

So You're Considering an Orchard

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Homeowners who grow fruit in backyards or small orchards find that diseases and insect pests often ruin the entire crop and in some instances damage the tree itself. It is difficult to produce noninsect-damaged and disease-free fruit. In some years it may be possible to grow acceptable fruit without the use of pesticides, but in most years a few well-timed insecticide and fungicide sprays are needed.

The effects of many pest problems can be reduced if several things are considered prior to buying and planting fruit trees. One of the most important factors is selection of an area suitable for growing fruit trees. Fruit trees prefer full sunlight and moist but well-drained soil having a pH of 6.0-6.5. Second only to having a good location is selection of fruits and fruit cultivars that are adapted to your area.

If environmental conditions are not suitable for growing fruits, pest and disease problems are more difficult to manage and in some instances cannot be controlled. Additionally, fruit quality will likely be poor.

It is important to buy only quality trees that are disease and insect free. Check the roots to be sure they have not been allowed to become dry. Large is not always better; a tree 3-4 feet in height is much easier to establish than a taller tree. Most fruit trees should be cut-back to a 2-3 foot height when planted, and the new



USDA photo by Doug Wilson

growth trained. Planting a tree this size also reduces stress on the root system allowing the tree to become better established during the first year after planting. A grass and weed-free area around the tree should be maintained.

Once trees are planted, they require regular maintenance. Fruit trees need to be properly trained and annually pruned so that sunlight can penetrate through the tree. Pruning should also be done to remove damaged and diseased wood and to stimulate new growth. Pruning out dead wood and removal of mummied fruit is the most important cultural practice that can be done to reduce disease losses.

Fertilize to maintain proper tree growth. The goal of fertilization is to produce adequate tree growth to support a quality fruit crop, not to produce excessive tree growth.

Although the extent of pest injury can vary from year to year

depending on environmental conditions, certain fruit are more likely to have problems than others. Stone fruits generally require more care than pome fruits. Tree fruits requiring the most care to those requiring the least are nectarine, peach, cherry, plum, apple and pear.

Conditions favoring disease development or insect occurrence vary depending on the particular disease or insect. Generally, warm, rainy or damp conditions are very conducive for the development of tree fruit diseases. For best control of diseases, pesticides should be applied before rainfall.

There are specific times of the year when certain pests can most easily be controlled. During the growing season, fruit are more susceptible to particular diseases and insects and damage is likely to be greater than during other times of the growing season.

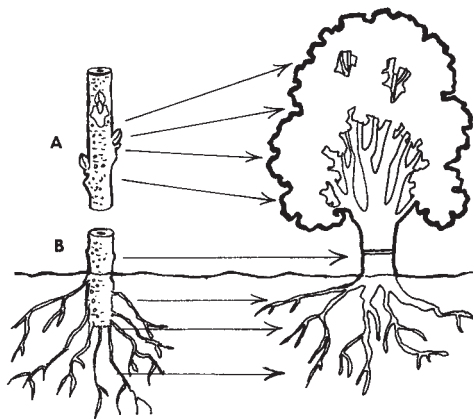
Plant Propagation: Grafting

Grafting involves the joining of different segments of two different plants of the same species. A branch or bud is joined to an UNDERSTOCK. In grafting, the cambium layers of the two different segments are aligned and grow together. Some plants graft naturally. Ivy commonly grafts itself. Natural grafting occurs where two branches are in close contact over several years.

Grafting allows gardeners to produce plants identical to a parent plant. It also allows growers to control size and shape of a tree or shrub. Apples are grafted onto root stock that regulates the ultimate size of the tree.

Grafting can produce more vigorous, earlier fruiting or two varieties can be grown on the same tree to provide pollination as with apples.

On the negative side, some grafting attempts will be rejected. This is called graft incompatibility. This might not occur in the first year, but may in successive years. Wind or winter cold can damage a GRAFT UNION. Some grafted trees or plants produce large numbers of SUCKERS. These can crowd out the desired plant or tree and are unsightly. If the graft union is planted below the soil surface, the SCION will root and the rootstock will die.



A. Scion - the twig or bud which will become the upper portion of the plant.
B. Understock - the root or rooted part of the plant upon which the scion is grafted.

Grafting is usually done in the spring. It involves collecting small branches called scion wood. These branches are 1/4 to 1/2 inch in diameter. Gather them several weeks before grafting is to occur. Collect wood that grew the preceding year. Select only wood with leaf buds, not flower buds.

Scion wood should be gathered in winter when wood is dormant, but not frozen. Use sharp clippers so that wood is not crushed. New growth over one foot in length is usually best.

Discard the wood at both ends of the branch and use the middle section. End growth is too succulent for grafting and wood closer to the base will graft more slowly. Label the scion wood, wrap it in moist paper towels or sphagnum peat, enclose it in an

airtight, plastic container and place it in the refrigerator.

Scion wood must be joined to the understock in spring when buds swell. It is critical that the two pieces are nearly the same size and that sap has begun to flow. The day before actually grafting, remove scions from the refrigerator and snip off the bottom ends. Place the clipped scions in a pail of water overnight.

It is critical that the cambium layer on the scion precisely matches that of the understock.

Grafts can be placed on a root or stem and be joined by any of several methods. The union is held firmly in place using wax, tape, plastic wrap, rubber bands or plastic tubing.

The grafted area must be protected from anything that will move the scion out of alignment. Bracing some grafts is advised. Side sprouts should be removed the first summer. Sucker shoots that sprout from below the graft also should be removed. If growth of new graft is satisfactory, do not fertilize the plant during the first year. There is danger that top growth will be very brittle and it could fail to harden off before the first frost.

Source: Nebraska Statewide Arboretum

Establishing a Commercial Vineyard

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Note: This is part of a series of articles related to commercial vineyards in Nebraska.



Soils

A wide range of soil types are satisfactory for growing grapes, with the exception of poorly drained soils (the "wet feet" problem mentioned earlier). Soils that will support root growth possess good aeration, moderate fertility, loose texture, good drainage (both internal and surface) and acceptable depth (preferably at least 40 inches, with no impeding layer). A well-drained sandy loam soil is ideal for grape root development.

Soil drainage is one of the most critical factors in site selection. Poorly drained soils cause poor root growth, resulting in slow vine growth, poor yields and reduced vine vigor and ultimately a lack of longevity. Grape roots may penetrate to depths of 10 feet or more in well-drained soils, but may be restricted to two feet or less in poorly drained soils. If the poor drainage is the result of an impervious layer such as a hardpan, plow pan or similar, "ripping" (sub-soiling) the soil exactly where you will place the rows is recommended. It may also be helpful to rip at right angles to the row orientation. If the poor drainage problem is related to heavy soils with inadequate internal drainage, it may be advantageous to install drainage tile. Consult the Soil Conservation Service (need to check correct new title) or your County Extension Office for advice regarding solutions to moderate drainage problems. Extremely poorly drained soils will be prohibitively costly to correct and should be avoided.

Conduct a Soil Test. Grapes grow well over a relatively wide range of pH, organic matter and fertility levels. However, if the soil is extremely infertile or possesses very acid or alkaline characteristics it will be important to amend the soil to achieve a desirable range of values. Generally speaking, grapevines tolerate soil pH levels of 5.0 to 8.0, but the ideal is between pH 5.5 and 6.5. A few cultivars are more sensitive to high pH-induced nutrient deficiencies, e.g. iron, and should not be grown on soils of pH in excess of 7.0. For a list of high pH sensitive cultivars, consult "Winegrape Cultivars for Nebraska" and "Grapes for Juice, Jelly, Table and Other Uses". A good range for organic matter is from 1 to 3%. Very high organic matter may provide excess nitrogen, resulting in very vegetative, soft growth that is highly susceptible to winter injury and often may cause low fruit yields and quality.

Phosphorous is very immobile in the soil, so if phosphorous levels are low (below 40 pounds per acre), it is essential that phosphorous fertilization be applied prior to planting. It should be worked into the soil as deeply as possible because it will remain where it is placed. Although most Nebraska soils have relatively high amounts of potassium, if soil tests indicate levels of exchangeable potassium well below 200 pounds per acre, it is advisable to also apply potassium fertilizer before planting. Since potassium is more soluble than phosphorous, and thus more mobile, it can also be added after planting. Occasionally magnesium, zinc and boron levels may be below optimum amounts, especially where field leveling was done, or other grade changes or modifications have taken place. In such cases, appropriate additions should be made. Exchangeable magnesium should be between 200 and 250, while amounts of actual zinc and boron should range from 8 to 10, and 1.5 to 2 pounds per acre, respectively. If levels of these elements are close to the recommended ranges, the grower may wish to defer application until after the first year of growth. Nutrient status of the vines should be monitored yearly by conducting foliar tissue tests. These tests will assist the grower in future years' fertilization practices.