

FACT SHEET: Safe Solutions

Many gardeners mourn the loss of Cygon, Diazinon (Spectracide) and Dursban, but there are many old and new materials which are much better and safer to use. These alternative products:

- Have little to no toxicity to us, our pets and wildlife.
- Break down quickly in the environment and do not pollute resources,
- Are fast acting – insects may take a few days to die, but they quit feeding immediately; and
- Are often more effective since many insects are resistant to the chemicals used in the past.

Even so, these materials should be used only as a last resort. Scout your plants often and catch problems early. Often a pest or disease can be controlled by simply picking off and destroying a few infested leaves. Rely on beneficial insects to control pests naturally – they normally do a very good job. When you must use a pesticide, choose one of the products below; mix only what you need and treat only the “sick patient(s).”

1. Insecticidal Soap

Target Insects: Soft-bodied insects like aphids, some scales, psyllids, whiteflies, mealybugs, thrips, and spider mites

Source: Salts of animal and plant fatty acids

Mode of Action: Disrupts insect cuticle (outer skin); kills on contact

Notes: Must be sprayed on insects to be effective; test small area of the plant first to check for potential damaging effect.

2. Horticultural and Plant Oils

Target Insects: Aphids, mites, thrips, scales, mealybugs, and their eggs

Source: Petroleum, vegetable or plant oils (ultra-refined, sesame, canola, citrus, etc.)

Mode of Action: Suffocates insects

Notes: Thorough coverage of the insect is important. The temperature should be below 90°F, and plants should not be water stressed.

Home-made Soap & Oil Sprays

A home-made soap and oil spray can be made from 2 tablespoons of vegetable cooking oil (corn, soybean, peanut, or sunflower oil) and 2 tablespoons of liquid dishwashing detergent (without degreasers) per gallon of water. Make sure the plant is not stressed from a lack of water; if so water it thoroughly the day before you spray. Spray in the cooler parts of the day. Test on a portion of the plant before spraying it entirely. Thorough coverage of the insect is important.

3. Neem – a fungicide and an insecticide

Target Insects: A variety of chewing and sucking insects

Source: Extracted from the seeds of the neem tree

Mode of Action: Repellent; insect growth regulator; some systemic affect

Notes: Use on actively growing, immature insects. Also effective against powdery mildew fungus disease.

4. Slug and Snail Baits

Target Insects: Slugs and snails.

Source: Iron phosphate (occurs naturally in soil)

Mode of Action: Stomach poison

Notes: Lasts about two weeks. Feeding ceases immediately, but it may take a few days for death.

Home-made Remedies: Coffee and coffee grounds. Coffee concentrations as low as 0.01 percent are effective. A cup of instant coffee contains about 0.05 percent caffeine, and brewed coffee has more.

Grounds repel slugs. Beer traps attract slugs but need to be buried at ground level (so they fall in) and deep

enough (so they can't crawl out before they drown. A yogurt cup is good). It is the fermented product that attracts them and a sugar-water and yeast mixture can be used in place of beer.

5. Microbials

Bt (sold commonly as Dipel and Thuricide)

Target Insects: Only caterpillars and worms (Lepidoptera larvae)

Source: The bacteria *Bacillus thuringiensis*

Mode of Action: Toxin produced by bacteria paralyzes gut of caterpillar

Notes: Must be ingested to be effective. Insects quit feeding immediately but may remain on the plant for 2-3 days. Bt is deactivated quickly by sun and rain; most effective against small, immature worms.

Spinosad

Target Insects: Caterpillars, thrips, leafminers, borers, fruit flies, and fire ants

Source: The soil bacteria *Saccharopolyspora spinosa*

Mode of Action: Causes rapid excitation of the insect nervous system.

Notes: Insects quit feeding immediately but may remain on the plant for 1-2 days. Effective up to 4 weeks. Highly toxic to bees when wet – use at dusk when bees are not active.

6. Pyrethrin/Pyrethrum

Target Insects: Broad range of pests including ants, aphids, roaches, fleas, flies, and ticks

Source: Powders and concentrated extracts of an African flower (*Chrysanthemum cinerariaefolium*)

Mode of Action: Attacks insect's nervous system causing immediate knockdown or paralysis

Notes: Available in dusts, sprays and "bombs". Powder form called pyrethrum; extracts called pyrethrins. Flea powders containing pyrethrum are extremely toxic to cats. Pyrethrins are toxic to aquatic organisms.

7. Baking Soda

As a fungicide: Target Diseases: Powdery mildew, black spot, leaf spot, anthracnose, phoma, phytophthora, scab, botrytis, and many other diseases. "Remedy" is a commercial product. Mode of action: Thought to disrupt the cell walls of fungal spores

Home-made fungicide: Sodium bicarbonate (baking soda) in combination with horticultural oils has been shown to control powdery mildew and blackspot of roses when used in a solution of about 4 teaspoons of baking soda per gallon of water with a 1% solution (or about 1 oz) of horticulture oil. Spray weekly to prevent disease.

As a control for ball moss – Ball moss is not a parasite of trees, but can look unsightly. Mix 1/2 pound of baking soda to 1 gallon of water. Spray on ball moss when trees are dormant or deciduous. Moss dies in a few days, but it takes wind and rain to eventually knock it out of the tree.

A word about "organic" pesticides – Beware...just because a pesticide is labeled as "organic" (which usually means it is derived from a plant) does not mean that it is not toxic at all. Organically derived pesticides (like nicotine sulfate, rotenone, sabadilla, etc) usually break down quickly in the environment, but can be toxic to bees, fish and mammals (including humans).

Caution: Always read the label of any pesticide before mixing or applying it. Test products (and home-made sprays) on a small portion of the plant; wait a day or two; and inspect for plant damage before spraying the entire plant. Mix up only what you need and dispose of pesticides according to the label.

8. Florida-friendly Fertilizers

Slow-release fertilizers encapsulate the nutrients so that they release slowly over a longer period of time. This helps prevent the fertilizer from leaching and/or running off into water resources. Products such as fish-emulsion and blood meal are derived from organic materials which also break down slowly. Iron is Florida-friendly because it can be used as a nitrogen alternative to "green-up" lawns in the summer. It will stain sidewalks.