United States Department of Agriculture

Forest Service

Southwestern Region

Low-Impact, Selective Herbicide Application for Control of Gray Rabbitbrush and Greasewood

A Field Guide by Max Williamson and Doug Parker

Printed on recycled paper – April 1996

Low-Impact, Selective Herbicide Application for Control of Gray Rabbitbrush and Greasewood

Background

Gray rabbitbrush (*Chrysothamnus nauseosus*), also known as rubber rabbitbrush, is a native plant that is widely distributed from southwestern Canada through the western United States into northern Mexico. It is a 2 to 5 foot tall shrub of cold deserts and grasslands and occurs in association with sagebrush, piñon/juniper woodlands, and greasewood. This perennial shrub is one of at least 12 native species of rabbitbrush and there are many different subspecies of gray rabbitbrush. Some subspecies are quite distinctive in appearance, while others are difficult to tell apart. The various subspecies tend to occupy different habitats. One prefers to grow on dry mountain slopes, another in meadows or riparian areas in valley bottoms. One can tolerate salty soils, another will not.

Although livestock and wildlife will browse it, the plant rates low in palatability. It is considered a problem because it tends to increase where soils have been disturbed, such as on overgrazed rangelands, at the expense of more desirable plants. It is commonly found along rights-of-ways, fences, pipe lines, and similar disturbed sites. Invasion into meadows and riparian areas is of particular concern to resource managers and ranchers. It also has been found to invade sites where sagebrush control has been done. In the absence of any disturbance, gray rabbitbrush possibly would slowly die out from competition from grasses and other plants. The exclusion of periodic wildfires also may be an important, albeit unknown, factor in natural control of this plant in some ecosystems. However, it is not possible to limit disturbances in many areas, and the amount of time it would take for plants to die out, especially without the natural sequence of burning, is much too long to be considered as a viable option on many sites. Concern continues to mount over the expansion of this shrub over thousands of acres in the Southwest and Intermountain West.

Control of this undesirable plant has proven to be difficult due to its ability to resprout after being burned, cut, or treated with herbicides.

Rabbitbrush burns readily due to its high content of latex, but the effects are short lived. Mechanical control approaches result in unacceptable soil disturbances and do not appear to be used to any appreciable extent. The high cost of mechanical treatments and reinvasion potential due to the soil disturbance are major drawbacks. The herbicides and the application techniques tried in the past have not been effective, but a new approach has provided excellent control of even large plants and no resprouting has observed one year following treatment. Although this new approach is in the early stages of development, sufficient control has been achieved to recommend its use for small scale operational control. The lack of any other control technique adds further support to this recommendation.

Application Technique

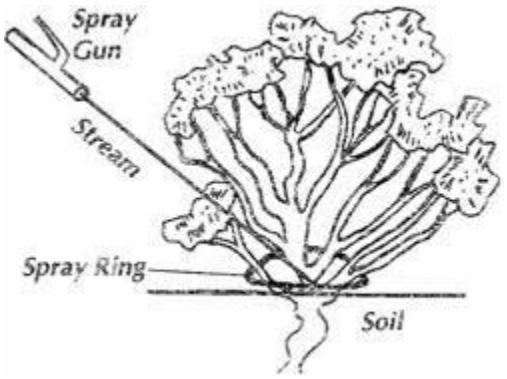
Tordon 22K* (picloram) has proven to be effective in controlling gray rabbitbrush on small trial plots in New Mexico, Utah, and Wyoming. Other herbicides were tested, but they had little effect.

* Trademark of DowElanco

Major advantages of using picloram follows: (1) it does not kill grasses at the recommended application rates; (2) it is registered for range and pasture, and wildlife management; (3) the low-volume approach allows applicators to carry sufficient product and carrier into remote areas to optimize application efficiency; and (4) it can be applied directly to the target shrub and desirable plants within 2 to 3 feet are usually not affected.

Tordon 22K is a liquid formulation that is mixed with water and a silicone wetting agent. At present, a 15 percent mixture is recommended for shrubs above 3 feet in height and with a crown diameter of over 3 feet. This mixture can be obtained by adding 20 ounces of Tordon 22K formulation plus water to make one gallon and 5ml of a silicone wetting agent. If almost all of the shrubs are less than 3 feet high and wide, a 10 percent mixture can be considered. Instructions for obtaining a 10 percent mixture follow: 13 ounces of Tordon 22K formulation plus water to make a gallon and 5ml of the silicone wetting agent. If there is any doubt about what percent of spray mixture to use, it is best to use a 15 percent mixture to ensure satisfactory control results of 85 percent or higher.

The herbicide mixture is applied with a backpack sprayer. Applicators should only use backpack sprayers with a diaphragm pump. Sprayers with piston pumps are not recommended because of their tendency to leak. Swissmex SPI and Solo Modal 475 are commonly used units that are relatively inexpensive. A Modal 30 Gunjet or CCI Triggerjet spray gun with a DE-2 or TP-0002 spray tip is suggested. Also, it is important to obtain backpack sprayers and spray guns with Viton chemical resistant seals.



The spray mixture is applied as a solid stream around the root crown of each shrub. The best results can be obtained by applying the spray to the stem of the shrub just above the ground level to allow the liquid to "slip" down the stem below the soil surface. This approach, however, is usually not possible because most plants have multiple stems and it is difficult to see the base of the plant through the stems and foliage. In this instance, the spray is directed at about a 45 degree angle in a circular or oval pattern into the center of the shrub about where the root crown is expected to occur as shown in the above figure. The key is to get a sufficient volume of the spray solution around the entire circumference of the root crown. For small plants, treatment can be accomplished by spraying the oval pattern from one side of the shrub. With larger shrubs, applicators usually will need to spray the circular pattern by walking around the plant so that spray stream is applied to the entire root clump.

The amount of spray mixture applied to individual shrubs depends on their size. As the plant size increases, an increasing volume of the mixture must be applied to obtain the desired results. It has been found that approximately 4ml of spray is need for each foot of shrub crown width, and it takes about half of a second to spray out 4ml. Thus, it would take about one second to treat a shrub that has a crown diameter of 2 feet. Refer to Table 1 to determine the timing of application for the various shrub sizes.

Management Options

Knowledgeable managers choose vegetation management methods that are effective, economical, and environmentally compatible. At present, the use of Tordon 22K as a water basal application is an effective application technique to allow resource managers or ranchers to control gray rabbitbrush. It appears that this shrub is sensitive to Tordon 22K using this approach. Treatment of plants in meadows and pastures, along fence lines and roads, and near buildings or other facilities is a viable and economical option. However, this new approach has not been tested on all types of soils and the numerous subspecies of *C. nauseosus*. Some modification of the application technique, concentration of herbicide in the mixture, volume of the spray solution applied to shrubs of various sizes, etc., may need to be modified as operational results are evaluated. Also, it is possible that other rabbitbrush species, such as Douglas rabbitbrush (*c. vircidiflorus*), may be effectively controlled with picloram.

Gray rabbitbrush often grows in such dense stands that it becomes difficult, if not impossible, to effectively apply the water basal application of the herbicide. In this instance, it may be necessary to consider burning and/or mechanical treatments, such as mowing with a brush hog, to remove the dense stands of plants to allow applicators to apply the spray stream to individual root crowns after the shrubs have begun to resprout. Care should be taken to limit soil disturbance as much as possible if brush cutting equipment is used.

Considerable efforts are being made in the West to control big sagebrush with an application of the granular herbicide Spike 20P. This herbicide is very effective in controlling big sagebrush, but it has little or no effect on gray rabbitbrush at the application rates being used. It has been found that removal of the sagebrush can allow resident gray rabbitbrush plants to flourish in the treatment areas. When the two plants occur in the same area, managers will need to consider controlling rabbitbrush with picloram. On some sites, it might be possible to lightly treat the sagebrush with tebuthiuron and leave sufficient sagebrush plants to limit invasion of rabbitbrush.

Greasewood (*Sarcobatus vermiculatus*) is a native, perennial plant that also grows on the same sites as gray rabbitbrush. Greasewood is a moderately poisonous shrub if consumed in large amounts by livestock. Thus, it is usually considered as an undesirable plant. Like gray rabbitbrush, greasewood will usually resprout if it is cut or burned, but it can also be controlled with a water basal application of Tordon 22K. The application technique is the same as for gray rabbitbrush.

At present, operational treatments have not been done and sound estimates of treatment costs cannot be provided. However, a 15 percent solution of Tordon 22K costs about 1.2 cents for four milliliters of spray solution. Thus, it would roughly cost a little less than two and a half cents to treat a shrub with a 2 foot diameter crown. Similar estimates can be made for other shrub sizes shown in Table 1. The overall treatment cost would depend on the total number and size of plants in the treatment area.

Table 1. Timing of Application to obtain the recommended volume of spray mixture for the various shrub crown diameters

Crown Diameter (feet)	Seconds of Application	Milliliters Of Spray Mixuture
1	0.5	4

Crown Diameter (feet)	Seconds of Application	Milliliters Of Spray Mixuture
2	1.0	8
3	1.5	12
4	2.0	16
5	2.5	20

Precautionary Statement

Care needs to be taken to avoid contamination of water when treating gray rabbitbrush near dry stream beds and similar sites. Picloram is a material that can travel over or through soil if rains occur after application.

Anyone applying or supervising the use of a restricted-use herbicide, such as picloram, must have a valid pesticide applicators license.

Assistance

Contact Doug Parker at 505-8423280, Max Williamson at 1-800-2418070 ext. 571, or your local Natural Resource Conservation Service office if you have questions or need assistance.

The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Pesticides used improperly can be injurious to human, animals, and plants. Follow the directions and heed all precautions on the labels. Store pesticides in original containers under lock and key — out of the reach of children and animals — and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first-aid treatment given on the label, and get prompt medical attention. If a pesticide

is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

NOTE: Some states have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your local forest pathologist, county agriculture agent, or State extension specialist to be sure the intended use is still registered.