Introduction

So you want to grow apples?

Growing apples and other tree fruit crops can be very rewarding, but also expensive and time consuming. There are many things that must be done in a timely manner to produce edible, attractive, and marketable fruit. This series of fact sheets will focus on overcoming pests that challenge beginner apple growers in their new orchards. Throughout this series the critical practices, "Must Do's", are highlighted. If these critical practices are not done in a timely manner, there will be very little usable fruit despite your best efforts. Look for the symbol throughout this series for the essential management practices required for successful apple production.

This is not an in-depth guide on apple planting and production practices, but a brief summary of what it takes to produce apples for sale:

Must Do — Protect the crop from pests, including wildlife. This series focuses on insects and diseases, but you will also have competition from wildlife and weeds. Deer severely stunt growth in trees by eating fruit buds and rubbing bark with their antlers. If you have deer in your neighborhood, take steps to protect new plantings by using repellents, or an 8 foot fence which is most effective. If deer find the trees before repellents are applied, you will have a constant battle to protect against stunted trees and reduced yields. Voles and rabbits also chew the bark, girdling trees. To deter small rodents, it may be necessary to apply wire mesh guards around young trees, but do not allow the guards to collect leaf debris as this favors trunk-boring insects. Keeping tree trunks free from weed growth also reduces habitat for these small pests. For information on how to control wildlife, go to wildlifecontrol.info/pubs/Pages/CornellUniversity.aspx.

Must Do — Identify, Acquire and Prepare an Appropriate Site. Identify your soil type. Apple trees need a well-drained site. Seasonal high water tables in the spring and fall can kill trees outright. To check this, dig a few test holes about 2 feet deep. Gray mottling in the soil profile indicates seasonal water logging. Test the soil to determine pre-plant fertilizers for correct pH, lime, calcium, phosphorus, and magnesium.

Kill the sod/weeds before the year of planting.

Must Do — Choose a Planting System. A planting system includes choice of rootstock, apple cultivar, planting density and spacing, and how to support trees from collapsing under the fruit load. With the help of your nurseryman, plan about two years ahead for specific rootstocks and varieties. All of these decisions are interdependent and key to a profitable planting. The choices made will impact initial costs in establishing the orchard and its later success.

Tree growth is dependent on the choice of rootstock, the nutrition you provide, and the variety. Tree anatomy is described in Figure 1. More dwarfing rootstocks (M9, Bud 9) have the potential to produce a limited amount of fruit the year after planting (2nd leaf) and, with appropriate tree care, grow to be about 10-12 feet. M26 can produce fruit in the 2nd-3rd leaf, and matures at about 12 feet. Semi-dwarfing rootstocks (such as M106, M111, M7) will grow a 15-20 foot tree, but will not produce many apples until the 5th leaf. Do not buy apple trees on seedling rootstocks because they can grow to 20 feet or more, are difficult to spray because of their height, and you will wait years before apple production.

Mature tree height also depends on tree support since most of the dwarfing rootstocks require a support
stake or trellis. It is critical to keep the main trunk growing upright, not bent over with a crop, until the trees reach the desired height.

**Cultivar or variety** (the scion grafted to the rootstock) of apples affects growth rate, and some grow more vigorously than others. Some cultivars are resistant to apple scab infections, but it is only one of the diseases you may face. If you want to spray less, look for scab resistant cultivars listed in your nursery catalogs. These cultivars have not been generally accepted by the big markets but are successfully marketed in farm markets and “low spray” niche markets. Scab resistant cultivars are essential in organic systems in the Northeast.

**Plan, plan, plan.** Lay out the field. Determine sources for fertilizer, and pesticides. Acquire trellising material and other important supplies. Determine labor and equipment needs, e.g. tractors, sprayer, boxes or bins, etc.

⚠️ **Must Do — Plant with care.** Control the planting depth so the graft union is 2-4 inches above the soil line when the ground has settled around the trees. Soil type will determine if you can plant with an auger, tree planter, or a shovel. Water the trees immediately after planting but never plant into wet soil.

⚠️ **Must Do — Learn as much as you can about the process.**

**Tree nutrition is a necessity.** Test your soil. Soil type, its pH and existing nutrients will determine any nutrients you will need to add through proper fertilization. Understand that weeds and grasses growing under the trees will rob trees of nutrients and water.

**Manage crop load.** Apple trees can produce twenty times the number of apples you want; without reduction, the apples will be small, poorly colored and unsalable. “Fruit thinning” is a “Must Do” practice to ensure quality fruit, and prevent alternate-year bearing (the tree sets heavy crops of small apples every other year).

**Harvest and storage.** Know the best time to harvest fruit by variety, and what kind of storage conditions are best for each variety. Proper storage until the fruit is sold reduces soft, greasy, overripe apples.

**How many apples are produced?** If branched trees are planted at a density of 800-1200 trees per acre and managed properly, growers can expect 100-200 bushels/acre in the 2nd year, 400 bushels/acre in the 3rd year. A mature yield of 100 apples per tree can be expected using dwarfing rootstocks. Planting costs can be recovered in 5 years depending on management skills and how the owner accounts for his/her labor.

**Where will this fruit be sold?** With an estimate of how much fruit might be produced, it is necessary to identify sales options through farmers markets, direct sales at the farm, or u-pick. Larger quantities might be brokered by a packer/shipper in the region. Unless there is a solid marketing plan, consider that there are many growers in the region that would be happy to sell apples by bulk bin for a farm market.

**Good luck on your endeavor!**

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**Figure 1. Tree Anatomy.**

- **Scion** – part of tree above the rootstock that determines the variety or cultivar of apple it will produce
- **Central leader** – main stem of tree, permanent structure
- **Scaffold limb** – side branches off the central leader, typically permanent for some systems, especially on lower portion of tree
- **Spur** – short growing branch (3-5”) one or more years old which flowers and produces fruit
- **Vegetative shoot** – this year’s growth that does not produce fruit, can be upright “sucker” or horizontal which will set fruit buds for next year
- **Graft Union** – should be planted about 2-4 inches above the soil line
- **Soil Line**
- **Rootstock** – provides anchorage and controls size of tree