FRUIT GROWING

On the Southern Kenai Peninsula

1. Parkland
2. Norland early
3. Yellow Transparent

westland-mantet-lodi--state fair
oriole-goodland - crab (rescue)
Zestar (honey crisp) -vista belle-lodi

1. Montmorency
2. Bali (Evans) (only for grafting)
3. Kristan (sweet)

nanking (small)-romeo (new)-

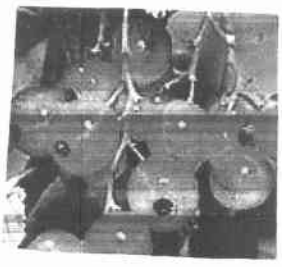
(sweetheart & 6 other varieties)

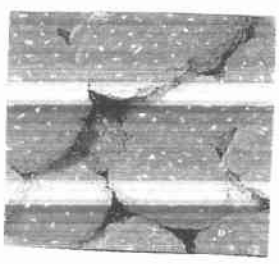
OTHER FRUITS

Strawberries (sitka - honeoye) Raspberries (red-golden-purple) Currents (red & black) Gooseberries Saskatoon (service)(June berry) Hascap Elderberries wine Cranberries

OTHER TREES

Larch Mayday (choke cherry) Mountain Ash Mugo Pine Maple (amur) Birch Spruce Oak (bur) Popular Aspen Cottonwood Sand Pear





FRUIT TREES IN GENERAL

1. LOCATION - micro climates - protection - moose - wind - birds - rabbits - fencing - clear plastic vs. black - south slope - drainage

2. PLANTING - spacing (minimum 15 feet) - hole size - rocks - raised beds

3. CARE - watering - fertilizing - weed control - disease control (powdered mildew) - overloading of fruit - use props

4. TREE SIZES - dwarf - semi dwarf - full - controlled by rootstock - pruning - watering - fertilizing - soil - etc

5. PRUNING - (see handout) - most anytime except late fall and winter - no more than 10% at any one time - topping tree - water sprouts - limb training - spreaders - collar - keep inside of tree open

6. POLLINATION - (see handout) - somewhat complicated depending on tree - generally need more than one tree - Montmorency cherries self-fertile

7. HARVESTING - bare root trees 3-4 feet tall will produce in 2-4 years - thinning when to pick - taste - start falling on ground - frost - when picking bend apple back toward branch - sunny side produces redness - back and inside ripen later - cherries, cut stem or just pull off seed
8. STORAGE - apples do NOT store well - leave stem on - don't stack - don't wash keep cool - can refrigerate up to a month - need high humidity but not wet - Don't store next to potatoes - can wrap individually in newspaper (like tomatoes) - apples and cherries are high in antioxidants

9. PRESERVING - another whole topic - check with extension agent in Soldotna

10. SOURCES - local nursery - Save U More - big box stores like Costco & Home Depot - Internet (but be careful!) I recommend - Raintree Nursery (raintreenursery.com) and St Lawrence Nursery (sln.Potsdam.ny.us). Beware of nurseries in the southern and central U.S.

Make use of google etc for information - it's amazing what's available.

Alaska Pioneer Fruit Growers Association in Anchorage (apfga.org) - they list 130 varieties of apples experimented with!! Plus other info

FRUIT TREES IN GENERAL

1. LOCATION - micro climates - protection - moose - wind - birds - rabbits - fencing - clear plastic vs. black - south slope - drainage

2. PLANTING - spacing (minimum 15 feet) - hole size - rocks - raised beds

3. CARE - watering - fertilizing - weed control - disease control (powdered mildew) - overloading of fruit - use props

4. TREE SIZES - dwarf - semi dwarf - full - controlled by rootstock - pruning - watering - fertilizing - soil - etc

5. PRUNING - (see handout) - most anytime except late fall and winter - no more than 10% at any one time - topping tree - water sprouts - limb training - spreaders - collar - keep inside of tree open

6. POLLINATION - (see handout) - somewhat complicated depending on tree - generally need more than one tree - Montmorency cherries self-fertile

7. HARVESTING - bare root trees 3-4 feet tall will produce in 2-4 years - thinning when to pick - taste - start falling on ground - frost - when picking bend apple back toward branch - sunny side produces redness - back and inside ripen later - cherries, cut stem or just pull off seed

8. STORAGE - apples do NOT store well - leave stem on - don't stack - don't wash keep cool - can refrigerate up to a month - need high humidity but not wet - Don't store next to potatoes - can wrap individually in newspaper (like tomatoes) - apples and cherries are high in antioxidants

9. PRESERVING - another whole topic - check with extension agent in Soldotna

10. SOURCES - local nursery - Save U More - big box stores like Costco & Home Depot - Internet (but be careful!) I recommend - Raintree Nursery (raintreenursery.com) and St Lawrence Nursery (sln.Potsdam.ny.us). Beware of nurseries in the southern and central U.S.

Make use of google etc for information - it's amazing what's available. Alaska Pioneer Fruit Growers Association in Anchorage (apfga.org) - they list 130 varieties of apples experimented with!! Plus other info

WEATHER (climate change?)

www.usclimatedata.com/climate/homer/united states

Homer airport records (there are other recording stations too)

Coldest - minus 24 degrees on Jan 23, 1961

Warmest - plus 81 degrees on July10, 1993

July has been the only month without frost - even then it was 34 degrees in July of 1993. It was 51 on 1/23/1961 and also 51 on 12/3/2002. April extremes - 65 on 4/29/2005 and minus 9 on 4/1/1944. May extremes - 6 on 5/4/1949 and 71 on 5/31/93

2014 was the warmest year even in Homer!

Non summer of 2008 - plants bloomed later and slower and ran out of time. In weakened condition they could not survive the sever cold in late Dec. and Jan. of 2009. Buds and tissue froze (buds are formed during the previous year). Inadequate sunlight delays the beginning of fruit bearing and will reduce the amount of fruit. Examples of winter kill in 2008 - sweet cherries - plums - pears - dogwood - raspberries - roses - bleeding heart - potted plants and trees left outdoors - and even mayday trees.

PDO - Pacific Decadal Oscillation is not the 4-7 year cycles of El Nino/La Nina.

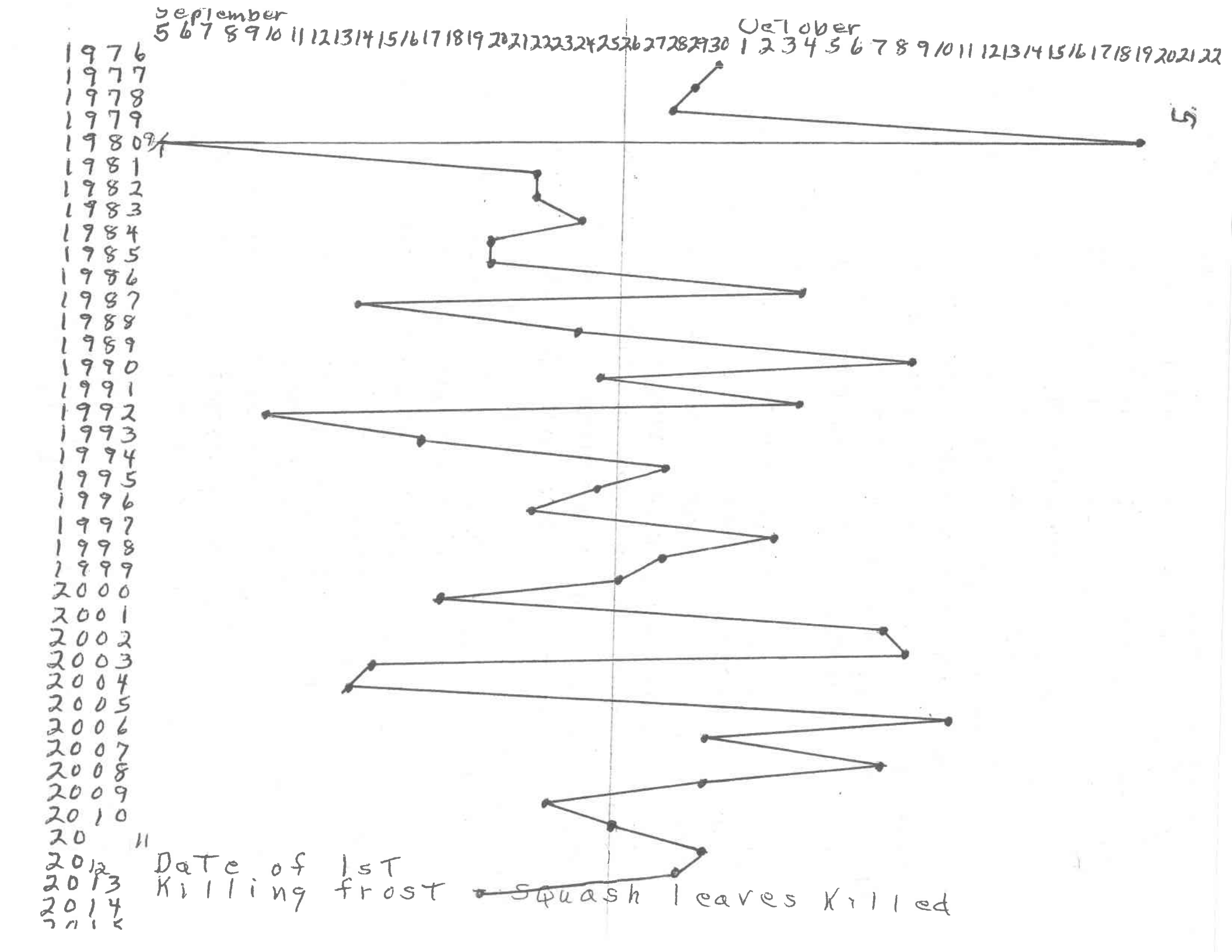
Phenology - the ancient art of timing of events in nature as plant bloom, bird migrations etc. (use of journal) Example of cherry trees in Japan for over 100 years. The Lilac Network. More info at www.naturescalendar.org.uk or google phenology.

Sept. is our wettest month (ave. 4.8 in.) May is driest. Annual is 27

Average precip - March 1.28 - April 1.31 -May 1.07 - June 1.05 July 1.47 - August 2.36 - September 4.8 - October 3.28

Growing degree units - March .79 - April 11.6 - May 100 - June 263 - July 384 - August 387 - September 229 - October 34.9

Watering - water to drip line - less water makes roots go deeper - You can semi dwarf trees by not watering as far as the drip line


September
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
October
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date of 1st
Killing frost
Squash leaves Killed

TREE HEALTH

Healthy trees produce good quality fruit. Weak or diseased trees produce fruit of poor quality or no fruit at all.

Pest problems involving insects and diseases if not detected early and managed properly can influence fruit production and weaken a fruit tree's overall health.

Bearing Age

Most fruit trees are propagated by grafting or budding the variety on a root stock. When you purchase nursery-grown trees, their tops will be one to two years old while the roots may be one or two years older. The age (from planting) when trees can be expected to bear fruit depends on the type of fruit you are growing: apple, apricot and sour cherry (three to five years), peach (two to four), pear and plum (four to six), quince and sweet cherry (five to seven). Dwarf fruit trees may begin to bear one to two years earlier than standard sized trees.

CLIMATE AND WEATHER

Most hardy fruit trees need a certain amount of cold winter weather to end their dormancy and to promote spring growth. When winters are too mild, spring growth is delayed, irregular, and slow. These factors extend the period of blooming, thereby increasing the possibility of frost injury.

On the other hand, extreme cold during winter dormancy may kill the fruit buds. Winter weather rarely threatens hardy apple, pear, plum, and sour cherry varieties. Sweet cherry trees, however, are relatively sensitive to cold until they become dormant. Peach trees are very vulnerable to cold weather. Their buds can be killed by midwinter temperatures around -10°F.

As the fruit buds grow and open, they become more susceptible to injury from frost. The exposed buds can usually withstand temperatures near 24°F. However, the open blossoms of practically all fruit trees may be killed if the temperature drops below 27°F.

When a heavy frost is expected, covering the trees will sometimes prevent bud or blossom injury, provided temperatures do not fall too low and the cold weather is of short duration. Protective coverings may be effective, such as floating row cover material or old bedsheets.

During spring frosts, some commercial growers heat their orchards, but this method is impractical for home gardeners. Overhead irrigation provides effective frost protection when temperatures drop to 32°F. Ice that forms on buds provides an insulating effect until temperatures rise above freezing. After a severe frost, injured blossoms may appear normal; however, if the pistils (center part of the blossoms) are killed, the tree will not bear fruit.

POLLINATION

Most fruit trees need to be pollinated. Pollination is affected by cold weather and reduced pollinating insect activity. Without sufficient pollination, trees may blossom abundantly but will not bear fruit.

Some species of fruit trees have "perfect" flowers. Both the anthers, which contain pollen, and the pistils, which develop into fruit, are located in the same blossom. Trees that bear fruit through self-pollination, or set fruit without pollination, are called "self-fruitful."

(over)

TREE HEALTH

Healthy trees produce good quality fruit. Weak or diseased trees produce fruit of poor quality or no fruit at all.

Pest problems involving insects and diseases if not detected early and managed properly can influence fruit production and weaken a fruit tree's overall health.

Bearing Age

Most fruit trees are propagated by grafting or budding the variety on a root stock. When you purchase nursery-grown trees, their tops will be one to two years old while the roots may be one or two years older. The age (from planting) when trees can be expected to bear fruit depends on the type of fruit you are growing: apple, apricot and sour cherry (three to five years), peach (two to four), pear and plum (four to six), quince and sweet cherry (five to seven). Dwarf fruit trees may begin to bear one to two years earlier than standard sized trees.

CLIMATE AND WEATHER

Most hardy fruit trees need a certain amount of cold winter weather to end their dormancy and to promote spring growth. When winters are too mild, spring growth is delayed, irregular, and slow. These factors extend the period of blooming, thereby increasing the possibility of frost injury.

On the other hand, extreme cold during winter dormancy may kill the fruit buds. Winter weather rarely threatens hardy apple, pear, plum, and sour cherry varieties. Sweet cherry trees, however, are relatively sensitive to cold until they become dormant. Peach trees are very vulnerable to cold weather. Their buds can be killed by midwinter temperatures around -10°F.

As the fruit buds grow and open, they become more susceptible to injury from frost. The exposed buds can usually withstand temperatures near 24°F. However, the open blossoms of practically all fruit trees may be killed if the temperature drops below 27°F.

When a heavy frost is expected, covering the trees will sometimes prevent bud or blossom injury, provided temperatures do not fall too low and the cold weather is of short duration. Protective coverings may be effective, such as floating row cover material or old bedsheets.

During spring frosts, some commercial growers heat their orchards, but this method is impractical for home gardeners. Overhead irrigation provides effective frost protection when temperatures drop to 32°F. Ice that forms on buds provides an insulating effect until temperatures rise above freezing. After a severe frost, injured blossoms may appear normal; however, if the pistils (center part of the blossoms) are killed, the tree will not bear fruit.

POLLINATION

Most fruit trees need to be pollinated. Pollination is affected by cold weather and reduced pollinating insect activity. Without sufficient pollination, trees may blossom abundantly but will not bear fruit.

Some species of fruit trees have "perfect" flowers. Both the anthers, which contain pollen, and the pistils, which develop into fruit, are located in the same blossom. Trees that bear fruit through self-pollination, or set fruit without pollination, are called "self-fruitful."

(over)

Stories Roots Can Tell

New ideas for transplanting trees and shrubs.

JACK RUTTLE

In 1968 Carl Whitcomb, a professor of horticulture at Oklahoma State University, set out to learn precisely how much soil amendment to add to the backfill when planting trees and shrubs. Enriching soil in the planting hole with peat moss, compost or the like has been a longstanding recommendation among nurserymen. Whitcomb thought there would be important advantages in knowing just how much was best. Growers who had been adding too much could cut back, saving time and money. Growers using too little could use his findings to produce better plants. What Whitcomb learned, though, was that the best amount to add was none at all.

When he announced his findings, most members of the nursery industry were shocked. His advice was largely ignored. Some even tried to disprove his work, with no success.

Whitcomb went on to research other practices for transplanting and establishing nursery stock. He learned that trees should *not* be pruned at transplanting as a matter of course and that plants should be mulched over a wider area—in a circle 10 to 14 feet across—than had been previously thought.

He has discovered these new ideas for transplanting by working with hundreds of species of trees and shrubs. With the aid of fellow researchers and his students, he has planted, grown, then dug up again thousands of plants, painstakingly measuring the root growth, shoot growth, trunk expansion and other things. He has come to know as much as anyone about moving trees and shrubs successfully. After following his work with interest for a number of years, I recently had the chance to ask him these questions:

Dr. Whitcomb, why do you prefer fall planting?

I don't prefer it for everything. But for balled-and-burlapped and container-grown plants, conditions in fall are perfect for the plant to make a lot of root growth. The soil is warm and the plant has accumulated lots of energy, which roots need for growth.

Fall is a long season. Can the roots grow after the weather's turned cold?

Root growth is excellent at soil temperatures in the 50s and 60s. You'll get good root growth in soils right down to the low 40s and upper 30s.

Are you talking about temperatures in the top foot or two of soil?

I'm talking about the top 6 to 12 inches. That's where most of the roots are going

Is stock grown so that the roots fill the containers before going to garden centers and retail nurseries?

Generally, yes.

If a plant doesn't sell in spring, should the retailer then pot it up?

I tell nursery people all the time: Sell it, shift it, or throw it away. If they pot them up a size, the plants will increase in size, health and value. Unfortunately, a fair percentage are left in their original containers, and by fall those plants will be so stressed that they'll be a long time recovering if they ever do.

The problem is that until that plant puts on a flush of growth, you can't *see* any signs of stress. The plant can sit there for six months and not do a thing, and look great. There'll be no visual signs of stress until the plant starts growing again.

What can I do if I get a plant with the roots growing around and around the sides of the container? Should I cut the roots and spread them out?

That's a severe shock to the plant, too, and I haven't seen that it does much good. I'd take the tree back to the nursery. By the way, it's not true that if the roots are growing around in a circle, they'll keep growing that way. Whatever position they're in when you plant the tree, they'll grow out in that direction.

You recommend fertilizing trees at fall planting time, but I've heard and read that fertilizer applied after midsummer can reduce a plant's winter hardiness.

Not if it's put on when the top of the tree is dormant, as I'm recommending. You plant and fertilize in fall *after* top dormancy but while the roots are still active.

Does fertilizer help the roots grow?

No, the roots can't use nutrients until they come from the leaves. The roots spend energy to absorb and accumulate nutrients for the plant to use when leaf and shoot growth starts in spring. But the roots benefit from the fertilizer after it has gone through the cycle in the leaves.

You don't recommend pruning back trees to balance root loss at transplanting either, fall or spring?

It's a time-honored practice, but we found no advantage to it. The plants that grew the best were unpruned. You see, a transplanted tree needs most of all to regrow its roots, and where is it going to get the energy to do that but from the leaves? When you prune that tree, you're cutting away potential leaf surface. There's also energy stored in the limbs that are removed, and root growth takes energy.

Does that hold true for fruit trees, too?

Yes, fruit trees have shown the same response in our studies. If you want to modify the *shape* of a fruit tree, some pruning may be helpful, or you can use weights or spreaders to get the branches into a better fruiting (more horizontal) orientation. It's best to prune for shape after the new root system is well-established.

When is good balled-and-burlapped stock dug and wrapped?

In the fall, right after the leaves have dropped, and continuing until just *before* bud swell in the late winter or early spring.

Could you dig when the leaves start to turn color?

That would be fine. When the leaves start to lose their green, they've stopped producing much energy. The buds are well-developed then and maximum energy is stored.

Is fall the best time to plant container-grown stock, too, or can you plant it spring through summer?

Well, you can plant all through summer, but I think there are advantages to fall planting. If you plant in spring or summer, you're going to have to spend time watering and caring for the plant all season. If you wait until fall, you can get that plant well established for the next season with a minimum amount of effort.

How do wholesale nurserymen produce container-grown stock?

Most is propagated in small containers or rooting beds, then potted into 1-gallon containers. Then the stock is grown for a season, sometimes two, before being shipped to the retailer.

Whitcomb's Revised Rules for Planting

1. Select plants well-adapted to the soil, light level and microclimate of the site.
2. Transplant only when the plant has ample reserves of stored food.
3. Make the planting hole as wide as possible, at least 18 to 24 inches wider than the root ball.
4. If in doubt, plant slightly shallower rather than slightly deeper.
5. Remove all containers, cord and wire from the planting site.
6. Expose roots to air for only an absolute minimum of time.
7. If the spade has glazed the sides of the hole, break up the compacted soil.
8. Fill the hole with the same soil removed from the hole. Don't mix amendments with the backfill.
9. To get rid of air pockets, water as you backfill. If you tread the soil around the tree, tread lightly.
10. Water again several hours after planting.
11. Water every seven to 10 days (unless it rains) for the first season.
12. Mulch heavily, 5 to 7 feet out from the tree, and 3 to 4 inches deep, but don't suffocate the bark. Use peat or compost.
13. Prune as little as possible. Remove only damaged branches. Prune for shape after the plant is well-established.
14. Stake only if necessary.
15. Fertilize immediately after planting and again the next fall after leaf drop. Use slow-release fertilizer. Apply it only on the soil surface.

Trees and shrubs are sold three ways—balled and burlapped, container grown, and bare root. Transplanting balled specimens is best done in September/October or March/April. Bare-root plants can only be planted in the dormant season—just after leaf fall in autumn or just before bud swell in spring. Container plants can be transplanted at any time, but there are advantages to waiting until fall. If planted in spring the plant will need special attention, especially proper watering, to get it well established.

Bare-root plants are lifted from the field and transported free of soil with the roots wrapped in a material to keep them moist. Balled plants are lifted with the soil ball held firmly in place with burlap to allow transplanting with minimal root disturbance. Container-grown plants are started and established in a pot by a nursery. You can tell a well-established plant by lifting the stem. It should hold the weight of the pot and the soil. Recently potted plants are best left with the nursery until well established, according to Peter Seabrook, author of *Shrubs for Your Garden*.

Carl Whitcomb, interviewed on page 22 of this issue, gives the following specific guidelines for selecting the best shrub or tree specimens:

- **Know the plant well. Leaf color, luster, and distribution on the plant are clear signs of health only if you know the plants. Observe them growing in gardens and parks whenever you can.**
- **Root tips should be a strong, bright white.**
- **Roots should not be growing in profusion out of the container.**
- **Roots should not circle the root ball.**

Why don't you recommend staking trees?

Staking can lead to problems with chafed bark or girdling if the ties aren't removed in time. Stake trees only if you see they need it, and never stake for more than one growing season.

You recommend a great deal of mulch around the tree. Why so much?

The roots of young trees can't compete very well with most grasses, which are dense and thick and very efficient at drawing up nutrients.

When is the best time to plant bare-rooted stock?

Just before bud break is the ideal time to plant bare-rooted trees. You'll get maximum root growth with minimum bud dehydration. We've done studies where we've transplanted trees and examined the root tips for signs of activity, starting in late

winter, and what we learned is this: Just as soon as you can see the slightest swelling in the buds, then you'll see the roots initiating new growth. It's in response to hormones produced in the terminal leaf buds. If you're buying bare-rooted trees, be sure you have them planted just as trees of that species in your area are starting to swell their buds.

FACT SHEET

FOR PART-TIME FARMERS AND GARDENERS

UNITED STATES DEPARTMENT OF AGRICULTURE

Liming Acid Soils

The degree of acidity in soil has a direct influence on the quantity and quality of a crop. An acid soil can restrict the root and top growth of plants, reduce the availability of plant nutrients, decrease desirable biological activity, and increase the availability of toxic elements in the soil (see fig. 1). If soil acidity is not managed properly, full benefit of other expensive and time consuming soil management practices cannot be realized.

What Is An Acid Soil?

Soil and organic matter particles that hold high concentrations of hydrogen or aluminum, or both, cause a soil to become acidic. The soil and organic matter particles carry a negative charge that hold or adsorb such positive elements as hydrogen, calcium, magnesium, potassium, sodium, and aluminum. Soils vary in their ability to hold these positive elements. The total amount of elements that can be held by the soil and organic matter particles is known as the soil's cation exchange capacity.

The term "pH" refers to the degree of acidity of a soil. The pH of soil indicates the concentration of hydrogen ions held on the clay and organic matter particles. A pH of 7.0 is neutral; below 7.0 is acid, and above 7.0, alkaline. The lower the pH (below 7.0), the more acid the soil. The higher the pH (above 7.0), the more alkaline the soil. A soil with a pH of 5.0 is 10 times more acid than one with a pH of 6.0, and 100 times more acid than one with a pH of 7.0.

What Causes Acid Soil Conditions?

Soil acidity develops gradually in humid regions as abundant precipitation percolates through the soil, carrying dissolved nutrients below the root zone. (This is called leaching.) Growing plants also remove calcium and magnesium from the soil. The lost calcium and magnesium is replaced by hydrogen and aluminum, resulting in increased soil acidity. The use of acid-forming fertilizers also contributes to soil acidity.

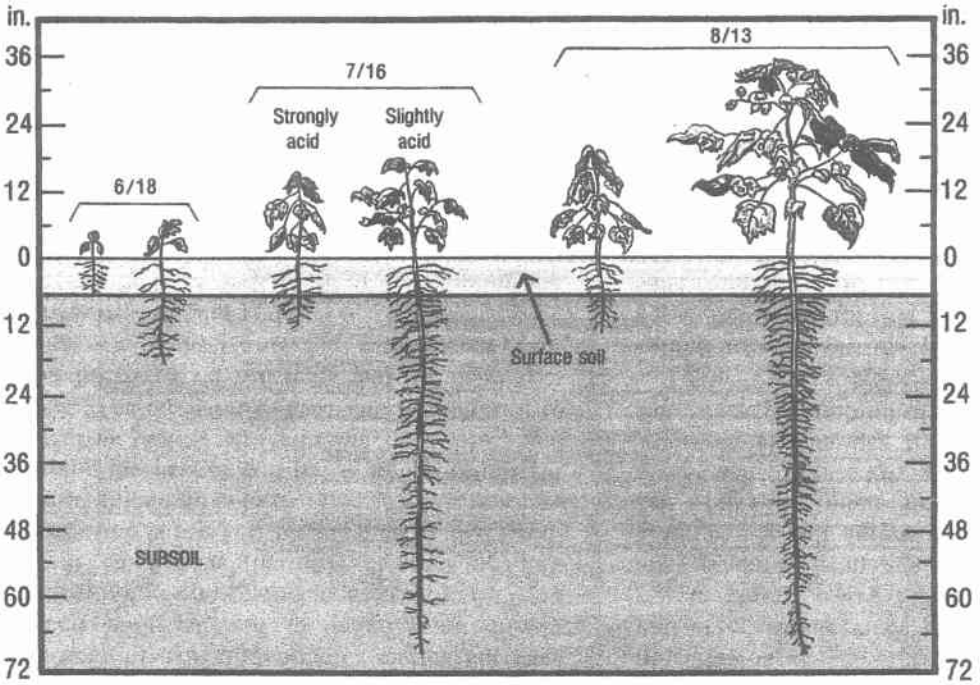


FIGURE 1.—Acid soils restrict rooting and plant height.

How Is Soil Acidity Corrected?

Soil acidity can be corrected when hydrogen or aluminum held by soil and organic matter particles are replaced with calcium or magnesium. Finely ground limestone is one of the most commonly used materials. If calcium is the only element needed, calcitic limestone is used. If magnesium is also needed, dolomitic limestone is used.

Maintaining the proper soil pH is as important for maximum crop yields as fertilizing, watering, and pest control. The decision to lime and the amount to apply must be based on soil tests and the crop species to be grown. Some plants, like azaleas and cranberries, grow best in acid soil.

Figure 2 can be used as a guide in determining the best pH range for different crops. For example, the preferred pH range for many kinds of grasses is from 5.5 to 7.0. Therefore, a desirable pH value for most lawns is 6.5. Agricultural experiment stations and extension services operate soil-testing laboratories in almost every State. Soil-testing services are also available from many private companies. These laboratories will determine the pH of your soil and tell you how much lime is needed. Some garden stores sell pH test kits and you can measure the pH yourself. If you use the test kit, table 1 can help determine the amount of lime needed.

Table 1 gives approximate amounts of lime required to increase the pH of soils of different textures. As a general rule, light sandy soil requires less lime to increase the soil pH than a heavy clay soil.

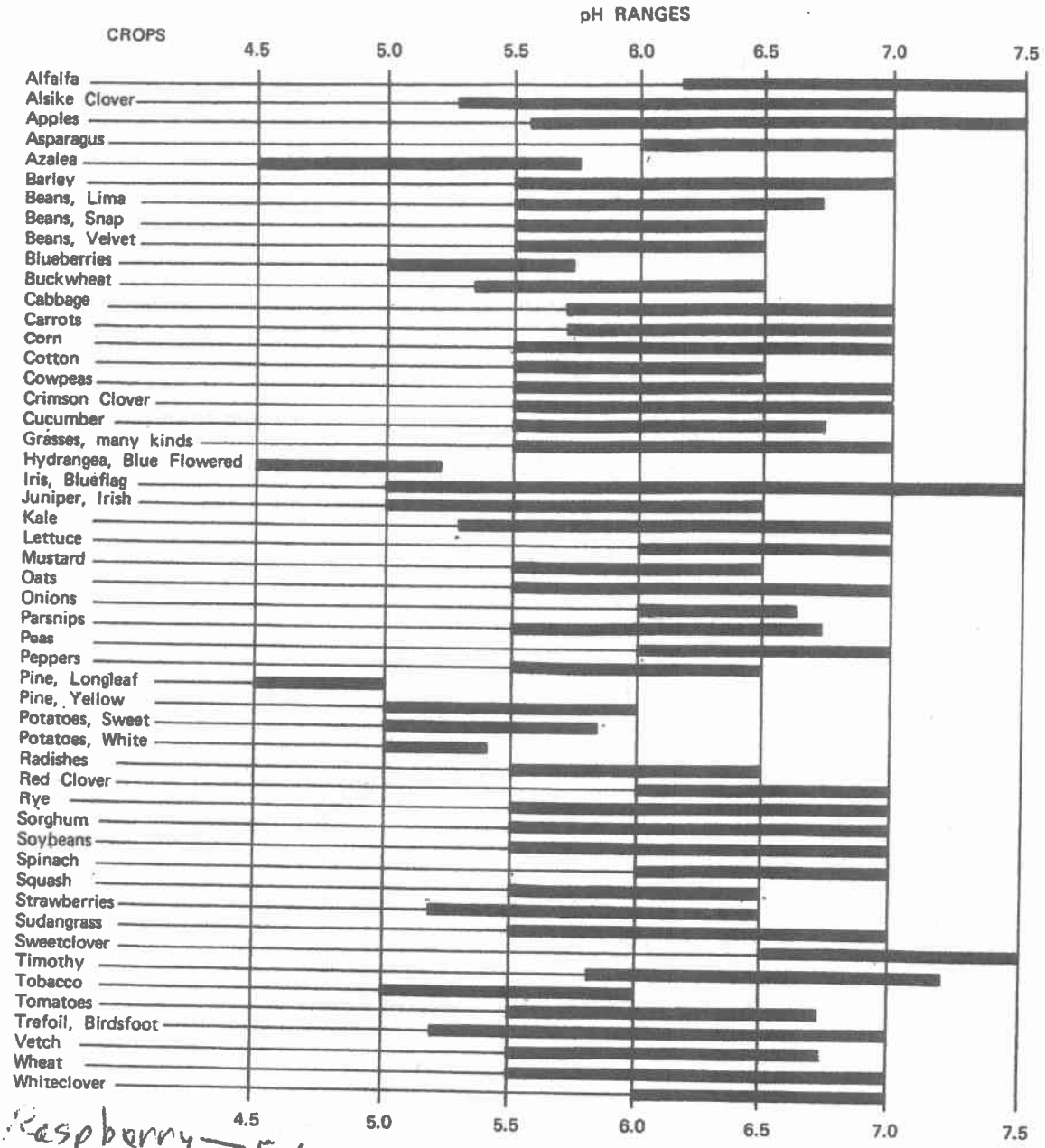


FIGURE 2.—Preferred soil pH range for maximum growth of different crops.

Harvest and Storage

Apples

The redness of an apple is not a good indicator of its ripeness. When assessing maturity of apples, look for a change in the background color, the part of the skin not covered with red pigment. When the ground color begins to change from green to a greenish yellow color, the apple is starting to ripen. Among Minnesota apple varieties, only 'Northwestern Greening'is truly green at harvest. All other apples should have a yellowish background color when fully ripened.

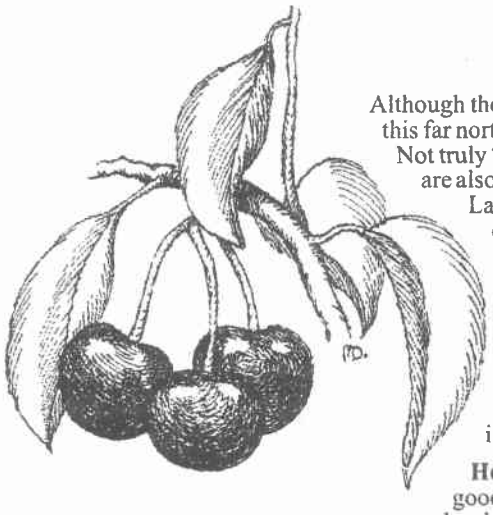
Pick a few apples that appear to be ripe and taste them to be sure they are at the maturity stage you prefer. As apples ripen, starch in the flesh is converted to sugar. An unripe apple will be starchy and leave a sticky film on your teeth. A ripe apple may still be tart, but it should also be sweet and have developed aromatic flavors. You may need to pick the fruit several times over the course of a week or two, in order to get all the fruit at the right stage of maturity.

To pick an apple, gently take the fruit in the palm of your hand, then lift and twist in a single motion. Alternatively, use one hand to hold the short, thick fruiting spur that bore the apple, and the other hand to lift and twist the fruit. Avoid pulling or yanking the fruit, as you could pull off the spur, taking with it next year's flower buds.

Apples last the longest in home storage at standard refrigerator temperatures, about 33 to 38 degrees F with about 85 percent humidity. Although garages, basements, and root cellars may provide adequate storage conditions, the best place to store apples at home is usually in a refrigerator. Warmer temperatures always shorten the storage life of apples. Apples stored near 33F may last as much as 10 times longer than apples stored at room temperature.

High humidity helps reduce the shriveling of apples in storage. If the storage environment is low in humidity, as most refrigerators are, the fruit should be stored in a perforated plastic bag or a loosely covered container.

Although apples may be displayed in a fruit bowl at room temperature for a short period, such conditions will dramatically reduce their usable life.



PIE CHERRIES

Although there are no varieties of sweet cherries (like Bing, Black Tartarian, Royal Anne) hardy this far north, pie or "sour" cherries are much hardier and, with care, will flourish and fruit here. Not truly "sour", these are the bright red cherries used for pies, cheesecake topping, etc. They are also delightful eaten fresh...just ask our nursery crew! (They like to blame it on the birds.) Late Spring frosts may occasionally kill the blossoms on these early-blooming pie cherries, a problem which can be partially prevented by planting in a protected spot near a house or barn. Because cold air flows downhill, try to plant cherry trees on or near the top of hillsides. They grow best in rich, well-drained soils.

Hardiness E—Extremely hardy, to -50°F or colder; V—Very hardy, to -50° F with occasional winter injury; M—Moderately hardy, to -40° F with occasional injury, P — Hardy only to -30° F to -40° F. May need extra protection.

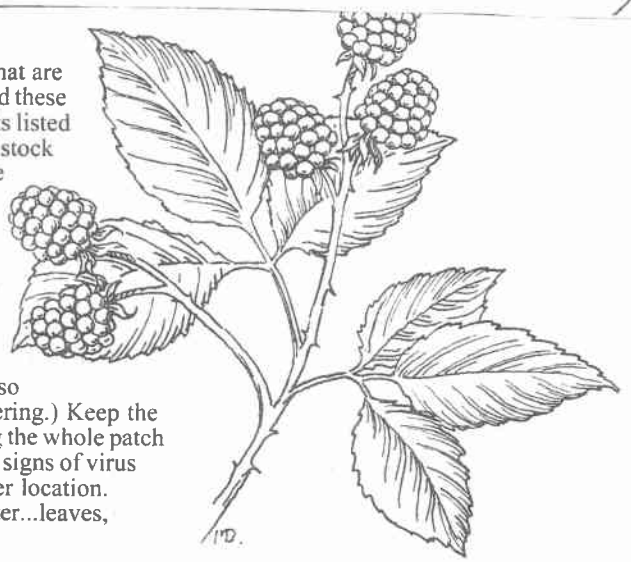
Pollination. All of the varieties of pie cherries listed in the chart below are self-fruitful, i.e. they do not require a second tree to bear fruit.

How long before it fruits? A pie cherry will begin to bear fruit in 2 to 4 years if given good care and planted in a favorable location. They should be screened to prevent rabbit and rodent damage.

2 to 4 ft. trees $24.00 each **Bali trees are 1 to 2 ft.**

Variety	Hardiness	Parentage	Description
Bali	E-V	Unknown	Discovered growing near Edmonton, Alberta, by Dr. Ieuan Evans, Bali has fruited after withstanding - 43 degrees F. A vigorous grower and precocious producer, yielding large (1 inch) fruit excellent for pies, sauces, jams and even fresh eating. Five-year old trees have produced up to 10 gallons of fruit Trees are from tissue culture, which means there is no graft or rootstock to worry about. A natural dwarf.
Bali trees are 1 to 2 ft.			
"No Subs" is not an option on this item. *We are short on Bali cherries this year. We will fill your orders for Bali as long as our stock lasts. When we run out of Bali, if you do not list a preferred substitute, we will substitute a Carmine Jewel dwarf bush cherry (p. 25 – identical fruit; tree habit more bushy) with its own brass tag.*			
Balaton	M-P	Unknown; morello type	New to the U.S.; not as hardy as Montmorency. Originated in Hungary, brought to the US in 1984 by Dr. Amy Iezzoni. Fruit deep red in color at maturity, with red flesh and juice. Fruit firm, a bit sweeter than most tart cherries. Vigorous grower. Space 25-35 feet apart.
Meteor	V	Montmorency X Russian variety	We find this variety excellent and more vigorous than Northstar. The fruit is delicious and while not as deep red as Northstar, is fine for pies, compotes, etc. Introduced by Univ. of Minnesota in 1952. Natural dwarf. Space 10-15 feet apart.
★ **Montmorency**	V-M	Sweet Cherry X Prunus tomentosa	The standard for comparison in sour cherries. Known since the 1600's, Montmorency will grow and fruit in Morden, Manitoba, although late frosts often take the crop. The tree lives 50-60 years and is a vigorous grower, becoming very large. Space 25-35 feet apart.
Northstar	M	English morello X Serbian Piel	Introduced by the Univ. of Minnesota a 1950. Fruit has red flesh and juice. Tree a natual dwarf. Space 10-15 ft apart.

RASPBERRIES



When purchasing raspberry plants, it is an advantage to start with plants that are "clean" or free of virus. There are many viruses which affect raspberries, and these are found to varying degrees in all parts of the country. The raspberry plants listed below are "virus indexed," meaning that they have been propagated from stock that is free of virus. They can and often will, however, gradually become virus-infected in later years, giving lower and lower yields after many years in the same spot. If properly managed, however, raspberries can be one of the easiest and most rewarding small fruits to grow.

Raspberry Culture. One of the most common mistakes in setting out raspberry cuttings is planting too deep. See our demonstration photo on p. 13. Set plants in rows rather than in a patch. Raspberries will "sucker", making new plants by sending out shoots from the roots. To limit their expansion, we rototill the soil between the rows 3-4 times in a season. We also mulch only *in* the rows, never *between* them.(Mulching encourages suckering.) Keep the rows managable by pruning out old and dead canes each year, or by mowing the whole patch after harvest if you have Fall berries. After several years, if the plants show signs of virus (general decline), dig up some of the new shoots and start them in another location. Raspberries like a slightly acid soil (pH around 5) and lots of organic matter...leaves, manure,etc.

Summer vs. Fall berries. Most raspberries bear two crops, a "summer" crop and a "fall" crop. The first crop is in July and is borne on 2-year canes. The late or "fall" crop is borne on 1-year canes, and may come as early as August or as late as November. A November crop is of no use to most Northern gardeners. Therefore, if we want a variety for its fall crop, it's important to choose one that bears before freezing weather. Redwing and Autumn Bliss are such choices.

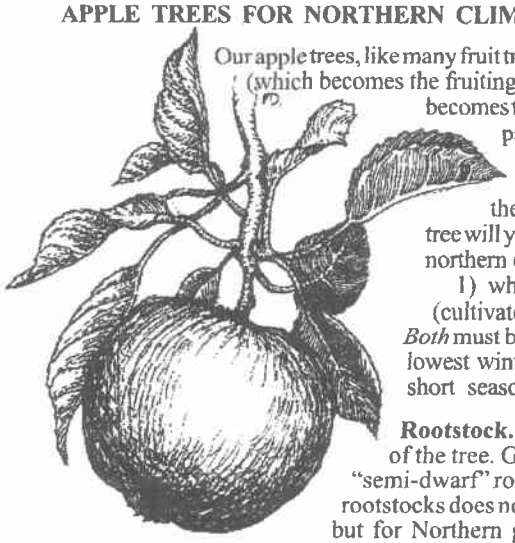
Pollination. It is not necessary to plant more than one variety for pollination.

How long before they fruit? Raspberries are precocious bearers and will usually yield some fruit the second year after planting. Full production can be attained in 3-4 years.

Spacing. Plants should be set 1-2 ft. apart, with 4 -5 ft. between the rows.

APPLES

APPLE TREES FOR NORTHERN CLIMATES



Our apple trees, like many fruit trees, are propagated by grafting: joining a scion (which becomes the fruiting part, or top of the tree) to a rootstock (which becomes the root of the tree.) This grafting allows the two parts to grow together and function as a single plant. Although the rootstock has an influence on the ultimate size and hardinesss of the tree, the scion alone determines what kind of fruit the tree will yield. Therefore, when we produce fruit trees for northern climates, there are two things to consider: 1) which rootstock to use 2) which "cultivars" (cultivated varieties) to graft onto that rootstock. *Both* must be hardy and vigorous enough to withstand the lowest winter temperatures and grow strongly during a short season.

Rootstock. The rootstock determines the ultimate size of the tree. Generally, there are "standard," "dwarf" and "semi-dwarf" rootstocks. Choosing one or the other of these rootstocks does not influence the type of fruit yielded by a tree, but for Northern growers it can have a huge effect on how winter-hardy the tree is, how well it grows, and whether it produces a crop. "Dwarf" trees are made by grafting onto rootstocks that are inherently weak growers; they stunt the growth of the tree. There is a popular notion that dwarf trees will produce fruit sooner, but in USDA Zone 3 or 4, the use of a dwarfing rootstock can cause even a hardy cultivar to winterkill or to simply linger season after season with minimal growth and no fruit. If you live in a northern climate with a short growing season, dwarf trees will not work for you. You need a rootstock that will grow strongly for 2-3 months and then start hardening off for winter. **We do not grow or sell dwarf or semi-dwarf apple trees, because they do not have the hardiness, vigor, and disease resistance needed to thrive in our northern climate.** For our apple trees we use the Russian rootstock *Antonovka*, an extremely hardy and vigorous "standard" size rootstock which can produce strong growth during our limited growing season. "Standard" means only that *Antonovka* is not a dwarfing rootstock; it will not limit the growth and thus the ultimate size of the tree, but rather will allow it to grow freely to its full size, about 12-15 feet. For growers in Zones 3 and 4, an apple on *Antonovka* "standard" rootstock will be much hardier, grow more vigorously, and bear fruit sooner and in greater quantity than the same apple on dwarfing rootstock. If you wish a smaller tree, this can be accomplished by pruning. A well-pruned apple tree on *Antonovka* rootstock, when grown in Zones 3-5, will be equivalent to a "semi-dwarf" tree in size (10-12 feet at maturity), and it will have many advantages. For instance, your tree will have the vigor to compete with grass that grows near the base of the tree, while a dwarf tree must have "clean culture" (no sod) to the drip line. It will not need to be guyed or staked, whereas dwarf trees tend to be shallow-rooted and usually require some support. Your tree might well be producing fruit for your great-grandchildren, while dwarf trees must be replanted every 10-20 years. Finally, the crop yielded by your mature standard tree will be many times greater than that of a dwarf or semidwarf tree.

Cultivars. In the apple table on pages 5-12, we list over 170 varieties of apples that can be grown in our climate. The hardiness ratings (from hardiest to least hardy: E–V–M–P) in the table can help narrow the choice for those in colder areas. Or, consider one or more of the special price packages or "our picks" listed at the top of the page 5.

CHOOSING A SITE FOR YOUR APPLE TREES

Apples like light, fertile soils and a south-facing slope if available. Your trees will grow faster on a well drained, sandy loam soil. They will not grow at all in wet, heavy clay or pure sand. Another consideration is proximity to your dwelling, especially for fruit trees, which require care every year. Will it be "out of sight, out of mind?"

Be sure that water can be provided at the site. *Each tree* should receive *5 to 10 gal. of water per day* until the end of May, and the same amount at least two to three times per week until mid-July (August in a dry year.)

Planting. Get your trees in the ground as soon as you can. Have the holes dug before the trees arrive if possible. For details on planting, see our Planting Guide: [http://www.sln.potsdam.ny.us/pg.html] or hard copy by mail on p. 34. A free copy will be sent with your plant order.

Spacing. Plant your apple trees 25 feet apart if they are to be kept well-pruned, 35 feet if they will be allowed to grow to full size.

Apple pollination. Most of the apple cultivars that we offer are self-fruitful, i.e. they do not need to be planted near a different variety of apple to produce fruit. However, since even self-fruitful varieties can often produce better crops with cross-pollination, we recommend that the backyard gardener plant more than one apple variety in his/her orchard location.

How long before it fruits? An apple tree from our nursery, planted in good soil, and *maintained adequately by its new owner* (rabbit protection, pruning, mulching with manure, attention to pest problems) can be expected to bear its first fruit in 3-5 years.

DR(sfr) Disease Resistance:
In the "code" column of the apple listing on pp. 5-12, you will see some apples tagged "DR" with the subscript "s" (scab), "f" (fireblight), or "r" (cedar apple rust). These are apples which are less susceptible (but not immune) to these diseases.

However, don't pass over a variety simply because it is not a "DR." "DR" does **not** mean "no spray" or "low maintenance." Insects like disease resistant trees as well as "normal" trees. Choose your trees *first* for vigor and fruit quality, *second* for disease resistance.

Keeping your tree healthy will help it fend off disease. Conversely, any tree that is under stress will be more likely to fall prey to disease, whether or not it is genetically disease resistant.

Code:
a-notably annual bearer (this does not mean other cultivars will not bear annually)
b-baking
c-cider
e-eating
f-ornamental flowers
g-jelly
j-juicy
k-keeper
l-large fruit
o-aromatic
p-productive
r-ripens over long season
s-sauce
u-unusual flavor
v-vigorous
y-bears young
$-sells well at market stands

Hardiness:
E —Extremely hardy, to -50°F or colder.
V —Very hardy, to -50° F with occasional winter injury.
M — Moderately hardy, to -40° F with occasional winter injury.
P — May need extra protection. Hardy only to -30° or -40° F.

Season: This refers to season of ripening and will vary with location. For instance, Yellow Transparent, which ripens here around Aug 1st, is ripe approximately one month later in Anchorage, AK. Our seasons in Potsdam may be roughly defined as:
Early — end of July thru mid-Aug
Mid — end of August thru Sept
Late — First week of Oct and later

ST Lawrence Nurseries-sln.potsdam.ny.us

PLANT ORDER FORM-2015

Orders are shipped by Priority Mail. Please remember that you may not receive this delivery at your home, but rather be notified of your package's arrival at the Post Office via a slip in your mailbox. If you provide us with your email address, we will notify you when your order has shipped.

Please do not write in this space

SHIP ORDER TO: _____

Postal Address _____
if you collect your mail at a Post Office box, use the box number here

Town, State, ZipCode _____

~~**Telephone**~~ sln.potsdam.ny.us

e-mail (not used for solicitation) _____

SUBSTITUTION POLICY.
Please list on the order form which substitutes you would prefer if we run out of the variety you have ordered. Should you wish a refund on items that are out of stock, write "No Subs." If your first choice is out of stock, no preferred substitute is listed, and you have not specified "No Subs," we will choose a substitute that is as close to your original preference as possible.

QUANTITY	PLANTS (List possible substitute in parentheses)	UNIT PRICE	TOTAL PRICE
Apples	ParKland-Norland-Westland	24.00	each
	ZesTar-Yellow Transparent	24.00	
2'-4'	State Fair-Lodi-Oriole	24.00	
	Is this a non-plant item? Please use the separate form and shipping schedule on reverse side.		
	Late ordering? Check www.sln.potsdam.ny.us for a list of out-of-stock items.		
	Rescue Crab	24.00	
	RootStock-Wild Apple	3.00	
Cherries	Montmorency	24.00	
	Bali (Evans) may not be available	24.00	
	Nanking (small)	7.00	
Berries	Currents-Red & Black	11.50 & 8.00	
	Gooseberries	8.00	
	Saskatoon (service-june)	9.50	
	Raspberries	4-5.50	
	Haskap	15.00	
	Cranberry-high bush	6.00	
	Bur Oak	14.00	
	TOTAL PLANT PURCHASE		

SHIPPING & HANDLING ON PLANTS

CATEGORY	STATES INCLUDED	PLANT TOTAL	SHIPPING & HANDLING
Nearby States	CT, MA, MD, NH, NJ, NY, PA, RI, VT	Up to $45	$14.00
		$45.01 - $90.00	$15.50
		$90.01 - $150.00	$18.50
		$150.01 - $200.00	$20.50
		over $200	10% of order
Middle Distance States	IA, IL, IN, KY ME, MI, MN, MO, NC, OH, TN, VA, WI, WV	Up to $45	$18.50
		$45.01 - $90.00	$21.50
		$90.01 - $150.00	$25.50
		$150.01 - $200.00	$29.00
		over $200	13.5% of order
Distant States	AK, AZ, CO, OR, ID, KS, MT, ND, NE, NM, NV, OK, SD, TX, UT, WA, WY	Up to $45	$25.00
		$45.01 - $90.00	$29.50
		$90.01 - $150.00	$33.50
		$150.01 - $200.00	$37.00
		over $200	18.5% of order

**Shipping & Handling _____

Total _____

Sales Tax (8%) if NY Resident _____

Amount Enclosed _____

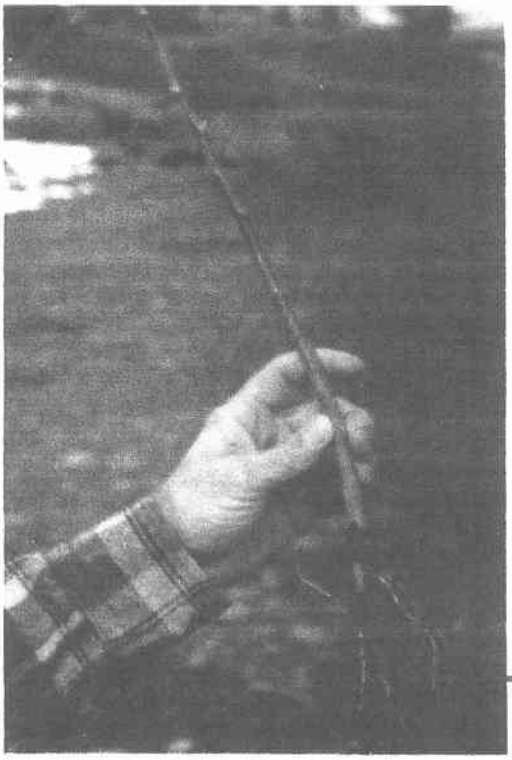
Please make checks payable to **BILL MACKENTLEY**

TERMS OF PAYMENT. Full payment by check or money order must accompany your order. The exception to this is local customers, who may pay when they come to pick up their trees. We do not take credit cards.

Mail to: St. Lawrence Nurseries
325 State Hwy 345
Potsdam New York 13676
Telephone (315)-265-6739

**NY State residents: Because the shipping & handling is not an exact shipping amount, NY State requires that it be included when figuring sales tax.

15.



Raintree Nursery Rootstock

A WORD ABOUT ROOTSTOCKS

We make virus free rootstock available to the backyard grower who wishes to start his or her own trees.

The choice of rootstock has much to do with tree performance. The rootstock is the major factor in determining the size of the tree, its cold hardiness and tolerance of wet or dry conditions. It helps determine how soon the tree will bear and some of the diseases to which it will be resistant. Raintree offers fruit trees grown on superior dwarfing rootstocks. The following rootstock information will also help you understand more about successfully caring for your Raintree fruit trees. Remember that with any rootstock, the ultimate height of the tree depends not only on the rootstock but on the variety grafted, the type of soil and the methods of pruning and care. You may graft on to patented rootstocks but may not reproduce the rootstock itself.

ROOTSTOCKS SENT IN FEBRUARY

Despite our best efforts to have them ready earlier, it is always February, sometimes early March, before we can send you the rootstocks. They may therefore be sent separately from the rest of your order.

Attend our grafting classes. **See Page 93 for details.**

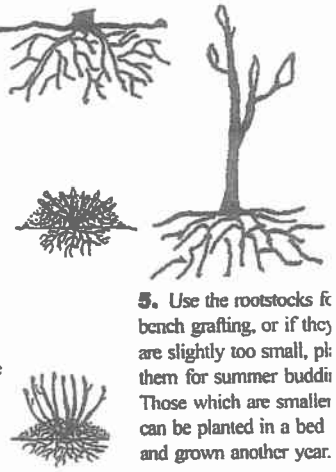
Starting Your Own (Stooling or mound layering for apples, plums and cherrie

1. Plant the rootstock in your garden one foot apart. Let it grow through the season.

2. Cut it off at ground level the following spring.

3. During the next (and each following) spring and early summer it will send up shoots. Every couple of weeks, hill up sawdust or dirt around the new shoots, always leaving the terminal bud exposed to continue its growth. Sawdust is preferred.

4. The following winter, use your hands to pull the sawdust away. Cut off the now rooted shoots at the base of the mother plant.



5. Use the rootstocks fc bench grafting, or if they are slightly too small, pl them for summer buddi Those which are smaller can be planted in a bed and grown another year.

APPLE

EMLA 27

Can be maintained at only four to six feet in height. It is well suited for growing in a container or a small yard. Trees grafted on EMLA 27 bear early and heavily. It needs staking. It is hardy to -25° F. This rootstock is patented and it may not be reproduced without permission of the patent holder. **#R020**

BUDAGOVSKY 9

A very dwarfing apple rootstock similiar to EMLA 9 but more hardy. Trees can be maintained at 6 to 10' in height. Requires staking. USDA Zones 3-9. **#R280**

EMLA 26

It will produce a dwarf tree from 8-14 feet tall. Does well in most soils. It is hardy to -40° F. Produces fruit in 2-3 years. Can be grown free standing but needs staking on windy sites. It doesn't sucker much in the orchard. **#R060**

EMLA 7

Produces a semidwarf tree from 11-16 feet tall. Trees can begin bearing in 3-4 years. It is hardy to -35° F. and does well on wet soils. Suckers need to be removed each year. **#R100**

MM 111

Produces a semi-standard heavy bearing, precocious, well anchored tree about 20 feet tall. This rootstock has fiberous roots and does well in a wide variety of soils. It is hardy to -35° F. It produces burr knots at the base and should be planted almost up to the graft line. **#R110**

ANTONAVKA

A Russian suckerless rootstock that produces a full-size, 25' to 35' tree. Hardy to -50° F. Wide soil adaptability. Produces large yellow edible apples if allowed to fruit. **#R055**

www.denaliseed.com
www.johnnyseeds.com
www.seedrack.com
www.sheffields.com
www.uaf.edu/ces
www.arborday.org
www.dnr.state.ak.us/forestry
www.treesaregood.com
www.apfga.org/research.html
www.isa-arbor.com

PLANTING YOUR GRAFTED ROOTSTOCK

Plant your grafted tree so that the graft is, if possible, only a couple of inches above the ground. This will help avoid the burr knots that sometimes form on the EMLA 26 and EMLA 7 rootstocks. If however, you need to graft higher on the rootstock to match the size of scion and rootstock this is also okay. It is often best to plant the grafted rootstock in a garden or easy to care for area, spaced about 18 inches apart for one or two years before planting the tree into your orchard. Use your fingers or pruners to keep any buds from growing below the graft union. Choose only one vigorous branch to tie up to start your new trunk and prune off any other branches that start to grow.

TIPS ON GRAFTING ROOTSTOCKS

How to collect scionwood: Cut pencil size (1/4" diameter) wood when the tree is dormant (Dec-Feb.) Select only last years new healthy growth. It's at the end of branches and has flat vegetative buds not plump fruit buds.

Storing the scionwood: You need pieces only 4 to 6" long for grafting. However you can store pieces a foot long or more. Label each variety. A piece of masking tape and magic marker works well. Dip the wood in a solution of one tablespoon clorox to one gallon of water and dry off. Place the scionwood in a plastic bag. Wet a paper towel and wring it out. Put it in the bag with the scionwood and seal. Keep refrigerated until you graft.

How to Protect The Graft

Immediately after completion of the graft the scions should be protected from drying out. Use a grafting compound on the graft unions and other cut surfaces.

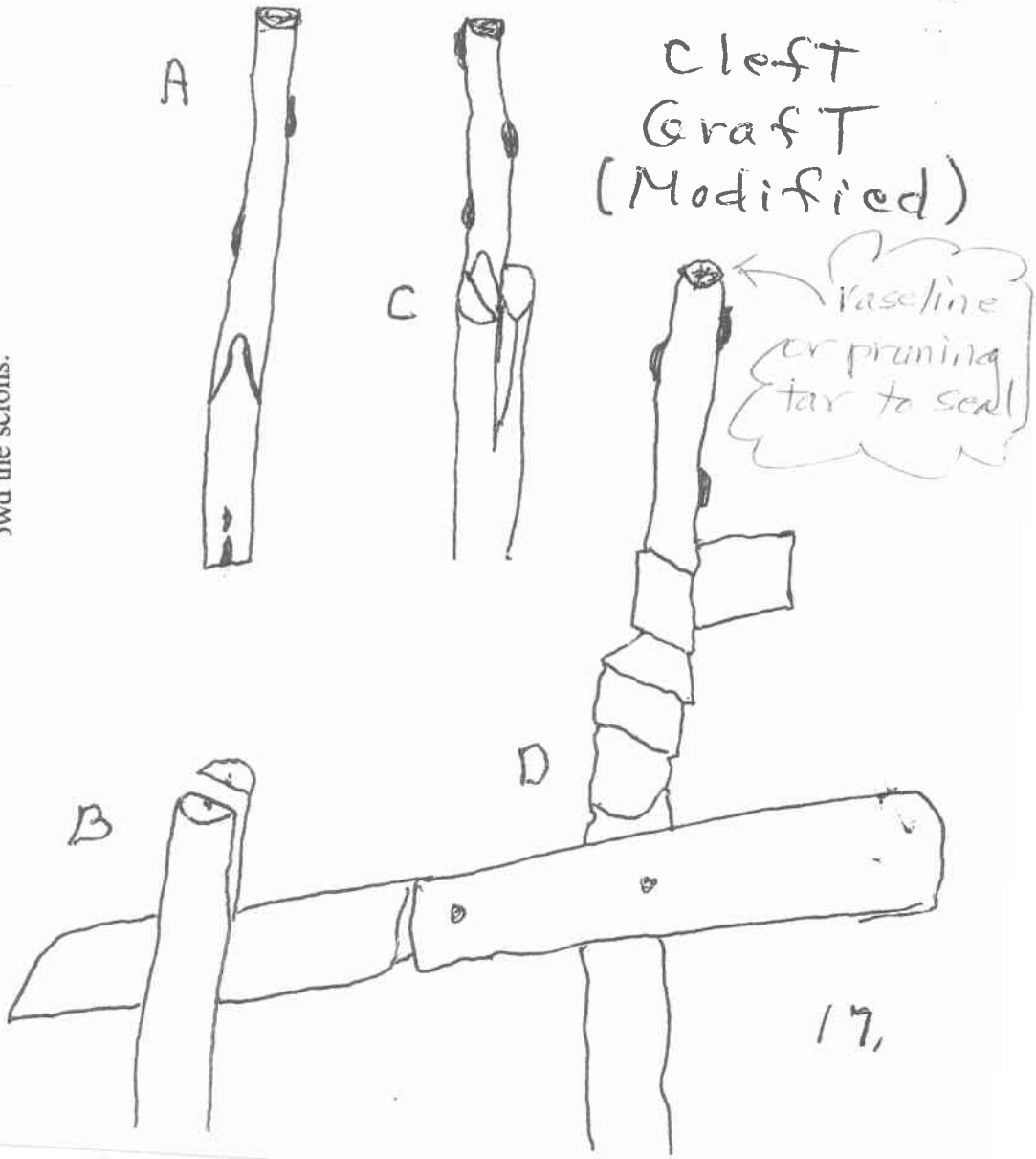
Some Reasons Why a Graft Fails

1. The scion and stock were incompatible; apple will not unite with plum, for example.
2. The grafting was done at the wrong season.
3. The understock was not healthy.
4. The scions were not vigorous.
5. The scions were dry or injured by cold temperatures.
6. The scions were not dormant.
7. The cambium of scion and stock were not meeting properly.
8. The scions were upside down.
9. The graft was improperly covered with grafting compound.
10. The scions were displaced by wind, birds or storms.
11. The graft was shaded too much after growth began.
12. New growth was damaged by aphids or other insects.
13. New growth was killed by fire blight.
14. The union girdled because the bindings or label were not released in time.

What If Grafts Fail?

One hundred percent success in grafting is rare. The failure of one or usually more scions are inserted than are necessary for the completed fail let the shoots grow. These can be budded the same summer or gra needed for regrafting, but don't let them become so dense that they cr

two scions is not serious, since tree. On branches where the scions fted later. Some shoot growth is owd the scions.

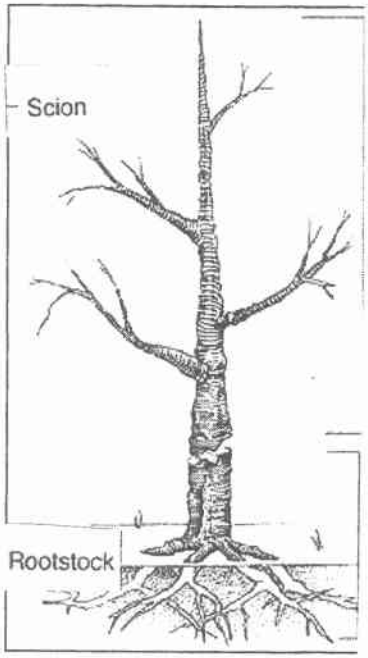


Antonovka
your seed variety

Botanical Name:	**Malus pumila Antonovka**
Family:	**Rosaceae**
Genus:	**Malus**
Species:	**pumila**
Variety:	**Antonovka**
Common Name:	**Antonovka Apple**
Seeds Per Pound:	**11,604**
Quantity:	**0.68 lb**
Avg Count Packet:	**25**
Germination:	**98%**
Germination Test Type:	**cut**
Purity:	**98%**
Height:	**40 feet**
Collection Locale:	**Russia**
Crop Year:	**2012**
Minimum Hardiness Zone:	**3**

How to grow your own rootstocks

When I summed up the purposes of grafting, I warned you that grafting won't create more plants, just change a rootstock from one variety to another. So where do all those rootstocks come from?



If you want to grow your own fruit tree rootstocks, you have two choices --- seeds or cuttings. Seedling rootstocks are easy to grow --- just collect pits from the fruit you eat and plant the seeds --- and seedlings have the benefit that they're usually vigorous and healthy. With some types of fruits, like peaches, a seedling roostock can be a good choice, but most homesteaders with a small backyard won't want to grow their apple rootstocks from seed since a standard apple tree can take over their entire growing space. Instead, nurseries count on carefully selected and vegetatively propagated rootstock varieties to change the size of their trees and to confer resistance to disease.

Characteristics

Specimen Tree
Wildlife Food
Bonsai
Flowering Tree
Honey Bee Food
Edible Fruit or Nut Plant
Crop Plant
Rootstock
Deer Attracting Plant
Medicinal Plant

Growing Info:

Scarification: **Soak in water, let stand in water for 24 hours.**
Stratification: **cold stratify for 60 days.**
Germination: **sow seed 1/4" deep, tamp the soil, mulch the seed bed.**

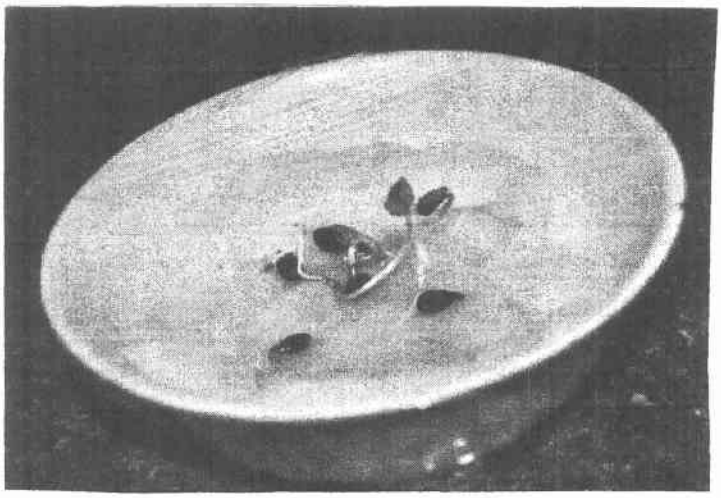
In a Nutshell:

* This variety is mainly grown in North America as an extremely cold hardy rootstock for grafting. more...
* The fruit can be eaten raw, cooked in pies, cakes etc or fermented into cider. more...
* The leaves contain up to 2.4% of an antibacterial substance called 'phloretin'. This inhibits the growth of a number of gram-positive and gram-negative bacteria in as low a concentration as 30 ppm. more...
* Used as a rootstock for the cultivated apples. more...

Usda description:
More info on http://plants.usda.gov

Rootstocks

Apples do not reproduce *true to seed*; if you plant a seed from a good apple the tree it produces will bear apples, but they may taste much different than the one the seed came from, and usually taste terrible, like grass or cotton. The only way to get a tree identical to the one the apple came from is to clone it by grafting, where a piece is taken from that tree and grafted onto another tree's roots. These roots are called the "**rootstock**" or "**understock**".



97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17

5-10
11 Parkland Apple
12
13 Montmorence Tart cherry
14
15 Bali-Evans Tart Cherry
16
17 Kristen Sweet Cherry
18
19
20
21
22
23
24
25
26
27
28
29
30
31
6-1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

Bloom Dates

	2013	2014
Kristen	June 9	May 13
Mont M	June 10	May 14
Parkland	June 11	May 16
Bali	—	—

19.

A SUMMARY OF 60+ YEARS OF AN ALASKAN ADDITION !

1. Important to keep a journal - record book - don't trust things to memory.
2. The key to success is giving pants a good start.
3. Try at least one or two new things every year.
4. Fruit trees - start with Parkland and or Norland apples - Montmorency cherry - get experience or talk with others before expanding.
5. Fruiting trees and berries - why they fail to bear - inadequate pollination bearing age (usually 3-5 years for trees) - unhealthy or wrong variety of tree - frost injured flowers (pistils) - time of bloom , rain, too cool etc - might be biennial bearing - not enough leaves (apples generally need 40 leaves per apple) - inadequate sunlight - severe winter temperatures - generally you need two varieties for pollination of apples.
6. Fruit trees in general - south slope with lots of sun - good drainage - wind protection - seek out micro climates especially above 500 feet elevation.
7. Berries - strawberries - red & golden raspberries - red & black currents - gooseberries - Saskatoon or service berries -blueberries are marginal.
8. I never fertilize or water an established lawn (leave clipping for fertilizer) grass may turn brown and go dormant during dry spells but will come back - grass around trees robs nutrients.
9. Oats, barley and wheat will usually mature when seeded directly early.
10. Transplant coles and onions thru slits in black plastic to control cut worm and weeds (will attract slugs later in fall) .
11. Plastic - black for weed control - clear for warmth - red plastic has done nothing for me.
12. Plant some flowers in your vegetable garden for color and variation.
13. Rhubarb - cover for awhile in early spring to give it a head start.
14. Killing frost - 30 year average is Sept.26 - earliest was Sept. 14 and the latest Oct. 11 (based on dying back of squash leaves).
15. Tart or pie cherries beat other fruits for antioxidants - also as a sleep aid.
16. Onions - bend over tops before Aug. rains & keep dry to prevent rot.
17. Make a to-do list for the following year.
18. Elevations above 500-600 - seek out experienced growers - as an example, raspberries usually will not mature - but maybe wild ones.
19. Till in fall to get rid of some slug eggs.
20. Use flat fiberglass cones for early warmth and wind protection.

21. Raspberries - cut out old canes in the spring - top new canes about Head high - no lower as you are cutting off a lot of the fruiting portion - tie up in rows - roots spread out a considerable distance.
22. Use earth boxes especially in the greenhouse - use these, half barrels etc for growing lettuce etc so they are close to the kitchen for quick use
23. Mint does well but can be hard to keep under control.
24. Test you soil occasionally - it pays - take 5-6 samples and mix together.
25. For real early potatoes green sprout & plant under remee in early May - Get golf ball sized by early July - use spot in same way for late crop.
26. 2004, 2005 & 2014 were exceptionally good growing years and 1985-87, 1999 & 2008-09 were very bad years - don't get lulled into thinking they were the norm. We seem to have quite extreem years in Homer.
27. Suggested flowers to keep track of first bloom date - peonies - crocus - himalayan and other poppies - tulip - lilac - that you grow each and every year (phenology)
28. Himalayan blue poppies & peonies are easily divided in the spring from established plants - just cut a portion off with a sharp spade.
29. Sprout regular pea seeds before planting them in the early cold ground.
30. Use mothballs around trees, peas, etc for vole control - don't like smell.
31. Watch for rabbit damage to trees - they like apple and other tender bark. cage with wire at least 4 feet high
32. Encourage gardening with your kids - in the early 80's our kids made $$ selling vegetables etc right from our home. Kids day at market too.
33. Record rainfall to better control your amount of watering.
34. The biggest failure in starting seeds is damping off - use a good seed germinating mix & clean containers - applying bottom heat really helps and quickens the process - I use the top of our water heater(warm & dark) or heating pad - some seeds need light to germ. but most don't.
35. Blossom end rot in tomatoes - it is a calcium deficiency caused by stress (both to the plant and grower!) such as extreme temperatures, too much nitrogen & uneven watering - using earth boxes has amost completely cured the problem for me.
36. Broadcast dirt, sand ashes (wood not coal) on snow to hasten melting in the spring - it really helps.

A ANTONOVKA Russia 1826 Growing Considerations for Antonovka apple tree seeds

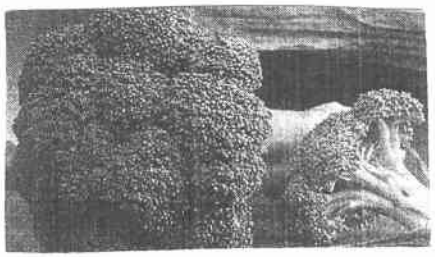
Zone: 3 to 8 (Hardy to -50 Degrees F) Growth Rate: Fast to Moderate Plant Type: Deciduous Fruiting Tree Family: Rosaceae Height: 15 to 35 feet Spread: 15 to 30 feet Shape: Rounded Bloom Time: Spring Bloom Color: White Harvest Time: Late Fall Sun: Full Sun Fall Color: Golden Yellow Drought Tolerance: Moderate Water: Medium Maintenance: Low Site Requirements /Soil Tolerances: Best grown in loamy, medium moisture, well-drained, acidic soil in full sun. Adapts to a wide range of soils. Culture: Fertilize in spring just before new growth begins. Prune damaged, diseased, dead or rubbing branches. Remove suckers in early summer. Stake newly planted trees. Protect the fruit from birds. Note: Get the best apples by harvesting a tree in 2 or 3 waves. The outside fruit ripens earlier than that in the center of the tree. Also thin heavily when fruit is very young. Uses: Rootstock, Espalier, orchard, lawn tree, patio tree, in the foreground of borders, or closely planted in rows, as high screens.

When fully ripe it is great for fresh eating. Baking with Antonovka is superior since it retains high acidity. This high acidity (tart) compliments the intense sweetness.

When not fully ripe it can be sour, it has to be yellow, not green for fresh eating. Also a very attractive fruit as it hangs delicately from the tree reminiscent of luminescent yellow lanterns. This also happens to grow true from seed, which means a planted seed from an Antonovka apple will produce a tree of that same variety. Disease resistant.

B Arcadia
(F1) Broccoli Seed

A rugged, vigorous broccoli with mid-late maturity. Big plants with heavy, very firm, dark green, domed heads with a unique "frosted" appearance. Tolerant of cold stress. Excellent side-shoot production.



C Caraflex Hybrid Cabbage Seeds

Small 1- to 1½-pound heads store for up to 8 weeks!

These pointed heads produce softer, sweeter leaves.

68 days from setting out transplants. Have you tried the new Sweetheart, or Pointed cabbage type yet? Unlike the old tightly wrapped round types, these are round at the base, open at the top, which seems to produce a more tender, succulent, sweeter leaf. They finish quickly and store well, too. And of all the new Sweethearts, Caraflex is by far our favorite for its heavy yields and delicious flavor!

These heads store very well, too, which might surprise you. Expect them to remain fresh and tender up to 8 weeks after harvest -- a respectable time for any cabbage, and really exceptiional for a Sweetheart type!

M | Amur Maple | WHATCOM SEED www.seedrack.com

Acer ginnala is grown as an ornamental plant in northern regions of Europe and North America, where it is the most cold-tolerant maple, hardy to zone 2. It is naturalised in parts of North America. Planted on exceptional sites facing south west with consistent moisture and light loamy soils, this tree can grow 3 to 4 feet per year making it a fast grower. It is often planted as a shrub along borders. [4]Fiery red autumn foliage, very strong vigor
Due to its vigor and fall colors of yellows and bright reds, the size being a small tree of 20 feet wide by 20 feet tall

P *Oriental Poppy Peony*

Oriental Poppy Mix

Scarification

Scarification in botany involves cutting the seed coat using abrasion, thermal stress, or chemicals to encourage germination. The seeds of many plant species are often impervious to water and gases, thus preventing or delaying germination. Any process of breaking, scratching, or altering the testa, seed coat, through chemical or thermal methods to make it permeable to water and gases is known as scarification.
In mechanical scarification, the testa is physically opened to allow moisture and air to penetrate. Seed coats can be filed with a metal file, rubbed with sandpaper, nicked with a knife, cracked gently with a hammer, or any other possible form of physical abrasion to weaken and open the seed coat.
Another scarification method involves the use of hot water for brief periods.

Color of apples. Color, both outside and under the skin, is a useful indication of maturity. Apples may be yellow, red, green, or combinations of these colors at harvest. When the green has almost completely given way to yellow, a yellow variety is mature. With red blush or striped apples, the area where there is no red color usually changes from green to yellowish at maturity. This does not help with the new red strains, which are red all over long before maturity. The change of flesh color (between skin and core) from greenish to white signifies maturity. The greenish color of spur-type Red Delicious may disappear only after several months of storage.

Ease of separation. Unless a stop-drop spray has been applied, mature apples are rather easily separated from the tree. Do not pull the apple down, but twist it upward with a rotating motion.

Dropping of sound fruit. When a few sound apples drop to the ground, the apples on the tree are nearly mature.

Do not shake the fruit from the tree. Segregate bruised and damaged fruit and use it rapidly because it is unfit for storage. Store only sound fruit.

Store apples and pears in clean wooden or cardboard boxes that are ventilated to allow air circulation. Do not line the boxes with paper or individually wrap the fruit. An old but still serviceable refrigerator makes a good fruit storage place. Ideally, storage temperature should be 30 to 32°F, but such conditions are difficult to achieve at home. An unheated garage, shed, or basement may be satisfactory if temperatures below 30°F and above 45°F can be avoided. An insulated box, storage cabinet, or dug-out underground room that can be ventilated at night for cooling makes a good storage place.

Maintain high humidity in storage by placing the fruit in unsealed or perforated plastic bags. Placing an open pan of water in the storage place will increase the humidity. Shriveling of Golden Delicious apples can be avoided by storing them in loosely tied plastic bags

Store fruit immediately after it's picked. Do not store fruit with onions, potatoes, or other strong-smelling items because the fruit will absorb flavor volatiles from them. Inspect regularly for mold, flesh breakdown, freezing, or excessive ripening.

Scarification, Cold and Warm Stratification

Success with certain seeds depends as much on the treatment before sowing as the method of sowing. Seeds may need treating to break dormancy. Seeds that have not germinated in the first season should be left for a further year as they may germinate in the second spring after sowing.

Scarification

Trees with hard seed coats, such as *Robinia* should be scarified to allow in moisture. Scarification can be carried out using sandpaper or a file to abrade the seed coat, or using a knife to nick the coat. Some seeds can be softened in warm water by soaking for 24 hours; care should be taken when soaking seeds, as rotting may be the end result.

Stratification

This is used for seeds which respond to either heat or cold. Stratifying will break dormancy by copying the conditions to which the seeds are normally subjected. Most commonly this is a spell of cold similar to that experience in the winter but with more reliable results. A few seeds have a multiple dormancy, germinating in the second spring after ripening with a spell of warmth in between, for example *Fraxinus* (ash). Subjecting seeds to a warm spell followed by cold can increase germination in the first spring.

Cold moist stratification

Place seeds in a clear plastic bag filled with moist but not wet coir, composted bark, or a mix of equal parts of the above with coarse sand, perlite or vermiculite and seal the bag.

Chill seeds in a refrigerator, kept below 40° F for four to 20 weeks, depending on the species.

Shake the bag periodically, and sow seeds immediately if it germinates in the bag.

Warm moist stratification

Place seeds in a bag as above and keep in a warm place at 65-75° F for up to 12 weeks, before giving a period of cold stratification.

Alternatively sow in pots and place in a heated propagator for the required spell. Following this place in a cold frame for the winter.

Sowing seeds in containers

This is the easiest way of sowing tree seeds. Generally, choose a free-draining soil-less compost for seeds quick to germinate and a loam-based compost for seeds slow to germinate. Cover seeds with fine grit or perlite to a depth of ¼ in. Place seeds where they will receive the appropriate minimum temperature, e.g. a cold frame or greenhouse. Transplant seedlings as soon as large enough to handle and harden off. It is best to use Rootrainers or deep pots, and plant out seedlings as soon as possible. This will avoid too much root disturbance or letting roots becoming pot bound which will reduce establishment.

Adapted from RHS Help & Advice, The Royal Horticultural Society: www.rhs.org.uk

WHATCOM SEED CO
http://seedrack.com

- **Once picked**, don't throw the apples into the baskets, place them in gently, or they will bruise and go bad more quickly.
- **Don't wash apples until** just before using to prevent spoilage.
- **Keep apples cool** after picking to increase shelf life. A cool basement is ideal

- **Nutrition and miscellaneous facts:** One-half cup of apples is only 42 calories. Apples contain no cholesterol or fat and are also low in calories. Apples are high in dietary fiber, Vitamin A and niacin. They contain iron and other trace minerals and are a fair source of Vitamin C.