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March 5th, 2016
Master Gardener

WHY IS THERE NO FRUIT ON MY TREE?
WHAT IS THE PROPER WAY TO PRUNE FRUIT TREES?
WHY IS THERE NOT FRUIT ON MY TREE?

ANSWERS FOR THE MOST COMMON QUESTION ASKED
#1 Reason

- Overly vigorous trees expend all their energy in growing wood and do not produce flower buds.
  - *Over-fertilization*
    - Heavy applications of nitrogen will stimulate excessive growth at the expense of flower production
      - Do not use lawn fertilizers: Mostly Nitrogen
    - Bearing fruit trees should average 12 to 18 inches of shoot growth per year. Nonbearing young trees should average 18 to 30 inches
  - Proper Fertilization
    - Apply fertilizer in early spring (late March)
    - Peaches, Plums, Cherries:
      » 0.5 lb/year of age => 5 lbs max of 10-10-10 fertilizer
    - Apples & Pears:
      » 0.25 lb/year of age of 10-10-10 fertilizer
        • Dwarf: 2.5 lbs max
        • Semi-Dwarf: 5 lbs max
        • Standard: 10 lb max
  - *Over-pruning*
    - Heavy winter pruning will also stimulate excessive growth and indiscriminate heading cuts will delay flowering and fruiting.
#2 Reason

- **Frost & Freeze Damage**
  - The flowers of fruit trees are very sensitive to late spring frosts.
    - Temperatures much below 29 degrees F will prevent fruit formation.
    - The frost does not have to occur during full bloom for the damage to occur. Once the flower buds begin to swell and develop there is a risk of frost damage. You may not even see the damage, because the flowers may open normally but be unable to set fruit.
  - **The solution**
    - Plant fruit trees on the most frost free section of your land.
      - Look for areas that are either close to the house or slightly elevated. Do not plant trees in low areas of the yard.
    - Plant fruits and varieties that are adapted to your area
  - **The following is the general order of fruit blooms from earliest to latest**
    - Apricots > Plums > Peaches > Cherries > Pears > Apples
#3 Reason

- Poor Pollination or Lack Of Pollination
  - All fruit trees must be pollinated in order to form fruit consistently.
    - **Self-fertile** will set fruit with their own pollen, and therefore require you to plant only one variety or plant.
      - Peach, Nectarine, Apricot, Sour Cherry
    - **Cross pollination** requires two or more varieties planted close to each other to set fruit
      - Apple & Pear
  - Bees are the main method for the transfer of pollen between flowers. Anything that interferes with bee activity will reduce pollination.
    - Temperatures below 55 to 60°F reduce bee flight and activity, as do windy & rainy conditions.
    - Avoid the use of insecticides during bloom that may kill honeybees.
    - If you do not see 3 to 4 honeybees per tree visiting the flowers, your fruit set may be less than desired.
  - Because bees naturally seek out the best nectar-producing flowers, other blooming flowers in the area can attract bees away from fruit plants, which generally are poor nectar producers.
    - In the early spring, dandelions in bloom can attract bees away from the flowers of fruit plants
- Some other factors that affect pollination.
  - The flowers must receive healthy pollen at the proper time.
    - Pollination must occur within 2-4 days after the flower opens
    - The bloom periods of cross pollinated varieties must overlap and must be in close proximity ~100 ft
  - Pollen will fail to germinate at temperatures below 41°F. Below 51°F pollination is greatly reduced.
  - Temperatures above 85 to 90°F dry the flower's surface and prevent pollen grains from germinating.
#4 Reason

- The effect from last year's crop.
  - Fruit trees form their flowers the previous growing season.
    - Heavy crops the previous year can reduce flower formation for the next year by reducing growth or preventing flower formation (aka Bi-Annual bearing)
  - The solution – Fruit Thinning: remove some of the fruit within 2 to 4 weeks after bloom.
    - If thinned later than this then you will not benefit from increased flowering the next year.
    - Thin apples, pears, plums, peaches and nectarines down to one fruit every 6 to 10 inches.
    - Be sure to leave only one fruit at a given site. Where doubles or triples are left, insects and disease will be difficult to control.
  - Keep in mind that only 7 or 8 percent of the tree's fruit are needed to set a full crop of fruit.
#5 Reason

- Tree age
  - Too Young
    - Do not expect to produce very much fruit on apples and pears until the third to fifth year after planting depending on the rootstock. Cherries can take up to 7 years to start producing fruit.
    - In fact, it is a good practice to remove any fruit that may form before the tree has gone through three full growing seasons.
      - This will allow the tree to develop the proper number of branches to support future crops and develop a good root base
  - The solution - patience.
  - Too Old
    - Trees will not bear fruit their entire life
      - Standard size fruit trees
        » Apple & pear trees live 35 – 45 years, but bear fruit only for about 30 - 35 years
        » Cherries, plums & apricots live about 15 - 20 years
        » Peach trees only live 8 – 15 years
      - Semi-dwarf apple trees will only live about 30 years
      - Dwarf apple trees only live about 20 years
    - The solution – new tree.
#6 Reason

- Use of the insecticide carbaryl (Sevin) immediately after bloom.
  - The insecticide carbaryl if applied to apple and pear trees during the first month after bloom will cause the fruit to drop.
  - This problem occurs most frequently when using general purpose spray mixtures.
  - The solution - read the label of all pesticides carefully and avoid the use of carbaryl during this period unless you want to thin the fruit.

#7 Reason

- Poor tree health
  - Insects, diseases or fungi can dramatically reduce fruit set.
  - About 30 to 40 good-sized, healthy leaves are needed to produce one good-quality apple
  - Solutions:
    - Proper Pruning
    - Application of appropriate pesticides (fungicides & insecticides)
    - Practice Proper Sanitation
      - Remove, burn, or bury all pruned, dead and diseased wood.
      - Remove all rotted fruit from within the tree & from the orchard floor and dispose of it.
      - Rake and burn leaves and other litter under the tree to destroy overwintering disease and insect habitats.
      - Cultivate. Do not let sod grow within 3 feet of the tree trunk.
      - Eliminate weed hosts. Many insects and diseases overwinter in weeds.
WHAT IS THE PROPER WAY TO PRUNE FRUIT TREES?

BASIC GUIDELINES FOR MAINTAINING HEALTHY AND PRODUCTIVE FRUIT TREES.
Pruning Fruit Trees

• Why Prune?
  – Increase sunlight penetration
  – Remove less productive wood
  – Improve fruit quality
  – Develop a desired tree shape
    • Induce branching
  – Maintain the tree at a desired size
  – Improve tree strength
  – Improve air circulation within the tree, which will reduce the potential for disease
  – Make spraying easier
  – Promotes uniform ripening
Pruning Cuts

• There are only two kinds of pruning cuts.
  – *Heading cut.* This cut involves shortening a limb or shoot by removing a portion off the end.
    • Heading cuts result in a thicker and denser canopy and reduce light levels within the tree.
    • Encourages shoot growth and reduces flower buds
  – *Thinning cut.* A thinning cut is the removal of an entire shoot back to its point of origin.
    • Thinning cuts do not induce excessive vigorous re-growth and open the tree's canopy to allow more sunlight into the interior.
    • Associated with increased flower bud production
Types of Heading Cuts

• A **heading cut** trims a branch back to a bud, or trims a branch or leader back to a small branch not large enough to assume the growth of the pruned branch.
  – Heading cuts are typically only used on young fruit trees

• A **reduction cut** is a heading cut that shortens a limb to a lateral branch large enough to resume the growth of the pruned limb
  – Always remove or shorten a branch to a side branch that is at least one-third the size of the one being cut
  – Reduction cuts are used to reduce the length and weight of heavy limbs, reduce the height of a tree and retain or enhance a tree’s natural shape

• A **stub cut** is a heading cut that is made indiscriminately to a point on a branch or leader where no bud or branch exists.

• **Limit the use of these type of cuts.** Use only when necessary.
Thinning Cuts

• A thinning cut removes a branch at its point of origin on the trunk or branch.
  – Thinning cuts are used to remove crowded, damaged, dead, or weak branches
  – Thinning cuts are placed so as to open up a tree’s canopy to allow air and light penetration.

• Thinning cuts should constitute 90-95% of all pruning cuts when properly pruning mature fruit trees.

• Thinning cuts should be made just outside the branch collar (the swollen area at the base of the branch next to the trunk or larger branch)
  – Do not leave a stub or cut flush against the trunk or branch.
  – Removing the collar would leave a larger wound that would take additional time to heal.
  – Do not paint wounds. Wounds heal more quickly if left open
Pruning Basics

- Prune late in the dormant season to minimize cold injury.
  - March - April
- Make all heading back cuts just beyond a bud or branch.
  - Avoid pruning too close
  - Don’t leave a large stub
- Make all thinning cuts just beyond the base of the branch being removed
  - Leave the branch collar
  - Flesh cuts heal slowly
Pruning Basics

- Disinfect your cutting tools prior to pruning
  - Disinfection solution: 1 Part bleach and 9 parts water
  - Ideally, dip your cutting surfaces before and after each cut
    - Disinfect after cutting any diseased wood
- Clean, dry and oil your tools before putting them away
- Excessive pruning encourages excessive shoot growth
  - Do not remove more than 30% of the trees canopy in a season
  - Do not fertilize after a HEAVY pruning (≥20% of tree)
- Remove pruned brush from the orchard area. Dead wood will harbor disease organisms that can spread back into the tree. Burning or burying the pruning’s is the best practice.
- Prune young trees (up to 10 years of age) lightly
- Prune older trees more vigorously
General Pruning Guidelines

• A. Suckers or water sprouts are vigorous vegetative shoots which drain nutrients needed for fruit production.
• B. Stubs or broken branches result from storms, heavy fruit loads, or improper pruning.
• C. Downward-growing branches develop few fruit buds and eventually shade or rub more productive scaffold branches.
• D. Rubbing branches create bark injury which also invite insects or disease.
• E. Shaded interior branches develop less quality fruit and limit access for harvest.
• F. Competing leaders result when suckers near the top of the tree are allowed to grow taller than the central leader.
• G. Narrow crotches result in weak limb joints
• H. When several branches originate at the same point on the trunk joints are weaker.
• I. Heading back cuts are used to limit or redirect the growth of the central leader or branches.
Pruning Mature Apples and Pears

• Tree Shape and Form
  – The preferred method of pruning pome trees is the Central Leader System.
    • The shape of a properly trained central leader tree is like that of a Christmas tree.
    • The lowest scaffold branches will be the longest and the higher scaffold branches will be progressively shorter

• Visualize a tree as seen from above without its leaves. From the trunk branches radiate out like the spokes of a wheel.
  – In order to allow sunlight and spray penetration, and to allow access for harvesting, it is necessary to thin out some of these "spokes."

Space scaffold branches to allow access.
Shaping Young Apples and Pears

Shortly after new growth appears, place wooden clothespins between the main trunk and the new growth to force growth outward and upward.

First Dormant Pruning:
Select 4 to 5 uniformly spaced limbs to form your first scaffold. Remove all other lateral branches. Head the central leader 24 -36 inches above the top scaffold branch. Head back new terminal growth by 1/4 to 1/3 just above an outward facing bud.

Second Dormant Pruning:
Select limbs for the second scaffold. Prune the same as first dormant pruning. Use limb spreaders to maintain 60° angle with trunk.

Third and Fourth Dormant Pruning:
Continue to head back new terminal growth by 1/4 and remove any upright limbs. Always maintain the central leader as the highest point in the tree.

Transition to Mature Fruit Bearing Tree
Once the tree begins to bear fruit and no later than the 5th year, discontinue heading back new terminals. Pruning for the rest of the tree’s life will be to maintain conical shape.
Pruning Mature Stone Fruit Trees

• Tree Shape and Form
  – The preferred method of pruning stone fruit trees is the **Open Center System**.
  – With the open center system, the leader is removed, leaving an open center.
    • Instead of having a central leader, the tree has 3 to 5 major limbs, called scaffolds, coming out from the trunk.
  – All stone fruits are very susceptible to brown rot.
    • Open-center trees allow better air circulation and light penetration within the tree--both important factors in reducing the development of brown rot on fruit.
Shaping Young Stone Fruit Trees

Shortly after new growth appears, place wooden clothespins between the main trunk and the new growth to force growth outward and upward.

**First Dormant Pruning:**
Select 3 to 5 uniformly spaced limbs to form your scaffold. Remove all other lateral branches. Head the central leader just above the top scaffold branch. Head back new terminal growth by 1/3 to 1/2 just above an outward facing bud.

**Second Dormant Pruning:**
Remove growth in the center of the tree. Head back new terminal growth by 1/3 to 1/2.

**Third and Fourth Dormant Pruning:**
Heavy pruning should no longer be necessary. Thin out inside limbs to prevent shading of center. Leave less vigorous wood for fruiting. Head back limbs to encourage new fruiting wood.

**At Spring Planting:**
Prune height to 24-30 inches before pruning.

**At Spring Planting: 1 Year old whip before pruning**

**Transition to Mature Fruit Bearing Tree**
Once the tree begins to bear fruit, prune to maintain vase shape and tree size.
Renovating Old Fruit Trees

- Large, neglected, ungainly, out of control fruit trees can be brought back to a more manageable state
- Apple and pear trees are most easily renovated. Stone fruits are not recommended for renovation. It is easier to cut the tree down and plant a new tree.
- Several questions should be answered before an attempt is made to rejuvenate an old tree.
  - Is the tree worth saving?
    - Did it formerly bear unique fruit that was exceptionally good
    - Does the tree hold some sort of sentimental value
  - Is the tree structurally sound--do the trunk and main limbs seem capable of bearing a heavy load of fruit, or would they simply break when heavily laden?
  - Is the tree in a suitable location or does it shade the garden or interfere with lawn mowing?
  - Is it full of insects and diseases?
- These are among the most important issues one should consider before proceeding
Renovating Old Fruit Trees

• If you decide to renovate the tree,
  – First, prune out all broken and dead branches and cut away the sucker growth around the bottom of the trunk.
  – The second step is to decide how big you want the tree to be.
    • A true dwarf tree can be maintained at about 6 to 10 feet tall
    • A semi-dwarf at about 10 to 16 feet and,
    • A standard at about 16 to 20 feet tall.
  – Trees that have not been pruned in many years should not be reduced to the desired height in a single pruning.
    • Plan on reducing tree height over a period of 3 or more years. This will prevent excessive growth.
  – To reduce tree height, use “reduction cuts” and selectively cut to branches growing more horizontal to the ground.
    • When using reduction cuts, always remove or shorten a branch to a side branch that is at least one-third the size of the one being cut
Removing Larger Limbs

- On limbs 2 inches or larger in diameter, three cuts are necessary to remove the limb properly. If a single cut is made, the weight may cause the limb and bark to tear down the trunk before the cut is complete. Such a wound is hard to repair and very slow to heal.

- Three cut Method
  - The first cut (a) goes up from the bottom of the limb several inches away from the main stem. The second cut (b) is down from the top, 3 to 4 inches farther out than the first cut. As the second cut approaches the depth of the first cut in the branch, the limb will break off and drop to the ground.
  - The third cut (c) is made to remove the stub, parallel to the branch collar
Renovating Old Fruit Trees

• **Important:**
  – NEVER remove more than one-third of the tree in one season.
  – DO NOT apply fertilizer after the initial heavy pruning
• During the summer after the first dormant pruning, remove the numerous water sprouts & suckers that will grow on the heavily pruned tree.
  – The method of removal is important. Pull the shoots off the trunk in mid-June when they are about 6 to 10 inches long. Keep pulling these shoots off throughout the season on the major scaffolds. The shoots can be pulled off safely as long as their bases remain tender and green.
• In the late winter or early spring of the following year(s), before growth begins, prune the tree again.
• Following the last year of renovation, apply a light application of fertilizer.
Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Cooperative Extension is implied.