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Low-Impact, Selective Herbicide Application for Control of Piñon-Juniper

A Field Guide by Max Williamson and Doug Parker

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Low-Impact, Selective Herbicide Application for Control of Pinõn/Juniper

Background

Piñon-Juniper (P-J) woodlands occupy a vast acreage in the West. As a result of an increase in tree densities, over a third of P-J type, which is in excess of 5 million acres, is considered to be in an unsatisfactory ecological condition. Although considerable controversy exists over the causes of the problem and past control measures, it is readily apparent that immediate action is needed to restore woodlands that are in an unhealthy condition and protect healthy ecosystems that are threatened. Vegetation management actions are needed to prevent soil loss, avoid erosion, improve water availability and quality, reduce competition between wildlife and domestic livestock, maintain local life styles, and resolve related issues and concerns.

In accessible areas, the most practical approach for controlling large trees is through firewood harvesting. Control of small trees and alligator juniper sprouts has been more elusive, especially where the use of controlled fire has not been a viable option. Recently, a new method has been developed to enable the control of p-J trees with a low-impact, selective application of a herbicide. This new technique (directed water basal-bark treatment) is most cost-effective for trees less than 6 feet in height, but it can be used to control larger trees. Where alligator juniper is being harvested, sprouts can be controlled using the same approach.

Table 1. Mixing Recommendations

Tree Species	Tree Size	Herbicide (Percent)	Mixture (Ounces).
Alligator juniper	Sprouts	15	20
	6 ft. or less	20	26
	Above 6 ft.	20	26
One-seed and	6 ft. or less	10	13
Utah Juniper	Above 6 ft.	15	20
Pinon Pine	6 ft. or less	10	13
	Above 6 ft.	15	20

Note: Ounces of herbicide formulation plus water to make one gallon. Also, 5ml of a silicone wetting agent should be added to each gallon.

Application Technique

Picloram (Tordon 22K) has proven to be an effective and economical herbicide for control of pinon pine (*Pinus edulis*), alligator juniper (*Juniperus deppeana*), one-seed juniper (*J. monosperma*), and Utah juniper (*J. osteosperma*). Piñon pine is the most susceptible to picloram and alligator juniper is least sensitive. Oneseed and Utah juniper are relatively easy to control. Major advantages of this technique are: (1) picloram does not kill grasses at recommended application rates; (2) picloram is registered for range and pasture, and wildlife management; and

(3) the basal-bark application method is target specific and untreated trees and shrubs within 2 to 3 feet of treated trees are usually not affected.

Tordon 22K is a liquid formulation which is mixed with water and a silicone wetting agent. Recommended herbicide mixtures are shown in Table 1.

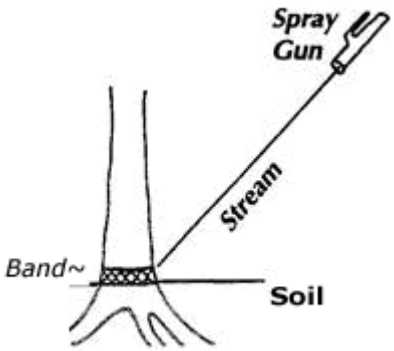

Figure 1. Applying the herbicide mixture

The herbicide mixture is applied to the base of selected trees with a backpack sprayer having a diaphragm pump. Sprayers with piston pumps are not recommended because of their tendency to leak. Swissmex SPI and Solo Model 475 are inexpensive backpack sprayers commonly used. A Model 30 Gunjet or CCI Tiggerjet spray gun should be used with a TP-0002 tip or a DE-2 disc. 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 to the base of the tree or stump with sprouts just above the soil. The key is to cover the entire contour of the trunk, including branching roots, to allow the mixture to spread down the trunk under the soil to the entire root system as shown in Figure 1.

For stems less the 1 inch in diameter, coverage of the stem is achieved with a back-and-forth motion of the spray gun. For stems 1 to 3 inches in diameter, apply a 2 to 3 inch wide band completely around the tree base or stem. A progressively wider band will be needed as the tree size increases. When alligator juniper sprouts cover a stump, treat the sprouts in a circular pattern about where the stump should occur. Applications of picloram can be made year-round, but the herbicide must be absorbed and translocated in treated trees to be effective. Thus, during dry periods, effects of treatment will be delayed until it rains and trees begin translocation.

The goal of the basal application technique is only to control selected trees and not affect grasses or nearby desirable trees or shrubs. The low volume approach will allow applicators to carry sufficient product and carrier into remote areas to optimize application efficiency.

Management Possibilities

Knowledgeable managers choose vegetation management methods that are environmentally compatible, effective, and economical. The use of a herbicide is a viable option. Some possible conditions where the herbicide option might be useful follow.

Firewood Harvest Areas

Treatment of alligator juniper sprouts or excess seedlings and saplings left during harvesting operations is one of the most economical uses of this new herbicide technique. The best time to treat sprouts is the year following tree cutting. Sprouts get so big after the second year that treatment is slower and more costly.

Create or Maintain Existing Openings

Removal of excess seedlings and saplings to create or maintain meadows or openings is another application. A major advantage of this technique is in avoiding ground disturbing activities within protected areas. Also, it is more effective and less costly than mechanical approaches. To expand

meadows or openings, treatment of trees should be done from the edge of the opening into the piñon-juniper stand to the point where grasses begin to disappear. This approach allows existing grasses to recover as treated trees die. Openings can then be expanded in upcoming years as the grasses continue to move into the piñon-juniper stands.

Wildlife Openings

Large expanses of dense canopied piñon-juniper woodlands are common and offer little in terms of plant and animal diversity. A directed herbicide treatment can be used to create openings to increase biological diversity, release native plants, and provide habitat for selected wildlife. This technique is most suited for dense stands of small trees that are in rough or inaccessible terrain.

Create Snags

One of the economical uses of herbicides to control larger trees is to create snags as important habitat for several birds and wildlife. Areas that are inaccessible would be best for this approach, since snags are usually harvested by the public in accessible areas.

Protecting Fences

Birds that feed on juniper berries deposit seeds in their droppings while perching on fence wires. As the resulting trees grow, they can eventually damage the fence. This problem can be effectively avoided by selectively controlling trees before damages begin.

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Thinning

Thinning of piñon-juniper woodlands is done to promote growth of remaining trees, release understory grasses, and create fuels to enable the use of prescribed fire. The herbicide approach would be appropriate where trees are too small to be of commercial value or in rough and remote terrain.

Also, control of small trees near the crown of large trees would help to prevent movement of fire into the crown of the larger trees when prescribed fire is used.

Protection of Archaeological and Historic Sites

Herbicides offer an attractive option to restore piñon-juniper woodlands to a healthy condition to provide protection of such sites. Mechanical treatments are limited since such treatments can damage such fragile resources. In some instances, these sites can be adversely affected by erosion and arroyo cutting, but they can be protected by selectively removing trees and favoring the growth of grasses and forbs.

Precautionary Statement

If not handled properly, herbicides can be injurious to humans, domestic animals, desirable plants, and fish and wildlife. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers

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

Risk Assessment

When Federal lands or funds are involved, a "Risk Assessment for Herbicide Use in Forest Regions 1, 2, 3, 4 and 10, and on Bonneville Power Administration Sites," or a similar document, such as one developed by the Bureau of land Management, should be considered in the analysis and incorporated into NEPA documents. Private land managers do not have such requirements.

Assistance

Contact Doug Parker at 505-842-3280 or Max Williamson at 1-800-241-8070, ext. 571, if you have questions or need any assistance.

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.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

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.