Insecticidal Soaps for Garden Pest Control

If you are looking for a safe, effective and low toxicity alternative to more toxic pesticides for the control of many undesirable insects in your garden, insecticidal soaps may fit the bill. Insecticidal soaps have many advantages when compared to other insecticides. They are inexpensive to use, are among the safest pesticides, leave no harsh residue, are natural products that are virtually non-toxic to animals and birds, and can be used on vegetables up to harvest. Most beneficial insects are not harmed by soap sprays.

Soaps are made when the fatty acid portion of either plant or animal oils are joined with a strong alkali. They are potassium salts of fatty acids. Commercial insecticidal soaps are a highly refined version of liquid dish soap. While you could make your own insecticidal soap mixture, there is a substantially increased risk of plant injury with them. Dry dish detergent and all clothes-washing detergents are far too harsh to use on plants because of all the additives in them. Some soaps and detergents are poor insecticides.

Small, soft-bodied insects such as aphids, mealybugs, thrips, scale crawlers and spider mites are most susceptible to the soaps. Insecticidal soaps kill by suffocation, they appear to disrupt the cellular membranes of the insect, and they remove protective waxes that cover the insect, resulting in dehydration. Insecticidal soaps are also an effective leaf wash to remove honeydew, sooty mold and other debris from leaves.

Some plants are sensitive to soap sprays and may be seriously injured by them. Read the label to make sure your plant is not one of them. Portulaca (Portulaca grandiflora) and certain tomato (Solanum lycopersicum) varieties may also be damaged by insecticidal soaps. Conifers may be sensitive under drought conditions. Plants with a bluish color caused by a waxy leaf coat may loose their desirable color as the wax is washed away.
Other sensitive plants include hawthorn (Crataegus spp.), sweet pea (Lathyrus odoratus), cherries (Prunus spp.), plum (Prunus spp.), horse chestnut (Aesculus hippocastanum), mountain ash (Sorbus spp.), Japanese maple (Acer palmatum), bleeding heart (Lamprocapnos spectabilis), maidenhair fern (Adiantum spp.), crown of thorns (Euphorbia milii), lantana (Lantana camara), nasturtiums (Tropaeolum spp.), gardenias (Gardenia jasminoides), and Easter lilies (Lilium longiflorum).

Other somewhat sensitive plants are azaleas (Rhododendron spp.), begonias (Begonia spp.), fuchsias (Fuchsia spp.), geraniums (Pelargonium spp.) and impatiens (Impatiens spp.). Rinse plants with a clean water spray if they show signs of wilting or leaf edge browning within a few hours of treatment.

To test for plant sensitivity, spray a small area and wait 24 hours to see if any damage occurs. Plants under water stress should not be sprayed.

Application

As with anything applied to plants, it is important to read the label completely and to carefully follow the directions. Insecticidal soaps are usually used as a 1 to 2% solution (2½ to 5 tablespoons per gallon). Always follow the label for the product you are using. Do not attempt to use in higher concentration, as this may be very harmful. Mix the soap concentrate in a clean sprayer. Do not apply the soap in full sun or at temperatures above 90 °F as this may damage the plants. High temperatures and high humidity may increase plant stress and therefore sensitivity. It is best to treat your plants in the early morning or late in the day. Since the soap spray is only effective as long as it is wet, the slower drying conditions of these times favor better insect or mite control.

It is important to spray both the top surface and, especially, the under surface of the leaves as many of the pests will be found there. Because of the relatively short residual action and the fact that the insects must be in contact with the soap to be effective, repeat applications may be necessary every 4 to 7 days (follow the label directions) until the pests are eliminated. Avoid excessive applications as leaf damage may accumulate with repeated exposure. Always follow the directions on the label.

The quality of the water you are using should be considered when using insecticidal soaps. Hard water reduces the effectiveness of the insecticidal soap. Calcium, magnesium and iron cause the fatty acids to precipitate out of the solution causing the soap to be ineffective. It is important to use the purest water possible. You can determine if your tap water is compatible by mixing the recommended concentration of soap that you want to use with the appropriate amount of water in a glass jar. Agitate and let the mixture stand for 15 minutes. If the mix remains uniform and milky, the water quality is fine for the spray. If there is a scum on the surface, you should use distilled or bottled water.

The only disadvantages of insecticidal soaps are associated with the limitations of their nature.

- The soap solution must wet the insect during application.
- There is no residual effectiveness because soap dries or is washed away.
- There is a potential for phytotoxicity when the soap residue is affected by high temperature.

Insecticidal soaps can be found where garden supplies are sold. They are sold as either a concentrate or as a pre-mixed RTU (Ready to Use). Some commonly available insecticidal soap brands are:

- Bonide Insecticidal Soap Concentrate; & RTU
- Safer Insect Killing Soap Concentrate; & RTU
Insecticidal soap is a great tool for any gardener. It provides a safe and effective way to grow plants naturally, control many soft-bodied pests safely and reduce the number of harsh chemicals needed to keep your garden lush, lovely and healthy.


This information is supplied with the understanding that no discrimination is intended and no endorsement of brand names or registered trademarks by the Clemson University Cooperative Extension Service is implied, nor is any discrimination intended by the exclusion of products or manufacturers not named. All recommendations are for South Carolina conditions and may not apply to other areas. Use pesticides only according to the directions on the label. All recommendations for pesticide use are for South Carolina only and were legal at the time of publication, but the status of registration and use patterns are subject to change by action of state and federal regulatory agencies. Follow all directions, precautions and restrictions that are listed.