

Using the Lawson Aerator for Range Improvement Practices

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The Lawson Aerator provides a management tool to achieve desirable vegetative results if used properly.

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 the livestock industry and reduce the spread of the noxious weed, halogeton. Rangeland drills, brush hogs, Dixie harrows, tandem discs and other equipment have played an important role in treating degraded rangeland environments. The Lawson Aerator is one of the newer implements to enter the scene for rangeland improvements. 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 with an option of adding liquid to the drums for additional weight. 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 (Figure 1). The variable pitch between the bladed drums can be adjusted to reduce or increase the impact to vegetation. Here, we report on two case studies using the Lawson Aerator to reduce decadent brush stands and early Pinon-Juniper invasion to increase desirable herbaceous species.



Figure 1. Lawson Aerator purchased by the USDA-ARS, notice the size, heaviness and steel plate teeth to crush old and decadent shrubs.

Case Studies

A small Creekside fenced pasture on the **Flying M Ranch**, located 110 miles southeast of Reno, NV is a degraded/decadent Wyoming/ Basin big sagebrush plant community with a very sparse understory of herbaceous species. In the fall of 2012, working cooperatively with a number of state and federal agencies, we treated approximately 15 acres of rangelands using the Lawson Aerator to crush the decadent brush, while at the same time pulling a rangeland drill behind the Lawson to test the seeding of native and introduced plant materials in four separate seed mixes (Figure 2). The second site was treated in 2011 and 2012 at the **Simpson Creek Ranch**, located just south of Eureka, NV.



Figure 2. Lawson aerator application pulling a rangeland drill with specific seed mixes.

Ranch owner Jim Baumann, in cooperation with Jan Schade of the Wildfire Conservation Group, treated 160 acres of rangelands on the ranch to reduce old-decadent Basin big sagebrush stands as well as decadent Wyoming big sagebrush stands and Pinon-Juniper invaded rangelands to improve wildlife and grazing resources. Following the Lawson Aerator application in 2011 and 2012, Jim Baumann drill seeded 8 lbs/acre rate of crested wheatgrass and broadcast seeded another 2 lbs/acre rate of 'Immigrant' forage kochia to the majority of the treated areas in the fall of 2013.



Figure 4. Perennial grass density in the spring of 2015 following a 2012 Lawson treatment and 2013 fall seeding application.

Seeding Results

Three seed mixes were tested at the **Flying M Ranch** (Table 1).

Seed mixes A and C had the greatest initial seedling establishment (May mean: 37/m²). Dry summer months, and seedling predation by black-tailed jackrabbits drastically decreased seedling densities. All of the seed mixes had less than 5 seedlings/m² survival by September and an all mix average of less than 1 seeded species/m² the following year, however residual plant species such as creeping wildrye increased and remained dominant at 2.6 plants /m², and big sagebrush resprouts and seedlings increased to 0.08/m². Herbaceous cover while low is an increase from pre-sagebrush removal cover (Figure 3) and acceptable considering the site received 3.56" of precipitation in 2012-2013 and 6.8" in 2013-2014.

Table 1. Seed mix treatments		
Mix A	Mix B	Mix C
'Roadcrest' wheatgrass	'Vavilov' Siberian wheatgrass	'Vavilov' Siberian wheatgrass
'Nezpar' ricegrass	Nezpar' ricegrass	'Nezpar' ricegrass
Yellow sweetclover	Tall wheatgrass	Northern sweetvetch
Pubescent intermediate wheatgrass	Pubescent intermediate wheatgrass	Blue flax
Sherman big bluegrass	Sherman big bluegrass	Sherman big bluegrass
'Toe jam' squirreltail	Forage kochia	
'Falcata' alfalfa	Rcky Mnt Bee plant	
Yarrow	Alfalfa	

The **Simpson Creek Ranch** treated habitat yielded an initial seedling density of more than 130/m², and established more than 10/m² by September 2016 with vigorous crested wheatgrass and 'Immigrant' forage kochia growing in the seeded rows (Figure 4). The application of the Lawson Aerator at the Simpson Creek Ranch resulted in an improved vegetative class and structure that resulted in a new sage grouse breeding ground (lek) and increased wildlife use as well as more than a 300% increase in herbaceous grazing resources.



Figure 3. Before and after use of Lawson Aerator at the flying M Ranch. Initial seedling emergence (center left) and creeping wildrye release (center right). The native root creeping *Iva axillaris* (right).

The use of the Lawson Aerator in sites that receive higher precipitation levels, and therefore have higher site potentials, actually results in the release of numerous grasses and forbs that were not seeded (Figure 5). Globemallow and numerous other forbs responded very well.



Figure 5. The application of the Lawson Aerator resulted in this habitat becoming a sage grouse breeding ground. Notice the succulent forbs, grasses and shrubs released from this management activity.