

ORGANIC APPLE SPRAY PROGRAM

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To successfully grow apples organically under Michigan conditions growers must recognize that the limited number of organically approved insect and disease control chemicals that are available leave them particularly susceptible to two major insect pests, Plum Curculio and Apple Maggot since no real good organic controls have been devised for these insects. Major diseases of apples can be controlled but require many frequent sprays particularly from silver tip to 4 weeks after petal fall.

If the soil is naturally very fertile, no fertilizer may be needed. For organic--fertilization with one bushel of composted manure per tree each year up to age 5 is adequate. After age 5 dwarf trees still only need one bushel but semi dwarf and seedling apples can use up to 3 bushels per tree per year. Use only enough to insure 8 to 12 inches of new growth after year 5. On many Michigan clay and clay loam soils no fertilizer is needed to produce adequate growth for many years.

Disease control should concentrate on Apple Scab and Powdery Mildew since they can reduce crop dramatically and even cause near total leaf loss. The summer diseases of Sooty Blotch and Fly Speck are cosmetic problems that do not affect the health of the tree or the fruit quality.

The diseases Black Rot and Fire Blight are occasional problems and can be reduced by a strict sanitation program of pruning out infected shoots each winter. Growing varieties that are not highly susceptible to fire blight is essential since antibiotics are not used in organic agriculture.

Maintaining moderate rather than vigorous growth is also important since fire blight can quickly kill young tissue and easily kills wood up to 3 years old but moves slowly in older wood. Controlling Scab and Mildew early in the season will insure little or no problem later in the year unless your neighbor's trees are heavily infected. Better yet, plant scab resistant apples.

Begin your control program as soon as you see green in the apple buds. For the rains occurring prior to when the green tissue is ~ inch long copper or lime sulfur can be used either just ahead of the rain or within 48 hours of the start of the rain.

Copper should be discontinued at ~ inch green tip or russetting of the fruit will result. Sulfur is applied every 3 to 5 days or prior to every rain from 1/2 inch green tip until 4 weeks after petal fall. If you cannot spray prior to a rain, use lime sulfur within 48 hours of the start of the rain. For summer disease control and if you have Scab infected leaves 4 weeks after petal fall you should continue sulfur sprays on a 2 week interval until harvest or the end of August whichever comes first. Spray until leaves are dripping. Leaves which fall from the tree should be mowed or removed and composted since the scab fungus overwinters in fallen leaves. Powdery Mildew overwinters in infected buds.

Materials	Rates		
	1 Gallon of water	Per 10 Gallon	Per 100 Gallon
Copper sulfate	1 tablespoon	1.6 oz by weight	1 lb
Lime sulfur	0.65 oz liquid	6.4 oz liquid	½ Gallon
Sprayable sulfur	3.4 oz	1.2 lb	5 lb

MATERIALS

Use Manufactures suggested rates as active ingredients vary by brand name.

Superior Oil or dormant oil are highly refined oils used in the early spring to smother the eggs of over wintering pests such as aphids and mites. Oils are incompatible with sulfur and cause damage to apple leaves and fruit. Sulfur should not be used sooner than 7 to 10 days after an oil spray nor should oils be used when sulfur residue is present.

Summer oils are highly refined light oils used to kill or suppress insect during summer. They should not be used during high temperatures over 80 F.

Pyrethrum is made from the dried flowers of a white daisy *Tanacetum cinerariifolium*. Pyrethrum insecticides are known for their fast knock-down action Pyrethrum insecticides are highly toxic to bees, wasps and other beneficial insects, as well as to fish. Pyrethrum is active against apple maggot. Pyrethrum breaks down quickly

BT or *Bacillus thuringiensis* is a toxin produced by bacteria that binds to the guts of insects. It needs to be ingested by the insect and is especially effective against caterpillar larvae such as leafrollers. It is not as effective against caterpillars that directly attack the fruit i.e. codling moth and oriental fruit moth. Product names: Biobit, Dipel

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Surround (kaolin clay) is a fine white powder, applied in a spray, that is an irritant to curculio, codling moth, and apple maggot.

Entrust (spinosad) is effective against oblique banded leafroller, and to a lesser extent codling moth, oriental fruit moth, and apple maggot.

A general schedule would look like this:

Silver tip early green tip Copper + Oil followed by Copper or Lime Sulfur at 1/2 inch green tip

During rest of scab season: before each rain use Sulfur or within 48 hours of rain use lime Sulfur

Petal Fall Sulfur + *Bacillus thuringiensis* 10 days later, Sulfur + *Bacillus thuringiensis* (BT)

About June 1

10 days later Sulfur + Pyrethrum

10 days later Sulfur + Pyrethrum

10 days later Pyrethrum –add Sulfur if Scab is present

About July 1

10 days later *Bacillus thuringiensis* add Sulfur if Scab is present

10 days later Sulfur + *Bacillus thuringiensis*

10 days later Sulfur + Pyrethrum

About August 1

10 days later Sulfur + Pyrethrum

10 days later Sulfur + Pyrethrum + *Bacillus thuringiensis*

10 days later Sulfur + Pyrethrum + *Bacillus thuringiensis*

Other insect control options are

Surround (kaolin clay) – moderately effective against codling moth, oriental fruit moth, and apple maggot