The mild winter temperatures, warm spring weather, sunny summer days, and cool autumn nights of the inland Pacific Northwest lend themselves to the production of apples. Furthermore, precipitation patterns in Eastern Washington State provide superb growing conditions for apples without encouraging the numerous disease problems encountered by most North American producers of apples, including those who live on the west side of the state. Ideal weather and climate is what makes Washington the leading producer of apples (and organic apples) in North America.

Apple trees have two serious insect pests, codling moth and apple maggot, that directly feed on the fruit itself and these pests plague both fruit growers and backyard gardeners. Proper pest management of backyard fruit trees requires considerable labor and, unfortunately, often requires pesticide applications to keep your fruit pest-free year after year. If you try to grow apples without adequate vigilance and management, these fruit pests will eventually come—and that’s guaranteed. What could be worse than finding a worm or maggot in your apple? Well, maybe finding only half of one.

The domestic apple is not native to North America. Apple is an introduced plant that originated from southern Eurasia. It was brought to this continent during colonial times and nearly every early settler planted trees—primarily for making cider, applejack, and other potables. By the mid 1870s, it was estimated that nearly one percent of the land area in New York State was occupied by...
apple trees. And as “Johnny Appleseed” and migrating citizens spread apple trees from coast to coast, another non-native species, the codling moth, was spread throughout the continent unfettered by its native predators and parasites.

**Life cycle**

In Washington State, the codling moth goes through at least two generations from egg to larvae to pupae to moth each year. In some years there can be a partial third generation of “suicidal” larvae that fail to mature before winter, but can still damage late-harvest apple varieties. Homeowners are most likely to encounter the codling moth larvae or the “worm of the apple” in late May to mid June, or mid August through September. An apple infested with larvae will sport an entrance hole that often has a glop of granular frass extruding from the hole. The larvae will have a brown head capsule, six dark claw-like legs with a creamy white to pinkish body and can be between one half to three quarters of an inch long when mature. One behavior that helps sort codling moth larvae from any other internal apple feeder is that the larvae will burrow directly to the core of the apple to feed on the seeds.

The apple maggot is another pest that homeowners may encounter in their backyard apples. Unlike codling moth, apple maggot is native to North America and has evolved a preference for apple over its native host—hawthorn. Apple maggot has been slower than codling moth in expanding its distribution from coast to coast and is found primarily in counties on the west side of Washington, but it may be invading the major apple-producing areas of the state. Apple maggot has one generation per year as it matures from egg to maggot to adult fly. Homeowners often encounter the apple maggot in unprotected apple fruit (especially the early maturing apple varieties) in August. The maggot appears as a headless, legless larva no bigger than one quarter of an inch long.

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MICHAEL BUSH
WASHINGTON STATE UNIVERSITY EXTENSION

Codling moth and its larvae, top photos, and apple maggot fly and larvae, bottom photos, are two of the most damaging insects in tree fruit production. Improperly cared for trees cause millions of dollars of damage annually.
long. An apple infested with maggots may have a dimpled or lumpy appearance with meandering brown trails in the apple flesh often just below the apple skin and rarely leading to the apple core.

Gardeners with apple trees in their landscape need to recognize the damage caused by the codling moth larvae and by the apple maggot. One of the best management strategies is to visually search and destroy any infested apples on the tree. Infested apples need to be crushed, buried or destroyed as both the worm and the maggot can complete their development in an apple separated or dropped from the tree. A widely practiced strategy is to place the infested apples into a plastic bag and leave the bag in direct sun for a couple days to kill the pests. Given the task of visually searching each apple fruit on the tree periodically through the growing season, it is highly recommended that homeowners purchase apple trees on dwarfing rootstock that will stunt tree size and minimize ladder work.

There are a number of cultural and mechanical strategies homeowners may use to control coding moth and apple maggot but with the possible exception of bagging the fruit while still hanging on the tree, homeowners will need to apply insecticides to control these apple pests. The two leading insecticide products for homeowners contain either kaolin clay or spinosad as the active ingredient. There are multiple formulations and trade names so always refer to the pesticide label before purchasing or applying these products. Both products need to be applied every 7-10 days starting at petal fall or timed to coincide with the egg laying activities of each generation of both pests. This can add up to a minimum of 4 to 6 spray applications each year.

**Protect your county’s agriculture**

If you are a resident of the Wenatchee Valley, Yakima Valley, Columbia Basin or Spokane County, I would strongly caution you against planting an apple tree in your backyard. Growing quality apples in Washington State is big business generating over a billion dollars that feeds our state’s economy each year. In many counties with a commercial apple industry, there are horticultural pest & disease boards that actively scout for backyard fruit trees that are improperly managed. These boards are responsible for enforcing Washington State Law (RCW 15.09.060) which states that property owners must control horticultural pests on their property.

So why grow your own apples? It is a major challenge to protect your apple fruit from the ravages of codling moth and apple maggot year after year. Should you fail to control codling moth and apple maggot, these pests will spread to other fruit trees in your neighborhood and could financially impact commercial apple operations. Backyard growers who do use effective management techniques should be commended, but they should consider removing their trees prior to selling their property. The next owner may not be so responsible. Given the legal implications as well as the challenges of controlling these pests in Washington State, it may be easier and cheaper to leave apple production to the “pros” and simply drive to your local fruit stand to buy that quality Washington State apple.