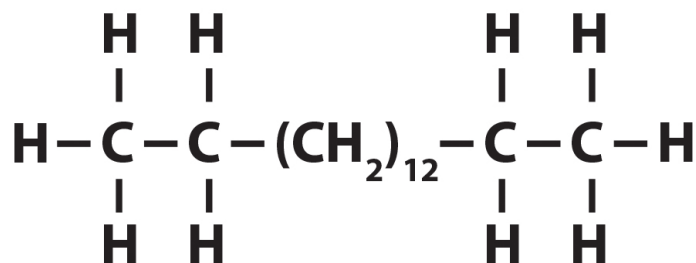


Olefin



Paraffin

PESTICIDE INGREDIENT: HORTICULTURAL OIL

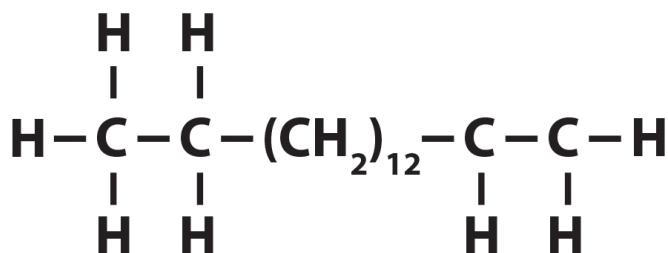
Home Garden Series

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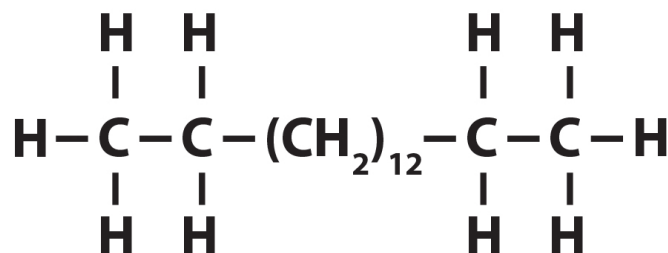
FS184E

Pesticide Ingredient: Horticultural Oil



Olefin

CAS Number 8012-95-1 (paraffin/mineral oil)



Paraffin

WSU Extension Pesticide Ingredient fact sheets describe basic traits of active ingredients found in WSDA-registered pesticides.

Introduction

Horticultural oils are manufactured using either petroleum or vegetable oils. They are produced by extracting and distilling (boiling, then condensing the vapor) the petroleum or vegetable source. In the past, it was difficult to use horticultural oils because they often damaged plants, even under perfect application conditions. The culprit was impurities, mainly naphthene and sulfur. In modern times, the distillation process is much improved and removes these impurities, making oils much safer to use on plants.

Both petroleum and vegetable oils are made up of mixtures of different compounds. Petroleum oils most often contain the two compounds, olefin and paraffin, whose chemical structure is pictured above. Vegetable oils, such as canola or soybean, contain mixtures of triglycerides, or unsaturated fatty acids. The amount and type of compounds in any horticultural oil depends on how extraction and distillation were done. The same is true for impurities contained in the oil.

The labels on horticultural oils often list ingredients such as paraffin oil, petroleum oil, or mineral oil/petroleum distillates. Gardeners may find it confusing to try to pick an oil based on its active ingredient name because names have changed over time. For example, paraffin is an old term that means the same thing as mineral oil in this circumstance. Whether the ingredient is called paraffin oil, petroleum oil, or mineral oil/petroleum distillates it will produce the same result.

Labels may also list summer oil, superior oil, dormant oil, or year-round oil. These terms also present historical problems. Dormant oils used to mean for winter application to woody plants only. They were thicker and beaded up on the plant, so they evaporated more slowly, thus staying on the plant longer. Dormant oils typically contained impurities that would burn summer foliage. Newer refining processes have made these oils lighter, with fewer impurities, so the term *dormant oil* now refers to the time of application, not the physical characteristics of the oil.

Summer oils may also be called superior oils. This is an older term that previously meant highly refined oils. Like dormant oil, the definition has changed. Now, summer oil just means the time of application.

Whether gardeners are looking at the current contents of their garden spray shelf or shopping for new horticultural oils, it is important to read the labels carefully. Regardless of its age or the name used for its active ingredient, its label will always tell you how to use the material correctly. Also, check to see if the label lists the plants you have and addresses your pest problem at the appropriate time of year.

How it Works as a Pesticide

Regardless of the source, petroleum or vegetable, these oils kill eggs, larvae, and nymphs of insects and mites by smothering them. It also works on all life stages of soft-bodied insects. Insects with waxy exoskeletons or dense body hairs are harder to kill because the oil cannot cover their body surfaces uniformly.

As a fungicide, oils work by interfering with fungal attachment to the host plant and by suffocating spores. Oils will also deter some insects from laying eggs, if the plant is sprayed while females are looking for good egg-laying sites, and it may deter other pests from feeding.

Because oils are only effective when applied directly to the pest, good plant coverage (top and underside of leaves) and correct application timing are critical. Never apply horticultural oil as a preventative: oil does not provide residual control if the pest is not present. Oils do not work as soil drenches either; they must be applied to aerial plant parts.

Remember, only apply pesticides to crops or sites specified on the label. Always store these oils out of the reach of children and pets, preferably in a locked cabinet. Keep pesticides in their original containers so you will always have access to instructions on personal protective gear and other precautions. Carefully dispose of these oils by contacting your local Hazardous Waste collection facility.

How to Use it Successfully

If you choose to use horticultural oils, your chances of success are increased if you keep these precautions in mind:

- Apply the correct product concentration in the correct season.
- Spray only when conditions minimize drift.
- Avoid application to already stressed plants (i.e., those affected by drought, winter injury, or severe insect feeding).
- Make sure plants are thoroughly watered before oil application (to avoid drought stress), and do not apply oils when leaves are wilted.
- Keep the spray mixture properly agitated. If the spray mix separates, the chances of oil burn increase.
- Resist applying oils to wet leaves because oils will not adhere effectively.
- Avoid application right before it rains or when there is overhead irrigation as the oil will wash off more quickly.
- Check humidity levels. A humidity level of 90% or more for 36 hours is too high for oil applications.
- Avoid applying oils within two weeks of a sulfur spray since this can damage plants.
- Check product labels to see if mixing with sulfur or certain fungicides is prohibited. Read and follow the label instructions carefully.
- Avoid spraying oils during a plant's active shoot growth. The oil damages tender new growth.
- Apply oil only when temperatures are between 40 and 90 degrees.

To avoid possible plant damage, test a small part of the plant first and wait a few days to see if burn symptoms appear.

Potential Drawbacks

It is fairly easy to accidentally damage your plants or nearby environments when applying horticultural oils. Here are some important points to consider before using these oils:

- Horticultural oils are non-specific so if beneficial insects get sprayed, they will die along with the insect pest. Only spray plants with confirmed pest problems in order to conserve the beneficial insects in your garden and landscape.
- Be aware that junipers and spruce often lose their blue color when oil is applied. (See Figure 1.)
- Oil and water do not mix: horticultural oil will inhibit oxygen transfer, which can kill fish. Keep applications and their airborne oil drift out of waterways.



Figure 1. Juniper damaged by oil overspray of apple tree. (Photo by Linda Petite, Horticulture Centre of the Pacific, Vancouver, BC.)

Further Reading

Information on beneficial insects can be found in the full-color WSU Extension Manual [*Beneficial Insects, Spiders, and Other Mini-Creatures in Your Garden: Who They Are and How to Get Them to Stay*](#). WSU Extension Publication EM067E.

The National Pesticide Information Center (NPIC), through an agreement with the U.S. Environmental Protection Agency (EPA), provides objective, science-based information on pesticides. [NPIC fact sheets](#) include details about ingredient toxicity and known environmental effects.

The [Pesticide Information Center Online](#) (PICOL) database lists all the registered pesticides in Washington and Oregon. This free, searchable database can be used to identify products with specific active ingredients.

The EPA offers a wide range of technical information about pesticides. Informational fact sheets can be found at <http://www.epa.gov/pesticides/factsheets/index.htm>.

WSU Extension provides information on managing plants and pests in its publication [*Hortsense: Home Gardener Fact Sheets for Managing Plant Problems with IPM or Integrated Pest Management*](#).



Use pesticides with care. Apply them only to plants, animals, or sites as listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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