



Bug-Wise

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Organic Insecticides for Use in the Home Landscape: Organic gardening is more of a challenge in the south than it is in some other parts of the country, but it is possible. You will need to rely more on non-insecticidal insect management tools than on the relatively few organic insecticides that are available. See Bug-Wise No. 2 of 2008, Non-Insecticide Management for Insect Pests in the Home Landscape. With organic insecticides, you may have to spray more often than you would if you used conventional insecticides, you may sustain more damage on certain plants, and there may be some insect problems you just can't control. But organic insecticides also have one important advantage; they are usually less detrimental to non-target beneficial insects than conventional insecticides.

The key to successful organic gardening in the South is to grow plant species and/or varieties that are relatively pest free, to keep these plants healthy and vigorous, and to be willing to tolerate low to moderate levels of insect infestation. Organic insecticides tend to be less effective than 'conventional insecticides', but there are exceptions. For example, spinosad is a biopesticide that is highly effective against thrips and caterpillar pests. One of the challenges with organic insect control is that, while there are quite a few effective organic products for control of caterpillars and soft-bodied insects, there aren't many organic insecticides that work well against beetles and 'true bugs' (stink bugs, lace bugs, plant bugs, etc). Some of the more useful organic insecticides currently available to homeowners are briefly discussed in the following section.

Useful organic insecticides for homeowners:

Spinosad: Spinosad is a biopesticide that is very effective against most caterpillar pests, as well as thrips and leaf miners. It is produced through commercial culture of a soil-born microbe that produces the toxic metabolites known as spinosad. These metabolites are harvested and formulated into insecticide, so the final product contains no living microbes. Although spinosad is organic, many formulations contain inorganic inert ingredients that disqualify them as 'organic insecticides', but some products are formulated to comply with organic guidelines. Greenlight Lawn & Garden Spinosad Concentrate and Bulls-Eye Bioinsecticide are two examples of organic spinosad products packaged for homeowners. Entrust is an organic formulation of spinosad for larger scale commercial use. Justice, Greenlight Fire Ant Bait with Conserve, and Safer Fire Ant Bait are granular baits containing spinosad that are approved for fire ant control in organic crops. These spinosad-based baits are the best option for organic fire ant control.

Bts: ‘Bt’ stands for *Bacillus thuringiensis*. Bts are naturally occurring soil bacteria that produce toxins that have insecticidal activity. There are many different strains of Bts. Some only control caterpillar pests (*Bt kurstaki* and *Bt aizawai*), while others only work on mosquito larvae (*Bt israelensis*). Bts are generally slow-acting and have to be eaten by the caterpillar in order to work. Thuricide and Dipel are examples of Bt products commonly sold to homeowners for caterpillar control. Because of their relatively slow activity, Bts are best used when caterpillars are small, so that they will be controlled before they are large enough to cause serious damage.

Azadirachtin: Azadirachtin is a natural insect growth regulator derived from the seed of the neem tree. This is a different compound than neem oil, which is also used as an insecticide. Azadirachtin is especially effective against sucking insect pests, such as whiteflies and aphids, but, because it is a growth disruptor, it is slow-acting. Azatrol is one example of an organic azadirachtin product labeled for homeowner use.

Neem Oil: Neem oil, obtained from the seed of the neem tree, controls soft-bodied insects, such as aphids and whiteflies, as well as helping control certain diseases. Products containing “clarified hydrophobic extract of neem” do not contain azadirachtin; they usually contain 70% neem oil. Green Light Neem Concentrate, Garden Safe Fungicide 3-in-1 Concentrate, and Monterey 70% Neem oil are examples of products that are available for homeowners.

Pyrethrin: Pyrethrin, also known as pyrethrum, is a natural extract from the flowers of the pyrethrum daisy. Pyrethrin is a broad-spectrum insecticide that affects most insect pests through contact activity. However, it is very short-lived and many pests may be ‘knocked down’ only to recover later. Inorganic synergists, such as pipronyl butoxide (PBO), are often mixed with pyrethrin to enhance activity. Although the addition of PBO improves initial control, it does not greatly increase residual control. Pyrethrin products that contain the inorganic synergist PBO cannot be considered organic. Safer Yard & Garden Insect Killer and Pyganic are examples of totally organic formulations of pyrethrin.

Iron Phosphate: Several companies make slug bait that contains iron phosphate. These products are generally safer for use around pets than snail and slug control products that contain metaldehyde, but they are only for control of snails and slugs. Sluggo and Garden Safe Slug & Snail Bait are two examples of iron phosphate based baits.

Horticultural oils: Petroleum based horticultural oils are useful for control of scale insects, and other soft-bodied pests, such as aphids, spider mites, and whiteflies. Although the oils themselves are classified as organic, many of the secondary ingredients added as emulsifiers are inorganic. This is important to vegetable growers who want to maintain Certified Organic production status. Only a few companies formulate petroleum oils using organic emulsifiers. BVA Spray 10 and Organic JMS Stylet-oil are two examples. Home gardeners who are not concerned about the small amounts of inorganic emulsifiers have access to a large array of horticultural oils, such as Volck oil Hi-Yield Dormant Spray, Bonide All Seasons Horticultural & Dormant Spray Oil, Monterey Saf-T-Side, Fertilome Scalecide or Fertilome Dormant Spray & Summer Oil Spray.

Plant oils and fish oils: There are a number of organic oils made from fish oil or various plant seed. These are effective against soft-bodied insects, such as aphids, mites, and whiteflies. Golden Pest Spray Oil is made from soybeans, Vegol Year-Round Spray Oil is extracted from canola seed, and Organocide is a combination of fish oil and sesame oil.

Insecticidal Soaps: Insecticidal soaps are potassium salts of fatty acids. Insecticidal soaps are useful for control of soft-bodied insects, such as aphids, spider mites, and whiteflies, but require direct contact in order to work. Be sure to read and follow label directions; insecticidal soaps can cause foliage injury. Be aware that chain length has a big effect on the phytotoxicity of fatty acids. Some short-chain fatty acids are actually used as herbicides. This is one reason why it is not a good idea to use dish soaps or hand soaps as insecticides— they are not labeled for use as insecticides and they might damage your plants. If you want to use soap to control insect pests, stick with labeled insecticidal soaps. Safer's Insecticidal Soap is one example.

Rotenone: Rotenone is a botanical insecticide derived from several different plants, including the roots of some plants in the genus *Derris*. It is moderately effective against beetles and true bugs, such as stink bugs and plant bugs. Although difficult to find as a stand alone product, rotenone is still available as a premix, combined with pyrethrins. Bonide Rotenone and Pyrethrum Spray is one example.

Sulfur: Elemental sulfur has long been used for control of spider mites and certain plant diseases and is approved for organic production, provided there are not other inorganic ingredients in the formulation. Organic gardeners can use sulfur as a dust for spider mite control, but sprayable formulations are also available. Sulfur can cause skin and eye irritation and can cause plant injury if improperly used, especially if applied in combination with horticultural oils or if applied within several weeks of horticultural oils. Fertilome Dusting Sulfur is one example.

Lime-Sulfur: Lime-Sulfur is a combination of lime and sulfur that is used primarily as a dormant spray on woody ornamentals for control of scale insects, mites, and certain diseases. Potential for plant injury, as well as eye and skin irritation, is greater than with sulfur alone. Do not apply within three weeks of an oil spray and do not apply when temperatures are greater than 80° F; see label for details. Bonide Lime Sulfur Spray is one example of a product currently available to homeowners.

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This information is for educational and preliminary planning purposes only. Brand names mentioned in this publication are used as examples only. No endorsement of these products is intended. Other appropriately labeled products containing similar active ingredients should provide similar levels of control. Always read and follow the insecticide label.