Horticultural Oil, a Slick Alternative

February is an ideal time to apply horticultural oil to your woody ornamentals and fruit trees to control adult scale and several other overwintering insects. However, understanding oil’s modes of action, its benefits and its limitations is important to having success.

Horticultural oils have been used for pest control for over a century. In the early years, they were used only on dormant plants because of the unpurities in the oil product. However, improvements in refining techniques have now made oils safe to use during both the dormant season and the growing season.

What is Horticultural Oil? Essentially all commercially available horticultural oils are refined petroleum products. Homemade recipes that include vegetable oils also can be used. The type of vegetable oil however can greatly affect its effectiveness. Cottonseed oil is generally the most insecticidal of all the vegetable oils.

There are two types of oils used for pest control—dormant oils and summer oils. Dormant oils are applied when the plant is dormant (winter). These oils have a high viscosity, or heaviness. This is important because during the dormant season, insects and mites have a lower respiration rate. The heavier oil is slower to dry and therefore covers the pest for a longer period before evaporating. This increases its effectiveness.

Summer oils are lower viscosity, lighter oils. Usually, an emulsifier has been added to ensure that the oil mixes well with water to ensure uniform spray coverage. Summer oils are applied during the growing season. Summer oils are known by many names including ultra-fine or superior oils.

How does horticultural oil work? Horticultural oils are most effective against soft-bodied insects like aphids, spider mites, scale, mealybugs and lacebugs. Oils act against insects in three ways. Its most important mode of action is suffocation. Oil actually coats the insect and blocks the insect’s breathing holes (spiracles). This mode is also effective against insect eggs. Oils can also act as a poison by interfering with an insect’s metabolism. Oils also can disrupt insect feeding especially with certain sucking insects like aphids and leafhoppers.

Because of its modes of action, horticultural oils are effective insecticides only as liquids. They lose their effectiveness after they dry.

What are the benefits? Horticultural oils are relatively safe. Oils are safe to
mammals (including humans), birds and reptiles. However, oils are toxic to fish because they coat the gills and prevent respiration. Oils can also harm bird eggs.

Oils have many other benefits. They are relatively inexpensive, easy to use, require no special spray equipment, are effective against a wide range of pests and insects rarely develop resistance to oils.

Are there any drawbacks? In spite of horticultural oils many benefits, they do have some limitations. First, because oils do not have a long lasting effect, the target pest must be present in order to be controlled and coverage must be thorough.

Horticultural oil is not selective. Therefore, oils will kill any susceptible beneficial insect if they become coated with the oil. However, fast moving insects (like many beneficials) survive because they move away from the area as it is being sprayed. When they return there is no residual effect to harm them, since horticultural oil evaporates rapidly.

The main limitation of oils is their small but real potential to cause plant injury (phytotoxicity) in some situations. Phytotoxicity shows itself in many different forms. Damage may appear as yellowing of the leaves, death of tissues, stunting, growth retardation, abnormal growth or defoliation.

Phytotoxicity, resulting from use of oil, may occur if the plant is a variety that is particularly sensitive to oil, an excessive rate of oil was used, there were too many applications of oil, the oil was applied at close intervals, mixing the oil with another incompatible chemical, or inappropriate weather conditions at the time the spray was applied.

Summer oils typically should be sprayed when temperatures are between 40-85°F on a day with moderate humidity and when the plant is not under moisture stress. Dormant oils are typically applied when temperatures will remain above 40°F for 24 hours.
Tips for Using Horticultural Oils

- Read the label.
- Know your pest before treating.
- Thorough coverage is necessary!
- Apply on days with relative humidity of 90% or less. The faster the drying time, the lower the potential for phytotoxicity. Oils should dry and evaporate within 1 to 2 hours.
- Spray summer oils as early in the day as possible before it gets too hot, or late in the day when temperatures cool.
- The potential for phytotoxicity increases when summer oils are applied on overcast days, when drying time is increased, during very high humidity, and following a rain.

Precautions When Using Horticultural Oils

- Do not use oils in a spray tank that has previously contained a sulfur-based fungicide.
- Do not mix oils with a fungicide, nor spray within 2 weeks of a fungicide.
- Do not mix oils with carbaryl (Sevin).
- Do not apply if rain is predicted, or foliage is wet.
- Do not apply if humidity is expected to remain above 90% for longer than 36 hours.
- Do not apply to drought-stressed plants.
- Do not apply to sensitive plants.
- Do not apply when buds are fully open and shoot elongation is occurring.
- Treat small areas first if phytotoxicity is a concern.