

Sagebrush Control—Costs, Results, and Benefits¹ to the Rancher

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I am of the third generation of Hyatts to live in the Paintrock Valley of the Big Horn Basin in Wyoming. Our ranching operation is a sheep and cattle combination.

The ranch lands consist mainly of hay meadows, which produce enough hay and pasture to feed the cattle for 6 months and the sheep 2 months each year. Also, enough grain is produced for our own use. The grazing lands are 4 different types; we have private lands, state lease lands, Bureau of Land Management permits, and Big Horn National Forest permits.

The majority of these lands is covered with sagebrush. In the higher elevations the big sagebrush grows vigorously; black sagebrush and small sagebrush or sageworts grow in the lower elevations. For years ranchers have known that sagebrush robbed their soil of moisture, choked out the grasses, curtailing their grazing capacity. In previous years, many acres of sagebrush land had been burned in hopes of eradicating the brush. In our area, this means of control was of no value, and the sagebrush returned thicker than before. Previous to spraying, roto beating was tried. This method was too slow and costly in our area.

During the late 1940's and early 1950's we were doing all we could to get the most from our range, developing the small out-of-the-way springs, putting in cross fences to keep the stock on the lower ranges, also hauling water in trucks to the area of feed and no water. Not helping matters any was the dry cycle we were going through. It seemed the rains never came at the right time.

In 1952, the University of Wyoming, with cooperation from the

Big Horn National Forest officials and Big Horn National Forest Permittees Association, the first aerial spraying of sagebrush with chemicals was done. The results from these experimental plots were tremendous. This demonstrated that it was possible to spray sagebrush at a reasonable cost with 200 to 400% increase in grass production.

Our first spraying was done in the year 1954. We sprayed 1,000 acres of private lands, using 2 lb/acre Butyl-Ester 2-4-D and 1½ gallons diesel oil. The results from this spraying were rewarding, and our ranching operations placed money needed for sagebrush spraying at the top of the budget for range improvement.

Since 1954 we have sprayed a total of 12,000 acres of sagebrush land. This acreage is in comparison to a total of approximately 55,000 acres of grazing land. The spraying has been done on private lands, state leased lands, BLM lands, and U.S. Forest Service lands. All the spraying on government lands has been done with full cooperation of government personnel. The BLM has shared ⅓ of the spraying costs on 2,400 acres and ½ the cost on 1,000 acres. We have sprayed 3,200 acres on Forest Service lands and this cost has been ours alone. The cost of spraying these lands has averaged \$3.00/acre.

The spraying has been done with three types of aircraft, the small fixed-wing plane, the large fixed-wing plane, and the helicopter. My personal preference is the helicopter, with the small fixed-wing plane at the bottom of the list. Use of flagmen is a must, and they must thoroughly understand their job.

We have obtained good results on big sagebrush using the Butyl-Ester formula mentioned above. When spraying sagebrush in the lower elevations we obtain better results using 2 lb. low volatile 2-4-D mixed with 1.5 gal. diesel oil and adding 1 pint of a good wetting agent in

200 gal. mixture. The use of a wetting agent has increased the sagebrush kill 10 to 20%.

Our results have varied considerably in percent of sagebrush control. On some areas we have had almost 100% results and on some of the poorer projects only 40%. This variation has been due largely to inexperience. Good results can be obtained when spraying is done with the sagebrush in the most vigorous growing stage, adequate soil moisture, competent flagmen, proper chemical mix, and a good pilot. All the variables involved must be at a maximum before near 100% results will be obtained.

The University of Wyoming had conclusive information showing increased forage production in areas where spraying had been done on big sagebrush in the higher elevations. Much of our grazing lands were at lower elevations, the sagebrush not so large and vigorous and, in some places, the lands were infested with black sagebrush. Plots were established and researchers from the Agronomy Department of the University took charge of gathering and compiling the information. The original survey made in 1956, showed we had a 52% ground cover of sagebrush and 28% ground cover of grass. Forage production was 343 lb./acre of air-dried forage. This land was sprayed and records kept for 6 years. At the end of the 6-year period, ground cover of sagebrush was reduced to 13%, most of this being dead sagebrush stocks, and a 70% ground cover of grass which produced 1143 lb./acre of air-dried forage. A check plot in the higher elevations showed a much higher increased yield. In the year 1962, we clipped 3,046 lb./acre of air-dried forage. Throughout the 6-year period of keeping forage production records, the percent increase between the sprayed and unsprayed areas has remained constant.

Along with sagebrush spraying, there has been an increase in water flow from our springs. These springs were not checked for flow before spraying, and the only proof is a visual one. In a couple of cases, springs were dry and had been for 30 years. These springs are again producing water. Further proof of more moisture made available to the soil can be obtained from Harold Alley

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Sagebrush range on Hyatt ranch in Big Horn Basin, Wyoming. Left, before control; right, after control.

of the University of Wyoming. He checked the snow and water measurements on sprayed and unsprayed sagebrush acres in two locations over a 6-year period. In the Hyattville area the depth of snow averaged 8.2 inches where unsprayed and 16.6 inches where sprayed. Resulting water averaged 2.3 inches where unsprayed and 4.9 inches where the sagebrush had been sprayed, or over 113% increase.

We now have increased grass production and increased water from springs. In order to better utilize our range, we began a program distributing water by means of plastic pipe. We now have 95,800 feet of plastic pipe laid on top of the ground, with tanks at various intervals. These tanks are kept full by means of float valves. These two factors have greatly increased the proper utilization of our grazing lands.

The control of noxious weeds is a must on grazing lands if a rancher wishes to maintain valuable grass land. Canadian thistle is the big threat to our grazing lands and hay meadows in the Paintrock Valley. Other noxious weeds of less importance are: perennial sow thistle, whitetop, quackgrass, and field bindweed. There are areas that have little grazing value because Canadian thistle has taken over. We live in a county which has a weed district, and the noxious weed problem

is at a minimum compared to neighboring counties. On our ranch, and grazing lands attached to the ranch, all noxious weeds are controlled by us. We became aware of this problem 15 years ago and started controlling our weeds. It is not easy to carry a hand sprayer while walking for miles in the canyons, accessible only by foot or horseback and to spray noxious weeds. Also many hours are spent in the open country treating patches. But it is rewarding, come the end of a growing season, to know that you have kept the weeds in check and a minimum of grassland is infested.

A new chemical, Tordon 22K², is now available, and experimental work by the University of Wyoming looks very good. Because we have had a diligent spraying program, complete control of our noxious weeds seems very near at this time, leaving valuable grazing and meadow lands in a high productive state.

What are our benefits from this range improvement program? Selling feeder lambs and calves is the main source of income of our ranching operation. The weight records show an increase of 10 lb./lamb and 16 lb./calf yearly for a period after 1957, as compared to the years prior to 1957. Additional gross income has

²Trademark for Dow Chemical Co. (4-amino-3,5,6, trichloropicolinic acid).

been a sizable amount when 2,000 lambs and 675 calves are sold each year.

The sagebrush spraying cost and plastic pipe cost have been completely absorbed with this additional income. Also, some net profit has been realized. A greater profit will be realized in the future with a higher carrying capacity of these ranges. These range lands are once more becoming sodded with grass, resulting in more pounds of forage available per acre. With the exception of one grazing unit, we have been able to maintain our basic A.U.M.'s. This has been done during a time when range reductions were being made. These range cuts were made by means of reducing either the number of livestock grazed or grazing the permitted number of livestock for a shorter grazing season. We received a 40% reduction on one grazing unit which had a Class I demand of 984 A.U.M.'s. This reduction was made effective in 1955.

In the year 1957 the sagebrush infested lands were sprayed. Cross fences and water development was done in the following two years. In 1960 we received a 25% increase, in 1961 another 10% increase, and the balance of the range reduction was restored in 1962. This has been a benefit in grazing 100 head of cattle for four months each season—a direct result from sagebrush spraying and water distribution.