



Maximizing effectiveness of growing season burns for sericea lespedeza control

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INTRODUCTION

Using fire during the growing season is a promising new way to manage sericea lespedeza in tallgrass prairies. Growing season burns offer advantages beyond sericea control, including easier to contain fires and a second chance to burn acres omitted during the dormant season.

Growing season fires have sometimes resulted in disappointing sericea lespedeza control, leaving land-owners and ranchers puzzled about why their burn did not meet management objectives. The key to achieving effective sericea lespedeza control is closely tied to not only when the fire is lit, but also to consideration of environmental conditions and management techniques. By making minor adjustments in applying fire, better control can be achieved.



Figure 1. Growing season burns can help control sericea lespedeza in tallgrass prairie rangelands.

CONSIDERATIONS AND MANAGEMENT TECHNIQUES

Environmental Conditions. Compared to dormant season burns, growing season fuel loads are much wetter and require slightly different weather and fuel conditions. The range for humidity (25-55%) and wind speed (8 to 20 miles per hour) are similar to dormant season burns, with the minimum wind speed adjusted upward and the humidity range adjusted downward to encourage fire movement through the damper fuel and to hasten smoke lift. Often the humidity will not be low enough for an effective fire until afternoon, so in general, morning burns should not be planned.



Figure 2. Heavy smoke can be expected with growing season burns due to high fuel moisture content.

Growing season fires produce heavy, wet smoke that can move along the ground for as much as two miles before lifting, causing air quality problems a considerable distance away, so a mixing height of greater than 3000 feet is desirable.

As always, stay within local and state regulations for agricultural burning.

Litter continuity. The litter layer carries the fire through the green vegetation. Two litter characteristics, continuity and humidity, are critical to achieving sericea lespedeza control with a growing season burn.

Litter that covers the surface of the ground is needed for a successful growing season burn. If there are areas with bare ground between plants, the fire may extinguish itself and need to be relit. Bare soil areas include cattle trails and wheel tracks. When lighting the fire, look down and go around obvious bare patches on the perimeter, moving the fire line towards the interior of the fire to where litter is heavier.



Figure 3. Adequate litter is important for the fire to carry through green vegetation.

Grazing is good for compressing the litter layer as long as sufficient litter is left to carry the fire. If the pasture has been burned with a dormant season burn the same year, it's unlikely that enough litter will be present to create the fire intensity needed to get sericea lespedeza control. Defer dormant season burning until after the desired level of litter is achieved.

Litter humidity. Because fire behavior will be related to the dryness of the litter layer, refrain from burning for at least 48 hours following rainfall. To get an idea of how dry the litter is, grab a handful of litter and squeeze. If your hand remains dry, the litter is dry enough to burn.

Sericea lespedeza itself can pose an additional humidity challenge. Tall, rank sericea lespedeza stands can trap humidity near the ground, and in a pasture where otherwise the litter is dry enough to burn, the fire may fail to adequately consume the sericea. Where the burn alone does not achieve the desired control, following up with chemical treatment after the fire may be desirable.



Figure 4. Squeezing a handful of litter can give an indication of fuel moisture.

Special techniques. Unlike dormant season fires, individual fuel drops may not burn together to form the desired uninterrupted fire line. Several simple burning techniques can improve your chances of achieving sericea lespedeza control with a growing season burn.

The best ignition source is the drip torch. Fire sticks do not dispense enough fuel, and propane does not generate enough heat in growing season conditions. Fuel should be 50% diesel mixed with 50% gasoline, and applied as a continuous line. This will require a slow ignition rate of 2 to 4 miles per hour, and require 2 to 3 times more fuel than with a dormant season burn. The drip torch petcock should be opened until the torch is producing a steady stream of lighted fuel.



Figure 5. Set the drip torch to dispense a steady stream of lighted fuel.

Plan on the fire moving slowly and allow enough time to complete the burn while the crew is still available. As a rule of thumb, a growing season head fire will move through the green vegetation at about one quarter the rate of the surface wind speed. For example, a 6 mile per hour wind surface speed will likely result in a fire that moves about one to one and a half miles per hour.

Let the head fire do most of the work. Quickly light backfires and flank fires, as only about a foot of blackened area is sufficient to stop a growing season headfire. Wet lines will work well to hold the fire within intended boundaries as damp litter discourages fire spread, as will green vegetation pressed into the litter by vehicle tires. Growing season backfires are easily extinguished, so be prepared to double back and check the fire line near trails to make sure the fire continues to burn in that area.



Figure 6. Backfires can be lit quickly as there is much less chance of escape than during a dormant season burn.

Post lookouts along the backfire and flank fire lines, and start the head fire as soon as possible. Face masks should be provided for lookouts as the smoke where they are patrolling is dense. Two-way radios are extremely useful all during the fire for coordinating crew member efforts.

Adapted from:

Alexander, J. A., W. H. Fick, J. Lemmon, G. A. Gatson, and K. C. Olson. 2017. Effects of prescribed-burn timing on vigor of the noxious weed sericea lespedeza (*Lespedeza cuneata*) on native tallgrass range in the Kansas Flint Hills. *Proc. West. Sec. Amer. Soc. Anim. Sci.* 68:92-95.

Lemmon, J., W. H. Fick, J. A. Alexander, G. A. Gatson, and K. C. Olson. 2017. Intensive late-season sheep grazing following early-season steer grazing is an effective biological control mechanism for sericea lespedeza (*Lespedeza cuneata*) in the Kansas Flint Hills. *Proc. West. Sec. Amer. Soc. Anim. Sci.* 68:124-129.



Figure 7. Vegetation that is still green immediately after a growing season burn will soon brown off.

Immediately post-fire, a summer burn may look unsuccessful due to the amount of standing green vegetation. However, additional vegetation brown-off will continue for up to 48 hours as the full extent of the burn effectiveness is revealed. After this period, any remaining green vegetation is unlikely to die. If unburned patches are large enough cause concern, they can be easily and safely re-ignited as the surrounding burnt vegetation is an effective fire guard.

To realize the maximize benefit for sericea lespedeza control, a three to four year commitment to yearly growing season fires is required. If conditions for burning are unfavorable one year, pick up sequence the following year. Continue growing season burns until the desired level of sericea control is achieved.

Implications. Growing season fires offer an excellent, comprehensive, and inexpensive opportunity to control sericea lespedeza with little or no additional expensive chemical treatment. The fire itself is easier to extinguish and manage compared to a dormant season fire. By following a few simple changes to adapt prescribed burning to growing season conditions, control of sericea lespedeza can be more effective.

Alexander, J.A., W.H. Fick, J.Lemmon, G.A. Gatson, and KC Olson. 2018. Comprehensive control of sericea lespedeza with four consecutive years of prescribed burning during summer. IN: E.A Boyle, ed. *Cattlemen's Day 2018*. Kansas Agricultural Experiment Station Research Reports Article 26 4(1): 1-3.

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Jack Lemmon, Figures 1, 2, 6, 7.

KC Olson, Figures 3, 4, 5.