Backyard apple production requires a proactive approach to disease, insect, and weed management. Preventative practices are recommended to minimize inputs. While intensive culture may result in the highest quality fruit, reduced inputs can result in acceptable fruit with minor crop losses or aesthetic maladies. This guide focuses on preventative cultural practices with options of low-input pesticide applications. Refer to the homeowner fruit spray guide (ID-21) for a more complete pesticide spray schedule.

**CULTURAL PRACTICES**
Cultural practices should always be considered when planning, planting, and maintaining a backyard orchard. Some practices keep plants healthy and assure the lowest risk for disease outbreaks or insect infestations. Other practices eliminate and eradicate sources for fungal and bacterial pathogens or insects, thereby reducing risk for disease or infestation. Combine cultural practices with a pesticide preventative program or use them alone for a no-spray alternative.

- A well-drained site located in full sun is required.
- Maintain plant vigor by watering during drought, mulching to regulate soil moisture and temperature, and amending soil nutrients according to soil tests.
- Minimize insect and wildlife damage.
- Prune to open canopy and increase air circulation.
- Utilize specific cultural practices listed in the table to eliminate disease-causing pathogens or insects and reduce risks for infections/infestation.
- Bagging developing apples when 3/4 inch in size is an effective way of managing pests without spraying. Use the method outlined in EntFacts-218 (bagging apples); remove bags 3 weeks prior to harvest so fruit will color properly.

**RESISTANCE**
A healthy orchard begins with planning. Disease-resistant cultivars can reduce the need for many fungicide and bactericide applications. Growers should focus on cultivars that are resistant to the most devastating apple diseases in their area. Fire blight and cedar apple rust are often the most challenging apple diseases in Kentucky. Refer to Table 1 in ID-21 (page 2) for a listing of disease-resistant apple cultivars.

**WEED MANAGEMENT**
Cultural practices, such as mowing, mulching, and applying landscape fabric, are the primary methods for weed management. These will be cost-effective for backyard growers while also providing the proper environment for tree growth. Mulch/landscape fabric reduces vegetation that can harbor pests and diseases or compete with trees for water and nutrients. If landscape fabric is used, it should be removed during winter to reduce vole hiding places. There are few organic herbicides labeled for use, and these may not be economical for growers with just a few trees. Herbicides that can be used include pelargonic acid (OMRI-approved contact herbicide) and glyphosate (a systemic herbicide); neither of these herbicides provide residual weed control. Herbicides, in combination with mulch during summer, will improve weed control beneath trees and help prevent mower damage to trunks. Herbicide applications should be made with low spray pressure to avoid drift and precautions should be taken to avoid contact with tree trunks, leaves, and fruit. Check labels for full use information and pre-harvest intervals.
**USING THE TABLE**

The following table focuses on cultural practices as a means for eliminating or reducing risk for tree and fruit diseases and insects. Cultural practices should be considered for each plant growth stage, and should be utilized regardless of pesticide programs. Fungicides and insecticides are listed in the right hand columns with target pathogens or insects. Always read and follow label instructions when using pesticides, including pre-harvest intervals. Organic products (OMRI-approved) are marked with an asterisk (*). Organic fungicides are generally less effective for managing diseases than synthetic products. Bagging is the most effective cultural practice for managing diseases and insects on apple fruit.

<table>
<thead>
<tr>
<th>Time of Year¹</th>
<th>Growth Stage</th>
<th>Cultural Practices</th>
<th>Disease</th>
<th>Insect</th>
</tr>
</thead>
<tbody>
<tr>
<td>February/Early March</td>
<td>Dormant (before buds swell)</td>
<td>Fire blight</td>
<td>Fire blight</td>
<td>Copper*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit rots/spots</td>
<td>Scab</td>
<td>Copper*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scab</td>
<td>Insect/mite</td>
<td>Copper*</td>
</tr>
</tbody>
</table>

- Prune cankers and dead, dying and diseased wood; Prune to allow for increased air movement, to speed drying, and allow for thorough spray coverage; Remove fruit mummies; Plant resistant cultivars.

- Remove alternate hosts.

- Prune and destroy cedar apples found on ornamental junipers and cedars; Remove new leaf growth that is tightly curled.

- Do Not Use Insecticides During Bloom

- Thin dense fruit clusters by hand; Bag developing fruit when they are 3/4 inch in size; Remove fruit with crescent shaped scars.

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<th>Insect</th>
</tr>
</thead>
<tbody>
<tr>
<td>June-July</td>
<td>Summer growth</td>
<td>Fruit rots/spots</td>
<td>Scab</td>
<td>Codling moth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scab</td>
<td>Codling moth</td>
<td>Alternate Malathion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oriental fruit moth</td>
<td>Oriental fruit moth</td>
<td>and Spinosad every 2 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plum curculio</td>
<td>Plum curculio</td>
<td>Japanese beetle</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Fruit rots/spots</td>
<td>Sevin</td>
</tr>
<tr>
<td>October-November</td>
<td>After harvest</td>
<td>Scab</td>
<td>Codling moth</td>
<td>Alternate Malathion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cedar apple rust</td>
<td>Oriental fruit moth</td>
<td>and Spinosad every 2 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit rots/spots</td>
<td>Stink bug</td>
<td>Monterey pine looper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Codling moth</td>
<td>Mites</td>
<td>Insecticidal soap*</td>
</tr>
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<td>Scab</td>
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</tr>
</tbody>
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1 The growth stage indicated typically occurs during this time of year; however, this may vary from year to year depending on environmental conditions.
2 Products noted with an * indicate those that may be used in organic production. For a list of products approved by Organic Materials Review Institute (OMRI) please see University of Kentucky publication *Homeowner’s Guide to Fungicides* (PPFS-GEN-07).
3 Either a liquid or wettable formulation is appropriate.
4 Use of lime sulfur affects fruit by causing russetting; switch to sulfur (liquid or wettable formulation) for the remainder of growing season.
RESOURCES

- Entomology Extension Publications/Fruit Pests
  https://entomology.ca.uky.edu/fruit

- Horticulture Extension Publications/Home Fruit
  http://www.uky.edu/hort/document-list-home-fruit

- Plant Pathology Extension Publications
  http://www2.ca.uky.edu/agcollege/plantpathology/extension/pubs.html

- Bagging Apples: Alternative Pest Management for Hobbyists (EntFacts-218)
  http://www.ca.uky.edu/entomology/entfacts/entfactpdf/ef218.pdf

- Disease and Insect Control Program for Homegrown Fruit in Kentucky (ID-21)

- Fruit, Orchard, and Vineyard Sanitation (PPFS-FR-T-05)
  http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFSHtml/PPFS-GEN-05.pdf

- Homeowner's Guide to Fungicides (PPFS-GEN-07)
  http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFSHtml/PPFS-GEN-07.pdf