



# ATLANTIC PROVINCES HOME GARDEN PRODUCTION OF PEARS



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The pear tree has been described as being the most exotic tree in the Annapolis Valley. Although not as cold hardy as apple, pear trees can endure winter temperatures of  $-25^{\circ}\text{C}$  without serious injury. In 1993 pear trees were damaged when mid winter temperatures dropped below  $-30^{\circ}\text{C}$ . The damage from this freeze is still evident in Valley pear orchards. Pears have been successfully produced in the Atlantic Provinces in locations outside the Annapolis Valley. However, the best results will be obtained in the milder areas and those with a warm growing season.

**SITE SELECTION:** The most important factor in the successful production of pears is the selection of the planting site. The main factors to consider in this area are:

1. **DRAINAGE** - Pear roots are more tolerant of wet soil conditions than apple roots, however, they will not tolerate excessive water (poor drainage). The water must run off or run through the soil relatively quickly.
2. **FERTILITY** - The soil pH should be within the range of 5.5 to 6.5. Phosphate and potash levels in the soil should be within the 400 to 500 kg/ha (200 to 259 ppm) range.
3. **SOIL TYPE** - All soil types are suitable for pears - gravel, sandy loam and clay loam but they must be well drained. Sandy loam and clay loam soils are the best. The best soil conditions are those that allow the roots to grow to a depth of one meter or more.

4. **WINTER CONDITIONS** - Attention should be paid to the snow and wind conditions at the proposed planting site during the winter months. Ideally the site should not be overly windy, have a slight grade and consistently have a 20 to 60 cm of snow cover through January and February. Areas where deep drifting occurs should be avoided as heavy snow load can cause major damage to limbs.
5. **FROST** - Avoid planting in low lying areas which are more prone to late spring and early fall frosts. Spring frost can kill flower buds while fall frost can damage the fruit. Planting pear trees on sloping land or next to large bodies of water can help reduce the risk of frost damage.
6. **EXPOSURE** - Avoid planting in shady and windy areas. Excessive shading can have a detrimental effect on fruit production, fruit quality and disease control. Tree growth, fruit production, and fruit quality are adversely affected by high winds.

**PREPARATION FOR PLANTING:** Start planning at least one year in advance of planting. Work the soil during the summer or at least the fall before planting. Soil with low phosphate or potash levels should have manure or fertilizer containing these two nutrients applied at this time. Apply limestone at a rate of up to  $1\text{ kg/m}^2$  and work into the top 7 or 10 cm of soil. Most soils in the Atlantic Region are acidic and need to be neutralized.

Select the varieties you want the fall before planting and place your order to be assured of receiving the desired varieties. Garden Centers are one source of fruit trees, however, variety selection tends to be more limited than that of a fruit tree nursery.

**PLANTING:** Pear trees should be planted in the spring before the buds begin to grow. In the Annapolis Valley, this is prior to May 15. Dig a hole large enough to hold all roots in a spread out position. Top roots should be at least 15 cm below the soil surface. Pack soil firmly around all roots to avoid air pockets. Tramp soil in around the tree until the tree is firmly in place, then water.

When planting leave adequate space between trees and away from buildings to accommodate the mature tree size. Note that the mature tree size will depend upon rootstock, variety and soil type. Consult a garden center employee or home garden specialist as to the potential tree size for the variety rootstock combination which is to be planted.

**POLLINATION:** Pear blossoms will not produce fruit unless they have been pollinated by a suitable pollinator variety. Bartlett for example, must be pollinated by another variety such as Clapp Favorite and not another Bartlett tree, in order to produce fruit. The bloom period of different varieties must overlap for cross pollination to occur. Early blooming varieties such as Anjou are not good pollinators for late blooming varieties like Bosc. Insects and bees transfer pollen from one variety to another and therefore insecticides **must not** be used during the bloom period.

**PRUNING:** Except at time of planting, it is recommended that pear trees be pruned in the spring while they are dormant. There are many forms to which the pear tree can be trained. The pruning and training method described below is for a central leader tree which is a tree form that should provide good fruit productivity and quality while not being overly complicated for the home gardener.

**When planting:** A one year old tree without limbs should be cut back to 1 meter above the ground. Trees with fewer than four healthy limbs

should be restarted by removing the limbs and cutting the tree back to 1 meter. Where there are four or more limbs on the tree, remove limbs that are broken, limbs that are too close to the ground (below 0.5 m) or those forming a narrow crotch angle with the main trunk. Head the tree back to 45 cm above the first limb.

**Second Season:** Select up to four branches of about equal size having wide crotch angles (45°-60° from vertical position) and uniformly distributed around the trunk. It may take 2 years to select the four desired limbs which will form the main framework of the tree along with the central leader. Limbs that compete with the four limbs or those with a narrow crotch angle should be removed. Limbs that form a narrow crotch angle are more prone to winter injury, canker and breakage. Limbs that are left on the tree should not be headed back, as this will stiffen them, make them rigid and the tree more upright. The result is that cropping is delayed. When the tree does bear fruit, the branches are not flexible enough for the weight of the crop to open out the tree.

**Third and later seasons:** A second and third permanent set of scaffold limbs can be developed depending upon the final height of the tree. Sets of scaffold limbs should be spaced at least 1 m apart on the trunk. With elevation of the limb, diameter should diminish so that a limb not larger than the permanent limb below it. If possible avoid allowing the diameter of a permanent limb to become more than 50 percent the diameter of the trunk immediately above it. At maturity the tree should have a Christmas tree or pyramidal shape.

**Maintenance Pruning:** Pear trees should be pruned on an annual basis to keep fruit spurs and fruiting wood in a healthy and vigorous state with good exposure to sunlight. A well pruned tree will be less prone to fungal diseases. Pruning should primarily consist of thinning cuts (whole limb removal) and removal of upright or drooping limbs. Some heading cuts (shortening of limbs) may be required on limbs that have become too long or tall. Aim to remove up to 10% of the bearing area on an annual basis. Removing too much wood will result in excessive sucker growth and reduce fruit quality.

**FERTILIZER:** Apply 500 g of 6-12-12 per year of tree age up to a maximum of 7 kg per mature tree. The fertilizer should be applied in the spring

prior to June. When applying fertilizer, distribute the fertilizer evenly under the branch spread. Manures, compost and mulch can be used to replace mineral fertilizers. Because the composition of manures varies with source, age and storage, it is difficult to judge how much to use, and with richer manures, it is easy to over fertilize. The fertilizer needs of mature trees range from 27 kg/10 m<sup>2</sup> of cow manure stored outside to 4.5 kg/10 m<sup>2</sup> of fresh poultry droppings. Manures should not be spread around fruit trees from May 1 to November 1. Decomposable organic mulches can reduce fertilizer needs, and if rich enough, e.g., waste hay, can entirely replace mineral fertilizer. A mature tree will require 1 to 2 bales of hay for the first mulching, after which ½ to ¼ bale every other year should be sufficient. Growers using mulch should be cautioned that the mulch can provide an ideal habitat for rodents which can feed on the tree bark in times of food scarcity.

**WEED CONTROL:** Hoe or cultivate lightly to remove competition for the first three years. Seed down with good lawn seed and keep well mowed. A grass or straw mulch spread under the tree will also help to control weeds while retaining soil moisture and adding fertility to the soil.

**ROOTSTOCKS:** Pears can be grown on the rootstocks of several species of *Pyrus*. The most commonly used rootstock in North America is domestic seedling stock. This rootstock is hardy but produces vigorous trees that can take up to seven years or longer to bear fruit. Pear trees on this rootstock can present some problems to the home gardener with limited gardening space, as these trees can reach heights and spread of 6 meters.

The quince is used extensively in European countries as a dwarfing rootstock. The quince however, is not as hardy as the domestic seedling, has a shallow root system, and should only be planted in rich fertile soil. Pear varieties grown on this rootstock may require a support system such as a stake or trellis system to prevent the tree from leaning. New dwarfing pear stocks are under evaluation and in the future more suitable dwarfing rootstocks may be available to Atlantic pear growers.

**VARIETIES:** Many pear varieties have been tested at the Kentville Research Station in Nova Scotia. Clapp Favorite and Bartlett are the two main commercial varieties grown in Nova Scotia. Bartlett is not considered hardy enough for planting in most of New Brunswick and the other Atlantic Provinces. Flemish Beauty is considered to be one of the hardiest varieties available. Harvest dates listed for varieties are those for Kentville.

**Earlibrite** - Picking date is August 17-24. This is an introduction from the Kentville Research Station. It is a medium size, attractive, good quality early season pear. The skin is greenish-yellow with a bright orange-red blush. The tree is moderately vigorous, has good fruit spur development, and is upright spreading. The pears store and ripen well for their season without excessive core breakdown. Earlibrite has outstanding appearance, size and quality for its season.

**Dave's Delight** - Picking date is August 20-30. A new pear variety named and released by the Kentville Research Station. It is medium to below medium in size, attractive, very high quality, early season pear. The skin is yellow with up to 50% washed with attractive bright red. The tree is moderately vigorous, comes into production early and is productive. The fruit stores well for its season and is relatively free of core breakdown.

**Clapp's Favorite** - Picking date is August 25-September 10. This is the first pear harvested in the season and can be grown in many parts of Nova Scotia and New Brunswick. It is cold hardy, a vigorously growing tree, annual bearing and enormously productive. It is a favorite when eaten fresh and can be preserved easily, making a very desirable finished product. The fruit is yellow in colour and grows to a good size.

**Morettini (Butirra Precoce)** - The picking date is September 1-10. An Italian variety which ripens 6-7 days before Bartlett. Fruit is medium in size, with a yellow skin and red blush. The tree is vigorous. Fruit drops readily as it approaches maturity.

**Bartlett** - The picking date is September 5-15. It is widely known throughout the world as a high

quality pear both for eating and canning. The fruit is medium to below medium in size, with a smooth yellow skin. The tree is moderately hardy and vigorous, an annual and heavy bearer. Fruit size is often improved by fruit thinning. It has a longer storage life than Clapp's Favorite.

**Flemish Beauty** - The picking date is September 15-20. A high quality pear that is suitable for fresh fruit eating and canning. The fruit is large, with a red cheek. If harvested prematurely the fruit wilts readily, loses its flavour and is poor in quality. The tree is hardy, very productive and vigorous. This variety is recommended for the home gardener but it has the one disadvantage of being susceptible to pear scab. A thorough fungicide spray program is required to control scab on this variety.

**Seckel** - The picking date is October 7-20. It is highly esteemed for pickling. The fruit is small with a yellow-brown russeted skin. It is a high quality pear which can be eaten fresh or processed. The tree is hardy, medium vigour with a low, compact profile. Trees don't grow well on heavy clay soils. Slow to bear fruit but, once into production they continue to bear regularly. The fruit is rather susceptible to scab. Its blossoms are self-fruitful.

**Bosc** - The picking date is October 15-25. This variety would be suitable for areas with a long growing season. A high quality, flavorful, dessert pear with excellent keeping quality. A medium to large size pear. The skin is a dark, rich yellow overspread with cinnamon russet. The tree is vigorous, upright and has a leggy growth habit. Slow to start bearing fruit, however when established on a favorable site and good soil the tree can be productive.

Although not commercially evaluated at the Kentville Research Station, the following varieties may be of interest to Home Gardeners where hardiness is a concern: Lucious, Menie, Miney, Summercrisp.

**HARVESTING:** Pears are picked at the "mature green" stage of maturity. If allowed to fully ripen on the tree the fruit matures too quickly, becoming soft at the core and is often mealy or gritty. Approximate harvest dates given for the

listed varieties are for Kentville in the Annapolis Valley and would need to be adjusted by as much as two weeks for areas with a shorter and cooler growing season.

**STORING FRUIT:** Bruise free pears keep best when stored at 0 to 1°C. An old refrigerator will serve as a good cold storage facility. Store only mid-or late-season varieties.

**RIPENING PEARS:** Pears should not be allowed to ripen until wanted for consumption. Remove pears from cold storage a few days before fruit is required. Place at room temperature for about three days for ripening before eating.

**DISEASE: Pear scab** is the main disease of concern to the home gardener and is the fungal disease that attacks apple trees. Spores of this fungus are released during prolonged periods of wet weather from May to August. This disease appears as dark green to black spots on the leaves and fruit about 15 days after the wet period. Early season fruit infection can result in deformed fruit while heavy leaf infections can result in defoliation. If left unchecked, over time this disease can weaken the tree and reduce cropping. At present there are no scab immune or resistant pear varieties however, there is a variation in varieties as to their susceptibility to this disease. Flemish Beauty and Seckel are very susceptible.

**Fire Blight**, although less common than scab, is a serious bacterial disease that can kill the trees and in some areas of North America restrict the production of pears. Home gardeners in the warmest areas of the Atlantic Region will only have to be concerned about this disease. Fire blight is a bacteria that can enter the tree through the blossoms or vigorous shoot growth. Infected shoots wilt and have a shepherd's crook appearance. The leaves on infected shoots or fruit spurs turn brown and in cases of heavy infections the trees can have a scorched appearance, thus the origin of the name fire blight. The disease overwinters as cankers on the limbs which appear as dead areas, surrounded by a crack in the bark where the live tissue separates from the dead. The disease is spread by rain splashing, insects and improper removal of infected shoots. The safest time to remove infected wood is in the winter

months when the bacteria is not spread with pruning equipment. If infected wood is removed in the summer, the pruning equipment will need to be disinfected between each cut with a bleach solution consisting of one part bleach to nine parts water.

**INSECTS:** You will not necessarily have a damaging population of a given insect. Past experience and careful observation are the best guides as to whether to use a control measure.

**Pear psylla** - This is a small sap-feeding insect that is related to the aphids. All nymphal stages of this species feed on the plant sap and produce a sweet, sticky, honey-dew; the combined effects of mold and honey-dew can ruin the fruit. Pear psylla overwinters as an adult and treatments can be applied in the early spring.

**Winter moth and green fruitworm** - Several species of caterpillars will feed on leaves and fruit in the early part of the year. The leaf damage is not usually serious but fruit damage during the calyx period will show up on the mature fruit. Green fruit worm often make a large hole in several pears on a given branch. When a caterpillar feeds on a young pear, a depressed, russeted area is left on the mature fruit. The damaged fruit is edible.

**Tent caterpillars** - These insects can be numerous in some years and scarce in others. Hatching of the eggs occurs in May as the leaves are first opening. Tent caterpillars can be controlled while massed on the branches or while in the nest. Crushing by hand can be an adequate method and insecticide may be unnecessary. Spot treatments can be effective if insecticides are used.

**Pear slug** - This is a slimy, dark-green larva, swollen at the front end, that is sometimes seen on pear. The pear slug is a species of the order Hymenoptera: it is not related to moths and butterflies. The larva, which are seen in June and early July, feed on the upper surface of the leaves. Almost any insecticide will control them.

**Green apple bug** - Nymphs and adults can cause serious damage to pears. The injured area is corky and hard and about 3 mm in diameter. The

injured fruit is gnarled and unattractive. The adult bug appears to prefer apple in July.

**WILDLIFE:** The feeding of mammals on the bark, shoots and fruit buds of pear trees can stunt tree growth and eventually kill the tree. Severity of feeding damage depends on location of the trees and local wildlife populations.

**Deer:** Deer will browse the terminal growth on young fruit trees which weakens the trees. Repeated browsing will stunt tree growth and possibly kill the tree. Winter browsing of fruit buds will reduce crop load. Fencing the tree in, particularly using an electrical fence will provide the best deterrent to deer browsing. If fencing is not practical the hanging of a bar of soap in a young tree is the second best option for deer control.

**Mice and voles:** These rodents will feed on the bark of trees and roots during the winter months when food is scarce. Feeding damage is more prevalent in years of prolonged heavy snow cover. Mowing around and under fruit trees will reduce the habitat for rodents and the placement of a mouse guard on the trunk of the tree will help reduce rodent damage.

**SAFE USE OF PESTICIDES:** Always handle pesticides with care. This includes herbicides.

1. Before using any pesticide, read the label carefully. Take note of precautions to be followed when using a specific product.
2. Avoid spilling pesticides on yourself or in the immediate area where you are working. If this should happen, wash yourself immediately with plenty of water to remove all traces of the pesticide in your eyes, nose or mouth.
3. Do not smoke or eat while you are applying a pesticide. Wait until you have washed.
4. When applying a pesticide, do not permit material to blow back on you or others or pets.

Consult the following spray schedule as to the time of insect and disease problems.

### HOME GARDEN SPRAY SCHEDULE FOR PEARS

Stage of Development	Disease or Insects	Remarks
Dormant (Late April-early May)	Pear psylla	Dormant oil spray should provide good control by discouraging egg laying by adult flies. Thorough coverage of the wood is required.
Bud Scale Separation (when green tips appear on buds)	Pear scab	After green tissue appears, the foliage should be sprayed before the first rainy period.
Blossom Buds Exposed	Pear scab	
Pink (just before blossoms open)	Pear scab Winter moth Green fruit worm	Apply if caterpillars can be seen on leaves.
Calyx (when petals have fallen)	Pear scab Pear psylla	Apply an insecticide only if pear psylla is present.
Cover Sprays (at 10-day intervals to mid-July)	Pear scab Pear psylla	Apply an insecticide only if pear psylla is present.

Consult your local Garden Centre or Department of Agriculture for suitable pest control products to control problems.

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