

## Orchard Site Selection in Pennsylvania

The success of an orchard is only as good as the planning and site preparation that go into it. This is a simple maxim, but one that is often overlooked by novice and experienced grower alike. Short cuts and haphazard approaches can result in less-than-ideal growth and other problems during the life of the orchard. It is easier to amend a site before the trees are planted than it is once they are in the ground.

Some form of tree fruit can be grown in about every county in Pennsylvania. There are some limitations, however, in choosing the type in certain areas of the state. Generally speaking stone fruit (peaches, nectarines, cherries, apricots) do best in the south central and southeastern portions of the state. Most stone fruits are susceptible to low winter temperatures as well as flower damage due to their earlier bloom period and exposure to spring frosts. Therefore, peaches, nectarines and apricots may not bear fruit consistently when planted above the lower third of Pennsylvania; cherries and plums are a little hardier. Stone fruits should only be planted on the very best sites in the area of Pennsylvania bordered on the east by Interstate 81; on the south by Interstate 80 and on the west by Interstate 79. The exception is Erie county which because of the influence of Lake Erie in moderating the winter temperatures allow the planting of all stone fruits in this county. Do not plant stone fruits in areas of the state where the minimum winter temperature drops below -20 F. Apples and pears are hardier than stone fruits and except for very cold spots within the state should do well on suitable orchard sites.

To build a good orchard, you need a good foundation. The ideal site is on rolling or elevated land, so that cold air can drain during spring frosts. Cold air is heavier than warm air and will travel down a slope to lower elevations. The vegetation at the base of the slope is also important. Dense woods can act as barrier to the movement of the cold air. The air moves down and is trapped by the trees creating a dam effect resulting in a back-up of the cold air. If tree rows are too close to the wood line then frost damage can occur when the air collects against the woods. One method that can reduce this problem is to provide "channels" for the air to escape. The removal of 50 foot wide strips of all vegetation in the woods will allow the cold air to be funneled down to a lower elevation.

Although elevation is necessary sites that are directly on top of a hill or ridge must be viewed with caution. The exposed top of may be too windy or cold during the winter. A careful check of the average winter temperatures for the area should be made as well as prevailing winds.

Slope aspect or directional exposure should be considered for its effect on fruit trees as they come out of dormancy. A southern-facing slope warms up faster in spring, while the opposite is true of a northern slope. Eastern-facing slopes are intermediate. In Pennsylvania western-facing slope tends to be windier. Wind can cause spraying problems during the growing season, as well as alter the tree's direction of growth.

While uphill or rolling land is the most desirable, the degree of slope can also limit its suitability. The ideal site has a 4 to 8 percent slope. It may be difficult to operate machinery on slopes of more than 10 percent.

Soil type and drainage are the next items to consider. The best soil is a well-drained loam a minimum of 3-4 feet deep. Good drainage, however, should take preference over depth. Before establishing an orchard carefully study the soil map for the area. These maps list the characteristics of the soils across the state. Your local county extension office or soil conservation office will have a copy of the map for your area.

Generally, speaking the top of ridges and hills may have shallower soils due to erosion. While, the bottom will tend to be deeper and often are too fertile. Soil fertility should be medium to low. Overly fertile soils can lead to excessive tree growth at the expense of fruit production. It is easier to add fertilizer to increase tree vigor than to try reducing vigor. Fruit trees grow well in soil with a pH of 6.0 to 6.5. Higher or lower levels can cause nutrient deficiencies.

Once a site has been selected, it is necessary to prepare it. If you are replacing an existing orchard, particularly a stone fruit orchard, it is important to take a nematode test before the old trees are removed to determine the need for remediation. Next, take a soil test to determine soil fertility. If you are replacing an existing orchard or clearing the land for a new one, take the soil sample after removing the trees and as many of the roots as possible. An initial plowing and leveling should also be done before taking the soil sample. In this way, any subsoil that comes to the surface can be thoroughly mixed.

If the site has been open pasture or field cropland, be sure to take a nematode sample and to examine the field for the presence of perennial weeds before working the ground. If multiflora rose, thistle, poison ivy, or hackberry are in the field, they should be treated in the summer or fall with glyphosate. If the problem weeds have been established for a number of years, controlling them will require two or three treatments of glyphosate. It is best to subsoil as deeply as possible. Running a deep shank in two directions across the field will break up any existing hardpans.

Plow down any stubble left from the field crop in late summer to increase soil organic matter. After the field crop has been plowed down, take a soil test before doing the final discing and leveling. Incorporate any needed amendments, such as lime, phosphorus, or potassium.

Author: R. M. Crassweller, Prof. of Tree Fruit  
Department of Horticulture, Penn State

Last revised 21 January 2008