UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
UC Master Gardeners of Napa County

Healthy Garden Tips
napamg.ucanr.edu
707-253-4221

USING HORTICULTURAL OIL SPRAY

By Dean R Donaldson, Farm Advisor

What are horticultural oils? Most horticultural oils are highly refined petroleum products. Horticultural oils are used to control insect pests on plants. Products packaged for home gardeners generally use the name 'superior oil' or 'summer spray oil' to indicate the highly refined nature of the oil which makes it safe to apply to growing plants. Technically, horticultural oils have low sulfur content and flow easily – properties that assure good coating action with low risk of plant injury. These oils have been developed as a result of continuing University of California research began in the 1930s.

Vegetable oils (such as cottonseed, corn, soybean, peanut, safflower, castor oil, and sunflower oil) have been field tested in many states. Most vegetable oils show promise for controlling certain insects, but crop phytotoxicity and formulation difficulties are consistent problems. None are as effective, safe and economical as the highly refined petroleum oils currently on the market as horticultural oil. One effective vegetable oil product, made from the 'Neem' tree nuts, is packaged and available for home use.

How are they used? Horticultural oil products are added to water and sprayed onto the surface of plants to control damaging insects. Generally, a two to four percent solution of oil is mixed into water and then applied. Mixing instructions on individual product labels must be followed carefully when preparing spray solutions. Failure to properly mix horticultural oil sprays can result in clogged equipment or an ineffective spray. Always read and follow product label instructions exactly.

How does horticultural oil control insects? Most experts agree that oil smothers sensitive insects. Fine droplets of horticultural oil easily coat tender insect bodies and egg surfaces, preventing oxygen from entering – resulting in insect death. However, insects which are partially coated by the spray or in a 'resting' or 'protected' stage of growth (such as mature hard shell scales or moth cocoons) will not be controlled. Oil spray residues do not effectively control pests. Proper spray technique, using fine droplets to thoroughly coat all plant parts give maximum results. Improved effectiveness of oil sprays is achieved when synthetic chemicals insecticides are added according to product label instructions.

When should I use oil sprays? Oil sprays are applied to plants when insect pests are in susceptible stages of growth. Here are common examples:

Scale insects – control the larvae, called 'crawlers' when found on new growth and leaves.
Leaf chewing caterpillars – control egg masses in the winter or small larvae in early spring.
Spider mites – control eggs on tree bark in winter or adult and eggs on leaves in summer.
Sucking insects such as plant bugs and aphids – control young when observed in high numbers.

Insect stages are easily observed on home garden plants. For the technology inclined dedicated gardener, computer models based on local weather observations give accurate timing for common insect pests. Consult: http://www.ipm.ucdavis.edu.

Beware! Sulfur and oil combinations are harmful to plants. Using horticultural oil within 30 days of a sulfur application to the same plant can result in severe injury to the plant. Also, oil should not be applied to plants under water stress. Horticultural oil is commonly packaged with other spray ingredients (such as fungicides or insecticides) for ease and improved performance. Be sure your product choice can be used on the plants and at the time you wish to treat. Some product combinations are damaging to certain species of plants or cannot be used when edible fruit are present. Avoid damage: Read product labels before you purchase and before each use.

What about effects on beneficial and the environment? Horticultural oil has a very low mammalian toxicity level and rapidly decays in the environment. Because of their short-term residual activity, spray oils do not severely affect populations of beneficial mites or insects. Bees, most insect predators and parasites are killed on contact when sprayed directly. However, reintroduction of beneficial can occur quickly from nearby untreated areas.

Additional Reading:

Integrated Pest Management for Apples and Pears, Second Edition, UC ANR IPM, Publication #3340, 2016.
Safe and Effective Use of Pesticides, UC ANR Publication #3324, 2016.