

Saltcedar (*Tamarisk*) and Russian Olive Management

Saltcedar (*Tamarix ramosissima*, *T. pentandra*, *T. chinensis*, and *T. parviflora*) and Russian olive (*Elaeagnus angustifolia* L.) are rapid growing, non-native deciduous trees that were introduced into the United States for erosion control (saltcedar), windbreaks (Russian olive) or as ornamental plantings. Both species initially spread from intentional plantings and currently dominate the plant community in many riparian and lowland sites in western states. These invasive woody trees cause serious ecological changes to riparian habitats with impacts to wildlife and watershed values, agriculture, and recreation.

There are several management options for saltcedar and Russian olive depending on tree size, density and environmental constraints. Seedlings and young sprouts can be effectively removed by hand or mechanical pullers when the soil is moist. On larger trees, most non-herbicide management methods (bulldozing, mowing, brush-cutting) are not effective unless the root crown is removed or all re-sprouts are continually cut. Burning is not an effective control technique due to re-sprouting. There are no biological control agents for Russian olive; however, the leaf beetle (*Diorhabda elongatata*) defoliates saltcedar and can effectively control plants on some sites. This saltcedar biological control agent may not be a management option in some watersheds due to

potential habitat impacts on the endangered Willow Flycatcher (*Empidonax trailii extimus*). Herbicide treatments over the canopy of small saltcedar or Russian olive trees, or cutting the tree and applying herbicide to the stump to prevent re-sprouting provides good control of established trees. The following information summarizes herbicide options for saltcedar and Russian olive management.

Management with Herbicides

The use of herbicides to control saltcedar and Russian olive historically had varying degrees of success. Some non-selective herbicides (e.g. imazapyr) used to control these invasive plants cause unacceptable injury to desirable species, especially



Figure 1. Saltcedar (above) and Russian olive both dominate plant communities in many riparian and lowland sites in the western United States.

grasses, in the understory or do not control other invasive plants under the tree canopy. Although selective systemic herbicides will control saltcedar or Russian olive, it is not a one-time treatment and sites will need to be monitored for re-sprouts and new seedlings after application.

Results of experiments conducted in Nebraska, Colorado, and Wyoming show that Milestone® in a tank mix with Garlon® 3A or Garlon® 4 Ultra will control saltcedar and Russian olive without injury to desirable understory grass vegetation (<http://tinyurl.com/wsws2011scro>). This tank mix also provides broadleaf weed control on species such as Russian knapweed and thistles.

Desirable plants remaining on the site will compete with saltcedar and Russian olive resprouts and germinating seedlings, decreasing the potential for re-invasion. There are several herbicide application options described below depending on tree size, density, and management equipment available.

I. FOLIAR TREATMENTS TO INDIVIDUAL TREES (LESS THAN 6 FEET IN HEIGHT)

Treatments can be made to small saltcedar or Russian olive trees less than 6 feet in height (Figure 2). It is important to calibrate your equipment to determine the amount applied per acre, including application made with a backpack sprayer or hand gun from a main tank. Typically about 100 gallons per acre (GPA) are sprayed when “spraying to wet” without any runoff from the leaves. At an application volume of 100 GPA, mix 7 fluid ounces (0.055% v/v) of Milestone and 3 quarts (0.75% v/v) of Garlon 4 Ultra in 100 gallons of water with 1 quart (0.25%

v/v) of a non-ionic surfactant. Note: Russian olive growing alone (not in a complex with saltcedar) can be controlled with a foliar application of Milestone at 7 fluid ounces per acre (fl oz/A) plus Garlon 4 Ultra at 2 quarts per acre (qt/A) with surfactant.

II. FOLIAR TREATMENTS TO RE-SPROUTING PLANTS AFTER MOWING OR CUTTING

Saltcedar and Russian olive will re-sprout following cutting, mowing or shredding operations. Wait at least 6 months after cutting and/or for re-sprouts to be 3 to 4 feet tall before applying the herbicides (Figure 3). This allows time for plants to re-grow and develop adequate leaf area for more herbicide uptake from a foliar application. This may mean the application will need to be done the year after cutting or, at least, in late summer after mowing the previous winter or earlier in the spring of the same year.

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Figure 2. Imazapyr at 16 ounces acid equivalent (left) showing excellent control of saltcedar but severe grass injury. Milestone at 7 fl oz/A plus Garlon® 4 Ultra at 3 qt/A (right) showing excellent saltcedar control and no injury to desirable grass (Wyoming location).



Photos courtesy of Mary Halstvedt

Apply Milestone at 7 fl oz/A plus Garlon 4 Ultra at 3 qt/A with a non-ionic surfactant at 0.25% volume to volume (v/v) or seed oil (e.g. methylated seed oil) at 1 qt/A. This treatment will also control many broadleaf weeds that may invade the area after cutting (<http://tinyurl.com/ipssmilestone>). Note: Russian olive re-sprouts can be controlled with a foliar application of Milestone at 7 fl oz/A plus Garlon 4 Ultra at 2 qt/A with surfactant.



Figure 3. Wait at least 6 months after cutting and/or for re-sprouts to be 3 to 4 feet tall before applying the herbicides to saltcedar (above) and Russian olive.

III. CUT STUMP APPLICATION

Cut stump treatments can be used any time of the year as long as the herbicide does not freeze when applied, and the tree is not frozen. When using Garlon 3A, cut stumps should be treated immediately (within 30 minutes) after cutting. When using Garlon® 4 Ultra, applications can be made up to one week after cutting but before re-sprouting begins (Table 1).

Thoroughly spray the outer 2 inches of the top of the stump. Apply mixture in a continuous ring between the bark and the wood of the stump. If the bark is

Table 1. Recommended herbicide rates and mixing guide for cut stump applications.

Product	Rate	Amount of Product for 1 Gallon Mix	Amount of Product for 3 Gallon Mix
Garlon® 3A	50% v/v in water	2 quarts	6 quarts
Garlon® 4 Ultra	50% v/v in oil	2 quarts	6 quarts

All spray solutions are mixed in water or basal oil as indicated.

Table 2. Recommended herbicide rates and mixing guide for basal or modified cut stump applications.

Product	Rate	Amount of Product for 1 Gallon Mix	Amount of Product for 3 Gallon Mix
Garlon® 4 Ultra	25% v/v in oil	1 quart	3 quarts
Garlon 4 Ultra	30% v/v in oil	1.3 quarts	4 quarts

All spray solutions are made with oil. Use oil carriers such as basal oils, diesel, kerosene, seed oils or other oils with use directions for basal and cut stump applications. Precaution: Some oils are more viscous at low temperatures and harder or impossible to use in cold temperatures. Herbicides and basal oil used need to be registered or accepted for use on the type of site where the treatment occurs.

torn away from the stump, be sure to treat down the side to form a continuous ring around the bark since the coverage and uptake is essential for root kill.

For a modified cut stump application with 25 to 30% Garlon 4 Ultra (Table 2), spray the sides of the stump including the root collar area, and the outer portion of the cut surface (the cambium) until thoroughly wet but not to the point of runoff or so that puddling occurs at the crown or root collar. The herbicide treatment is effective when applied up to one week after cutting but before re-sprouting.

IV. LOW VOLUME BASAL BARK APPLICATIONS

This treatment method can be used on trees with stems up to but not greater than 6 inches in diameter (Figure 4). The herbicide application can be made any time of the year, including winter months, except when the bark is wet, frozen, or frost is present on stems. Applications are easier from late fall to early spring when there is little foliage to intercept the spray. Another advantage to treatment this time of

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year is that many desirable plants are dormant, and selectivity can be improved. For best results, herbicide applications should be avoided during rapid growth of saltcedar or Russian olive in the spring.

A mixture of Garlon 4 Ultra in an oil carrier is very effective for low volume basal bark applications. An oil carrier ensures good coverage and herbicide absorption through the bark. The recommended concentration of Garlon 4 Ultra is 25 to 30% (see Table 2 for specific recommendations).

Be sure to adjust the sprayer nozzle to deliver a narrow spray. Spray the herbicide mixture lightly but evenly (similar to using spray paint) on the plant's stem or trunk from ground level up to 12 to 15 inches. Apply the mixture to all sides of every stem, but not to the extent that runoff and puddling occurs at the crown or root collar. Saltcedar or Russian olive with old, rough bark may require each stem to be treated higher up the stem (15 to 18 inches) than plants with smooth bark (12 to 15 inches). Larger stem diameter trees may require retreatment.

Figure 4. Low volume basal bark applications can be used on trees with stems up to but not greater than 6 inches in diameter. Spray around the circumference of the trunk at a height of about 12 to 15 inches until wet, all the way around the main stem to the groundline, but not to the point of runoff or puddling.



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