

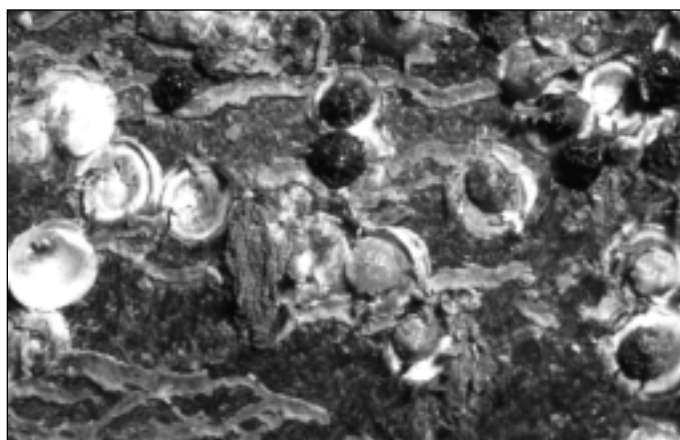
Horticultural Oils and Pest Control

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Petroleum and plant-derived spray oils have been used for insect and mite control for more than 100 years. Today, these oils show increasing potential for use as part of Integrated Pest Management (IPM) systems that use reduced-risk pesticides and nonchemical pest control strategies in place of conventional pesticides. Horticultural oils demonstrate reduced-risk properties: they are low in toxicity to mammals; they possess effective pest control properties; they have minimal impact on beneficial insects; and they are cost effective and easy to apply. These attributes make horticultural oils a wise and safe choice for pest control in the home landscape or in commercial agriculture.

A horticultural oil is sometimes referred to as a dormant oil, summer oil, supreme oil or a superior oil. Depending on the plant species, plant condition and the air temperature, horticultural oils may be used during any season of the year instead of just the dormant season. There are, however, limitations to their use on some plant species. Their misuse may result in plant injury, so read and follow all label directions.

Horticultural oils control small soft-bodied pests on fruit trees, shade trees, woody ornamentals and household plants. Oils recently have been approved for use on flowers and vegetables.



Scale insects can be controlled with horticultural oils.

Some difficult to control plant pests, such as scale insects, aphids and mites, can be effectively controlled with horticultural oils. These pests spend most of their time on a particular host plant and do not readily move from one plant to another. This habit makes them vulnerable to oil applications. If horticultural oils are applied during the dormant season, when higher rates

are recommended, they are especially effective against scale insects and eggs of certain plant pests and are not a threat to beneficial organisms.

Horticultural oils pose few risks and have a limited impact on natural enemies. Oils control plant pests either by contact or by acting as a poison. Through contact, they interfere physically with the pest's breathing by blocking the spiracles or air holes through which the insect takes in oxygen. Death is caused by asphyxiation. In some cases, oils may also act as poisons by interfering with the fatty acids and normal metabolism of the pest.

Sources of oils

Most horticultural oils are refined from petroleum products. Most of the sulfonated hydrocarbons and other impurities have been removed, making modern oils safe for more uses and on more plant species. Early oils first used as a pesticide were not well refined and could only be used safely during the plant's dormant season, hence the term "dormant oil."

Vegetable oils are also used as horticultural oils. The source of these oils affects their activity. Cottonseed oil, for example, is considered the most insecticidal of the vegetable oils, while soybean oil provides fair to good insect control.

Neem oil, an extract from the neem tree, has recently been discovered to have insecticidal properties and several neem-derived insecticides have been developed. Extracts from the neem seed also have shown promise as insecticides and fungicides. The discovery of more plant oils will give gardeners and farmers more selections of horticultural oils in the future.

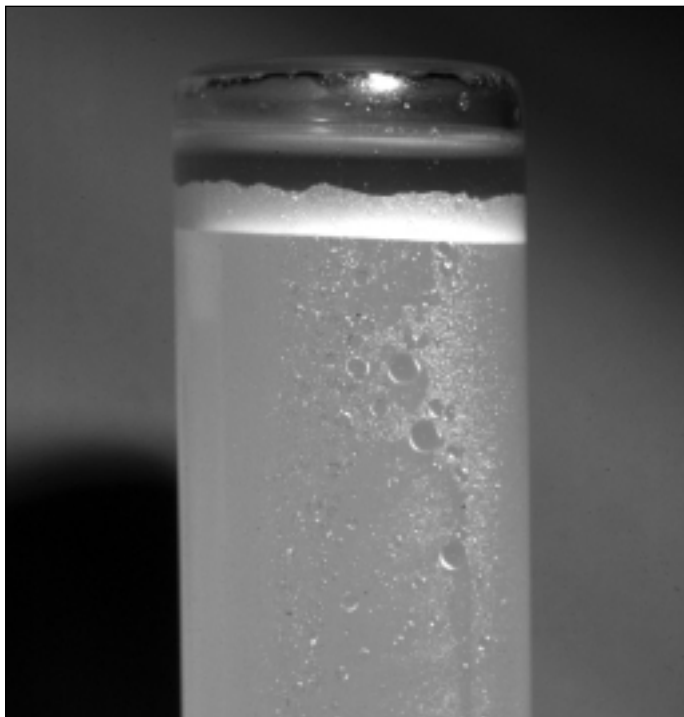
Preparing oils for use

Horticultural oils can be used by home gardeners or by farmers producing commercial crops. Oils by nature do not mix well with water. Therefore, they are normally formulated with an emulsifying agent that helps the oil mix with water. Agitation of the spray solution in the sprayer is important for both the gardener using a compressed air sprayer and the commercial grower.

When mixing horticultural oils in a compressed air sprayer for garden use, fill the sprayer one-half full with water, add the oil and finish filling the sprayer with water. Occasionally shake the sprayer to keep the oil in suspension.

Large mechanical sprayers used by commercial growers and pest control operators are usually fitted with either a by-pass or a mechanical agitation that helps keep the spray mixture in solution. When using mechanical sprayers, keep the engine running. Add the oil to the tank as the water level reaches the agitator shaft. If the sprayer has a by-pass agitation, add the oil when the tank is half full. Increase the volume to three-fourths full, then add other chemicals as needed.

Note: If the sprayer is idle for even a short period of time, the oils often will separate from the water even though an emulsifying agent has been added to the solution. Shake the sprayer or run a mechanical sprayer for a minute or two to get the oils back into suspension.



Oils will separate from the carrier. Agitation is necessary to keep oils in solution.

Application

Follow all product label directions when using horticultural oils. Recently improved refining processes have produced oils with increased safety to plants and have expanded their usefulness to seasons other than the dormant season. If an oil is safe to use during the spring or summer, it will have those instructions written on the label.

If oils are used in the dormant season, do not use them until winter hardening of the plants being treated has occurred. For best results, apply a dormant application of a horticultural oil in

late winter before buds swell. This allows the plant pest to be exposed to the harsh affects of the winter and makes them more vulnerable to the oils.

Note: Avoid spraying oils during periods of rapid temperature fluctuations during the winter. Plant injury may occur if the oils are used and the temperature decreases suddenly.

Mixing oils and insecticides

Horticultural oils may be mixed with certain insecticides, such as chlorpyrifos (Dursban, Lorsban) and diazinon, to improve their pest management success. Always read the label of all products used to understand compatibility and restrictions.

Precautions when using oils

1. Oils may be phytotoxic to some plants. Avoid drift to sensitive plants.

Oil-sensitive Plants

Black Walnut	Maples
Cryptomeria	Redbud
Hickory	Smoke tree
Juniper and cedars	Spruce

2. Do not apply when temperatures are excessively high (above 100 degrees) or low (below freezing).
3. Use caution when using oils on drought stressed plants.
4. Do not apply oils if plant tissues are wet or rain is likely. These conditions inhibit oil evaporation. High humidity (above 90 percent) may also contribute to injury, while low humidity generally reduces it.
5. Do not spray when plant shoots are growing.
6. Avoid treating plants during the fall until winter hardening has occurred. Fall treatments have sometimes caused increased susceptibility to winter injury.
7. Do not apply oils in combination with sulfur or sulfur-containing pesticides such as Captan. Also do not apply oils within 30 days of a sulfur application or do not apply sulfur within 30 days of an oil application.

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