

# Apple Sprays for non-commercial growers/gardeners

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This is a summary of chemicals useful for management of important diseases and insects common on apples in the Midwest. Other diseases and insects not covered here can also be important in some locations and years. Also not covered are factors such as variety selection, pruning, fertilizing, etc., that can influence disease and insect impact.

## Disease Management

Fungicide applications for apple scab is most important for healthy fruit. Even fruit with good resistance to the disease can benefit from a minimal spray program. To be thorough, sprays should start when apple buds are showing green tissue in the spring. Ideally, keep reapplying the fungicide every 7 to 10 days to cover up the new leaves and flowers as they emerge. Reapplication may be needed after a heavy rain. A bare minimum spray program for scab would be to apply fungicides at green tip, pink, bloom, petal fall, and 1 week after petal fall.

Remember that captan and other sulfur-containing fungicides, are not compatible two weeks either side of an oil application.

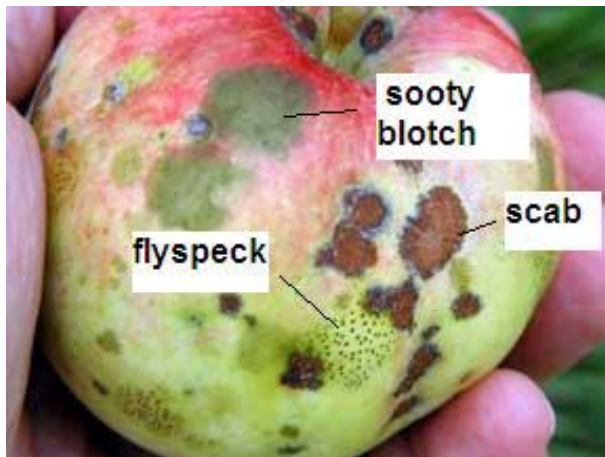


Figure 1. Common apple fruit diseases



Figure 2. Cedar apple rust lesions on apple leaves



Figure 3. Powdery mildew can stunt shoot growth and russet fruit.

<b>Table 1. Partial list of materials for backyard disease control for apples (check label)</b>			
<b>Trade name</b>	<b>Common name</b>	<b>Diseases managed</b>	<b>Comments</b>
Sulforix	Lime-sulfur	Scab, powdery mildew	Lighter version of lime sulfur with surfactant. Not compatible with oil, can cause russetting of leaves and fruit under hot conditions.
Kocide, COCS	copper	scab	Short spray cover duration, can cause green tissue burning. Generally used silver tip to green tip.
Captan	captan	scab, sooty blotch & fly speck, rust, summer rots	Generally not prone to resistance problems. Not compatible with oil
Dithane, Mancozeb	mancozeb	scab, rust, sooty blotch & fly speck, summer rots	Generally not prone to resistance problems, long days to harvest restriction
Sulfur	sulfur	scab, powdery mildew	short duration, not compatible with oil, can be tough on beneficial insects
Immunox	myclobutanil	scab, powdery mildew	may be prone to pathogen resistance problems if used repeatedly over several seasons

Rust is a problem for apple plantings near cedar and hawthorn trees, the alternate host for the disease. There are several materials that work both for scab and rust. Rust is generally a leaf disease. Apple trees can have a heavy infestation without affecting yield, so the need for treatment is generally not important.

Powdery mildew is a problem on certain apple varieties such as Cortland, Gala, Ginger Gold, Idared, Jonathan, Mutsu (Crispin), Paulared, and Rome. Severe infestations can stunt young plantings of susceptible varieties. Minor infestations may be of little importance in older plantings, if fruit russeting is acceptable. Powdery mildew requires different fungicides than scab.

A common problem, especially in older trees with thick foliage are the fungal diseases sooty blotch and fly speck (Figure 1). Use of captan and/or mancozeb in the summer months in cover sprays, especially during wet seasons, can help to keep these diseases at bay.

Summer rot diseases tend to be a problem on older trees with trunk and limb canker. Summer treatment with captan and mancozeb helps to hold these diseases in check.

### Insect management

The older approach for insect control in apples was to spray with Sevin, malathion, or Imidan. Newer classes of insecticide include pyrethroids, neonicotinoids, and kaolin clay. Check pesticide products to see if they are labeled for apples and the insects controlled. Insecticide coverage is most important starting when fruit are greater than 1 inch in diameter and attractive to insects. A general spray program starting at this time with reapplication every 10 to 14 days should eliminate much of the insect problems. The management strategy can be fine-tuned by identifying the insect problem.



Figure 4. Apple maggot (see larvae in middle) makes tracks in fruit that turn brown and rot.



Figure 5. Surface feeding by a leafroller caterpillar

<b>Trade name</b>	<b>Common name</b>	<b>Insects managed</b>	<b>Comments</b>
Superior oil, dormant oil	Spray oil	San Jose scale, mites	High grade petroleum oil. Avoid use when temperatures are in the 30s. Dormant oils are heavier than summer oils
Neem oil	azadirachtin	Caterpillars, codling moth, stink bugs	Short shelf life, can cause damage to foliage under hot conditions
Sevin	carbaryl	Beetles, codling moth, apple maggot, sting bugs	Tough on beneficial insects including bees, can thin fruit if applied when fruit are small
Permethrin (various names)	Permethrin	Codling moth, leafrollers, plant bugs	Rapid action, general category is pyrethroid (synthetic), loses effectiveness when hot, can be harmful to beneficial organisms
Malathion	malathion	Codling moth, stink bugs, yellowjackets	Short duration of activity
Ortho Bug-B-Gone	bifenthrin	Worms, stink bugs,	Pyrethroid, loses effectiveness

Max		tarnished plant buds	quickly when hot, can be tough on predatory insects
Entrust, Monterey Garden Insect Spray, Green Light Lawn & Garden Spray and others	spinosad	Codling moth, worms, caterpillars	Entrust is an organic product, other Spinosad products may not be.
Assail	aceetamiprid	Broad spectrum, plum curculio, codling moth, apple maggot	Neonicotinoid, absorbed into tissue so is long lived
Imidan	phosmet	Broad spectrum	Organophosphate, spray water should be pH of 5.0 to avoid breakdown
Intrepid	methoxyfenozone	Worms and caterpillars	Insect growth regulator, must be ingested
Pyganic	pyrethrum	Caterpillars, bugs, beetles	From chrysanthemum, not the same as pyrethroid, short duration
Bacillus thuringiensis (Bt)	Microbial insecticide	Codling moth and other caterpillars	Slow acting, relatively safe, must be ingested by insect
Surround	Kaolin clay	Apple maggot, plant bug, somewhat weak on curculio	Repellant



Figure 6. Egg laying scars caused by the plum curculio.



Figure 7. Codling moth larvae has dark head and pinkish body.

**Plum curculio** over-winter as adults in the soil, litter, ground cover trash in orchards and surrounding areas. When evening temperatures exceed 60 F, the weevils move into orchards and begin to feed as leaves begin to emerge. Their feeding activity expands to blossoms, stems and fruit as they become available. In a backyard orchard, insecticide treatment generally starts when fruit reach about ½ inch in diameter. The **tarnished plant bug** has a piercing mouthpart and causes uniform indentations tapering

to a pinhole size. Tarnished plant bug are active in the first month after bloom. The insect builds up on flowering broadleaf weeds and move over to apple fruit where they can cause damage. Insecticide treatment for plum curculio and tarnished plant bug more or less overlap.

The most significant insect pest on apples in most orchards is **codling moth** which is a major apple pest in Michigan and has 2 generations a year in mid Michigan. The first generation attacks the fruit when it is about an inch in diameter in early June to early July and the second from early August to late August. Some orchards, especially those close to large peach planting, may have similar damage by oriental fruit moth. The treatment for codling moth and oriental fruit moth are very similar.

If the apple planting is approximately 4 acres or more, pheromone disruption is a generally useful control method for managing codling moth and oriental fruit moth. Dispensers releasing a synthetic female attractant, confusing the male moth and disrupting mating and egg laying.

Another group of insect pests are the **leafrollers and fruit worms**. These feed on foliage and on fruit. Unlike codling moth, this group tends to be surface feeders, often webbing a leaf onto the apple, or webbing a leaf edge for protection. These are less predictable group of insects. Monitoring the tree may be helpful to know when a problem is starting.

**Apple maggot** is a pest of apples and other fruit in some orchard sites, usually sandy areas. The adult fly generally emerges in July, lay eggs in fruit, the hatched larvae feed within fruits, causing flesh to brown and rot. Picking up fallen fruits daily starting in July and sealing them in a plastic bag helps to reduce future infestations. If using an insecticide, apply mid-July and again every 10-14 days until a few weeks before harvest.

**Brown marmorated stink bug** is an occasional pest at the end of the growing season, usually starting in mid to late August. The piercing mouthpart of this insect can cause 1/3 to 1/2 sunken areas on the surface of fruit, with flesh under the apple skin to become discolored, disorganized, and tough. Late season feeding damage can show up on fruit after harvest. The insect is very mobile. Insecticide sprays generally need to contact the insect directly to be effective. Again, monitoring can help to know when treatment is needed.



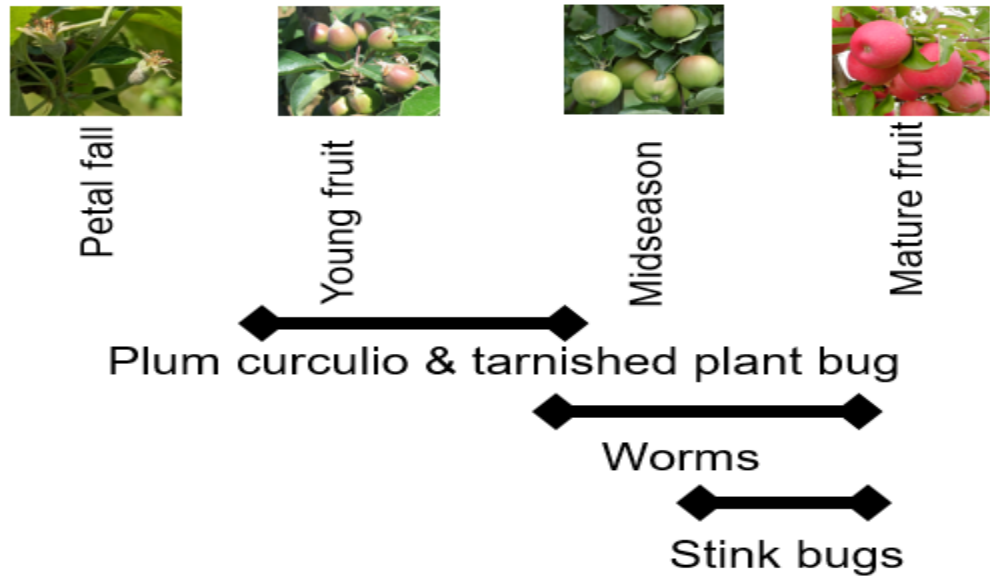


Figure 11. Management windows for primary insect pests of apples