

Management information: *Ligustrum sinense*

Preventative measures:

A [Risk Assessment of *Ligustrum sinense*](#) for Hawaii and other Pacific islands was prepared by Dr. Curtis Daehler (UH Botany) with funding from the Kaulunani Urban Forestry Program and US Forest Service. The alien plant screening system is derived from Pheloung *et al.* (1999) with minor modifications for use in Pacific islands (Daehler *et al.* 2004). The result is a score of 11 and a recommendation of: "Likely to cause significant ecological or economic harm in Hawaii and on other Pacific Islands as determined by a high WRA score, which is based on published sources describing species biology and behavior in Hawaii and/or other parts of the world."

Physical:

Mowing and cutting are appropriate for small populations or environmentally sensitive areas where herbicides cannot be used. Stems should be cut at least once per growing season as close to ground level as possible. Repeated mowing or cutting will control the spread of *Ligustrum* spp., but may not eradicate it (Tennessee Exotic Pest Plants Council 1996, Batcher, 2000). *Ligustrum* spp. can be effectively controlled by the manual removal of young seedlings. Plants should be pulled as soon as they are large enough to grasp but before they produce seeds. Seedlings are best pulled after a rain when the soil is loose. The entire root must be removed since broken fragments may resprout (Tennessee Exotic Pest Plants Council 1996, in Batcher, 2000).

Fire management may be useful in some cases where the density of *Ligustrum* spp. is low and sufficient fuels available. In experimental trials of prescribed burning, there was no significant difference in the abundance of *L. sinense* in burned vs. unburned plots (Faulkner et al. 1989, in Batcher, 2000). *Ligustrum* litter has a low flammability and fires did not carry well in these treatments. Burning top-kills *L. sinense* and eliminates

them over time, and burning is effective at controlling *L. sinense* if done annually during periods of low fuel moisture and a high Keetch-Byram Drought Index (Randall and Rice unpublished, in Batcher, 2000).

Chemical:

Unlike most woody species, experimental defoliation did not result in reduced percentages of flowers producing fruits, decreased seed number, or decreased seed quality (Obeso and Grubb 1993, in Batcher, 2000). Foliar spray method may be effective for large thickets of *Ligustrum* spp. where risk to non-target species is minimal. Air temperatures should be above 17° C to ensure that herbicides are absorbed. The ideal time to treat is while plants are in leaf in late autumn or early spring but when many native species are dormant.

A number of concentrations have been used successfully. A 2% solution of glyphosate and water plus a 0.5% non-ionic surfactant is used to thoroughly wet all leaves (Tennessee Exotic Pest Plants Council 1996, in Batcher, 2000). For a handgun sprayer, 1 liter Roundup and 100 mls of a surfactant per 100 liters of water (1% solution) is recommended; for a backpack sprayer, the recommendation is 100 ml Roundup and 20 mls of a surfactant per 10 liters of water (The New Zealand Weeds Web Site 1999, in Batcher, 2000). A 2% solution of triclopyr and water plus a 0.5% non-ionic surfactant is sprayed to thoroughly wet all leaves (The Tennessee Exotic Pest Plants Council 1996, in Batcher, 2000). Use a low pressure and coarse spray pattern to reduce spray-drift damage to non-target species. Metsulfuron methyl was identified as the most cost-effective herbicide in an experimental treatment comparing metsulfuron methyl, triclopyr ester and 2,4-D (Madden and Swarbrick 1990, in Batcher, 2000).

The cut stump method should be considered when treating individual shrubs or where the presence of desirable species precludes foliar application. Immediately after cutting stems at or near ground level, apply a 25% solution of glyphosate and water or triclopyr and water to the cut stump, being careful to cover the entire surface

(Tennessee Exotic Pest Plants Council 1996, in Batcher, 2000). Effectiveness of the herbicide is increased if holes are cut in the top of the freshly felled stump, which holds the herbicide in for better absorption (New Zealand Weeds Web Site 1999, in Batcher, 2000). In the basal bark method, a mixture of 25% triclopyr and 75% horticultural oil is applied to the basal parts of the shrub to a height of 30-38 cm from the ground. Thorough wetting is necessary for good control, and the bark should be sprayed until run-off is noticeable at the ground line. Like the cut stump application, this method may be effective throughout the year if *Ligustrum* spp. responds similarly to *Rhamnus* spp. (Reinartz 1997, in Batcher, 2000).

In New Zealand, researchers have killed standing *Ligustrum* trees by drilling downward-sloping 20 mm wide holes 5 cm into the trunk at no greater than 5 cm spacing around the trunk, and filling the holes with a stump paint-herbicide mix (New Zealand Weeds Web Site 1999, in Batcher, 2000).

Biological:

Batcher (2000) reports that in North America, *Ligustrum* spp. have no important pests or predators. The various species are widespread and occasionally locally abundant. *Ligustrum* spp. have no known biological controls, although a few pathogens are known to attack them in North America. *Nectriella pironi* creates galls on *L. sinense*.