

BASAL BARK HERBICIDE TREATMENT FOR INVASIVE WOODY WEED MANAGEMENT ON THE FARM

Sometimes trees, and other woody weeds, just need to go!

Why is this? Woody weeds can reduce the quantity and quality of desirable native and/or forage plants available for livestock grazing on the farm. These unwanted plants are often more aggressive than existing native vegetation or the desired forage species and compete for light, water, and nutrients. Often the aesthetic value of the farm is also significantly impacted by woody weeds.

Because of these problems, an increasing number of farmers are looking for simple solutions to control the ever increasing numbers of these weeds, especially scattered wilding pines. The good news is that by using the basal bark application method you can quickly kill most single or scattered woody weeds in an environmentally safe way if you follow a few simple rules (see Appendix 1 - Instructions on how use the basal bark and cut stump methods to control woody weeds on the farm).

The basal bark application method provides the ideal solution for scattered woody weed control because it is quick and easy to use, highly effective and incorporates a practice that enhances to the growth of the desirable native and forage. Using this method, the herbicide is applied to a specific area on the tree which significantly reduces impacts on adjacent vegetation or the soil from drift or overspray.

The basal bark application method uses a knapsack to squirt a mixture of 120g/l triclopyr butoxyethyl ester (Grazon or equivalent generic) herbicide in oil onto the lower trunks of woody species including pines, willows, alders, elders, sycamores, hawthorns, cotoneasters, rowans, barberries, etc. The technique is highly effective on saplings and trees with a stem diameter of less than 20cm and which have not yet developed a thick bark. As the trees become bigger, the bark becomes rougher and thicker and the technique becomes less effective. It must be noted that treated trees may take up to 1 year (or more) to die so don't draw conclusions too soon if you use the method.

The following questions have been asked and answered to help you decide whether the basal bark method is a solution for your woody weed problem.

Is basal bark herbicide treatment the best option for my situation?

Basal bark herbicide treatment is most useful where the target tree or shrub density is moderate to low, where manual labour is available and where small dead standing trees and shrubs can be tolerated. Basal bark treatment is not recommended where there are thousands of stems per hectare to treat and boom spraying would be more appropriate. Additionally, basal bark treatments cannot be used where spraying into water is inevitable.

Where aesthetics is an issue and dead standing trees cannot be tolerated the trees can be cut down and the herbicide mixture applied to the cut stump. The

application of the herbicide to the cut stump will kill the root system and prevent the woody weed from re-growing.

What equipment do I need?

Basal bark treatments are most easily applied with 5 or 7.5 litre knapsack sprayers (Figure 1). An advantage of using a smaller knapsack is that it can be carried on your farm vehicle at all times (the herbicide mixture does not go off and can be kept indefinitely) so that you can treat those odd single outlier woody weeds whenever they are found rather than leaving them to set seed and spread.



Figure 1: The components of a 7.5 litre backpack spraying system for applying a basal bark treatment to invasive trees. Note non-drip valve for spray nozzle. (Photos: Peter Willemse).

What carrier and herbicides do I use?

Basal bark treatments are different than foliar treatments because the herbicide penetrates the bark, not leaves, to be effective. An oil carrier is used instead of water and oil soluble triclopyr butoxyethyl ester herbicide. Diesel oil or kerosene can be used as the oil carrier.

There is a new pre-mixed herbicide and oil product coming onto the market called X-Tree Basal (marketed by ETEC Crop Solutions) which uses biodiesel and a special penetrant as the oil carrier. This product is much more eco- and user friendly than diesel or kerosene. Also, the product removes the need for you to mix the herbicide and oils, which can be messy and time consuming.

How do I apply the herbicide?

Use an adjustable cone nozzle or a narrow angle flat fan spray tip at **very low pressure** (one or two pumps of the knapsack) to prevent over application and herbicide waste (Figure 2).



Correct – low knapsack pressure with no splashing

Wrong – high pressure causing splashing

Figure 2: The correct and wrong ways to apply the basal bark herbicide mixture.

What size trees, shrubs and vines will this method work for?

Basal bark treatment is effective on almost all woody invasive trees, shrubs and vines that are less than 20 cm in diameter. Bark of trees in this size range is thin and does not prohibit herbicide penetration. Trees that have trunk diameters much larger than 20 cm will require more herbicide to be applied higher up the trunk.

Two principles to be followed are:

1. Apply the herbicide to at least twice the height of the diameter of the tree being treated; and
2. Rather use slightly more rather than less herbicide to ensure good kills.

Figure 3 shows the correct, low pressure application of the basal bark herbicide mixture to a *Pinus contorta* tree using low pressure and a flat fan spray tip orientated in a vertical position. Note that the amount of herbicide applied to the tree is more than twice the width of the diameter of the trunk.



Figure 3: Correct method of applying the basal bark herbicide mixture to the lower trunk of a contorta pine.

How long will it take for the trees to die?

Most trees die within one growing season especially if the herbicide is applied when they are actively growing but others may take up to 2 years to die. You may have to re-treat some trees but you can do this when you do follow-up work in the same area.

When must I not use the method?

Squirting trees should not be done during or after recent rain. This is because the "free water" on the trunks will cause the oil/diesel to emulsify and run down the trunk without penetrating the bark. If this happens, a chemical girdle will not form and the trees won't die.

If you think you should be using the basal bark method then follow the instructions in Appendix 1 to maximise the chances of killing your woody weeds.

If you need further information or want to share any insights please contact Peter Raal, Technical Advisor: Threats (Science and Technical's Christchurch Service Centre's Threats Unit) located in the Otago Conservancy Office.
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APPENDIX 1

Instructions on how use the basal bark and cut stump methods to control woody weeds on the farm

1. A basal bark mixture of 200 millilitres of a 600 g/l triclopyr butoxyethyl ester herbicide (for example, Grazon) in 800 millilitres petroleum-based oil or diesel should be used to poison the trees. This gives 120 g/l of active ingredient per litre of herbicide mixture. For difficult to control species such as hawthorns, use a 30% solution (300 ml triclopyr butoxyethyl ester herbicide in 700 ml oil). This gives 180 grams of active ingredient per litre of herbicide mixture. When you make up the herbicide mixture of oil and Grazon be sure to mix it well by vigorously shaking the knapsack before use.

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2. Water or water-based products such as dye, for example, must **not** be added to the mix. This is because an invert emulsion will be formed which will clog up your knapsack.

If you want/need to mark the trees you have treated, spray them with spray paint or mark them in some other way, just don't use dye in the mix.

You can add oil-based white enamel paint to the mixture (250ml per 5 litres of mixture). This works really well and helps you keep track of where you have been.

3. For best and reliable results, spray to saturate the entire circumference of the bottom 30 - 50 cm (up to 2 m for bigger trees) of trunk, including the root collar area, until just before the point of runoff using a knapsack (one dedicated for oil use only) and a solid cone or flat fan nozzle. Although narrow angle, flat fan nozzles can be used, the ideal nozzles are Teejet 5500-x3 solid cone spray nozzles.
4. The herbicide penetrates thinner bark best and it is found trees up to 20cm in diameter can be effectively treated using this mixture. For larger trees which have thicker bark, treat the stem up to 2 meters from the ground. If correctly applied, you should get a greater than 95% kill.
5. With 7.5 litres you can treat about 200 small trees (i.e. about 35 ml of herbicide per tree). It will cost about \$150 to make up a 7.5 litre mixture of Grazon/oil mixture which equates to between \$0.25 and \$0.75 per

tree. However, you can expect to kill 4 to 8 times more trees for the same amount of time cutting them down.

6. If you stop for a break good practice is to shake the knapsack again before you resume your work to ensure that the herbicide has not separated out from the oil.
7. Care must be taken to minimise the amount of spray drift and chemical/oil that runs into the soil which could potentially damage adjacent non-target trees. This is only because there is the possibility of injury to plants whose roots may extend into areas treated with the herbicide.
8. Particular care must be taken to ensure that the oil does not get into water in a wetland situation (you may want to apply the solution using a paint brush in these instances).
9. The spray should not be used if there is "free water" on the trunks which would cause the oil/diesel to emulsify and run down the trunk without penetrating the bark. If this happens, a chemical girdle will not form and the control is unlikely to be complete. For this reason, spraying should not be done during or after recent rain.
10. Although much quicker and efficient than cutting and pasting, frilling or drilling and filling, basal bark treatments are still labour-intensive because each and every stem needs to be treated. For this reason it can reasonably be expected that some trees and saplings will be missed during a poisoning operation.

Follow-up operations should therefore be planned for missed stems, new saplings and root suckers. Usually one or two follow-up spot treatments at 6-month intervals will provide a complete kill if the trees are susceptible. Re-treatment should include any living parts of treated stem(s) and re-sprouted stems.