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# RANGE IMPROVEMENT



VOL. 7, NO. 2

## NOTES

APRIL 1962

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## STATEMENT OF PURPOSE

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This publication is printed primarily to inform professional range administrators of important range improvement and management developments and findings. These "Notes" may include extracts of published papers, unpublished preliminary reports of research work, unpublished reports on administrative studies, and personal observations or suggestions of other range administrators. No claim is made as to the accuracy or completeness of studies or conclusions drawn.

All who read these RANGE IMPROVEMENT NOTES are encouraged to submit material for publication, or suggestions for improving its usefulness. Full credit will be given for any material used.





## SEEDING DIRECTLY INTO SPRAYED SAGE AND RABBIT BRUSH

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U. S. Forest Service  
P. O. Box 4137  
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(From an address delivered at the 11th Stockmen's Short Course,  
Washington State University, Pullman, Washington,  
December 10 to 16, 1961)

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Two years ago, Mr. Avon Denham, Assistant Regional Forester, while a guest professor of the Stockmen's Short Course said, "Trials are now in progress to determine the feasibility of seeding directly into sprayed sagebrush and rabbit brush. To date, these trials look favorable and soon may be an established practice." It is my pleasure to report to you the results of this method of seeding. In evaluating a new technique it is always best to view the results first hand, however in this case, I will bring the results to you by use of colored slides.

Two developments are responsible for the success of direct seeding in brush stands. First is the development of effective herbicides and improvement in the application of these herbicides.

For several years the killing of sage brush by application of chemicals has been a rather common practice in Oregon and Washington. Not so common has been the killing of rabbit brush by herbicides. Agriculture Research Service through its Squaw Butte Stations, at Burns, Oregon carried out a rather extensive research program on chemical control of rabbit brush. The basic information from this research was used, and when tailored to fit the local conditions of the National Grasslands of Central Oregon some very satisfying results were obtained. Two important factors stand out in obtaining good rabbit brush kills, namely plant development and soil moisture.

Under conditions at the National Grasslands new leader growth of rabbit brush must be at least 3 inches. Soil moisture must be within 3 to 4 inches of the soil surface. Some years are such that the brush has not developed sufficiently before the soil moisture is dangerously low. Under these conditions very poor rabbit brush kills are obtained.

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\*The author acknowledges the work and assistance of Joseph M. Mohan in the field phase of this project.







DEEP FURROW RANGELAND DRILL

The second development to make this type of seeding possible has been the deep furrow rangeland drill.

The Forest Service rangeland drill is a rugged piece of equipment designed to work on rough sites. It has high clearance. Each disc operates independently of the other and is held in the ground by weights instead of spring tension. The disc will roll over objects 2-1/2 feet in height, enabling the operator to go over stumps, logs, rocks and other obstructions. The discs are cupped and canted enough to make satisfactory furrows. The depth of furrow is controlled by adding or taking off disc arm weights. Two and one-half inch pipe in 40-inch lengths is attached to be used in lieu of press wheels. The pipes follow in the furrows and aid in shallow covering of the seed.







CLOSE-UP OF DRILL SHOWING WEIGHTS AND PIPE DRAGS



BEFORE SEEDING

This stand of gray rabbit brush has been sprayed. A very good kill was obtained. Spraying was done the first week of June by helicopter, using 2# of butyl ester in 3 gal. of diesel.

Areas such as these must be seeded. There is not enough native grasses left to take over when the brush is killed.







AFTER SEEDING

Crested wheat grass was drilled in the standing dead rabbit brush in December following spraying. A deep furrow range-land drill was used to do the seeding.



STAND OF CRESTED WHEAT OBTAINED BY SEEDING  
DIRECTLY INTO SPRAYED RABBIT BRUSH





## IMPROVE YOUR RANGE BY HEAVY FALL GRAZING

By: William A. Laycock, Range Conservationist  
Intermountain Forest and Range Experiment Station  
Forest Service, U. S. Department of Agriculture, Ogden, Utah

(Excerpt from the article in the June 1961 National Wool Grower)

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Sagebrush-grass range has been improved by grazing management with no reduction in stocking. Spring rest with heavy fall grazing by sheep resulted in less sagebrush and more grass and other herbage in studies on native range at the U. S. Sheep Experiment Station near Dubois, Idaho.

When this range is in good condition it has only an open stand of sagebrush with a good ground cover of native grasses and forbs (nongrasslike herbs). In many areas this type of range now has such dense stands of sagebrush that herbage production is limited and much of the desirable forage is unavailable to sheep. Most recommendations for improving such areas involve burning, spraying or other expensive methods of sagebrush control, plus elimination of grazing for one or more years.

Heavy fall grazing offers a cheaper and more practical method of improvement. The loss of grazing from spring deferment is offset by the increased grazing rate allowable in the fall.

### History of the Study

Starting in 1924, one 80-acre range unit at the Sheep Station was grazed heavily in the spring and lightly in the fall, while an adjacent unit was grazed heavily in the fall only.

In 1950, both units were cross-fenced. The former grazing treatments were reversed in one-half of each, but were continued in the other half. The object was to see how quickly the poor range would improve under heavy fall grazing and how quickly good range would deteriorate under heavy spring grazing.

### Changes Due to Grazing

Conditions did not change much where grazing was continued essentially as in the past. The spring-grazed area was still in poor condition in 1957, and the fall-grazed area was still in good condition. However,



changes were very evident in the units where the grazing treatments had been switched in 1950. Range conditions improved from poor to fair from 1950 to 1957 in the new fall-grazed unit.

In contrast to this, the area changed to spring grazing in 1950 deteriorated from good to poor condition by 1957. Heavy spring grazing caused the grasses and forbs to decrease and the sagebrush to increase.

### Fall Grazing Better than Protection

Part of the area previously grazed in both spring and fall was fenced in 1950 to exclude grazing. Both this enclosure and the portion of this area that was switched to fall grazing in 1950 were then in poor condition. By 1957, the new fall-grazed unit had less sagebrush and more grass than the ungrazed enclosure. Thus, spring deferment and heavy fall grazing improved range condition faster than did complete exclusion from grazing. All factors other than grazing were identical so far as known.

### Practical Applications

The Sheep Station now plans to test different management systems that include the heavy fall grazing method of range improvement. Such a system could be tried on your range. Important things to consider are:

1. Any one area should be rested in the spring and grazed heavily in the fall for two or more years in succession. This system could be rotated from one unit of range to another over a period of years.
2. Fall utilization of the shrubs should be as heavy as possible. On fairly level ground, condition of the sheep probably will determine when they should be removed from the fall-grazed area rather than any certain level of utilization. On steeper slopes, grazing rates probably will have to be lower than on level ground to prevent excessive soil disturbance by the sheep and the resulting accelerated erosion.
3. Improvement can be accomplished only if enough native perennials, especially grasses, are already growing under the sagebrush. If range is in such poor condition that the perennial grasses and forbs have been almost







entirely replaced by such annuals as cheatgrass, little improvement can be expected from merely removing the sagebrush by heavy fall grazing. Such areas probably should be reseeded.

4. Range should not be grazed in the spring of years it is to be heavily grazed in the fall.

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Your WORK is what you should keep OFF YOUR MIND when at home  
and

Your MIND is what you should keep ON YOUR WORK when on the job.

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### S A F E T Y

PROJECT SEASON IS THE TIME TO GIVE EMPHASIS  
TO "ON-THE-JOB" ELEMENTS OF  
A SAFETY PROGRAM

1. Hazard identification and removal.
2. Protection against nonremovable hazards.
3. Job analysis for safety.
4. Safety promotional activities.
5. Training for safety.
6. Supervising for safety.
7. Reporting and analysis.







Fig. 1. Spring deferment and heavy fall grazing increased the grasses and forbs but decreased the sagebrush in the range on the right. Areas on both sides of the fence were in poor condition in 1950 and appeared similar to the range on the left. Neither area had been grazed when photographed in 1960.



Fig. 2 . Heavy spring grazing reduced the range on the right to poor condition. Areas on both sides of this fence were in good condition in 1950 and were similar to the range on the left. Neither area was currently grazed when photographed in 1960.





## Discovered: A DEADLY RANGE PLANT\*

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An unpalatable range plant that grows in sandy and gravelly soil in Arizona, Nevada, Utah, and southern California has been proved deadly to sheep.

The plant (Psathyrotes annua) is a leafy, low-growing herb that doesn't have a common name.

It isn't known whether sheep on range have eaten the plant. Scientists learned about its toxicity by grinding mature plants and feeding them through stomach tubes.

USDA research veterinarian Wayne Binns and ARS associates, working in cooperation with the Utah Agricultural Experiment Station at Logan, found that less than 3 grams of the plant per pound of body weight killed sheep in 2 days.

One sheep fed the residue of a lethal dose of the ground plant (after water had been removed) wasn't affected. But another getting the water extract died 30 hours after feeding. This shows the plant's toxic substance is water soluble--useful knowledge to scientists attempting to isolate the substance.

After receiving lethal amounts of the plant, the animals got weak and depressed. Their heart beats quickened. They stood as long as possible, then fell to the ground in a coma. They died soon after, without struggling.

The sheeps' livers appeared to be most affected by the poisonous plant. The livers were swollen, congested, and mottled.

Losses aren't likely on pastures that provide good forage; sheep probably won't eat Psathyrotes annua if they can get enough palatable feed.

If poisoning occurs, a preventive is obvious: Keep sheep off pastures containing the plant. Supplemental feeding - to prevent hunger - also should stop losses.

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\* AGRICULTURAL RESEARCH U. S. Department of Agriculture, December 1961.







This plant (Psathyrotes annua) thrives in dry creek beds in four Western States. It has a pungent odor. Its small yellow flowers turn purple at maturity.





