

Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel



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October 23, 2009 No. 30

Benefits of Using Dormant Oils to Manage Arthropod Pests

Arthropod (insect and mite) pests normally survive the winter months in an over-wintering stage such as an egg or a mature female that emerges in the spring. Instead of waiting until spring to initiate management or regulation measures, it may be beneficial to apply a dormant oil. The advantages of dormant oil applications are 1) a wide range of activity against most species of mites and scales; 2) minimal likelihood of arthropod pests developing resistance; 3) in general, less harmful to beneficial insects and predatory mites (=natural enemies) than those pesticides (insecticides and miticides) with long-residual activity; and 4) relative direct safety to animals and humans. Disadvantages of dormant oil applications are 1) potential phytotoxicity (=plant injury) during the growing season, and 2) minimal residual activity or less persistence.

Dormant oils, which are commonly derived from paraffinic crude oil, are the heaviest of the petroleum oil sprays with a low unsulfonated residue (UR). The unsulfonated residue is an assessment of the phytotoxic compounds remaining after distillation and refining. A UR value $\geq 92\%$ indicates a highly refined product with less potential for phytotoxicity. In general, dormant oils have a UR value $<92\%$.

Dormant oil applications are typically directed at killing overwintering arthropod pests including mites and scales—before they become active in the spring and are capable of causing plant injury during feeding. Applications are performed during the winter-time in order to minimize phytotoxicity to ornamental plants (trees and shrubs). A 2 to 4% rate is commonly used in late fall through early spring. Dormant oils are contact materials that either suffocate, by blocking the breathing pores (spiracles), or directly penetrate and disrupt cell membranes of exposed arthropod pests. It is important to understand that dormant oils have minimal residual activity once the material dries, so thorough coverage of all plant parts is critical.

Dormant oils are applied to all plant parts since the overwintering stages of certain arthropod pests are located somewhere on the plant (e.g. bark). However, a number of arthropod pests do not overwinter on plants. For example, dormant oil applications are not effective against the twospotted spider mite (*Tetranychus urticae*) because this mite overwinters as a female in plant debris, mulch, or other non-plant protected places. In contrast, the spruce spider mite (*Oligonychus ununguis*) is susceptible to dormant oil sprays because this mite species overwinters in the egg stage on plants such as arborvitae, juniper, hemlock, and pine.

Dormant oils are effective in killing the overwintering stages of scales, especially first and second instars or nymphs (=crawlers), and immature females. The euonymus scale (*Unaspis euonymi*), for example, overwinters

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as second instar nymphs or mated mature females; both life stages are susceptible to dormant oil applications. However, certain scales that typically overwinter as eggs such as oystershell scale (*Lepidosaphes ulmi*) and pine needle scale (*Chionaspis pinifoliae*) are more tolerant of dormant oil applications. The reason for this is that the eggs are usually stacked on top of each other, and the dormant oil may not penetrate and contact the bottom layer. As a result, additional insecticide applications are typically required after egg hatch.

A concern when applying dormant oils is the potential for phytotoxicity. For example, some plants such as arborvitae, beech, redbud, and certain maples (Japanese, red, sugar, and amur) may be harmed by dormant oil applications. Moreover, the needles of Colorado blue spruce may be discolored or change from blue to green as a result of dormant oil sprays. Phytotoxicity is commonly a problem when higher rates (>4%) are used and/or when applications are performed in early fall before dormancy or in late spring at bud-break. Problems associated with phytotoxicity are less likely to occur when applications are performed in early November through February, which is when most plants are completely dormant. In order to avoid phytotoxicity, it is imperative that the spray solution is continually agitated. In addition, never apply dormant oils when there is a possibility of freezing. Dormant oils should be applied to deciduous plants when the ambient air temperature is above freezing for at least 24 hours. Evergreens are more susceptible to spray injury than deciduous plants, so it is best to apply dormant oils when the ambient temperature remains above 40°F over a 24-hour period. Additionally, dormant oils should never be applied to plants that are stressed because plants that are experiencing “stress” are more susceptible to phytotoxicity. For example, lack of moisture, extreme ambient air temperatures, sudden drastic changes in the ambient air temperature after application, prolonged windy conditions, or insect/mite infestations or disease may predispose plants to phytotoxicity.

Preventative dormant oil applications can save time and money later when dealing with arthropod (insect and mite) pests. In fact, insecticide and/or miticide treatments may not be necessary, or the number of applications may be reduced, which can preserve the natural enemies (parasitoids and predators) of mites and scales.



Raymond Cloyd

Autumn Home Invaders

We are starting to see, and get reports about, some of the annual household invaders. These include crickets, boxelder bugs, millipedes, and especially the multicolored Asian lady beetle. These insects typically try to invade homes this time of year looking for a shelter to survive the winter. These pests are really just a nuisance and pose no threat to health or property but when significant numbers do build up they can be a serious nuisance.

The best way to protect your dwelling from these pests is to limit access by eliminating, or at least reducing, the points of entry. Ensure that all screens are tight fitting and intact. Make sure the caulk around windows and door frames are in good condition. Remove excess foliage and mulch from around the foundation.

Insecticides can also be effective if you treat the exterior foundation and some of the area around the outside of the building. This often reduces the number of potential household invaders. Once inside, sometimes hand-picking or vacuuming is enough to eliminate the problem. Glue boards can also be helpful to trap the insects. However, if significant numbers do succeed in entering, an insecticide application inside the home may be required. Aerosol sprays may work to give a quick knock down but have short lasting effects. Insecticides with longer lasting effects can be sprayed along baseboards, in cracks, crevices, and other hidings places, and often work quite well. Always check the pesticide label to make sure the product you select is effective against the target pest and has no unwanted side effects, i.e. does not stain, leave unsightly residues, etc.



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Multicolored Asian Lady Beetles

These insects deserve a little more explanation as they are considered “beneficial” insects during the growing season. However, they can be serious nuisances for the next month as they aggregate for overwintering. These beetles were first imported into the US by the USDA in the late 70s and early 80s to help with aphid control. They are very efficient aphid predators and since they have biting/chewing mouthparts they can also deliver an irritating bite to people. If enough beetles congregate inside a home they can also cause a small odor problem, may stain certain substrates when smashed, and occasionally cause an allergic reaction in some folks. If there are significant numbers of beetles in your area this fall it probably means that aphids were plentiful in nearby crops and other plants this past summer. These beetles are primarily attracted to the south- and west-facing sides of structures because they radiate/reflect the most heat.

Jeff Whitworth

Holly Davis

Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostician Laboratory from October 2nd to October 22nd.

October 2 2009 Douglas County – Bat bugs in dwelling
October 2 2009 Cowley County – millipedes in home
October 7 2009 Riley County – Lone star tick
October 14 2009 Bourbon County – German cockroaches in home
October 15 2009 Riley County – Wolf spider in home
October 15 2009 Barber County – Carpet beetles in home
October 16 2009 Edwards County – Wolf spider in home
October 19 2009 Riley County – Codling moth larva in apple
October 20 2009 Republic County – Rodent bot fly larvae in rat
October 20 2009 Clay County, MO – Carpet beetles in home

If there are any questions regarding these samples or about the identification of any arthropod please contact the Insect Diagnostician at (785) 532-4739 or GotBugs@ksu.edu.

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Sincerely,

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