



Eastern Redcedar Expansion: Perspective, Response, and Strategy

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Biology, History, and Context

Eastern redcedar (*Juniperus virginiana*) is an evergreen tree native to all states in the eastern United States, including the Great Plains. It is the only coniferous tree native to Kansas.

Eastern redcedar is dioecious, meaning there are separate male and female trees. Only female trees bear seeds, which are usually produced after six years. Seeds are dispersed primarily by birds, with a significant amount distributed within a short distance from the mother tree. Seeds are viable for a short time.

Eastern redcedar seeds are high in fat, fiber, and carbohydrates, and are an important winter food source for many birds and mammals, including many game animals. Eastern redcedar is also an important roosting and cover site for a variety of wildlife.

Since the late 19th century, eastern redcedar has been planted for windbreaks and shelterbelts on farms and homesteads throughout Kansas and the Great Plains. These plantings were significantly enhanced from the 1930s to 1970s for conservation purposes. Eastern redcedar is a significant component of windbreaks across the state. This evergreen element is essential in windbreaks, particularly in western Kansas, protecting homes, crops, and livestock. In field windbreaks, eastern redcedar provides sheltering, which increases crop yields. Compared to other species, it can tolerate incidental herbicide drift.

There are more than 22,000 miles of windbreaks in Kansas, providing wind protection to more than 1.2 million acres of land. At least 65,000 Kansas farmsteads are protected by windbreaks. Field and home windbreaks contribute \$50 to 60 million in value to Kansans annually.

Other evergreen species have been tested as a substitute for eastern redcedar in windbreaks, but have experienced poor establishment and minimal success due to long-term survivability, adaptability, and disease challenges. While eastern redcedar is a critical asset in windbreaks, monitoring and management of the windbreak is needed to maintain functionality and prevent encroachment into surrounding areas.

In the early 20th century, views on fire shifted from being a natural occurrence on the prairie to something dangerous needing suppression. This fire-control philosophy subsequently removed one of the natural checks that confined eastern redcedar to low-lying rocky areas, allowing it to expand into upland native rangelands and grasslands. Since 1965, the volume of eastern redcedar in Kansas has increased more than 23,000 percent within its native range, mostly through conversion of grassland and rangeland where fire has been excluded. In regions routinely managed with prescribed fire, such as the tallgrass prairies of the Flint Hills, eastern redcedar has not become a nuisance species. In addition to the undesirable spread of this species, other challenges, including fire threat, are indicated.



An example of good grassland management adjacent to a redcedar windbreak.



Without periodic burning, redcedar becomes invasive in grasslands.



Eastern redcedar is an extremely volatile fuel during wildfires.

Eastern redcedar foliage contains volatile oils, causing it to ignite and burn easily. Its structure brings foliage into direct contact with grasses, acting as ladder fuel to transition grass fire into crown fire. Eastern redcedar burns extremely hot, and flame heights of 50 feet are not uncommon. As this species burns, it produces ember showers, inducing spot fires, which help the fire spread quickly. Homes in the vicinity of eastern redcedar expansion are at a greater risk of damage from wildfire due to flame intensity and traveling embers.

Methods of Control

Integrated management should be based on a combination of cultural, mechanical, biological, and chemical methods to keep eastern redcedar from spreading. Regardless of the methods used, it is best to control the plant when it is young.

Range Management

One of the most effective and economical methods of controlling eastern redcedar is prescribed fire. Eastern redcedar does not resprout when top-killed by fire or when the above-ground green growth is completely removed. A five-year burn cycle is beneficial for pastures with sufficient fuel load, as they will have the ability to effectively burn five-foot eastern redcedar trees. A five-year burn cycle reduces

eastern redcedar population; however, this interval would not be necessary for all regions of the state. Areas in western Kansas benefit from burning every seven to 10 years.

Where native grasses are thick and healthy, eastern redcedar growth is slowed. Heavy grazing or dormant grazing on tallgrass pastures can slow the spread of eastern redcedar. From a livestock gain or production aspect, many choose to burn pasture every year, which also hampers expansion. Intensive early stocking rates are used to allow for later season fuel load build up, which provides for an adequate burn to control smaller eastern redcedar populations. Overgrazing can reduce too much of the fuel load to allow for a good burn. Intensive hoof action, exposes bare soil, making it easier for eastern redcedar to germinate and establish.

Mechanical, Biological, and Chemical

Eastern redcedar does not require a chemical stump treatment when using the cutting method. It does not have the ability to resprout if no foliage remains. Hand removal is quick and simple if done on a one- to three-year cycle. Removal of female eastern redcedar is a method to reduce seed dispersal on grassland areas, but not in windbreaks.

Kansas Forest Service Strategies

Using 2015 imagery, the Kansas Forest Service, in cooperation with the United States Forest Service, mapped the statewide rural tree canopy. While this geospatial layer does not identify tree species, it is a valuable resource that provides a baseline for tree cover statewide. This tool allows for the observation of change over time, including woody species encroachment into rangeland.

The Kansas Forest Service is continually exploring developing markets for eastern redcedar, including cedar lumber and posts, landscape mulch, cedar oil, biomass utilization, and soil amendment or nursery soil substrate mixes. Research on asexual propagation of male eastern redcedar is currently being performed with the goal of offering a seedless wind-break option. The Kansas Forest Service continues to test other evergreen species as alternatives to eastern redcedar. At this time, the only recommended use of eastern redcedar is for windbreaks.

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