Phosphonates for Control of SOD

Revised 10/27/09

Phosphonate Use Guidelines and Application Protocol

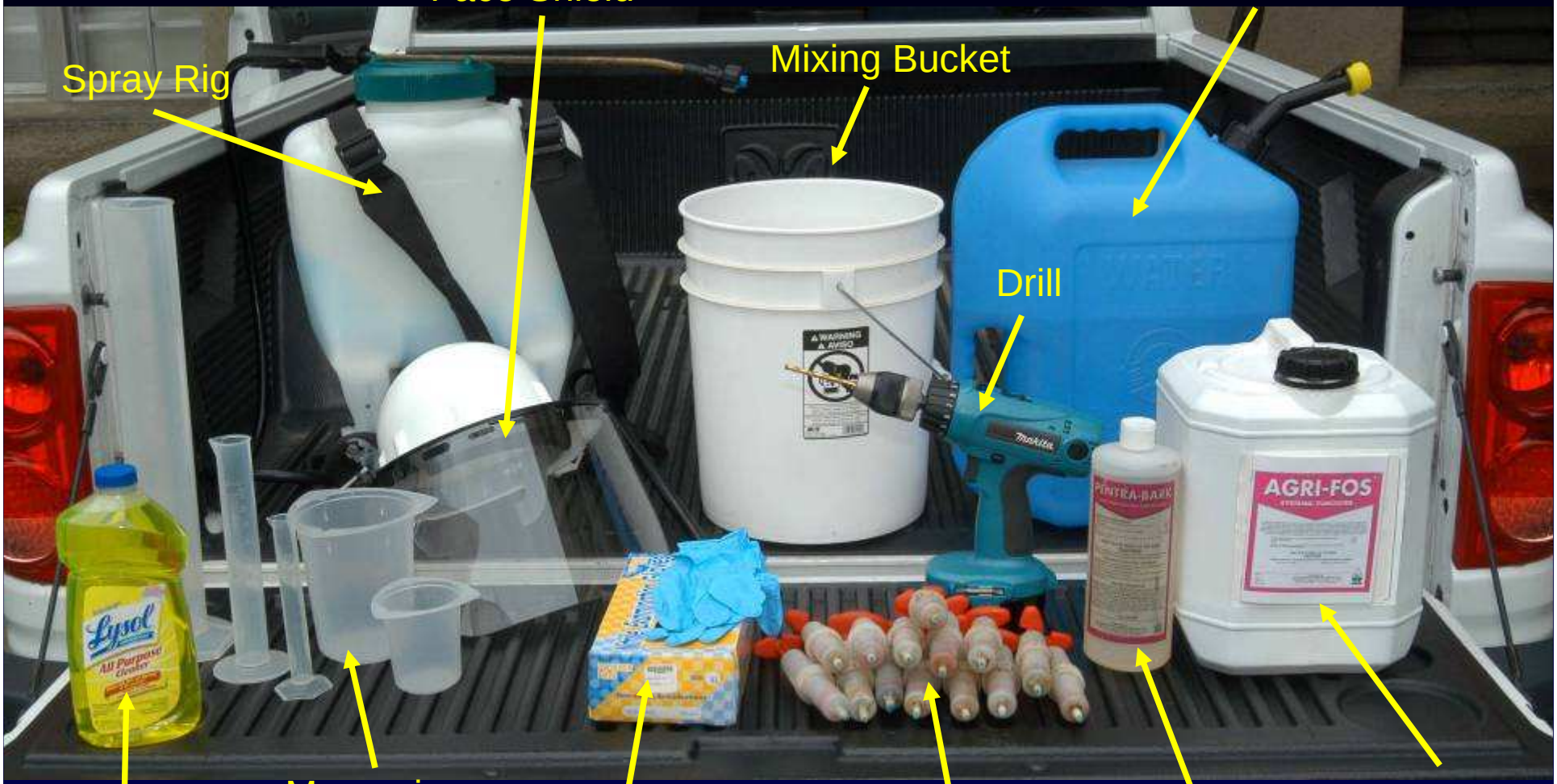
This protocol is designed to give the applicator practical information for successfully applying Agri-Fos® systemic fungicide to Oak and Tanoak trees for the treatment of sudden oak death (SOD). Two application methods are currently available, injection under the bark directly into the sapwood and topical application of the product, mixed with Pentra-Bark™ penetrating surfactant, onto the trunk of the tree. Both methods have been found to be effective at controlling the growth of *Phytophthora ramorum*, the causal agent of the disease, in oaks and tanoaks.

Application Protocol Pt. 2

Injection treatments require additional equipment in the form of syringe-type injectors that maintain a positive pressure or a backpack mounted hydraulic injector. The injections are made through multiple holes drilled in the trunk. But injections use significantly less product, usually about 10-80ml, to treat a tree.

The topical application, on the other hand, uses commonly available equipment and does not leave holes in the tree. The topical method however requires considerably more product and may damage surrounding vegetation, including moss and lichens.

Phosphonate Application Materials and Supplies



Application Protocol Pt. 3

Applications should be made when the tree is actively transpiring. Avoid treating trees during very hot or very cold weather, or when new leaves are emerging.

Currently in Northern California two applications in the first year are recommended, one Fall treatment in November or December and a second treatment approximately six months later. Subsequent treatments should be made once every year, preferably in the Fall, alternating between injection and topical application methods.

Preventative treatment, before infection has occurred, has been found to be more effective than curative treatments. At least 4 weeks are necessary for the applied chemical to take full effect.

List of Application Materials and Supplies

Checklist for injection treatments:

- Agri-Fos systemic fungicide
- Water
- Disinfectant
- Liquid measuring devices, pipettes, conical tubes, or beakers
- Plastic mixing containers, beakers etc.
- 5 gal bucket for carrying syringes, washing, and disinfecting
- Rechargeable cordless drill and bit
- Syringe-type tree injectors Chemjet®, Marley®, Sidewinder®, etc.
- Examination gloves
- Safety glasses or face shield

Checklist for topical application:

- Agri-Fos systemic fungicide
- Pentra-Bark surfactant
- Water
- Liquid measuring devices, pipettes, conical tubes, or beakers
- Plastic mixing containers, beakers etc.
- Spray equipment, hydraulic, pump-up type, or backpack mounted.
- Examination gloves
- Safety glasses or face shield

Topical Application

Prepare the treatment solution as per the label:

1.9 L Agrifos + 1.9 L water + 95 ml Pentra-Bark surfactant

equals

62.4 oz Agri-Fos + 62.4 oz water + 3.2 oz Pentra-Bark surfactant

Adult trees may require between 1 and 6 liters of mix per tree depending on their size.

Measure Agrifos and water and mix in tank.

Measure Pentra-Bark and add to tank just prior to application.

The mixture will foam if shaken or agitated.

Apply treatment solution uniformly to the tree trunk from 3-4m (9-12’) height, or as high as you can reach without spraying the foliage.

Soak the tree trunk thoroughly until the application solution just starts to run off at the base of the tree.

Avoid overspray. Application to foliage will cause damage to the leaves of most plants.

Injection Application

Prepare the treatment solution as per the label and inject 10ml per injection site:

1 part Agri-Fos + 2 parts water

equals

3.5 ml (0.1 oz) Agri-Fos + 6.5 ml (0.2 oz) water (makes 10 ml)

equals

324 ml (11 oz) Agri-Fos + 624 ml (21 oz) water (makes 1 quart)

Calculate the number of injection sites:

1 injection per 1 yard of canopy diameter, measured at the drip line.

or

1 injection per 6 inches of trunk circumference measured at 4 feet above the soil line.

Example: Canopy diameter = 24 feet (8 yards) and trunk circumference = 48 inches (48/6=8). Prepare 80ml of treatment solution, 8 injections of 10ml each.

Multiple trunks or an asymmetrical crown may make it difficult to calculate the number of injections. If in doubt take both measurements and use the one that results in the higher dose.

Measure volume of Agrifos and water.

Prepare injectors 10 ml per site.

Place injections where there is a clear translocation path up the tree, and stagger the injections vertically to prevent bark delamination.

Avoid drilling below limb stubs or near shakes, cracks, depressions, or into soft or punky wood.

Drill injection holes in bark.

Sharp bits and slower drill speeds perform better as they cut rather than tear the wood.

The drill depth is dependent upon the type and age of the tree as well as the thickness of the bark. There is a slight “pop” as the drill enters the sapwood.

The hole should be drilled perpendicular to the tree trunk or at a *very slight* downward angle.

Run the bit in and out of the completed hole to clear out wood chips that may interfere with the injection.

Insert Injectors

Check for leaks around the injection site. On actively transpiring trees the treatment solution will be absorbed in 5 to 15 minutes.

If the injection fails to be absorbed by the tree try cleaning out the hole with the drill bit or move to another site and drill a new hole.

High injection pressures can cause damage to the tree at the injection site.

Injection holes may be left open, covered with a sealant such as grafting wax, or plugged with specifically designed plastic pegs.

Sanitation

Use Lysol or bleach to disinfect equipment and prevent the spread of SOD.

Clean and rinse injectors between applications.

Disinfect boots, vehicles, and equipment thoroughly.

Signs of significant SOD infection

Oozing bark

Hypoxylon

Safety

Read and follow all label instructions.

Follow safety guidelines.

Wear appropriate clothing and equipment.

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