

## Horticultural Mineral oil

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### Introduction

Horticultural oils are made from a complex mixture of petroleum hydrocarbons produced from paraffinic crude oil. After distillation and filtration, they are formulated with an emulsifier to make it easier for the oils to blend with water. Since the 1880's horticultural spray oils were primarily used in the spring soon after green tip to control pests on fruit and in dormancy on shade trees. Oils (often referred to as 'dormant oils') are very effective against the eggs of certain mites, and scale insects that overwinter on fruit and shade trees. A new generation of more highly refined horticultural oils also known as "all seasons spray oils" or "summer oils" can be safely used on many plants during the growing season.

### Mode of Action

Horticultural oil acts as a contact insecticide until it evaporates. They are applied as sprays with direct contact needed to ensure complete and thorough coverage of the targeted insect or mite pest. It interferes with respiration more physically than chemically. Insects and mites are affected in 3 ways:

- 1) Prevention of gaseous exchange, disrupting respiration,
- 2) Interference with membrane function and some toxicity to cells from oil penetration and
- 3) Interference with feeding of certain leafhoppers and aphids on oil-covered surfaces.

Oil sprays are effective only against exposed eggs and insects that are coated with a layer of oil. The oil must be present long enough to suffocate the pest without doing the same to the plant. The heavier the oil, the more effective it is in control and the more likely it is to cause plant damage. One way to achieve effective results is to use the lighter oils for both dormant and summer treatments and use higher concentrations in the dormant season. Horticultural oils are most effective against many soft-bodied pests including aphids, spider



mites, scale insects, greenhouse whiteflies, mealybugs, plant bugs, lace bugs and some caterpillars.

### **Benefits of Horticultural Oils**

Horticultural oils are safe to mammals (including humans), some birds, and reptiles. Horticultural oils are not selective so will kill any susceptible beneficial insects, as well as pests, that are coated by the oil. However, horticultural oil evaporates rapidly, and, when dried, it will have little toxic activity. Thus, beneficial insects may safely re-enter oil-treated areas after the spray residue have dried. Spot treatments with oil will minimize the impact on beneficial insects because only those individuals covered by the oil will be affected. Because oils work by smothering (mechanically), there is less chance that insects or mites will develop resistance to the oils. Some formulations can be used by organic gardeners.

### **Limitations of Horticultural Oils**

In spite of these benefits, many potential users do not use horticultural oils because of a concern that phytotoxicity (plant damage or browning or burning of the leaves) will occur. The heavier, less-purified dormant oils used in the past were more likely to cause phytotoxic reactions than the more highly refined oils in use today. Superior horticultural oils can now be safely used on more than forty-five different types of woody ornamentals, as well as various fruits, berries, and vegetables. Because there is a little residual effect, oils may need to be re-applied (consult the label for more information). Spray in the morning or evening to avoid contact with foraging bees.