Dormant Season Fruit Tree Spraying

Many Northern Arizona gardeners enjoy growing various deciduous tree fruits. Yavapai County has a particularly good climate for peaches, plums, apples, pears, and other species. Once the harvest is over, fruit tree care continues. First, gather the mummies (rotten fruit) from the tree and soil surface to reduce overwintering pests (the mummies may be composted). In addition, an application of horticultural oil can further reduce overwintering pest populations.

The use of oils to control pests goes back over 1,900 years. Pliny the Elder wrote that mineral oil controlled certain plant pests. Starting in the 1700's, petroleum oil, whale oil, kerosene mixed with soap and water, and other oils were in common use for insect population control. Oils are also effective at managing some diseases such as powdery mildew.

Horticultural oils pose few risks to people and many beneficial natural enemies of insect pests. Because of this, oils are often integrated with other biological insect and disease controls. Horticultural oil toxicity is minimal, at least compared to alternative pesticides, and oils quickly dissipate through evaporation, leaving little residue. Oils also are easy to apply with existing spray equipment and can be mixed with many other pesticides to extend their performance.

Most horticultural oil products sold today are petroleum based. Modern refining techniques yield oils that are less harmful to plants and more harmful to insects. Today's horticultural oils are a complex mixture of hydrocarbons containing traces of nitrogen- and sulfur-linked compounds. Newer products have been developed from vegetable products such as safflower and corn.

In general, horticultural oils kill insects either by blocking their breathing apparatus or interfering with their metabolic processes. These modes of action are mostly physical and do not promote resistance like other synthetic insecticides that disrupt the insect (and other non-target species) nervous systems (i.e. malathion, pyrethroids, etc.). In addition, horticultural oils must be directly sprayed on an insect to harm it. Pollinators and other beneficial insects can be protected by applying oils when beneficial species are not present.

Horticultural oils are usually sold as emulsified liquid concentrates or oil emulsions. These are mixtures of oil, soap, and water. Here, the soap helps keep the oil and water from separating. This creates a mixture of very fine globules of oil surrounded by thin films of soapy water.

Apples can be sprayed with dormant oil sprays to decrease numbers of overwintering insects (photo from Oregon State University Extension Service).

Between the 1930's and 1970's, oil products were highly viscous (thick) and recommended for dormant use only. These products were called "dormant oils". They controlled over-wintering pests on dormant, leafless, deciduous trees. This sometimes caused undue stress on the plant and burning of tissue. This was compounded by high concentrations of sulfur containing compounds that carried over from the crude oil.

Today's horticultural oils (also called superior or supreme oils) are highly refined and much less viscous, they can be applied to leaves and stems with little or no damage to the plant. These products are sometimes referred to as "summer oils". Horticultural oils are effective at controlling many common ornamental and fruit tree pests. These include: aphids, leafhoppers, leaf rollers, mealybugs, mites, psyllids, scales, tent caterpillars, and fall webworm, particularly in overwintering stages. Other insecticides such as Bacillus thruringiensis (Bt) or NPV (nucleopolyhedrovirus: another larvicide) can also be mixed with horticultural oils for improved penetration and coverage.

January 15, 2023

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