Organic Options for the Garden

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Here is a quick list of some items that can be used on gardens, vineyards and orchards that meet the organic guidelines. For a more detailed list refer to the Organic Materials Review Institute (OMRI) List.

Insect control:

Botanical or Plant-derived

Pyrethrin or pyrethrum is a botanical insecticide that is used primarily by organic gardeners. This insecticide provides rapid knockdown of most insects, but insects often recover. Pyrethrin is active against a wide range of insects, is labeled for use on most vegetables, and has a very short pre-harvest interval. However, its efficacy is limited by its very short residual activity.

Plant mums on edges/throughout the garden. Chrysanthemums naturally produce a chemical called pyrethrin (see above). Pyrethrin is the best of both worlds- it's a neurotoxin that kills insects but does not harm mammals or birds. Insects prefer to stay away from it, so using mums to control pests can be achieved simply by planting them throughout your garden, especially close to plants that tend to be plagued by bugs.

Neem Oils is a botanical product that come from the seed of the neem tree. It is primarily useful against aphids, mites, and whiteflies. It is labeled for use on most vegetables and is sold under several brand names. Thorough coverage of the pest is necessary in order to obtain control.

Rotenone is a plant extract obtained from plants of the pea (Leguminosae) family. It is toxic to fish.

Inorganic

Insecticidal soaps are potassium salts of fatty acids. They control insects that they contact by disrupting cell membranes. They are most effective against soft-bodied pests like aphids, mites, and thrips. Thorough coverage of the pest is necessary in order to achieve control. They have a short pre-harvest interval and are labeled for use on most vegetables.

Diatomaceous Earth is a fine powder formed from the silica-rich "skeletons" of tiny marine plants (diatoms). This material acts by absorbing the waxes from the waterproof layer of the insect's cuticle so that the pest eventually dies through desiccation. Although there are organically approved products based on this material, their registered uses are limited mainly to control of ants and similar pests around dwellings.

Kaolin Clay is a naturally occurring clay mineral that is finely ground and processed to produce a sprayable material. It acts as a protective covering when sprayed on plants. A white film will appear on plants when used.

Microbial

B*acillus thuringiensis* is a naturally occurring bacterium that is common in soil, in dead insects, and on plants and it produces compounds that are toxic to certain insect species. There are different species and strains of this bacteria that produce different toxins. It is most effective against leaf-feeding caterpillars like loopers and diamondback moths.

Spinosad (Bonide 8) are derived from the fermentation of a Caribbean actinomycete (soil bacterium) called *Saccharopolyspora spinosa.* Products based on spinosad disrupt the insect's nervous system and is very effective against most caterpillar pests, but it is not effective against some other types of insects. However, it is also effective against thrips, leaf miners, and Colorado potato beetles. It is acceptable to use certain formulations of spinosad in organic gardens.

Disease Control:

Inorganic

Sulfur is the oldest recorded fungicide and has been used for more than 2,000 years. Early in agricultural history, the Greeks recognized its efficacy against rust diseases on wheat. Sulfur can be a preventive fungicide against powdery mildew, rose black spot, rusts, and other diseases. Sulfur prevents fungal spores from germinating, so it must be applied before the disease develops for effective results. There is a smell associated with sulfur.

Copper fungicides effectively kill fungi and bacteria. The key is that it must be applied before the presence of disease in order to be the most effective. However, copper washes off the leaf tissue during rainfall or with overhead irrigation and enters the soil. Therefore, frequent applications are necessary to maintain copper on the leaf surfaces.

Botanical or Plant-derived

Neem Oil at a 70 percent concentration, kills powdery mildew spores, virus vectors (such as aphids and white fly), and the eggs of numerous insect pests. See above for more details.

Special Note: East Tennessee has high humidity. Moisture on leaf surfaces for long periods of time lead to high disease pressure. Spraying should be done on a regular basis (every 7-10 days or after rain events) to have good prevention of disease and insects.