

General Comments about the Use of Horticultural Oil

by Mark Halcomb, UT Extension Area Nursery Specialist
and Dr. Frank Hale, UT Extension Professor of Entomology, Nashville, Tenn.
(Revised 4-11-2012)

While it has been suggested that oils smother or suffocate small insects and mites that cannot crawl out of it, the disruption of cell membranes and the resulting desiccation of the pest is another mode of action. Oil is a very environmentally safe and effective product. Insects generally do not build resistance to the oils. But do not breathe the spray mist as serious pulmonary problems may result.

Horticultural Oils work best when they are composed of tiny droplets. Absolute total coverage is essential for effective control. Insects or eggs not covered will not be killed. The oil must cover the insects and eggs that overwinter within the crevices of the bark, around the branch collars, bud union, etc.

Insects and mites are more vulnerable to Horticultural Oil when applied as a delayed dormant spray in late winter because they have resumed their activity and growth. Actively growing insects or mites are more susceptible than dormant ones. Horticultural Oil is usually best sprayed from Feb 15 into March or as long as the plant is still dormant.

Labels advise 1 or 2 applications, depending on the population. One application with complete coverage might be sufficient as a preventative. When a known population exists, apply two applications of horticultural oil separated by several weeks beginning around Feb 15. The dormant rate is a 2-3% solution on most labels or 2-3 gallons per 100 gallons.

During the dormant period, spray Horticultural oil when the temperature is above 40 degrees F and when freezing will not occur before the spray can dry. Spray oils on bright, clear, sunny days that will provide good drying conditions. Avoid periods of high humidity and low air movement. Light rain is of no concern.

Ensure that the plants have received sufficient cold temperatures and are completely dormant. Avoid spraying plants under moisture stress or with tender new growth.

Labels of most horticultural oils warn against applying them to plants when temperatures are below 40° F or above 90° F. Labels continue to include this advice

despite increasing evidence that this temperature range is conservatively narrow. It's more important that the plant is not stressed for moisture and the humidity should be low enough (45 to 65 percent) for oil to evaporate quickly.

There are two basic petroleum oils: superior oil and the summer horticultural oil (this includes ultra-fine oil). Superior oil can only be used during the dormant period. Summer horticultural oil is more highly refined and less likely to cause phytotoxicity to plants. It can be used both as a dormant application and during the growing season. Ultra-fine oil is safer because it is even more highly refined (cleaner, fewer impurities) and can be applied when the temperature is in the 80's or perhaps the 90's if the humidity is less than 65 percent.

Here are some of the overwintering insects and their eggs killed with Horticultural Oil:

immature whiteflies;

the white cottony **pine bark adelgid** (check the trunk and branches of white pine);

Spider Mites, all types: broad, southern red, two-spotted, rust mites and eriophyid mites on (hemlock, juniper, spruce, arborvitae, occasionally on burning bush & silver maple);

some types of overwintering eggs (the **spiny witch hazel leaf gall aphid** on birch and the **white pine aphid**);

oak phylloxera (that causes oak leaves to wad up in July).

Scale, all types

Euonymus scale on Manhattan and burning bush

White peach tree scale

Japanese Maple Scale – see the handout “Scale- White peach & Japanese Maple on the web site or request it for more specific details on control.

Application

Oil and water separate rapidly. Constant agitation is required. If a sprayer has been idle for a few minutes, be sure to spray into the tank for a minute to ensure that the oil is thoroughly mixed or begin spraying several feet from the crop. Otherwise, the emulsion in the hose and tips will have separated and the first plants sprayed may receive pure water or pure oil. The oil might burn in some situations, especially if foliage is present.

An airblast sprayer is more effective on foliar pests than on trunk pests. The air assistance provides better coverage with less water. The air also causes the leaves to move about rapidly, allowing the pesticide to reach both sides.

But an airblast does not achieve complete coverage of the trunks and branches. Those that attended the Sprayer Workshop in 2011 witnessed that.

Producers have gotten use to successfully controlling foliar insects and fungi by driving an airblast sprayer around multiple row blocks of 2 inch trees. Units I have checked were applying around 35 gallons of spray solution per acre.

Making two trips around a block to double the spray volume per acre does not increase the coverage as you might think. Hanging water sensitive paper in the center of the block has shown that dry paper after the first application remained dry after the second trip around the block, while wet spots got wetter. Oil is only effective where absolute total coverage is achieved. Begin planting host crops of the more difficult to control pests into 4 row blocks to improve spray coverage from existing airblast sprayers.

There must be adequate pressure to blow the oil through the plants, from 2 sides, achieving total coverage. Air blast sprayers are great, but the output will have to be increased to 60-80 gallons of spray solution per acre to obtain the degree of coverage required to control many pests with oil. (The required water volume will depend on foliage density.)

Airblast sprayers are available narrow enough to be driven in each middle to help achieve better coverage in large blocks and for the more difficult to control pests, such as the Japanese Maple Scale.

Handgun

A nursery may be forced to apply some pesticides with a handgun or backpack sprayer in blocks with more rows than an airblast sprayer can be effective in. Spray the same plants while moving down the row from two directions, from the north and then from the south.

Caution

Oil will remove the bluish blush from existing foliage on blue spruce but the new growth will be normal.

Oil-Sensitive Plants

Various labels and entomologists suggest various plants as being susceptible to oils such as maples, particularly Japanese and red maple; hickories and black walnut; plume cedar (*Cryptomeria japonica*) and smoke tree (*Cotinus coggygria*). Redbud, junipers, cedars, spruce and Douglas firs are listed as being somewhat sensitive.

Many of the precautions originate in northern states. It may be that oils were applied before plants became fully dormant one year, resulting in injury and the warning has persisted ever since. Davey Tree Co. realized this 30 years ago.

Use the more highly refined horticultural oils on the oil sensitive or even potentially sensitive plants in the nursery and landscape instead of the less expensive superior oil typically used for dormant applications.

Labels of most horticultural oils warn against applying them to plants when temperatures are below 40° F or above 90° F. Labels continue to include this advice despite increasing evidence that this temperature range is conservatively narrow. It's more important that the plant is not stressed for moisture and the humidity should be low enough (45 to 65 percent) for oil to evaporate quickly.

Visit for more information:

<http://www.colostate.edu/Dept/CoopExt/4DMG/PHC/hortoil.htm>

mhalcomb@utk.edu

phone 931-473-8484

Comm/Insects/Oil/Hort Oil Handout 4-11-12

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development.
University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating.
UT Extension provides equal opportunities in programs and employment.