Improving Great Basin Wildrye Communities: The advantage of using the Lawson Aerator

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Introduction

Heavy duty implements designed and built for manipulating rangeland vegetation and soils have been around for many decades. In the 1950's, the early developments of Rangeland drills resulted in the effective seeding of hundreds of thousands of acres of deteriorated rangelands to perennial grasses in an effort to curb erosion and increase the forage base for livestock and reduce the spread of noxious weeds.

The Lawson Aerator is one of the newer implements to enter the scene for rangeland improvements. The Lawson Aerator, designed as a pasture renovator in southern states that were being invaded by woody species, has earned a solid reputation and since found its way West. The aerator has significant weight distributed over 2 tandem drums that are typically 12' x 3' diameter. The drums display angled, protruding and spaced 8" x 4" x 1" steel plates with sharpened ends for effective chopping of woody material and penetration into soils for aeration (**Fig. 1**) . The variable pitch between the bladed drums can be adjusted to reduce or increase the impact to vegetation.

Figure 1. Lawson Aerator is a tool that can be used on rangelands to improve stand decadence, herbaceous forage and edge effect for wildlife.

Methods

In the fall of 2019, in cooperation with Jan Schade of the Wildfire Conservation Group and Edward Bartell of the Buffalo Ranch, we applied the mechanical treatment of using the Lawson Aerator to 900 acres (364 ha) of a decadent big sagebrush (Artemisia tridentata)/Bailey's greasewood (Sarcobatus baileyii) community with a sparse understory of Great Basin wildrye (Leymus cenereus) and saltgrass (Distichlis spicata) (**Fig. 2**).

Mechanical treatment operation ran from October 2019 through March 2020. Eight 2-acre plots were set up in a cardinal direction to measure the impact/benefit of manipulating this degraded/decadent community to release remnant perennial herbaceous species and improve grazing resources (**Fig. 3**).

Figure 4. Same photo point/plot as figure 2. The vegetation manipulation using the Lawson Aerator has significantly increased herbaceous species, specifically Great Basin wildrye.

Table 1. Increase in density and biomass of Great Basin Wildrye (GBWR) after shrub overstory removal by the Lawson Aerator.

	Untreated	Treated	increase
GBWR Plants /m²	1.2	8.1	675%
Forage lbs/acre	4,580	49,511	1080%

Figure 3. Lawson Aerator can be used with seeding implements and culti-packers to improve increase diversity and seeding success.

Results and Discussion

The mechanical treatment of this decadent/degraded shrub community resulted in an increase of 675% in density from 0.11 plants/ft² (1.2/m²) in untreated plots to 0.75/ft² (8.1/m²)in treated plots. Forage production increased from 4,580 lbs/ac (5,133 kg/ha) in the untreated plots to 49,511 lbs/ac (55,494 kg/ha) in the treated plots, a 1,080% increase (**Fig. 4**)(**Table 1**).

Using the Lawson Aerator as a mechanical vegetation manipulation tool has significantly increase sustainable grazing resources, while at the same time improved edge affect and wildlife use. When there is evidence that perennial grasses are present, such as Great Basin wildrye (**Fig. 2**), it can be very beneficial to manipulate the shrub community and release remanent vegetation to improve stand vigor, grazing resources, and wildlife habitat.

Managers should take a closer look at using this implement to improve degraded shrub habitats and improve herbaceous species composition.

Figure 2. Old decadent shrub community with sparse herbaceous component, Great Basin Wildrye, lacks the grazing resources to provide lasting forage during winter for the livestock/land owner.