchers have documented up to 30,000 seeds per individual sericea plant."

That profile, coupled with the region's cultural attachment to beef cattle, has created quite a dilemma for the area's cattle ranchers.

"We haven't been successful getting control of the plant with herbicide," Olson says. "With typical aerial application, much of the herbicide is intercepted by the plant canopy — we can successfully contact and kill adult plants that way, but not seedlings or juveniles that are nearer the soil surface. With fire, we're working at the problem from the opposite direction. We don't let it produce seed."

Olson says the proactive method is already catching the attention of producers in the area.

"I know of at least a half dozen producers between Manhattan and Council Grove, Kansas, that tried it last year and will probably try it again this year," he says. "The only question we can't answer yet is how growing-season prescribed burning will affect subsequent stocker-calf performance. We just don't know."

According to the study, late-summer burning is temporarily compatible with intensive early stocking. Although late-summer burning may work for producers who practice intensive grazing from late April to the end of July or the first part of August, Fick says it's important to remember that cow-calf producers often leave their cattle on pasture long after Sept. 1.

"Late-summer burning may work for some, but those cattle have to have somewhere to go while you're burning off those pastures," he notes.

Alternative control methods

Where burning may not be an option, Fick says, other methods of sericea control include applying herbicide, grazing sheep or goats, and mowing.

"Frankly, we've been spraying with herbicide in the early summer and fall for a number of years and we just haven't seen much improvement," he says. Traditional herbicides used for broadleaf weed control, including 2, 4-D; Banvel® and Tordon®, simply aren't effective.

Spraying with Remedy® Ultra at 1 to 1½ pints per acre or PastureGard HL at ¾ to 1½ pints per acre in June when the plant is in a vegetative state and about 10-15 inches (in.) tall shows some effectiveness, Fick says. Applying Escort® XP at ½ ounce (oz.) per acre with a nonionic surfactant, or Cimarron® Plus at ⅝ oz. or Chaparral™ at 2½ to 3 oz. per acre can offer effective control, but he says producers should use caution, as some of these products can stunt some species like tall fescue.

"People have been spraying for sericea for over 20 years," Fick says. "Some herbicides can kill existing plants, but it has such a heavy seed bank that it seems like every two or three years, you have to go out and spray it again."

Traditional spring burning can stimulate seed germination, so a producer can then hit sericea with a herbicide in the early summer and possibly go back in the late summer and spray again, Fick says. Unfortunately, those combination methods haven't controlled it yet, either.

Sheep and goats have a greater tolerance for high tannin content, and will readily graze sericea lespedeza. That method is also being explored in the study, but many producers don't have or want access to those additional species.

Producers are simply tired of fall herbicide application, Olson says. "Herbicide has, at best, just brought us to a stalemate with the plant."

Producers can burn pasture for about 75¢ per acre (cash cost, exclusive of insurance) vs. applying herbicide for about $8 to $16 per acre.

"Human eyes and human herbicide-application techniques miss a significant number of sericea plants," he says. "Fire doesn't miss anything."

►Fire treatment of sericea lespedeza is quite comprehensive during the growing season. Note the crisp fireline in the center of the photo. There are no live sericea plants right of the fireline.