3 Types of Treatment Kill Brush, Make Roads Safe, Easy to Maintain

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Before treatment, brush threatened the road.

After treatment, growth started to die off.

### 3 Types of Treatment Kill Brush, Make Roads

1—Foliage treatment, 2—basal spray, 3—slashing and stump treatment effective in Forest landowners must combat roadside brush encroachment to maintain road efficiency and driving safety. When they do not, many roads become engulfed by brush and are impassable. “Brush tunnels” in the coast areas of Oregon are all too common; with effective, inexpensive brush control available, they need not be.

Treatment of roadside brush at the Cascade Head Experimental Forest near Otis, Ore., has helped develop methods effective for coastal Oregon where red alder, salmonberry and thimbleberry are problem species.

Either foliage or basal treatment, or slashing followed by stump treatment, were found to provide effective control.

Foliage treatment is effective on brush if the foliage can be thoroughly wetted with spray solution.

Small red alders are killed the first time sprayed; usually, however, only the aerial parts of the salmonberry and thimbleberry stems are killed, and repeated treatments are needed to kill sprouts.

A recommended spray solution is a 1 to 1 mixture of 2, 4-D and 2, 4, 5-T carried in a 5-percent (by volume) oil-in-water emulsion at the rate of 4 to 6 pounds ahg.

Basal spray is a practical alternative for brush too tall for foliage treatment.

Most plant species can be sprayed with either dormant or summer sprays. Red alder, however, should not be treated until fast spring growth is well under way. An effective basal spray solution is 2,4-D and 2,4,5-T in a diesel oil carried at 16 pounds ahg. Solution must be applied to the point or runoff, with good coverage around the root collar.

Slashing and stump treatment gives immediate results.

For red alder, the same solution recommended for basal treatment should be used and should be applied immediately following slashing.

### Foliage Treatment

When completely wetted with chemical spray, the three problem species and most of their associates are usually defoliated and aerial parts of the stems are killed. Small red alders are destroyed, but salmonberry and thimbleberry need repeat treatments to kill the sprouts.

Spray volumes needed for complete coverage vary with brush height, species, and density, and whether or not brush is continuous along the roadside. Although complete coverage is recommended, red alder can sometimes be killed with less spray than salmonberry or thimbleberry.

A recommended volume for spraying a continuous 4-foot strip of salmonberry and thimbleberry brush not over 4 feet high and of medium density on both sides of the road is 100 to 150 gallons per mile. On 30 miles of treated road in the test area where brush was not continuous, the average volume sprayed was 73 gallons per mile. Chemical sprays should thoroughly wet the brush foliage to the point of runoff to insure effective control. However, the volume should be kept at the minimum needed because spraying costs increase directly with volume sprayed.

### Standard Spray Concentration Is Practical

Ideally, recommended spray concentrations should vary with changes in brush composition. However, it is often more practical to use a standard concentration that is effective on all roadside brush species. The recommended concentration for coastal Oregon is 4 to 6 ahg (pounds acid equivalent of chemical per 100 gallons of solution).

When the primary species is salmonberry or thimble-
A year later growth was completely destroyed.

Today, visibility is excellent, maintenance easy.

Safe, Easy to Maintain

Oregon problem area.

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berry, the 6-ahg rate is preferred. Recommended chemicals are mixtures of low volatile esters of 2,4-D and 2,4,5-T. Either 1 to 1 or 2 parts 2,4-D to 1 part 2,4,5-T are common mixtures. Carriers are water, diesel oil, or aromatic oil. An oil-in-water emulsion containing 5% diesel oil (by volume) improves coverage and penetration.

Satisfactory results were attained on the Cascade Head Experimental Forest and Siuslaw National Forest by using a 4-ahg 1-to-1 mixture of 2,4-D and 2,4,5-T in an oil-in-water emulsion.

Spring Is Best Time to Spray

The most effective time for treatment is usually just after the first spurt of spring growth. Plants are lowest in stored food at this time and are probably most susceptible to 2,4-D and 2,4,5-T. Both of these chemicals tend to change the more complex plant carbohydrates into sugars, thus further exhausting the food supply of the plant. In addition, translocation of the chemicals from the crown to the root seems to accelerate during this period, thereby making chemicals more effective.

Equipment must be capable of handling large volumes of spray solution at medium pressures so that the solution can be driven to the stems and underside of the foliage.

Recommended pressures for foliage spraying range from 150 to 200 pounds per square inch. With suitable nozzles, these pressures produce droplets that give good coverage without drift. Low pressures with improper nozzles require excessive volumes of spray solution for adequate plant coverage. Nozzle size must be selected according to pump capacity and pressure so droplets less than 100 microns in size—those subject to drift—will not be formed.

Fire Pumps Can Do the Jobs

Several types of power pumps that can be mounted on trucks or trailers and that will do a satisfactory job of foliage spraying are available. Most landowners have found that fire pumps, with a few minor changes, are satisfactory for spraying. The changes include installation of chemical-resistant hose and a bypass back to the tank for agitation of the solution. Siuslaw National Forest personnel use equipment that provides an air stream to blow the spray solution on the brush.

Adequate roadside brush control must provide for periodic respraying to destroy brush sprouts and seedlings. Treatment every 2 to 4 years is recommended.

Foliage spray costs vary with equipment, chemical, carrier, brush density, species, and frequency of treatment. Therefore, costs on other areas may deviate considerably from those presented here. Siuslaw National Forest costs during 1957 were $34.05 per mile of road; spraying is done every fourth year, resulting in an annual cost of $8.26 per mile. Costs at Cascade Head Experimental Forest, where roads are sprayed every second year, are comparable at $14.85 per mile, or an annual cost of $7.43 per mile.

Basal Treatment

Basal treatments are suitable for controlling brush too tall to receive adequate coverage with a foliage spray unless special boom equipment is available. Normally, plants over 15 feet high fall in this category.

Basal treatment consists of spraying the lower section of the stem until the solution thoroughly wets the bark and runs down and collects around the root crown. Chemical on the root crown usually increases plant kill. The lower (Continued on next page)
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1 to 3 feet of the stem is sprayed; a rule of thumb is to spray a height equal to four times the stem’s diameter at ground level.

Equipment for basal spraying varies with plant size and miles of roadside needing treatment. Power equipment can be used for treating large areas; for small areas, a backpack sprayer equipped with a "wand" is effective. A straight wand is good for small red alder stems, but a horseshoe-shaped wand is better for larger stems.

**Dormant or Summer Sprays Are Best**

The season for basal treatment varies with species to be treated, but most coastal plants can be effectively controlled by either dormant or summer sprays. Red alder—tests at Cascade Head Experimental Forest indicate—should not be treated until early spring growth is well under way.

A 16-ahg solution of 2,4-D and 2,4,5-T carried in diesel oil proved effective when tested on red alder.

Immediate control of brush can be obtained by slashing the stems and then chemically treating the stumps. Slashing has the advantage of leaving no standing dead brush to hinder visibility and reduce safety. Slashing as a treatment by itself is unsatisfactory, however, and should be supplemented by chemical treatment to prevent sprouting. If sprouting is uncontrolled, the slashing effort can be nullified within a year. Red alder sprouts commonly grow 4 or more feet the first season after slashing.

A slashing and stump treatment crew usually consists of several men for cutting brush and one man for applying chemical. Spraying equipment is usually a knapsack sprayer.

The chemical should be applied to the entire stump surface to the point of runoff. Treatments may be applied throughout the year, but the stumps should always be sprayed immediately after slashing. A 16-ahg solution of 2,4-D and 2,4,5-T in diesel oil is effective for stump treatment of coastal brush species.