

Two of the very best choices for sensible pest control are horticultural oil and insecticidal soap. They control more of the pests that trouble our landscape plants, garden plants and house plants than an arsenal of synthetic pesticides and do it with minimal danger to us, our pets and the earth. Horticultural oils are the modern descendants of the dormant oils used by our grandparents to protect their fruit trees from overwintering pests such as scale. Dormant oil could not be used on plants in leaf because the low level of refinement left impurities that caused damage. Only in the last decade have new techniques produced ultra-refined (also known as superior) oils that will not cause damage when applied according to directions to plants in leaf. Now you can find products such as Bonide All Season Oil that can be used safely anytime. Like the oils, insecticidal soaps have taken their place in the gardener's arsenal as an alternative to many compounds that remain in the soil or can contaminate ground water. There are no elaborate requirements for special protective clothing when using oils or soaps and no restriction on eating vegetables, fruits or herbs sprayed with them.

Soaps and oils are most effective on sucking insects such as spider mites, aphids, scale and whiteflies. Though they are not effective against most adult chewing insects such as caterpillars and beetles, they are effective against the larval stages of many of them. Timing the application is the most important factor when using these products against any pest. Unlike their chemical counterparts, using soaps and oils doesn't increase pesticide resistance because their mode of action is mechanical, not chemical. Oils smother insects and their eggs. Soaps disrupt their membranes. Oils have several other benefits including their protective effects against viral diseases and several types of fungus. Aphids are a major carrier of plant viruses, and oils have shown effectiveness as a protector against transmission of the viruses as well as controlling the aphids. Powdery mildew, black spot on roses, alternaria leaf blight on melons and early blight on tomatoes are all fungus diseases prevented by timely oil sprays, especially in conjunction with bicarbonate of soda.

Finally, if it becomes necessary to use a stronger chemical than these, the oil can often enhance the effectiveness of the chemical pesticide when mixed with it, thus reducing the amount you must use.

## Misconceptions

There are several misconceptions about soaps and oil. You may hear and read about substituting dish soap (or liquid laundry detergent) for insecticidal soap. Home dish soaps often damage plants when they are substituted for insecticidal soap and they generally are not as effective in killing the insects. The damage may be clear (browning edges or spots on the leaves) or it may also be less evident. Tests done on tomatoes and cucumber show that spraying with the homemade soap solutions reduces and delays the yield of vegetables. Dish soaps commonly found in grocery stores today are no longer soap. They are all detergents. In addition, they all contain a lengthy list of moisturizers, degreasers, fragrances and dyes that can add to the damage of the detergent. In addition, the household products vary greatly in concentration and effective rates of application have not been established. Insecticidal soaps are only slightly more expensive than dish detergents, but they will do their job without plant injury when used as directed. Occasionally, you will run into a recommendation to substitute a fine vegetable oil instead of horticultural oil. The ultra-refined horticultural oils are much, easier to use since they will stay mixed into the water long enough for you to spray. Vegetable oils are also larger particles that are difficult to force through a sprayer. We recommend using the ultra-refined products manufactured for horticultural use.

## Using Horticultural Oil

Horticultural oil can be the solution to many of your garden problems, but there is no one-size-fits-all remedy in horticulture. Horticultural oil is not tolerated by some plants, notably ferns and black walnut trees or other members of the genus Juglans. It should not be sprayed on plants with blue foliage such as blue spruce or blue hosta. Since their color is the result of the waxy coating on their leaves or needles, the application of oil may remove it, leaving them green instead.

**Cautions before spraying:** Plants under water stress (at or near wilting) may be damaged by horticultural oil. When in doubt, water the plant before spraying. If it is wilted, water the plant and wait for it to recover before spraying.

**When to spray:** The ideal time to spray is on a cool, cloudy morning when there is no wind and the temperature is between 40° and 90°. The spray should dry before direct sun falls on the plant or before freezing occurs. If it rains before the leaves are dry will wash the oil away and make re-spraying necessary. If your plants are under attack by a heavy insect infestation while the weather is uncooperative, particularly while it is too hot, spray them with water to knock off as many pests as possible, then wait for more favorable conditions.

**How to spray:** Be sure to mix the oil with water at the recommended rate. A stronger solution is likely to cause leaf damage. Agitate the sprayer often to keep the lighter oil mixed with the water. Always try to cover both sides of the leaves when you spray. Most insects hide beneath leaves or along the stems. Remember that oil must contact the pest to kill it. There is no residual killing action, but the coating it makes on leaves and stems can protect against transmission of some plant viruses and fungi.

**Horticultural oil used as a fungicide:** By mixing baking soda with the horticultural oil solution you can make a very effective, nontoxic fungicide. Add one rounded tablespoon of baking soda along with one tablespoon of horticultural oil to a gallon of water to make a spray that helps prevent powdery mildew, black spot and several other fungal leaf problems. Fungicides of all kinds are preventive not curative, so you must use them before or just as an infection sets in. They will not cure an advanced case. However, since oil and baking soda mixed according to directions is nontoxic, it can safely be used as often as weekly to prevent these problems.

## Using Insecticidal Soap

**NOTE:** Horticultural insecticidal soaps are not the same as dish soap or liquid laundry

## Horticultural Oil & Insecticidal Soap

soaps. Insecticidal soaps are potassium salts of fatty acids and their purity and concentration is controlled.

**Cautions:** Plants that should not be sprayed with insecticidal soap include horse chestnut, mountain ash, Japanese maple, jade, lantana, gardenia, bleeding heart and crown of thorns. Also some cultivars of azaleas, poinsettias, begonias, impatiens, ferns, palms and succulents are sensitive to soap. If in doubt, try a small area first and wait 24 hours to see if any damage develops. As with using horticultural oil, plants under water stress should not be sprayed. Water them before spraying if you are not sure. Wait until they have recovered if they were wilted.

**When to spray:** Once the insecticidal soap has dried on the plant it is no longer effective, so conditions that favor slow drying are best. Early or late in the day when the air is calm and cooler are good choices. Immediately after a rain or other times of high humidity and clouds are also good. Avoid hot, windy days or when the sun is falling directly on the plants that need to be sprayed.

**How to spray:** Be sure to coat the bottoms of the leaves as well as the tops. Most insects, their larvae and eggs are found under the leaves or along the stems.

**Follow-up:** Insects vary in their susceptibility to insecticidal soap and horticultural oil. Often the eggs or pupae are resistant to one

or the other, so it is important to follow up with another spray in 4 or 5 days and in the case of tough problems like the whitefly, use a third spray, especially if the infestation has been severe. Due to their low toxicity, oils and soaps can be used as needed without fear of build up on the plant or in the soil.

**Note:** Spraying the plant first with a fine mist of water will make the soap a more effective insecticide.

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