

Starting a Community Orchard in North Dakota





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NDSU

Extension Service

Written by Thomas J. Kalb, Ph.D., Extension Horticulturist, North Dakota State University Extension Service

Contact information:
North Dakota State University
3715 E. Bismarck Expressway
Bismarck, ND 58501
Tel: (701) 221-6865
tom.kalb@ndsu.edu

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Introduction

Community orchards are growing all across America today. These orchards are being established by local organizations looking to beautify their land and grow healthful food for their people.

A community orchard is owned, leased, or held in agreement by a community group or local authority. Community orchards can provide a place for gardening, relaxation, pleasure, and healing.

The orchards can be found anywhere, including parks, schools, churches, hospitals, jails, and farms. Activities in these orchards are as diverse as the groups who manage them:

- Some orchards focus on fruit production while others serve as outdoor classrooms for education.
- Some orchards are developed for youth programs while others are developed into a living museum honoring a community's history.
- Some orchards serve as the center of a community festival while others serve as an alcove of peace and tranquility.
- Some orchards are fenced to keep wildlife out while others try to attract wildlife.

The success of a community orchard will depend on the commitment and resources of the local people who manage it. Community orchards

usually are open and accessible to the community at all times. As well as enjoying the surroundings, local people can share the harvest or profit from its sales, taking responsibility for work in the orchard (Common Ground, 2011).

Community orchards can be valuable assets to communities in North Dakota. Our people need to eat more fruits. Only 30 percent of North Dakotans consume the recommended amount of fruits needed for good health (two servings per day). This deficiency stunts the mental and physical growth of our children. This deficiency makes us more susceptible to infectious diseases (such as colds and flu) and chronic diseases (such as diabetes and cancer). This deficiency contributes to obesity and related health concerns (CDC, 2009).

North Dakota is one of the leading agricultural states in America, yet it ranks 47th in fruit production (USDA, 2009). An increase in locally grown fruit will increase our access to fruits and encourage greater fruit consumption in our daily diets.

Community orchards can be used to grow fruits for profit. A 2008 survey of North Dakota's farmers markets showed a great need for more farmers and fruits at the markets.

Many of our communities have open parcels of land with access to water. These plots could be future sites of orchards where communities can host local events plus grow food for their families.

This publication is a guide to help North Dakotans start community orchards. We discuss the basics of establishing the orchard and selecting cultivars. We describe organizational structures, financial considerations, and highlight the activities of other orchards.

Orchards can provide a setting that brings communities together for celebration and for healthier living.

Let's get growing!



Starting Your Orchard

Selecting your site

The first step for success in a community orchard is to select the proper place. No spot in North Dakota is perfect. We all know this is a tough place to live for us and our plants. Use the information below to find the best spot for your community orchard and make adjustments as needed.

Fruit trees and shrubs demand full sun (at least eight hours per day) to flourish.

Fruit trees and shrubs need good drainage. Plants that sit in water for extended periods will suffer from root rot.

Orchards often are planted on slopes not suited for row crops. Avoiding low spots where frost accumulates is critical. A killing frost (28 degrees) in late spring can kill flower buds, which will eliminate your crop for that year. A killing frost early in fall will damage fruit before it is ripe.

Avoid the top of a hill because the plants will be fully exposed to strong winds. Plants exposed on top of a hill may be subject to more hail damage and exposure to fire blight disease.

The exposure of the slope is important, too. A south-facing exposure experiences more temperature fluctuation than a north-facing exposure. Trees on a south-facing exposure will be more likely to break their dormancy during a warm spell in late winter; then, when cold weather returns, these buds will be killed. Trees on a south-facing orchard will more likely suffer sunscalding and cracking of their trunks in winter.

North- and west-facing slopes will be more subject to harsh winter winds. A shelterbelt would be especially helpful in this situation.

North Dakota is famous for its winds. A sheltered location is preferred to prevent the ripening fruits from falling before they are ready to harvest. A sheltered area also will be less likely to suffer from bud-killing temperatures in winter.

As stated earlier, trees on a north-facing slope will be slower to bud out in spring and thereby be less affected by late-spring frosts. This is beneficial, but trees on a north-facing slope may not get enough heat during the growing season to ripen the crop before the first killing frost in fall. In this case, early ripening cultivars would be advised.



Figure 1. Considerations when selecting a site for your community orchard.

A community orchard should be easily accessible to the community it serves.

A community orchard is a major investment of time and money. A nearby source of water is required for at least the first two years.

Clean, cultivated areas away from brush favored by deer and other wildlife are preferred.

Now that we have found the ideal spot, we have to make sure the site is available and stays available. A common problem of community *garden* projects is their land is taken away from the project after a couple of years, often after the project has made significant improvements to the site. The long-term availability of the land with an *orchard* is even more critical because the fruit trees may not bear decent crops for a few years. A long-term agreement must be in place with the landowner (see Appendix 4) to ensure the work involved in establishing the community orchard bears fruit (literally) and does not go to waste.

Preparing the land

The land for a community orchard should be prepared the year before planting, if possible.

A soil test is a good idea. This will help you understand what nutrients are lacking and gives you the opportunity to make adjustments before planting.

The pH of the soil should be known and adjusted, if needed. Many soils in our state have a neutral pH (7.0). This is suitable for most popular fruits. A slightly acidic soil pH (6.5 to 6.9) is ideal since it will maximize the availability of nutrients to the plants. A slightly alkaline pH (7.1 to 7.5) is acceptable for most fruits. A pH above 7.5 will make growing popular fruit crops difficult because some nutrients will be locked in the soil and not become readily available to plants.

Phosphorus is important for the establishment of roots and flower buds, but it does not move easily within the soil. This makes phosphorus an especially important nutrient to adjust before planting the orchard.

Salty sites are not recommended. No plants like salt because the salt will desiccate roots. A few fruits, such as aronia, cherry plum, juneberry, and seaberry, are more tolerant to salt than others. Ap-

plications of compost to the soil can improve the structure and moisture-holding capacity of salty soils. Mulching will prevent evaporation and subsequent accumulation of salt. Also, planting on a slope where salty water does not accumulate can help. If possible, seek a better, less saline location.

In an urban area, you need to be cautious of the possible presence of lead from old paint or heavy metals from waste products. Old buildings or piles of debris should be warning signs. A soil test to evaluate the presence of heavy metals would be wise for this public gathering place.

Buying plants

Learn your hardiness zone (see Figure 2) and select good-quality plants from a reputable nursery (see Appendix 1). If possible, purchase trees that were grown at a northern nursery.

Soil conservation districts can provide inexpensive plants. In most cases, these are *seedlings* of plant species and not *cultivars*. For example, a seedling of hardy plum will be available, but not a ‘Waneta’ plum, a cultivar that was selected for superior hardiness, productivity, ease of care, resistance to disease, and/or flavor qualities.

If the goal of the community orchard program is to plant some fruit trees and share the fruit with wildlife, soil conservation districts can be an economical source of plants. On the other hand, if you are aiming to have a productive orchard with high-quality fruit, you will be better off in the long run to grow cultivars from commercial fruit nurseries.

Bare-root plants are less expensive than containerized plants but are available only in the spring and must be planted soon upon arrival. If the orchard is not prepared, the stock can be planted in a temporary trench in the garden. Bare-root stock is soaked two to four hours in water before planting.

Bare-root plants are highly recommended for strawberries, raspberries and other small fruits due to their affordability and ease of planting.

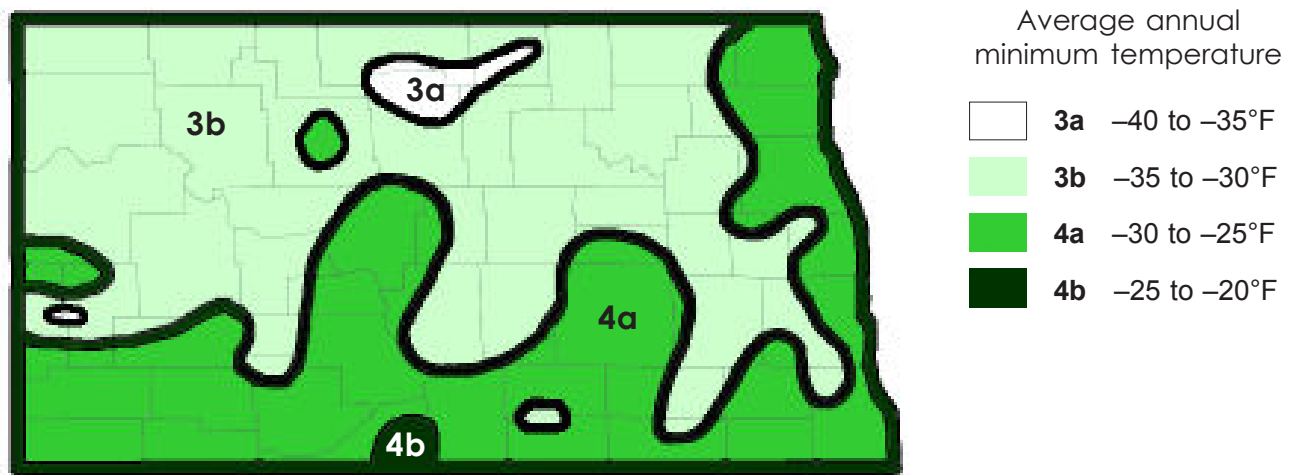


Figure 2. Plant hardiness zone map for North Dakota. Source: U.S. Department of Agriculture.

Planting

Plant your orchard in the spring once the soil becomes dry enough to work. Before digging, consider whether you need to call the Diggers Hotline to avoid damaging underground utility lines.

When planting a tree, dig a *wide* hole that will allow the roots to spread out evenly without cramping or coiling within the hole. Roots can be lightly trimmed, if needed.

Tree depth is important. We generally plant trees and shrubs at a depth so the soil surface is about 1 inch above where the uppermost major roots (crown roots) appear on the trunk. Don't plant too shallowly: Crown roots should not be exposed. Don't plant too deeply: The tissue above the crown roots is stem tissue and is not meant to be belowground, where it can suffer from stem rot. We have a tendency to plant our trees and shrubs too deeply; maybe we are worried our Dakota winds will blow them away.

For apple trees on dwarfing rootstocks, plant the trees so the graft union is at least 2 inches *above* the soil surface. This will prevent the upper portion of the graft (scion) from establishing roots that will reduce the dwarfing effect of the rootstock.

For other grafted trees (such as pears, plums, and cherries), we like to plant the tree so that the graft union is a couple of inches *below* the soil surface. This will stabilize the tree and prevent the union from breaking apart.

Do not add compost, manure, or other soil amendments in the planting hole. The tree needs

to get used to the native soil. If you add lots of amendments in the hole, the tree roots might like the conditions in the hole so much they never push out into the native soil. This is especially likely to occur in heavy clay soils. In this case, this is comparable to planting a tree in a clay pot; the roots will grow in a coiling pattern and the tree eventually will girdle itself to death. In heavy soils, roughen the perimeter of the hole to help the tree roots break through the clay.

As you fill the planting hole with soil, gently but firmly tamp the soil over the roots. When the hole is about three-fourths full, pour a bucket or two of water into the hole to help the soil settle and to remove large air pockets. Then fill the remainder of the hole and water again.

Trees in established pastures sometimes are planted without cultivating the land. Prepare an area at least 3 feet in diameter before planting each tree (wider is better). Mulch after planting. Grass is a very aggressive competitor with trees, absorbing water and nutrients out of the soil. Keep the grass away from the trunk of the tree using cultivation or a grass-killing herbicide such as glyphosate. Do not use mowers or weed whips to control grass near young trees or you will risk damaging their bark and girdling the tree.

For strawberries and raspberries, add a couple inches of compost or rotted manure into the row before planting. Mix it thoroughly into the native soil to make a rich, well-drained bed. Just as in the case of trees and shrubs, plant berries so the crown roots are just below the soil surface.

Pruning

If you purchased a tree with branches, we will do minimal pruning at planting time. Remove any broken branches. If two branches are rubbing against each other, trim out the least desirable branch. We'll start pruning and training the tree next spring.

If you purchased a nonbranched "whip" tree, cut the stem at 30 inches. This will stimulate the first flush of branches at this point.

Fertilizing

Fertilizer generally is not needed at the time of planting (ideally, we will have corrected any major soil deficiencies before planting). Do not apply standard granular fertilizers in a planting hole because they can burn the roots. Wait to fertilize at least a couple of weeks for a newly planted tree or shrub.

Spring is the best time to fertilize. The worst time is in late summer because the fertilizer can create a flush of new growth that may be succulent when winter arrives.

A good way to monitor the fertility of the soil is to see how much new growth you get each year. The annual growth of a tree can be seen as the glossy tissue from the tip of the branch to a dark scar that encircles the branch. Young fruit trees should grow about 18 to 24 inches per year and then about 10 to 12 inches when they get fruit-bearing age. If you are not getting this type of growth, consider a soil test and fertilizer treatment.

Watering

Watering is absolutely critical at the time of planting. Thoroughly soak the root area. Check on the plants every few days and make sure the soil below the surface never dries completely. Young trees need approximately 5 to 10 gallons of water per week when the weather is dry.

The orchard will need to be watered regularly until the plants have recuperated from their transplanting shock. This is at least two years. A weekly watering should be expected.

Water deeply. Roots will grow where the water is. If you water deeply, the roots will grow deeper. Keep the foliage dry when watering to prevent fo-

liar diseases. Watering in the morning is best; watering at night is worst because you encourage a humid environment that favors disease.

Mulching

Mulch is especially important in North Dakota. Organic mulches, such as wood chips and shredded bark, will conserve moisture and reduce moisture stress on the young plants.

Organic mulches moderate soil temperatures. Mulches will slow warming of the soil in the spring, thereby delaying flowering and reducing the risk of frost damage to the buds. Mulches will moderate summer heat, keeping the roots comfortably cool.

Rock mulches never should be used in an orchard. They trap heat, accelerating bud break in spring (and potential frost damage) as well as creating excessive heat stress in the summer.

Mulch will reduce weed problems near the trees. Mulch also can serve as an effective barrier between the trunk and grass. Lawn mowers and weed whips are common killers of trees. The most precious tissue of a woody plant is the tissue just beneath its bark (this is where the water and nutrients flow). Keep your mower away from the trunk.

Set mulch in a ring pattern at least 3 feet in diameter. Arrange the mulch so it is at a minimal depth near the trunk and then steadily gets deeper, up to 4 inches along the perimeter of the mulch ring. In this way, the mulch will serve as a reservoir and bring applied water toward the trunk. Avoid building mulch up against tree trunks because this could serve as nesting habitat for bark-biting voles.

Fruiting shrubs also will benefit from mulching. Keep the mulch minimal at the trunk and extend it out at least 18 inches to either side of the shrub. Organic mulches will need to be replaced periodically as they settle and decompose.

Staking

Staked trees bear earlier and produce higher yields than unstaked trees. Staking will protect trees from damaging winds and keep the root system stabilized in the soil. Grafted trees especially will benefit from staking because it will prevent the scion from snapping off the rootstock.

A 10-foot-long, 3/4-inch-diameter electrical conduit pipe works well. Locate the pipe a few inches away from the trunk and pound it 2 feet into the ground at the time of planting. After several years, the pipe will rust at the soil surface. At that time, pound the pipe 2 feet down again. If you don't like to use a pipe, use 2- to 3-inch rounded wooden posts or 2-inch square pressure-treated lumber.

Trellising

Raspberries (especially the vigorous purple raspberries) and some gooseberries will benefit from trellising. Permanent posts can be spaced 20 to 30 feet apart down the row. Cedar or pressure-treated posts, 4 to 6 inches in diameter and 6 to 8 feet in length, work well. Bury them at least 2 feet in the ground. Wrap heavy-gauge wire from post to post on either side of the posts, 42 to 48 inches above ground. The canes will grow between the wires. More complicated trellis systems also are available.

If raspberries are planted in hills, a metal or wooden post can be placed in the middle of each hill. Twine then is used to wrap the canes around the center post.

Grapes should be staked at the time of planting. A trellis should be constructed in short order to train the vines. Growers should seek technical advice in selecting the best trellis for their situation, giving consideration to the type of grape grown, management skills, and amount of land available. The high-cordon system often is used to train vigorous grape cultivars, which commonly are grown in North Dakota. This system has one wire located 6 feet off the ground, running down the support posts.

Wrapping and painting

Fruit trees are sensitive to the scalding rays of the winter sun. Trees should be wrapped in the fall to protect the trunks. White plastic spiral tree guards are an alternative. These wraps also will protect against rabbit and rodent damage.

The trunks of trees should be painted with white paint to reflect the sun's rays. Use a 1 latex paint : 1 water mix. Make sure you paint at least the south- and west-facing sides of each trunk.

Managing wildlife

Wildlife can destroy an orchard planting quickly. In North Dakota, we are most worried about voles, rabbits, deer, and birds.

A good way to minimize problems with voles and rabbits is to reduce brushy areas near the orchard. Keep the lawn mowed regularly.

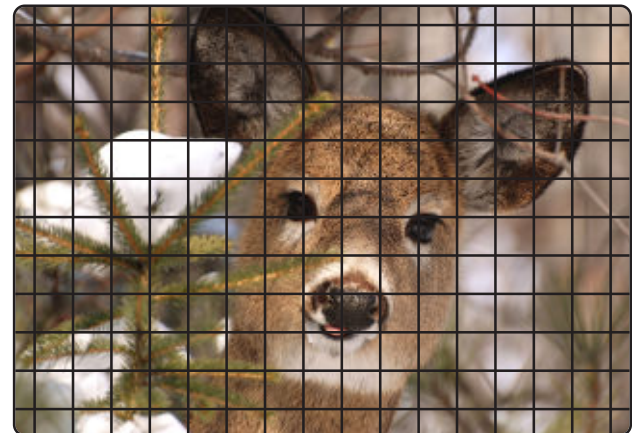
The trunks of the trees can be protected with a ring of hardware cloth wrapped around them. The cloth should be at least 2 feet tall with a mesh of 1/4 inch. Bury it an inch in the ground. Ideally, we should protect the trees up to at least the first branch.

Birds usually are controlled with nylon netting. Cherries and juneberries are especially at risk. Place the netting before the fruit begins to change color. Scare devices such as one-eye plastic balls and plastic owls may work for a day or two, but the birds soon will learn these devices are harmless.

Chemical repellents that repel rabbits and deer temporarily are available. These will work when wildlife pressure is light. If wildlife pressure is aggressive, the only solution is fencing.

For deer, an 8-foot-tall fence is recommended. Fencing made with nylon is relatively affordable and will work for several years. Metal fencing will last longer but is more costly. The first few years are most critical to help the orchard get established. Electrical fences are most reliable but usually not appropriate for a public orchard.

For rabbits, a 2-foot-high fence, buried a few inches in the ground, is recommended. The mesh should be 1/4 inch.



Fencing is the only sure way to prevent damage.

Spraying

This can be a touchy issue in a community orchard. Nobody likes to use pesticides, but fruits are susceptible to insect pests and diseases. Have a policy in place before the planting is established. This policy needs to address whether chemical control is allowed in the orchard and whether this control must be exclusively organic.

In a public orchard, the minimal use of toxic chemicals is strongly encouraged. Whenever pesticides are sprayed, signs should be posted to alert the public.

An integrated approach is needed. Start by keeping the plants in good health. Healthy plants are more likely to tolerate pests.

Prune on a regular basis to open the plants to good air circulation and sunlight. Sterilize pruning shears between trees if bacterial diseases such as fire blight or black knot are in the orchard.

Remove any rotting or fallen fruits in the orchard.

Remove weeds, which harbor insect pests.

Avoid overhead watering, which creates a humid environment for diseases.

Select disease-resistant cultivars, if possible.

Monitor your plants closely to detect the first signs of problems and then take actions quickly.

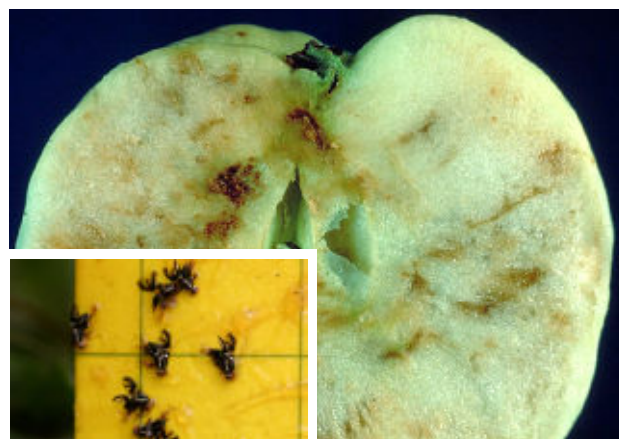
Insect traps are available. Apple maggot traps, for example, can be hung in apple trees to monitor for the presence of the pest. If the pest is not there, you don't need to spray.

Monitor weather. Foliar diseases, such as apple scab, are most likely to occur when the spring season is wet.

Relatively safe products are becoming more commonly available. Copper sprays including copper sulfate (Bordeaux mix) will control most diseases. Neem (azadirachtin) is an organic product that controls many insect pests and is relatively safe. Products containing *Bacillus thuringiensis* can control some types of insects safely and effectively. Some organic apple growers dust their trees with Kaolin clay to reduce feeding damage from insects.

Organic products are not necessarily safer than synthetic products. For example, malathion, a

popular insecticide in fruit production, is less toxic than organic products such as rotenone or nicotine. Contact your local Extension Service and/or local fruit growers for advice on controlling pests.



Sticky yellow and other traps (inset) can be used to monitor for apple maggots, which lay eggs in apples.



Apple scab disease can be controlled with regular pruning, fungicide sprays, and resistant cultivars.



Bacterial diseases such as fire blight can be managed with pruning and resistant cultivars.

Pruning and training young trees

All fruit trees need to be pruned and the best time is late winter (March through April). The tree is dormant and the wounds will heal quickly in the spring. Also, the tree is leafless and we can see the branches and their structure easily.

Pruning is needed to keep a tree healthy. This will bring more sunlight and air movement into the canopy, thereby reducing disease problems.

Pruning will keep a tree stronger. We will remove the weak branches that cannot support fruit. This will create a structure that can stand up to the winds and blizzards of North Dakota.

Pruning will improve fruit quality. The increased sunlight in the canopy will brighten the fruit. The increased air movement will reduce pest problems, too.

Pruning helps us manage the tree. By keeping the tree low, we can spray (if needed) and harvest the fruit more easily.

On the other hand, unpruned apple trees produce low-quality fruit. Unpruned trees are more susceptible to diseases and storm damage. Unpruned trees are more likely to be attacked by insect pests; no one likes wormy fruit.

The major goal when pruning is to maximize the amount of sunlight and air movement in the canopy.

The most popular structure for fruit trees is the modified central leader. This structure has one major branch in the center and the widest part of the tree at the bottom with the branches working their way up in a “Christmas tree” shape. To maximize the amount of high-quality fruit, the tree should not be taller than 16 feet tall (10 feet is better).

Pruning a fruit tree is not hard, but you have to take your time, constantly stepping back to make sure you see all of the angles.

Start by taking out the suckers that develop at the base of the trunk.

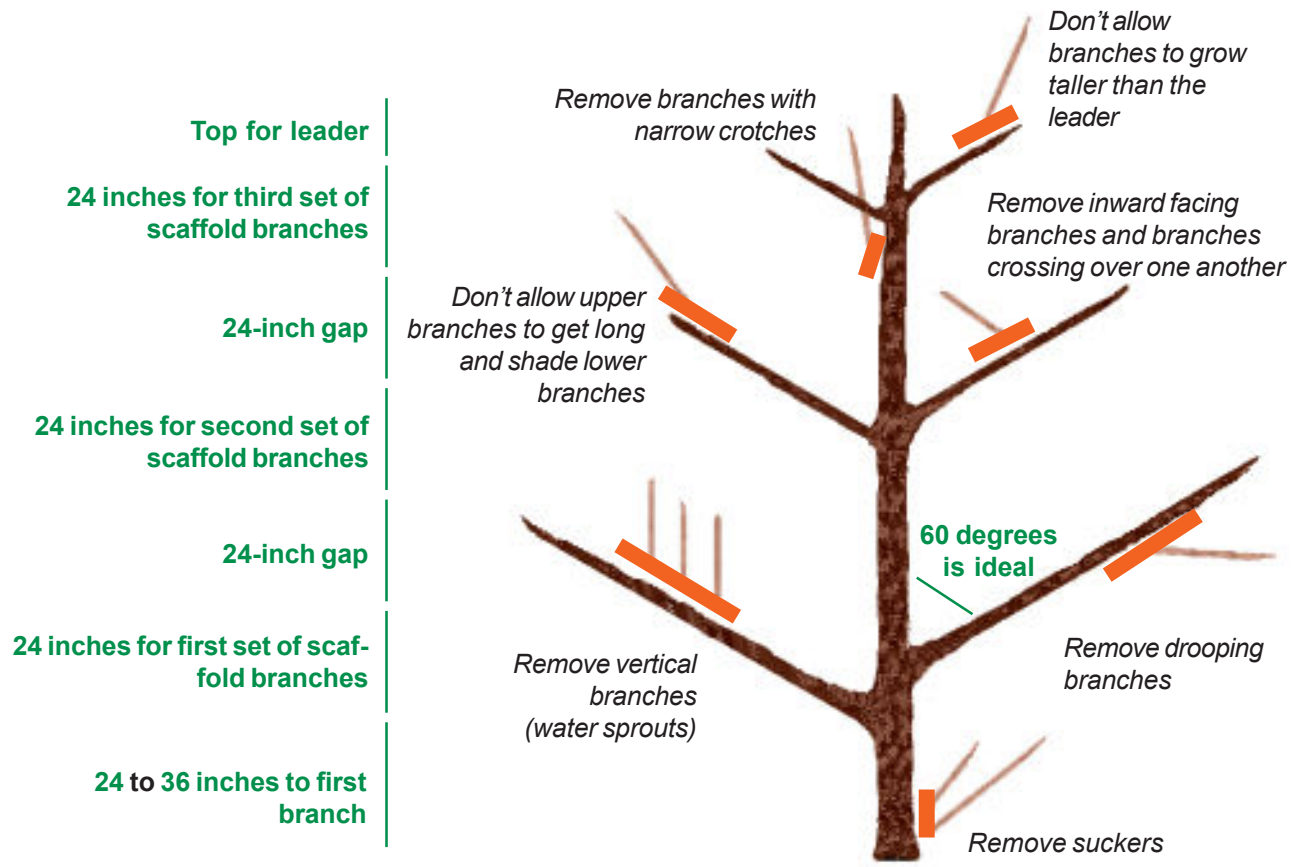


Figure 3. The basics of pruning fruit trees.

Fruit trees, especially apples and pears, have a tendency to develop vertical branches (we call them water sprouts). Water sprouts clutter the tree and do not produce fruit. Remove all the water sprouts.

That was the easy part. Now we have to think a bit. If the tree is 5 years old or younger, it still has time to develop the structure of the tree.

If possible, the first branch should begin about 30 inches from the ground. Ideally this branch will face the west or south to shade the trunk from the scalding rays of the winter sun.

In the next 24 inches, we will develop our first series of major “scaffold” branches. Four branches, each facing a different angle (north, south, east, and west), would be ideal. The branches coming out of the trunk should resemble spokes coming out of the hub of a wagon wheel.

Then keep a gap of about 24 inches to maximize sunlight and wind movement between the sets of scaffold branches.

Next, develop the second set of scaffold branches. As the tree grows, you may allow for another 24-inch gap and then a third and final set of scaffold branches. Allow a foot for the leader and you have a perfect tree.

Of course, nothing in nature is that perfect. These are principles only. Maybe you cannot have a gap between the sets of scaffolds; in many cases you will have more of a steady progression of branches up the tree (keep adjacent branches going in different directions so they do not shade each other).

Look for branches with sturdy angles. Sixty degrees is best (some growers call these 10 o'clock and 2 o'clock branches). Branches with narrower crotches are less fruitful and subject to splitting.

Vertical branches do not produce fruit. *Horizontal* branches produce fruit, but will droop from the weight of the crop. Also, horizontal branches will not generate the vegetative growth we need.

Remember to maximize air movement and sunlight in the canopy. Remove any inward facing branches, which create shade pockets.

Remove the weaker of branches that cross over one another. They can rub against one another and create wounds. Remove any broken branches.

Try not to remove more than 25 percent of the tree’s wood during any single year. If your tree has been neglected for a long time, a lot of wood needs to be removed, and getting it in shape will take a few years.

Most fruit growers use a lopping shears and hand pruning shears when pruning. A bypass shears will make cleaner cuts than anvil shears. A pruning saw sometimes is used after the tree is well established to remove large branches.

We never use wound dressings when pruning fruit trees. The wounds will heal faster if you leave them alone.

After the major branch structure in place, we can develop the secondary branches.

We will make the cuts with our hand pruners, making the cuts just above a bud, allowing for a collar (see Figure 4). This will encourage healing and lead to more outward growth (less cluttering of the canopy). Prune to a bud that faces where you want the branch to grow; usually this is an outward-facing bud.

Don’t leave stubs when pruning. These do not heal well and often lead to disease.

If you are not sure you are done pruning, keep pruning. Open the tree up. *Create lots of windows for air and sun.* Open up the tree and you will be rewarded with high-quality fruit.

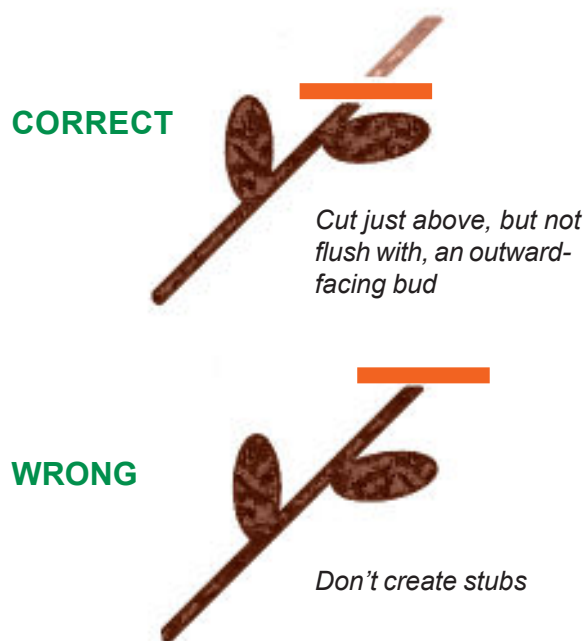


Figure 4. How to prune a small branch.

Rejuvenating old apple trees

There are lots of old apple trees in North Dakota. These trees are tall, rarely pruned, and never sprayed. The trees provide some flowers in the spring, shade in the summer, and a few decent fruits in the fall. It's nice, but we can do better.

If you prune the tree, you could have a healthier tree with more blossoms in the spring and fruits of higher quality in the fall.

To get better apples, you need to get more sunlight into the canopy. You also need to bring the tree down to size so you can manage and harvest the fruits more easily.

The ideal "Christmas tree" shape described earlier is going to be more difficult to develop in an already mature tree. After all, the leader may have grown 30 feet tall. In most cases, it's wise to go for an umbrella shape now, with branches cascading in all directions from the main trunk(s).

The tree has been neglected for years, and getting the tree in decent shape will take years. This first year, focus on reducing the height of the tree. The ultimate goal is to bring the tree down to about 12 feet tall.

The principles of pruning are the same as described earlier. Establish a network of sturdy branches, preferably at 60-degree angles from the trunk. Search for sturdy branches about 3 to 4 inches thick within the old canopy. Look for young, strong branches; these branches have *glossy* bark while old branches are *scaly*.

Once you identify a strong, young branch, trim above it to bring the tree down to size (Figure 5). To avoid sunscalding and shocking the tree, try not to remove more than 25 per cent of the tree's wood at any one time. Giving yourself at least two years to reshape the tree is best.

Remove the clutter within the tree. Remove suckers, water sprouts, broken branches, and inward facing branches.

This mature tree has an extensive root system and it will keep pumping a lot of nutrients and water to the branches. Expect lots of new shoots to appear this year. Aggressively trim out the vertical shoots the following spring. Also, take advantage of any new 60-degree branches that emerge and use them as future scaffold branches.

After about four years, you will see a big difference in the health of the tree and fruit production. But to be honest, you still have an old tree, and the best days of this tree are long gone.

Unless the tree is a special heirloom type or has historical value, the best long-term solution may be the single-cut "chainsaw" method. In this case, we remove the old tree. In the place of the overgrown tree, you could plant two apple trees (or perhaps add a cherry or plum), which will be properly trained. After four years, you will have superior yields of superior fruit and the best days of your young, vigorous trees will be ahead of them—not behind them. The trees will be an attractive feature in your landscape, not a curious eyesore.

Some of us feel cutting down a tree in a prairie state such as North Dakota is a sin, but trees are renewable resources. Cutting down one tree and planting two in its place is okay. We can chip up the old tree to use as mulch for the new tree(s). Plus, we will have more fruits to share with our families. It's a win-win situation.

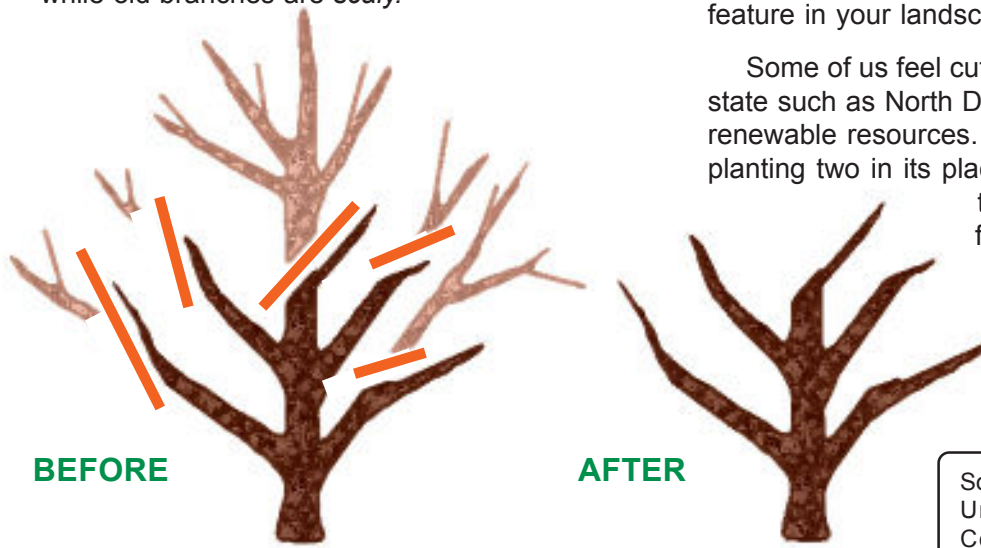


Figure 5. Pruning an overgrown apple tree.

Sources for this chapter include University publications from Cornell and Wisconsin (see Literature Cited).

Fruits for North Dakota

Fruit production is difficult in North Dakota. Bitterly cold winters, strong winds, hailstorms, unexpected frosts, cool summers, and irregular rainfall limit the production of fruit crops.

Selecting fruits and *cultivars* (cultivated varieties) adaptable to our state will be critical for success. The first step is to know your hardiness zone

(Figure 2). This will be the biggest limiting factor in selecting the right fruits for your orchard.

The following are some of the most promising fruits and cultivars for our state. Cultivars are listed in order of ripening.

Tree fruits

Apple

Apple is the favorite fruit grown in backyards of North Dakota. Look for cultivars that are hardy, mature early, and produce high-quality fruit. The earliest varieties generally are good for fresh eating but do not store well. Later-ripening varieties store better, but they run the risk of never maturing before the snow flies.

Apple growers in Zone 4 should strongly consider a tree with dwarfing rootstocks, especially if snow cover is present during the winter. Trees with dwarfing rootstocks bear earlier, are easier to manage, and more productive.

Look for the hardiest rootstock available. Among the hardiest are Ottawa 3 and Bud 9, but these are not as commonly available as others. G30 from Cornell University is hardy and resists fire blight. The introductions from Malling are most common in the marketplace, and M26 is the hardiest of this group. All of these rootstocks will create trees about 12 to 16 feet tall under normal growing conditions.

Dwarfing rootstocks are not hardy in Zone 3. These gardeners should grow “standard” trees with rootstocks of ‘Dolgo’ or ‘Antonovka’, and then prune aggressively to keep the trees 16 feet or lower in height.



Apples are susceptible to many diseases and insect pests. Prevent diseases by pruning every year to open the tree to more sunlight and better air movement. Pick up fallen apples in fall. Use traps to monitor for insects such as codling moth and apple maggot.

The following are some of the best cultivars for North Dakota. All are hardy in Zone 3 unless noted otherwise:

Apple (continued)

CULTIVAR	FEATURES
Lodi	Early yellow apple. Hardy and productive. Large fruits for sauce and pies.
Oriole	Early, yellow fruits striped with red. Excellent quality for desserts or cooking.
State Fair	'Mantet' × 'Oriole'. Bright red apple with crisp, juicy white flesh. Fresh eating. From Minnesota.
Zestar!	Excellent early apple. Crisper and better storage life than other early apples. Striped red skin. Marginally hardy in Zone 3. From Minnesota.
Paulared	Solid red apple with pure white flesh. Good all-purpose early apple.
Hazen	Large, dark red fruit. 'Duchess' × 'Starking Delicious' parentage. Natural semi-dwarf (10 to 15 foot) tree. Does well without spraying. Mild flavor for fresh eating and cooking. Short storage life. From North Dakota.
Duchess	Popular apple from Russia. Medium to large size; mildly tart taste good for pies and sauce. Shows resistance to scab, rust, and fire blight. Ripens in early September.
Goodland	Medium-large apple; creamy yellow with blush of red. Ripens in late September and stores well. Flesh is crisp, juicy and aromatic. For fresh eating and especially good in pies. From Manitoba.
Northern Lights	Red with striped color pattern. 'Haralson' × 'McIntosh' parentage. Excellent, slightly tart flavor good for eating and cooking. Short storage life. From North Dakota.
Prairie Magic	Yellow with red blush. 'Goodland' × 'Mantet' parentage. Medium-large fruit is sweet and crisp. Vigorous tree. From Manitoba.
Red Baron	Medium-sized apple. Productive tree bears at a young age and tolerates fire blight. From Minnesota.
Wolf River	Very large apple. Yellow with red stripes. Used for cooking. Zone 4 only.
Sweet Sixteen	Medium-size, red apple with spicy-sweet, crisp, aromatic taste. Creamy yellow flesh. Good for fresh eating.
Honeycrisp	Most popular apple in Midwest. Sweet and balanced taste; very crisp flavor. Exceptional for fresh eating. Large fruits ripen in late September and store very well. Marginally hardy in Zone 3. From Minnesota.
Haralred	A bright red selection of 'Haralson' (the standard cooking apple of the north) and ripens earlier (late September). Juicy and tart. Good keeper. Some resistance to fire blight.
SnowSweet	New apple from Minnesota with bright white flesh that resists browning when sliced. Ideal for snacks. Shows some resistance to scab and fire blight. Zone 4.
Wodarz	Popular heirloom in North Dakota. Green, knobby "ugly" apple is very sweet and stores well. Shows some tolerance to fire blight. Late.

Apricot

Apricots are loved as much for their delicate blossoms in the spring as their golden fruits in the summer. Apricots bloom very early, so keep out of frost pockets and plant in a protected site, if available.

These varieties are naturally dwarf and can be planted 10 to 15 feet apart. Apricots are self-unfruitful. The Manitoba cultivars work well as a team; these are hardy to Zone 3. Likewise, the Minnesota cultivars are compatible; these are hardy to Zone 4 only.



CULTIVAR	FEATURES
Scout	Its golden flesh is tender, sweet and juicy. Freestone type. Good for desserts, canning and drying. From Manitoba.
Westcot	Large, freestone fruits. Excellent for fresh eating and processing. From Manitoba.
Moongold	Matures in mid-July; earlier than 'Sungold'. Flesh is firm and sweet. Freestone. Grows 8 feet tall. From Minnesota. Zone 4 only.
Sungold	Golden fruits with orange flesh. Freestone type. From Minnesota. Zone 4 only.

Cherry

Tart cherries are easy to grow and very hardy. Also called "pie" or "sour" cherries, they are used for pies, sauces, jams, and breads. Ripe cherries are delicious to eat right off the tree, too.

Late-spring frosts can kill blossoms, so plant them out of frost pockets. Bird netting may be needed to protect fruits as they ripen.

Pie cherry cultivars are self-fruitful. They are naturally dwarf and can be planted 10 to 15 feet apart. These tart cherries are hardy to Zone 3, unless noted otherwise. Sweet cherries are not hardy in North Dakota.



CULTIVAR	FEATURES
Bali Evans	Hardest tart cherry (Zone 2). Bright red cherries. Precocious and extremely productive. Introduced from Alberta.
North Star	Deep red fruits with red flesh. Ripens in late July. Resists leaf spot disease. Introduced from Minnesota in 1950.
Meteor	Large, bright red fruit with yellow flesh and small pits. Vigorous tree is hardy. Fruit ripens 10 days after 'North Star'. Resists leaf spot disease. Introduced from Minnesota.

Cherry plum

Cherry plums were developed to survive the extreme weather of the northern Great Plains. They are extremely hardy (Zone 3), resist drought, and will bear fruit after one to two years. They grow as small trees 6 to 8 feet tall and can be spaced 4 to 8 feet apart.

They are self-unfruitful. Plant both cultivars for fruit set. The fruit is not as big or as delicious as most other plums. Fruits begin to ripen in early September.



CULTIVAR	FEATURES
Sapalta	Dull purple skin and flesh. Nearly freestone. Very productive.
Compass	Dark purple fruit with yellow flesh. Juicy flesh with sour skin. Good for jams and sauces.

Crabapple

The tart flavor of crabapple makes it popular for canning and in making jellies. This fruit is grown just like apples.

A crabapple will pollinate an apple tree and vice versa. Most crabapples are partially self-fruitful but will produce higher yields in the presence of another apple or crabapple cultivar.

These cultivars are all hardy to Zone 3. Aggressive pruning will be needed to keep the tree low enough to manage easily.



CULTIVAR	FEATURES
Dolgo	Russian variety popular for its bright white flowers and brilliant red fruits. The 1-inch fruits make good jelly. Tree resists scab and fire blight. Fruit ripens in late August.
Centennial	A progeny of 'Dolgo' and 'Wealthy'. Large (1.75 to 2 inches) fruit is one of the best for fresh eating. Red blush over orange skin. Short storage life.
Whitney	Large, yellow fruits with red stripes. The juicy, slightly yellow flesh is good for preserving and pickling.
Chestnut	Prized for its mildly tart, nut-like flavor. Fruits have a reddish-bronze skin and average more than 2 inches in diameter. The yellowish flesh is good for fresh use and desserts. Ripens in mid to late September.

Peach

The flavor of a tree-ripened peach, bursting with juices all over your face, is one of the greatest taste experiences you ever could have. Peaches are not reliably hardy in North Dakota. Limit plantings to Zone 4 and in sheltered areas only (and have very low expectations). Keep the tree short and consider shielding it from winter winds by wrapping the branches with cord and burlap. Keep trees out of frost pockets to protect the delicate blossoms in the spring. Peach trees often are grafted on American plums. Space them 12 to 15 feet apart.



CULTIVAR	FEATURES
Reliance	Its hardiness makes it the most widely grown variety in the north. Bright yellow flesh is fairly soft and juicy. Fair flavor. Matures in early August. Self-fruitful. Grows 18 feet tall.
Contender	Freestone type with bright yellow, very juicy flesh. Outstanding flavor. Ripens in mid to late August. Self-fruitful. Grows 12 to 15 feet tall. New variety.

Pear

The bright white blooms of pears in the spring are spectacular, but they are sensitive to frost. Pears are especially sensitive to fire blight disease, which often is introduced into a tree from hail (a common problem in North Dakota). Look for fire blight-resistant cultivars and manage properly to remove the bacteria if it is introduced into the orchard. Cultivars below are hardy in Zone 4 and marginally hardy in Zone 3, unless noted otherwise.



CULTIVAR	FEATURES
Summercrisp	Fruits can be eaten green when they have a crisp texture like an Asian pear. Ripe fruit is sweet with a fine texture. Some resistance to fire blight. Ripens in mid-August.
Gourmet	The medium-sized fruit is sweet and delicious. Good for desserts. Matures in mid to late September. From South Dakota.
Luscious	Very large, 'Bartlett'-like fruits with excellent quality. Very juicy and sweet. Tolerates fire blight. Matures in late September. From South Dakota.
Golden Spice	Small fruits have a tart spicy flavor. Good for canning. Vigorous trees are very hardy (Zone 3). Excellent choice as a pollinator.
Ure	Greenish-yellow fruit is small but very juicy and sweet. Very hardy (Zone 3).

Plum

Most plums are hardy but bloom very early in the spring, making the blossoms at risk of frost injury.

Blue (European or prune) plums are self-fruitful. Only one cultivar is needed and 'Mount Royal' is the hardiest. It is hardy only in Zone 4 and may experience dieback.

Other cultivars mentioned here are "red" or hybrid plums. These plums are self-unfruitful so plant at least two of these cultivars for good fruit set. 'Toka' often is used as a pollinator. All "red" cultivars described here are hardy in Zone 3.

Plums often are grafted on American plum rootstock to promote hardiness and vigor. Plant the graft union a few inches below ground.

Plums require little pruning and naturally grow 12 to 15 feet tall. Space them 10 to 15 feet apart.



CULTIVAR	FEATURES
Underwood	Red skin with golden yellow flesh. Clingstone type. Ripens early (mid to late August) and harvest continues throughout a long season. Very reliable.
Waneta	Very large fruit has yellow skin with a red blush. Clingstone type with sweet and juicy, yellow flesh. Very reliable.
LaCrescent	Small yellow fruit with a red blush. Freestone type is very sweet and aromatic; excellent for eating fresh and for making jam. Does not store well. Vigorous tree.
Toka	Small-medium fruit with dark red skin. Flavor is rich and spicy. Clingstone type. Outstanding pollinator. Developed in South Dakota. Matures in late August.
Pipestone	Very large, red fruits. Tough skin will peel easily. Clingstone type with sweet, yellow flesh. Matures in late August.
Alderman	Large, burgundy-red skin. Clingstone type with sweet golden flesh. Precocious tree is vigorous with a heavy bloom.
Pembina	Large, oval plum with red skin. Flesh is yellow and delicious; especially good for fresh eating.
Superior	Dark red fruits are large. Clingstone type with firm yellow flesh of outstanding quality. Tree has a somewhat weeping habit. Matures in early September.
Mount Royal	The most popular blue European variety. Beautiful blue, juicy fruits. Good for fresh eating. Clingstone type. Matures in early September. Hardier than other blue plums but less hardy than red plums. Self-fruitful. Will not pollinate red plums. Tree is a natural semidwarf.

Small Fruits

Aronia

Very productive and easy to grow. Also called black chokeberry, the fruits have a sharp, dry flavor and usually are not eaten raw. Europeans prize this American fruit for its nutrition (high in anthocyanins) and use it to make juice, syrups, and preserves. Almost pest free, this fruit is popular among organic growers. Aronia is a beautiful ornamental shrub with white blossoms in the spring, showy dark purple fruit in the summer, and brilliant red fall foliage. The multi-stemmed shrub grows 4 to 8 feet tall and is hardy to Zone 3. Space 4 to 6 feet apart. Tolerant to salt.



CULTIVAR	FEATURES
Nero	Compact, 4-foot shrub from Russia. Very productive.
Viking	Popular commercial variety in Europe. Vigorous, 6-foot shrub bred in Sweden. Very productive.
McKenzie	Seedling strain from Bismarck. Grows 5 to 8 feet.

Blackberry

Blackberries do not grow well in North Dakota. Blackberry canes bear fruit on their *second-year* growth. Our winters are bitterly cold, and canes never live to their second year. A new series of cultivars are available that bear fruit on their *first-year* canes. Harvest the fruits in September and mow the canes in April. The crowns will send up new fruit-bearing canes every summer. Hardy to Zone 4; mulch for additional winter protection. These cultivars ripen late and are best suited for tunnel production. Cultivars are self-fruitful. Space plants 2 feet apart and grow in a hedge like fall-bearing raspberries.



CULTIVAR	FEATURES
Prime Jan	Smaller, sweeter fruits. Vigorous canes are productive.
Prime Jim	Larger, firmer fruits. More upright growing habit.

Blueberry

North Dakota is a terrible place to grow blueberries. Our soils are too alkaline, we do not get adequate snow cover, our winters are too cold, and our climate is too dry. Grow haskaps or juneberries instead.

To grow blueberries, start with a soil test to know your soil pH. If your soil pH is 7.5 or below, add sulfur to drop the pH down to 4.5 to 5.5. Spread peat moss over the site, building a 4- to 6-inch mound. Mix the peat moss and sulfur into the soil bed. Expect to add sulfur every few years.

If soil pH is 7.5 or higher, reducing the pH will be very difficult. You will need to grow blueberries in raised beds or containers using purchased topsoil and peat moss.



The following blueberries are hardy to Zone 4 and grow low (18 to 30 inches). Plant two cultivars for fruit set.

CULTIVAR	FEATURES
Northcountry	Sky blue berries are half-inch in size with a sweet, mild flavor. From Minnesota.
Northblue	Dark blue, large berries with good flavor. Good yields. From Minnesota.
Northland	Small, dark blue berries. Wild berry flavor. A hybrid from Northern Michigan.

Bush cherry

The Romance series of prairie cherries from Saskatchewan shows great promise. They are extremely hardy (Zone 2) and can be trained into trees or shrubs (minimal suckering). Fruits are large (quarter-size), dark maroon, and flavorful. Very productive. Shrubs grows 6 to 8 tall. Space 4 feet apart. Look for more cultivars ('Romeo', 'Juliet', 'Cupid', 'Valentine', and more) soon. The fruits of these and the traditional 'Nanking' cherries should be protected from birds when ripening. Rabbit damage can occur during the winter. Plant 4 inches deeper than previously grown.



CULTIVAR	FEATURES
Carmine Jewel	Easy to grow. Good quality for pies, cooking, juice, and fresh eating. Self-fruitful.
Crimson Passion	Extremely sweet (22 degrees brix), large fruits for fresh eating. Self-fruitful.
Nanking	Fast-growing, short-lived shrub from Asia. Dark red fruits have a sharp flavor suited for pies and jellies. Grows 6 to 10 feet tall and wide. Tolerates drought and alkaline soil. Plant at least two shrubs for pollination. Zone 2.

Currant

Currant is one of the world's most nutritious fruits. Black currants, in particular, have a tremendous following in Europe. Currant has a tart flavor and usually is used in breads and jellies. Some cultivars serve as a host to white pine blister rust, but white pines are not common on our wind-swept prairies. Cultivars listed below show resistance to the rust. The multi-stemmed shrub grows 4 to 5 feet tall and is hardy to Zone 3. Space 3 to 4 feet apart in rows 6 to 8 feet apart. Among the most shade-tolerant fruits. Self-fruitful.



CULTIVAR	FEATURES
Consort	Strong, musky flavor of the black berries is good for jellies, juices, and drying. Heavy bearing and precocious. Hardy Canadian cultivar.
Titania	Very large, black berries with mild flavor. Vigorous plants are hardy and resist mildew.
Pink Champagne	Light pink fruits have mild flavor; good for fresh eating. High yields.
Red Lake	Its bright red berries make a beautiful jelly. Very hardy, vigorous bushes.
Rovada	Very large, glistening red fruits borne on long clusters. High yields. Blooms late to avoid spring frosts and ripens in late July.

Elderberry

This American native is hardy (Zone 3) and easy to grow. The creamy white flowers in June develop into dark purple fruits. Cultivars have larger and sweeter fruits than wild elderberries. The fresh berries will give you a stomach ache, but processed fruits are popular in wines and jellies. Elderberry prefers a rich, moist soil and grows 6 to 10 feet tall. Space 7 to 8 feet apart in rows 10 to 12 feet apart. Needs two cultivars to set good yields. Canes are unproductive after three years; remove in the winter. Late ripening.



CULTIVAR	FEATURES
Adams #1, #2	Large fruits. Earliest to ripen (mid-August).
Nova	Large, sweet fruits. Plants grow 6 feet tall and are productive.
York	Largest fruits. The jet black fruits are juicy and sweet.
Samdal	Newer variety. Easy to manage: simply prune out canes after fruiting in the fall and keep six to eight new canes for next year's crop. Use 'Samyl' for pollinator.

Gooseberry

Native to the north, gooseberries are hardy and fairly productive. The thorniness of the bushes and their susceptibility to powdery mildew are concerns. This multi-stemmed shrub grows 3 feet tall. Space 3 to 4 feet apart in rows 6 to 8 feet apart. Hardy to Zone 3. Self-fruitful. Remove old canes to maintain vigor and productivity.



CULTIVAR	FEATURES
Invicta	Good yields of large green fruit. Spiny stems. Tolerates late spring frosts.
Hinnomaki Red	Beautiful, dark red fruits are delicious. Outer skin is tangy and flesh is sweet. Upright plants resist mildew. Very impressive and productive introduction from Finland.
Poorman	Large green berries turn pink when mature. Productive, less thorny plants.
Pixwell	Productive variety from North Dakota. Pale green fruits become pink when mature. Mild flavor. Stems have short spines, but hanging fruits are easy to pick.

Grape

Grape growing in our state has been limited due to our frigid winters and short growing season. Select cultivars that ripen early and are hardy enough to survive winter without protection. Cultivars are self-fruitful. Space 8 feet apart in rows 10 to 12 feet apart. Trellis required. Hardy in Zone 4 unless noted otherwise. State growers associations in North Dakota and Minnesota have helpful advice.



CULTIVAR	FEATURES
Louise Swenson	Hardest white grape. Disease-resistant vines. Makes a delicate wine with aroma of flowers and honey. Not especially sweet.
Valiant	Vines are productive and very hardy (Zone 3). Blue fruits grow in small clusters.
King of the North	Vines are productive and extremely vigorous. Sweet, blue Concord-type grapes for juices, jams and wines. From Wisconsin.
Somerset	The hardest seedless grape for North Dakota. Rose-colored fruits are delicious.
Frontenac	One of the hardest wine grapes. Small, blue-black grapes make a full-bodied red wine with cherry and berry flavors. Good resistance to diseases. From Minnesota.

Honeyberry

Honeyberries can be called the blueberries of the northern Great Plains. New Canadian cultivars (called haskaps) are larger, sweeter, and fleshier than blueberries or other honeyberries. This nonsuckering shrub grows 4 to 6 feet tall and is hardy to Zone 2. Widely adaptable to soils in North Dakota. Space 4 feet apart in rows 8 to 10 feet apart. One pollinator needed for eight female plants.



CULTIVAR	FEATURES
Borealis	Very large, sweet fruit. Best haskap for home gardens. From Canada.
Tundra	Fruit is firm and does not bleed when harvested. Canadian haskap well suited for commercial operations.
Berry Blue	Tall, vigorous honeyberry. Produces good crops of tasty berries. Excellent pollinator.
Blue Belle	Honeyberry with good flavor. Picks easily. Good pollinator.

Juneberry

Native to North Dakota, juneberries are hardy and tolerate slightly alkaline soil. The delicious fruits are prized by gardeners and birds alike; use netting to protect the ripening fruits. The shrub itself has ornamental beauty with white flowers in the spring and brilliant red-orange color in the fall. Blossoms are sensitive to late frosts in the spring; avoid frost pockets and south-facing slopes. Shrubs grow 4 to 18 feet tall and may spread 12 feet across. Plant more than one cultivar for better fruit set.



CULTIVAR	FEATURES
Regent	Dwarf (5 feet) cultivar grown for the mild flavor and even ripening of its dark blue fruits. Easy to manage.
Smoky	The standard variety in Canada. Preferred for its large fruit and high yields. Vigorous, upright plants grow 12 feet or taller. From Alberta.
Northline	Large fruits of superior quality. Productive plants grow 12 feet.
Martin	A selection of 'Thiessen' with larger fruit size and more uniform ripening. Grows 12 feet.

Raspberry

Raspberry is a popular fruit that is easy to grow in North Dakota. Plant both summer- and fall-bearing types to extend your harvest.

Fall-bearing types bear fruit on their first-year canes. Select early ripening cultivars only. You can mow the canes in April for a strong fall crop or allow the canes to develop and bear fruit during the summer. Summer-bearing types bear fruit on two-year canes, which are pruned out after harvest.

Raspberries are established to grow in hedgerows or hills. If hedgerows, set canes 2 feet apart in rows spaced 6 to 8 feet apart. Prune every winter to thin canes to stand 3 to 4 inches apart. If hills, set hills 4 to 6 feet apart in each direction. Prune in the winter to allow six to eight canes per hill.

Purple raspberry canes are pinched when 30 inches tall to encourage lateral branches and these



lateral branches are trimmed back to 18 inches long in the winter.

Trellising will make plantings easier to manage, especially the more vigorous purple types. The following are red summer-bearing cultivars and hardy to Zone 3 unless noted otherwise.

CULTIVAR	FEATURES
Prelude	Earliest raspberry. Good-quality fruits. Also bears a few berries in fall. Zone 4 only.
Boyne	Productive and very winter hardy. Medium-sweet berries good for freezing and desserts. Ripens in mid-July. From Manitoba.
Killarney	Large, bright red fruit. Excellent flavor and aroma. Good yields. Sturdy canes.
Latham	The standard red raspberry. Very reliable producer of bright red fruits. Good quality. Very hardy.
Nova	Good yields of firm, bright red fruits. Canes are vigorous, upright, and nearly thornless. Heat tolerant. From Nova Scotia.
Jewel	Hardest black raspberry. Tall, productive canes produce shiny black fruit. Good flavor. From New York. Zone 4 only.
Encore	Late-season berry. Large, cohesive fruits with good flavor. Sturdy, upright canes are almost thornless. Zone 4 only.
Royalty	Thorny canes produce excellent yields of large, purple berries in late summer. Excellent for freezing and jams. Use trellis. Zone 4 only. From New York.
Polana	Earliest fall-bearing type. Canes are very hardy and produce impressive yields of glossy red berries. Ripens in August. From Poland.
Autumn Britten	Improved fall-bearing type. Good yields of firm, large berries. Bright red. Good flavor. Canes are vigorous with few spines. Ripens in early September. Zone 4 only.
Anne	The largest, most flavorful yellow raspberry. Large, pale yellow berries ripen late in fall. Very sweet. Zone 4 only.

Rhubarb

Although not a fruit, rhubarb is used like a fruit in pies, sauces, jams, and breads. It is a perennial crop more suited to a community orchard rather than a community vegetable garden, which usually is tilled every year. Rhubarb is very easy to grow and thrives in the cool temperatures of North Dakota. Prepare a sunny spot with a rich, well-drained soil. Space crowns 3 feet apart. Harvest stalks in the spring. These selections are especially hardy, at least to Zone 3.



CULTIVAR	FEATURES
Canada Red	Productive and sweeter than most. Smallish stalks with long, thick petioles. Dark red with light red interior.
Valentine	Thick, fleshy stalks that hold their rich red color when cooked.

Seaberry

Bright orange clusters of berries adorn thorny branches with silvery foliage. Used in cut-flower arrangements. The fruits are extremely nutritious but have a very intense, orangelike flavor. Most often is sweetened and diluted for use in juices. Very hardy (Zone 3) and tolerates salt, alkaline soil, sandy soil, and drought. The shrub grows 6 to 10 feet tall. Space plants 6 to 9 feet apart. Fruit-bearing female plants need a male pollinator (one male for up to eight female). This plant requires minimal pruning. Suckers readily. Can be invasive.



CULTIVAR	FEATURES
Sirola	New German hybrid with unusually sweet fruit. Suited for fresh eating and juice. Early.
Leikora	Standard German variety valued for its berries and beauty. Ripens in late September.
Orange Energy	Very productive. New hybrid from Germany.
Botanica	Very large, bright orange fruits. Easy to harvest. Developed in Russia.
Orange Delight	Tropical fruit flavor. Easy to harvest. From Russia.

Strawberry

June-bearing types are the easiest to grow. Choose an array of cultivars to spread your harvest from mid-June into mid-July. Space plants about 24 inches apart in rows spaced 36 to 42 inches apart. Remove the flowers the first year to help plants focus on establishment instead of using their energy to produce a few berries. The following year and for several years thereafter, you will have buckets of berries with minimal work.

Ever-bearing types send out a small summer crop and then one or two more flushes of fruits later. Day-neutral types produce a few berries all summer long. Neither of these types produces many runners, so space them closer, about 12 inches apart. Remove blossoms for the first six to eight weeks. These are less vigorous plants, and new plantings are established every two years. No



matter the strawberry type, mulch with a blanket of straw after the ground freezes. Cultivars listed below are hardy to Zone 3 unless noted otherwise.

CULTIVAR	FEATURES
AC Wendy	Very early. Large, bright red, delicious fruits. Risk of frost injury to blossoms.
Annapolis	Large, attractive berries. Fair taste. Productive.
Cavendish	Dark red, firm, very large berries. Excellent taste. Extended harvest season. Good disease resistance.
Honeyoye	Very hardy and productive. Easy to grow and very popular. Attractive fruit is good for fresh eating and excellent for freezing. Tolerates leaf diseases.
Sparkle	Fruit is smaller but has excellent quality for fresh use and freezing. Very hardy.
Earliglow	Small, firm fruits with exceptional quality. Vigorous plants. Zone 4 only.
Mesabi	High yields of large, delicious, scarlet-red berries. Excellent disease resistance package makes it especially good for low-maintenance plantings.
Jewel	Very large berries of excellent quality. Less hardy. Zone 4 only.
Cabot	Huge berries late in the season. Firm and flavorful. Zone 4 only.
Ogallala	Early ever-bearer. Rich flavor. Resists diseases and tolerates drought.
Ozark Beauty	Popular ever-bearer. Vigorous plants. Good berries for fresh use and freezing.
Mara Des Bois	Day-neutral type for containers. Berries are small but have exceptional gourmet flavor and fragrance. Zone 4 only.
Seascape	Productive day-neutral type; especially good for containers. Large berries of fair flavor. Zone 4 only.

Sources for this chapter include University publications from Minnesota, Montana, and Wisconsin (see Literature Cited); and catalogs of Bailey's, Jeffries, Jung, One Tree World, Nourse, Raintree, and St. Lawrence Nurseries.

Chapter 4

Starting Your Organization

Structure

The concept of a community orchard in North Dakota likely will begin as a series of small, locally based projects, much like our community gardens and farmers markets did. These projects start off with a series of meetings to discuss the objectives of the project and organization. As the project evolves, the members gain new insights into how their organization can run most effectively.

A community orchard organization should be structured to encourage high levels of participation and impact. It should promote trust and transparency among its members and foster growth as an organization.

Bylaws are rules enacted by an organization to provide it with a framework for operation and management. These rules may specify the qualifications, rights, and liabilities of membership. Powers and duties are specified, as well as grounds for the dissolution of the organization. See Appendix 5 for an example of a community orchard's bylaws.

Bylaws are required when an organization decides to become a nonprofit corporation. This step typically is done when an organization decides to take on major projects (such as a community orchard) and seek outside funding and liability protection. Major projects bring with them some risk

and some disagreements among members. A formal structure can help guide the organization through any turbulent times.

Formal bylaws should include the following:

- Official name of organization and legal address.
- Organizing members, names and addresses.
- The purpose, goals and philosophy of the organization.
- Membership categories and eligibility requirements.
- Membership dues, how much and when paid.
- Specify when and how often regular or special meetings of the membership are to be held, as well as regular and annual meetings of the board of directors.
- Describe what officers are necessary, how they are chosen, length of term, their duties and how vacancies are filled.
- List any special committees, their purpose and how they operate.
- Establish a system for bylaws to be rescinded or amended, maybe by a simple majority.



- State any official policies or practices; for example, the group will not use toxic chemicals; the group will donate fruits to the local food pantry; the group will maintain the orchard and keep it attractive.
- Include a “hold harmless” clause (sample):
“We the undersigned members of the (name) community orchard group hereby agree to hold harmless (name owner) from and against any damage, loss, liability, claim, demand, suit, cost, and expense directly or indirectly resulting from, arising out of or in connection with the use of the (name) orchard by the orchard group, its successors, employees, agents, and invitees.”
- Organizational dissolution processes.

Liability

We live in a litigious society, and one accident can destroy a community orchard.

The community orchard organization needs to have an agreement in place with the landowner before the project begins (See Appendix 4 for an example).

Many landowners insist on protection from lawsuits stemming from accidents in the orchard. Pruning mishaps, falling off ladders, strained backs from carrying heavy loads, exposure to toxic pesticides, and stings from wasps are just a few examples of accidents that can occur in a community orchard.

At the very least, a landowner can be partially protected by inserting the “hold harmless” clause mentioned earlier in the bylaws of the organization managing the project.

Even better, liability insurance can be purchased. Not all insurance agencies will offer this protection, but many major agencies will. Insurance agencies that work with social service agencies in the region may insure you. You also may call a pick-your-own farm in the area for guidance. Insurance firms that deal with many carriers may help you get the best policy at the best price.



In some cases, the landowner may provide liability protection to your group at no charge. This might happen when the community orchard is in a public park, school, or other public place. For example, the activities of an orchard in a county park may fall within the jurisdiction of the county government’s existing liability insurance policies.

If volunteers or people renting plots are working in the orchards, the organization may require the volunteer to sign the following agreement:

“I understand that neither the (name) community orchard group nor (name owner) of the land are responsible for my actions. I therefore agree to hold harmless the (name) community orchard group and (name owner) of the land for any liability, damage, loss, or claim that occurs in connection with use of the orchard by me or any of my guests.”

The key is to prevent accidents. The community orchard group can place a warning sign at the entrance of the orchard. If toxic pesticides (organic or synthetic) are applied, people entering the orchard should be notified. Lessons on proper pruning and spraying techniques can be offered. Keep the heights of fruit trees as low as possible to reduce the need for ladders. Another way to reduce liability is to limit the dates and times the orchard is open to the public.

Source: The American Community Gardening Assn.

Chapter 5

Community Orchard Projects

United States

Community orchards are a new phenomenon in much of the USA. The following are stories from local organizations currently starting community orchards. These orchards are varied in their goals and approaches, but many are linked with community garden programs. You will notice many of these projects emphasize the improvement of diets and the alleviation of poverty.

Many of these emerging community orchard programs are sponsored by the Communities Take Root Program of Edy's Fruit Bars and the Fruit Tree Planting Foundation. The following stories are told in the words of the community organizers (with editing). These and other stories are described at www.communitiestakeroot.com/Grow/.

ARIZONA

Hopi Tutskwa Permaculture, Kykotsmovi

Hopi Tutskwa Permaculture is a community group based on the Hopi Reservation. We have been involved in an ongoing effort to restore historical orchards and heirloom fruit trees as well as the traditions that accompany them. With the introduction of mass-produced and commodity foods, farming and the cultivation of fruit trees has been in decline to the point that community health has been very negatively affected. Our hope is to revive, innovate and continue the sustainable farming traditions of Hopi in order to provide our community with more fresh and healthful foods. Through our work with fruit trees, we have been able to bring together our community in a very special way as elders, youth, parents and community leaders interact with each other and share their knowledge, stories, and experiences about the trees that once flourished in Hopi.



CALIFORNIA

One Stop TAY Center, San Bernardino

Transitional Age Youth (TAY) are individuals between the ages of 16 and 25 years. Our center targets this underserved population, especially those with mental and/or emotional problems who may be emancipating from foster care, group homes, juvenile justice system, and our impoverished community. The Center's main purpose is to improve the quality of life for these individuals through food, housing, counseling, group activities, medication management, and peer mentoring. This year, one of our projects was to create a garden where our youth can learn gardening skills, relaxation techniques, and build their self-esteem. Another main goal was to focus on healthful eating and nutrition. Our orchard will bring a sustainable resource for the youth to enjoy for years to come. The fruit-bearing trees will supply the kitchen with fresh organic fruit for these youth to enjoy. This orchard will give our youth a safe haven when they need a break, nutrition in their diet, and a sense of ownership and pride they may have not had in their past.

COLORADO

Arvada Gardeners, Arvada

The Arvada Gardeners is a nonprofit group organized in 1967. Its members share the common interest of gardening. Our community garden is the primary focus of the club. More than 139 plots are rented to the community. The club provides supervision, water, tools, limited seeds and plants, and plenty of advice. The community garden has several communal plots of vegetables. These are shared with all the gardeners many of whom are Hmong and Russian immigrants who rely on the community garden for much of their food. The addition of an orchard will help the club provide foods to the gardeners and the food bank.

COLORADO

The Growing Project

The Growing Project (TGP) and Mulberry Community Gardens (MCG) address local food security issues by connecting members of the community to their food system. We offer food, nutrition, agriculture and self-sufficiency classes, and increase the supply of fresh local produce. (In 2009, we do-



nated approximately 1,000 pounds of fresh produce to the Food Bank. Our goal for 2010 is 10,000 pounds.) We have three programs: MCG, Garden Time, and the Glean Team. MCG is a free, shared-space community garden open to our low-income neighborhood residents, students, and other community members as space permits. Garden Time is a horticultural therapy and gardening program at a residential treatment facility for youth ages 10 to 18. The Glean Team is dedicated to harvesting and donating food from local farms that would otherwise go to waste. This orchard will contribute to food security in our neighborhood. To learn more, visit www.TheGrowingProject.org.

FLORIDA

Flagler County Department of Juvenile Justice Community Garden, Bunnell

The Flagler County Department of Juvenile Justice Council adopted the development of a community garden project in 2009. The purpose of the garden is to provide a location for area youth to volunteer, and acquire community service hours while working to help feed Flagler County's hungry. In less than one year, the Garden Advisory Council, with assistance from the community organizations and individuals, developed a garden providing fresh vegetables to area food pantries. An additional bonus of the garden location is the availability of a few mature fruit trees. Preparation for the community garden's spring planting has begun. Necessary resources and labor have been

solicited throughout the community from Master Gardeners to youth, all understanding the need for this project. The addition of an orchard, with citrus trees and bushes to complement the garden is exciting!

INDIANA **City of Bloomington Parks and Recreation Department**

Our budding community orchard is about the future. It is about leaving a legacy for generations to enjoy. But it is also about right now. It is about finding others who share a vision of abundance and coming together to make one patch of the Earth a better place for everyone. The orchard will contribute to Bloomington's food security, inspire joyful community engagement, and educate citizens. The City of Bloomington has offered support and a spacious site adjacent to our largest and oldest community garden, a public park, and the YMCA. The first public meeting for the orchard, held in February at City Hall, was standing room only. Participants are eager to put their expertise, resources, and physical labor into the creation and maintenance of the public orchard. Work groups are establishing the administrative and operational structures needed to allow the orchard to thrive. Bloomington's People's University is offering a low-cost course on orcharding to create a core of educated volunteers to care for the trees. To ensure that fruit from the trees will reach those in need, Bloomington Community Orchard is partnering with the Hoosier Hills Food Bank Gleaning Program, which harvests surplus crops on local farms to feed those who are hungry. Strong traditions of community gardening already exist in Bloomington, offering educational opportunities, food, and beauty for all to enjoy. We are ready for our community orchard.

INDIANA **City of Kendallville**

This small, rural city in northeast Indiana, in cooperation with the group Activate Noble County, is planting a fruit tree orchard to help feed families and promote good eating habits. With an unemployment rate as high as 16 percent and an overweight/obese population at 75 percent, we are striving to provide healthful meals to citizens of need in our community. Our food banks are seeing record

numbers of families in need. In an effort to take root and drive meaningful change in our community, we have established a community garden to provide fresh vegetables to those in need. An orchard will add fresh fruit that has previously been unavailable. Youth and service groups within our community will care for the trees and harvest the fruit. The development of this orchard fits our mission, which is "To improve the health and wellness of Noble County by increasing opportunities for healthy eating and active living."

MAINE **Houlton Band of Maliseet Indians, Houlton**

The Houlton Band was federally recognized in 1980 and the Maliseet Riverside Village was established in 1994. Fifty families are living in the village with another 100 families living within the surrounding communities. In 2008, we built an elder community center and have established a garden that was the center of a combined elder/youth project. The food grown in the garden was used in elder community meals, and the excess was shared among the elders. Plans this year include growing enough to share with the local community food pantry. Our new orchard will help everyone become more aware of his or her value by means of participating in community projects. It also will provide a renewed awareness of their environment, the nutritional benefits of eating locally grown fruits, and the long-term health benefits of maintaining an organic orchard for generations to come.



MAINE **Unity Barn Raisers, Unity**

On Jan 12, 2000, a fire destroyed the home of Kurt and Carmen Freyer in Unity. Their 6-year old autistic triplets, Joshua, Marcus and Brydon, died in the fire. While fighting the fire, former Fire Chief Robert (Jonesy) Jones died after suffering a heart attack at the scene. The entire area was devastated by this tragic event. Bravely, the family allowed the community to be part of its healing process by gifting the land to the Unity Barn Raisers (UBR) for the creation of a memorial park. A series of fundraisers, in which every organization in town participated, raised about \$7,700 for the park, and work began in 2002. Volunteer workers continue to maintain and grow the park. To date, a gorgeous raised boardwalk built from locally harvested timber has been built connecting the park to the local Head Start and elementary schools; an outdoor learning space was built by local college student volunteers; perennial gardens have been created; and interactive gardens, including a cucumber tunnel, bean teepee, and sunflower house, were installed. Wildflowers and sustainable edibles such as rhubarb and raspberries have been planted and harvested by groups of children. UBR is now planting an orchard in Triplet Park. Fruit from these trees will support another UBR project, Veggies for All (VFA). VFA grows local produce for our food pantry to improve the diets of residents who are dependent on local food relief.

MARYLAND **Kayam Farm, Reisterstown**

Kayam Farm is an organic educational farm serving the Chesapeake watershed community. We are entering our fourth growing season, cultivating two

acres of vegetables along with a small vineyard, berry patch, youth gardens, and greenhouse. Last year we welcomed goats and chickens onto our farm as well. Our mission is to embody and inspire social and ecological responsibility by transforming our community through hands-on agricultural education. Kayam educational programs serve all ages and institutions, teaching sustainable agriculture and just food systems in a fun, hands-on way. We welcome 2,700 participants to the farm each year. We donate 10 percent of everything we grow. All of this orchard's harvest will be donated to local shelters and those in need. Our orchard will include 40 to 50 fruit trees. The Kayam orchard will provide healthful food to those in need. It will inspire thousands of people to plant their own fruit trees.

MARYLAND **The Samaritan Women, Baltimore**

In 2007, The Samaritan Women acquired a neglected estate with two historic homes and 23 acres of land. Through the efforts of our volunteer network, one home is being renovated to serve as a transitional residence for women in recovery, which will offer vocational training in culinary arts and food preserving. The other home is open as a public events and education center, bringing the community together in learning and fellowship. We're also tackling the problem of Baltimore as an urban food desert, where access to a variety of fresh produce is often nonexistent and generations are growing up with no awareness of how to care for the Earth, how food grows, or the importance of good nutrition. Our land is being cultivated to serve the whole community as a large urban farm. We donate our produce to local shelters, nonprofits, and families in need, and through neighborhood markets.

MINNESOTA **Dream of Wild Health Farm, Hugo**

This is a 10-acre organic farm created to help American Indian people reconnect with traditional foods and medicines. Dream of Wild Health has the largest collection of indigenous heirloom American Indian food and medicine plants in the Upper Midwest combined with critical educational programs for our community. With Native people suffering from diabetes and obesity at epidemic levels, our educational programs help Native people



relearn the healthy lifeways of our ancestors, with a focus on nutrition and exercise. We provide summer garden programs for urban Native youth that teach traditional American Indian agriculture and an indigenous understanding of health, along with basic job skills and leadership. Our ancestors relied on berries as essential to a healthy diet, but access to fresh fruit is limited for many Native people. The orchard serves as a teaching tool, helping American Indian people learn to grow, harvest, and preserve seasonal fruits.

MISSOURI
International Institute of St. Louis
Community Orchard, St. Louis

The International Institute of St. Louis provides an array of services for immigrants and refugees, including English-language instruction, employment assistance, and support during the adjustment process. The institute assists newcomers to become productive participants in their communities. The International Institute's Global Garden North creates a space where immigrants, refugees, and native-born Americans come together and share their agricultural skills while working toward a common goal. The gardeners come from a variety of countries including Burundi, Nepal, Somalia, Iraq, and the United States. Yet even with their cultural barriers, the gardeners work together to grow produce and beautify their neighborhood in north St. Louis. In one year, we have transformed four abandoned housing plots into an urban garden and orchard.

NORTH DAKOTA
Dragonfly Garden, Bismarck

The Dragonfly Garden at United Tribes Technical College is a new outdoor classroom for campus students and their families in Bismarck, North Dakota. The goals of this project are to teach families how to grow a garden, eat healthful food, and enjoy the beauty of nature. Educational programs in the 1.5-acre garden will demonstrate science-based, sustainable gardening practices, with an emphasis on native plants. The Dragonfly Garden will be an open park where everyone in the region can tour the display gardens and use this information in caring for their own gardens and landscapes. The produce from the garden will be donated to campus families, school cafeteria, and local food



pantries. Our partners include North Dakota State University, local garden clubs and nurseries, and gardening programs of the National Resources Conservation Service (NRCS), Dakota Prairies Resource Conservation & Development Council (RC&D), and North Dakota Department of Agriculture.

OREGON
Redeemer Community Garden, Salem

Redeemer Lutheran Church (RLC) has been serving the northeast Salem community for 49 years. Part of its mission is to spiritually uplift the community and work toward its greater good. With this in mind, RLC is creating a neighborhood community garden on its property. The Redeemer Community Garden connects people through the joy of growing nutritious food. Together we will learn to care for the land entrusted to us through environmentally sustainable ways that are pleasing to God and all His creation. The quarter-acre garden brings together members of the community, the church, and two on-site preschool programs through a sustainable food garden. One preschool program serves migrant families. RLC also hosts



a Vietnamese, a Pacific Islander and two Hispanic congregations. Marion Polk Food Share (MPFS), a local organization that provides emergency food for all of Marion and Polk counties through a network of 83 member charities, also will receive food from this garden. As you see, the garden provides a means to grow healthy food, build community, educate for self-reliance, and feed those in greatest need. It will be a visible presence in the community where people can come together.

OREGON

Sabin Community Orchard, Portland

This orchard was founded with the mission of creating a site that will provide nutritious food, educational demonstration, and the opportunity for community leadership in northeast Portland. The Sabin Community Association and the Portland Fruit Tree Project co-founded the orchard. With help from many community members and Mayor Sam Adams, eight new fruit trees were planted in 2010 to accompany two existing cherry trees and an apple tree. The site has understory plantings around many of the fruit trees, water catching swales along the slope, and impressive signs explaining the space to the public.

SOUTH DAKOTA

Bear Soldier Tribal Orchard, McLaughlin

In 2004 and 2005, our community of Bear Soldier was dubbed the “Suicide Capital of the U.S., second in the world to Japan.” This project will help our people to begin healing from the past by building something beautiful for the future. We named it the “Medicine Wheel of Healing,” and it is to be a place where people can bring their children and

families together to eat, play, and heal. The community has organized a council to oversee the beautification of the Bear Soldier community through the Medicine Wheel of Healing, future walking trails, and other projects. The medicine wheel has a walking path with entryways from each of the four directions, all leading to the center of the wheel. In the center, a play and picnic area will be available for community use. It also will have vegetable and flower gardens with waterfalls and swimming area. Having organic groves of fruit trees is an essential component of our vision of the Medicine Wheel of Healing.

TEXAS

San Antonio Food Bank, San Antonio

The mission of the San Antonio Food Bank is to fight hunger in southwestern Texas through food distribution, programs, and advocacy. The mission is fulfilled through 460 agencies that help feed the needy in Bexar County and 16 surrounding counties. The mission of its garden is to produce organic, culturally acceptable, healthful and sustainable produce for the food insecure. In the first year of operation, the garden produced 2,641 pounds of produce and received 700 volunteers, served as a summer working site for five local high school students, and received community groups for nutrition and gardening classes.

WEST VIRGINIA

Southern Appalachian Labor School, Beards Fork

Southern Appalachian Labor School (SALS) is a nonprofit 501(c)(3) organization that runs a community center and after-school program. The small town of Beards Fork has a history of economic and cultural riches stemming from the coal economy from which it was founded. Once the mines began to lay off workers, and eventually shut down altogether, this hollow began to lose its stores, doctors, theater, and elementary school. SALS is the only employer in Beards Fork, and serves as a hub for many community activities and services, such as delivering food to those in need, rehabilitating homes, and providing an after-school program, not just for the youth of Beards Fork, but throughout Fayette County. SALS is also the central location for an educational youth gardening program in this county, called “Growing Together.”

We believe that an orchard will provide a wonderful element to our educational garden program, as well as bring back some semblance of the prosperity that once existed here.

WISCONSIN

Bock Community Forest and Garden (City of Middleton Sustainability Committee)

This is a new community garden in Middleton, a town outside of Madison. This spring, the fence and water will be in place, the plots tilled and marked off and the children's garden waiting for small hands to dig in. Soon, buckets and scales will be laid out to gather produce for the garden's "Plant A Row For the Hungry" program which will provide thousands of pounds of fresh tomatoes, cucumbers, and other vegetables for our local food pantry. The living fence will take shape as vines weave their way across the grid, providing a beautiful backdrop for the orchard that lies in wait, cleared and ready for the young trees. In time, the fruit trees will provide more than a scenic gathering space in spring and throughout the rest of the season. These trees also will provide fresh apples, pears, and cherries to people in need and serve as an education space for the children in the garden. The orchard is an integral part of the Bock garden and the garden community itself. More than 50 volunteers are dedicated to the development of the Bock garden and orchard. Volunteers have worked countless hours in planning the garden and raising funds for a fence and an irrigation system.

WYOMING

LaBonte Park Community Garden, Laramie

The City of Laramie Parks Department has set aside a portion of LaBonte Park to be utilized for youth and community gardens. The purpose for the gardens is to educate children and adults about sustainable food through direct experience. Educational programs include gardening basics, composting, bees and pollination, insect and weed control, water harvesting, and plant anatomy. We recently have partnered with Eppson Senior Center to add the intergenerational component. This will allow us to have a senior/junior mentoring program. Having access to the Senior Center kitchen and dining area we will be able to include nutrition and food preservation classes. Adding fruit trees



and fruiting shrubs to the gardens will allow us to show the benefits of trees. We will have the benefit of harvesting and preserving the fruit and adding one more component about healthful nutrition to our program. Excess vegetables and fruit will be given to our local soup kitchen, used in meal preparation at the Eppson Senior Center, and given to Interfaith Good Samaritan (an organization that provides food for people in need).

WYOMING

Rock River Community Garden, Rock River

Rock River is a small, rural community where shopping and conveniences that you would normally find in a town are next to nonexistent. The town of Rock River has provided an area for a garden next to the Community and Senior Center. Having a community garden with fruit-bearing trees will produce a convenient supply of fresh vegetables and fruits. In addition to providing nutritious food, we will encourage self-reliance; reduce food budgets; stimulate social interaction; and create an opportunity for recreation, exercise, therapy and education. This project will allow for intergenerational and cross-cultural connections. Any excess food will be utilized by the Senior Center in its meal preparation. The garden space has been fenced, water is on site, raised beds are being built by FFA (Future Farmers of America) members, and a local school has started seeds.

United Kingdom

Community orchards in North Dakota do not have to emphasize fruit production. The British, for example, often emphasize other attributes of community orchards.

During the past 40 years, most of the orchard land in the United Kingdom has been lost due to new housing and economic development pressures. Several British groups have been active in saving old orchards as a way to preserve their cultural heritage.

These orchards become living museums where people gain a feeling of the past, not to mention an opportunity to taste heirloom apple cultivars. The orchards are used as public places for local festivals and for places where one can enjoy nature in a restful setting. Apple Day festivals are arranged in late October to promote conservation activities. Fruit production is of secondary importance, and wildlife is attracted into the parks. The following is a sampling of recent projects:

Blondin Orchard, Ealing, West London

Blondin Orchard covers one acre of land owned by the public since 1926. Before that, it was part of a family farm and from 1750 to 1834 was part of the Brentford Nursery, which specialized in fruit trees and sold more than 300 apple cultivars.

The local council organized a series of meetings to bring the land back into community use. More than 150 residents participated in these meetings. They agreed to establish a community orchard with the following goals: bring the public land into active and sustainable community use, develop the area's interest for wildlife, establish a successful orchard with good fruit production, and develop the area through ongoing consultation with local people. Forty-six trees of heirloom cultivars were planted in 1997, and the grassland beneath the trees is mowed twice a year by the council.

A longer-term plan for the orchard will be drawn up by the council and the Friends of Blondin Park. Ideas include fruit production, links with schools, training for new skills, grazing of the orchard by sheep, and wildlife observances. The orchard may be expanded to take in many of the existing cherry trees within the nature area.



Walbottle Community Orchard, Walbottle

Encouraged by several successful Apple Day celebrations, the Countryside Ranger Service of the Newcastle City Council led a public discussion of plans for a community orchard on the edge of Curtens' Quarry in Walbottle in October 1997. Four months later, local people planted more than 50 apple, pear, and cherry trees on about one acre of former grazing land.

The orchard has been a site for community plays and school tours. In autumn of 1998, thousands of snowdrop and bluebell bulbs were planted between the fruit trees, and these spring flowers will continue to attract people into the orchard while the young fruit trees develop.

Gabriel's Orchard, Pilton

Gabriel's Orchard is a new orchard in a rural area where orchards encompass much cultural and social history. In 1996, the first discussions were held to consider suitable projects for Pilton's millennium celebrations. A family subsequently donated two acres of land on the edge of the village that once had been part of Pilton Vineyard.

The community decided that creating a community orchard would be a great opportunity to preserve the variety of trees that had been important to Pilton.

The legal formalities were dealt with and a trust document was set up making the Somerset Parish Council the custodian trustees. Grant funds were secured for fencing and the first purchase of trees of heirloom apple cultivars.

Volunteers are encouraged to come the first Saturday of every month to maintain the orchard. Villagers are encouraged to sponsor a tree in the orchard, and nearly 100 trees now are sponsored. Important cultivars in local orchards have been identified and cuttings have been taken to develop trees for the orchard in the future.



Bloomfield Community Orchard, Bath

Two community residents noticed some vacant public land and gathered support to create a community orchard. Local government authorities allowed the group to secure the land plots at a reduced rate and gave permission for the land to be used as an orchard.

A public meeting at one of the resident's homes led to the design of the orchard. They decided to plant apple trees and a hedge of willows and other plants. They agreed to dig a pond to promote wildlife and provide a restful place for sitting.

The group meets three to four times a year to maintain the land. They received donations for trees, a mower, and operating funds. Plants for the pond were provided by local residents. In October 1999, they held their first Apple Day festival.

Other New Orchards

New community orchards continue to be planted throughout the country. These include school orchards, city orchards, an orchard along a cycle track in Gloucestershire, an orchard of local varieties around a caravan site and footpath in Norfolk, and around a community hospital in Leicestershire.

Source: Common Ground

Ten Steps to a Community Orchard



1. GET A PLAN

Organize meeting(s) to:

- Determine the main goals of the orchard (communal fruit production, renting plots, marketing, beautification, historic preservation, other, or combination thereof).
- Determine who the garden will serve (general public, food pantries, youth, other).
- Develop a leadership team and arrange for future meetings.
- Envision committees needed for the project (planning, fundraising, volunteer recruitment, other). Assign leaders, if ready.
- Develop a list of project priorities (site location, fundraising, volunteer recruitment, other).
- Develop an orchard identity (name, logo).

2. FIND A SITE

- Look for a sunny spot with well-drained soil and access to water. The land should be accessible to the public. An old farm or cultivated field is ideal.
- Avoid frost pockets and be wary of south-facing slopes.
- Identify the owner.
- Understand liability issues related to the property.
- Understand the history of the land: any contamination, waste dumping?

3. GET A CONTRACT

- Obtain a long-term agreement (10 years or more is desired).
- Define liability issues for the project with the owner. Seek legal assistance if needed.

4. FIND MONEY

- Consider forming a 501 (c)(3) nonprofit corporation.
- Pursue funding opportunities, both locally and nationally.
- Solicit donations from community organizations and businesses, including fruit nurseries.
- Establish contacts in the news media.
- Get a website to promote the project.
- Develop a plan to fund the orchard beyond establishment.

5. FIND HELPERS

- Identify sources of volunteers including Master Gardeners, garden club members, youth groups.
- Identify local experts: fruit growers, NDSU Extension staff, local fruit nursery operators.
- Promote the project through the news media.
- Give presentations to community service organizations and garden clubs.
- Encourage neighbors of the site to get involved. Trade them berries for their watchful eye.

6. DESIGN THE ORCHARD

- Consider project priorities.
- Select hardy fruits, preferably those resistant to diseases and insect pests.
- Understand your limitations of human resources and funding. Better to start small and excel (this will generate more community interest) than start big and struggle (this will lead to frustration and burnout, and will lose community support).
- Gauge the level of commitment you have from your project team. Plan accordingly: Fruit trees will require a longer and stronger commitment to grow compared with berries.
- Organic or not?
- Fencing?
- Storage area for tools?
- Beautify public entrances with flowers and other ornamentals.
- Plants requiring pesticide applications should be placed in less visible, low-traffic areas.
- Maintain adequate walkways.
- Determine rental plot areas, if any.

7. PREPARE THE ORCHARD

- Prepare written rules for renters and volunteers.
- Make a sign to let people know a community orchard will be established at the site.
- Clean the site.
- Kill existing vegetation, if needed.
- Cultivate the site.
- Outline beds for small fruits. Add compost or other organic matter to the beds.
- Lay out plots for renting, if any.
- Contact the news media on planting day to generate publicity.
- Plant, stake, and mulch trees. Trellis other fruits, if needed.
- Start a watering program.

Source: The American Community Gardening Assn.

8. INVOLVE YOUTH

- Talk to local schools and youth groups. Youth will serve as positive ambassadors for the project.
- Invite neighborhood children to get involved. Give them ownership into the project; this will reduce vandalism.
- Consider establishing an area for youth plots.

9. MANAGE THE ORCHARD

- Encourage activities at the orchard; this will generate public interest and reduce vandalism.
- Establish contact people in case of emergency.
- Organize work crews and work days.
- Encourage volunteers.
- Monitor for disease and insect pest problems, weeds, wildlife damage.
- Use the website to keep everyone informed of the activities and needs of the project.
- Arrange for regular meetings of the leadership team at the orchard.
- Establish a plan for distributing the harvest.
- Contact the news media when the harvest season starts.
- Clean up the orchard and protect plants before winter arrives.
- Recognize volunteers and key project “friends” (sponsors) for their efforts.

10. REASSESS THE PROJECT

- Any new needs for the project to address?
- Future strategies for funding?
- Any new resources available? New support from sponsors may appear once they see the progress and “legitimacy” of the project.
- What worked and what didn’t?
- Changes needed in organization structure or leadership?
- Organize an end-of-year meeting and celebration.
- Set a date for the next planning meeting.

Appendix 1

Sources of Plants and Supplies

The following list of companies is provided as a convenience to readers. It is not an endorsement by NDSU Extension, nor is it exhaustive. Plants and supplies may be available from other equally suitable companies.

Adams County Nursery
Aspers, Pa.
www.acnursery.com

J.W. Jung Seed
Randolph, Wis.
www.jungseed.com

Van Well Nursery
Wenatchee, Wash.
www.vanwell.net

Boyer Nurseries & Orchards
Biglerville, Pa.
www.boyernurseries.com

Miller Nurseries, Inc.
Canandaigua, N.Y.
www.millernurseries.com

Wafler Farms
Wolcott, N.Y.
www.waflernursery.com

C & O Nursery
Wenatchee, Wash.
www.c-onursery.com

Nourse Farms, Inc.
South Deerfield, Mass.
www.noursefarms.com

Willow Drive Nursery
Ephrata, Wash.
www.willowdrive.com

Cameron Nursery
Eltopia, Wash.
www.cameronnursery.com

One Green World
Molalla, Ore.
onegreenworld.com

Columbia Basin Nursery
Quincy, Wash.
www.cbnllc.com

Peaceful Valley Farm Supply
Grass Valley, Calif.
www.groworganic.com

Farmer Seed & Nursery
Faribault, Minn.
www.farmerseed.com

Raintree Nursery
Morton, Wash.
www.raintreenursery.com

Hartmann's Plant Company
Lacota Mich.
www.hartmannsplantcompany.com

St. Lawrence Nurseries
Potsdam, N.Y.
www.sln.potsdam.ny.us

Henry Field's Seed & Nursery
Aurora, Ill.
www.henryfields.com

Stark Bro's Nurseries
& Orchards Co.
Louisiana, Mo.
www.starkbros.com

Hilltop Nurseries, LLC
Hartford, Mich.
www.hilltopfruittrees.com

Swedberg Nurseries
Battle Lake, Minn.
www.swedbergnursery.com

Indiana Berry
Plymouth, Ind.
www.indianaberry.com

TRECO
Woodburn, Ore.
www.treco.nu



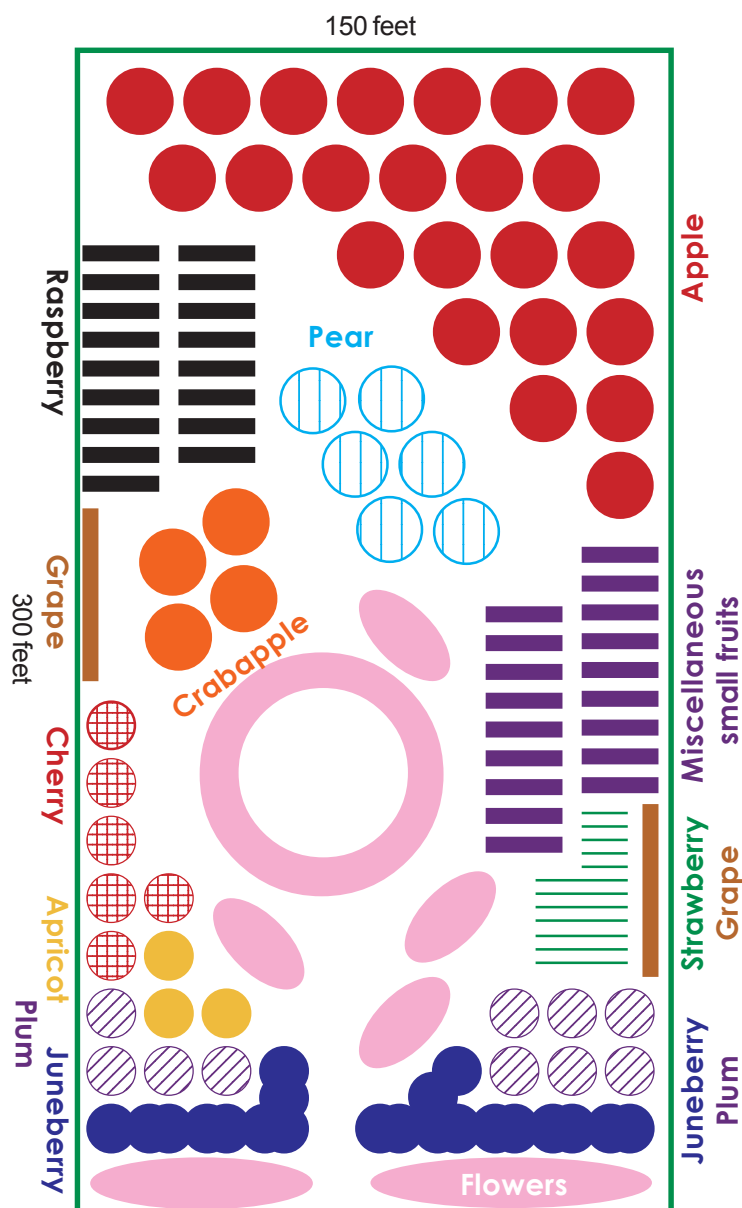
Sample Budget

A community orchard may be as simple as planting a few “whip” trees in a pasture or as elaborate as establishing a public park. The following example is something in between. This one-acre orchard is a pleasant place to visit, a pleasant place to learn, and a pleasant place to grow fruit.

You enter the orchard through a doorway with flowers (see pink ovals) and serviceberry (a most ornamental fruit) in front. Plums, cherries and apricots are near the front; these early bloomers will attract interest to the garden in early spring and rarely, if ever, will need spraying. Visitors will walk toward an open area. This could be lawn in the beginning but eventually could hold a gazebo, sculpture, or an outdoor classroom structure. Beds of flowers (shrub roses, perennials, and annuals) coax the visitor into the orchard. Grape trellises appear on either side. An area is dedicated to miscellaneous small fruits (haskaps, bush cherries, aronia, currants, gooseberries, other) to draw interest and use for demonstration purposes. Crabapples have ornamental value and will be placed near the orchard “gazebo.” Pears and apples will be our tallest trees and will serve as the background planting. Raspberries and strawberries may be grown for the community or rented to families. Similarly, any of the fruit trees could be rented to a family, if this is an aim of the community orchard. Turf will be grown throughout the orchard, with soil beds prepared for the flowers and small fruits. A deer fence is installed around the garden. A plan similar to this was devised in the Dragonfly Garden in Bismarck. The following is an estimate of expenses:

Land preparation and turf seeding	\$1,750
Compost, mulch and its delivery	2,650
Trees (52 trees @ \$20)	4,540
Small fruits (200 raspberry, 150 strawberry, 108 miscellaneous, 20 juneberry, 12 grape)	1,075
Flowers (50 shrub roses, other miscellaneous)	800
Tree protection (stakes, paint, hardware cloth, spiral guards)	520
Fence (7.5-foot black nylon)	2,100
TOTAL	13,435*

*Does not include labor costs (volunteers), and ongoing watering and fertilizer costs.



Funding Opportunities

Many sources of funds are available. Many local businesses, banks, and community organizations sponsor local projects. The following are some funding sources dedicated to community gardens and orchards. These sources are listed as a convenience for readers; this is not an endorsement by NDSU Extension, nor is this list exhaustive.

North Dakota

Foundation for Agricultural and Rural Resources Management and Sustainability (FAARMS)/Farmers Union Marketing and Processing Foundation

Who May Apply: Community groups with projects (including community gardens and orchards) to sustain low-income families

Amount: Up to \$1,000

Deadline: Open

Contact: www.farms.org

Green and Growing School Garden Program/North Dakota Farmers Market and Growers Association (NDFMGA)

Who May Apply: Schools

Amount: Up to \$500

Deadline: Applications reviewed in February

Contact: www.ndfarmersmarkets.com

North Dakota State University Junior Master Gardener Program

Who May Apply: Youth groups including 4-H clubs, schools, churches, and other community organizations

Amount: Up to \$1,000 each

Deadline: Open and flexible; applications reviewed in March/April and ongoing until all annual funds are distributed

Contact: Local county office of North Dakota State University Extension Service, www.ag.ndsu.edu/extension/

Midwest

National Gardening Association's Adopt a School Garden Program/ASG Midwest School Garden Grant

Who May Apply: Schools serving low- to middle-income students

Amount: \$1,000 in materials and funding

Contact: www.kidsgardening.org

Otto Bremer Foundation Grants

Who may apply: 501(c)(3) organizations in Minnesota, North Dakota and Wisconsin involved in the right to food, environmental rights, right to participate in cultural affairs of the community

Amount: Unspecified

Deadline: Open

Contact: www.ottobremer.org

Sustainable Agriculture Research and Education (SARE)

Who May Apply: Researchers, educators, farmers, and youth

Amount: Typically between \$1,000 and \$15,000

Deadline: Ongoing, depending on specific grant

Contact: www.sare.org/grants/

National

Brita FilterForGood Eco-Challenge

Who May Apply: Colleges, students, teachers and schools with ideas to turn green ideas into action

Amount: \$1,000

Deadline: Open

Contact: www.filterforgood.com/ecochallenge/

DoSomething Grants

Who May Apply: Available to U.S. and Canadian citizens, age 25 or under, who want to create a community action project, or further the success of an existing program

Amount: One grant of \$500 will be awarded each month

Deadline: Applications are accepted on a rolling basis and stay active for consideration for two months after submission

Contact: www.dosomething.org/grants

Fruit Tree Planting Foundation's Communities Take Root Orchard Program

Who May Apply: Communities compete in a nationwide vote to win a complete community orchard

Amount: The first 125 qualified applicants will be in the running to win a free orchard, including free community workshops on planting, pruning, and caring for fruit trees

Deadline: Ongoing

Contact: www.ftpf.org

Green Education Foundation and Gardener's Supply Award

Who May Apply: Schools and youth garden programs that have demonstrated impacts in the lives of kids and their community

Amount: \$5,000

Deadline: September

Contact: www.greeneducationfoundation.org

Lowe's Charitable and Educational Foundation

Who May Apply: Funding to 501(c)(3) tax-exempt nonprofit organizations and public agencies in communities where Lowe's operates stores and distribution centers

Amount: \$5,000 to \$25,000

Deadline: One grant can be submitted per year with no deadline

Contact: Visit Lowe's stores for an application or www.lowes.com/cd_Corporate+Citizenship_674540029_

Pepsi Refresh Project grants

Who May Apply: Any citizen or group with an idea that has a positive impact on society

Amount: \$5,000 to \$250,000

Deadline: Ongoing

Contact: www.refresheverything.com

Toms's of Maine 50 States for Good

Who May Apply: Nonprofit organizations involved in grass-roots community projects

Amount: 5 winners each year, \$20,000 each award

Deadline: Ongoing

Contact: www.tomsomaine.com

Youth Garden Grants Program/National Gardening Association and Home Depot

Who May Apply: Schools and community organizations with child-centered garden programs

Amount: \$500 to \$1,000

Deadline: Ongoing

Contact: www.kidsgardening.com/ygg.asp



Appendix 4

Sample Contract for Land Use

The following form is intended as a guide only; be sure that the final agreement you use meets the needs and details of your group and the property owner.

I, _____ give permission to _____
(property owner's name) (community orchard project)

to use the property located at _____ as a community orchard
(site's street address)

project, for the term of ____ years beginning _____ and ending _____.
(start date) (ending date)

This agreement may be renewed with the approval of both the property owner and the community orchard organization at the end of the agreement period. All questions about the community orchard, including its nature, risks and hazards have been discussed with the orchard coordinator to my satisfaction.

The community orchard agrees to indemnify and hold harmless the property owner from all damages and claims arising out of any act, omission or neglect by the community orchard, and from any and all actions or causes of action arising from the community orchard's occupation or use of the property.

As the property owner, I agree to notify the community orchard organization of any change in land ownership, development, or use 90 days prior to the change in status.

Property owner's signature

Community orchard coordinator's signature

Date

Date

Source: The American Community Gardening Assn.

Sample Bylaws

The following are the bylaws adopted by the Bloomington Community Orchard in 2010. These bylaws serve only as an example of how a community orchard organization may structure itself and is not necessarily an endorsement of this organization or its structure. Organizations in North Dakota may find it helpful to use these bylaws as a framework and then modify them accordingly.

Bloomington Community Orchard Bylaws

Adopted unanimously at the Annual Meeting

April 12, 2010

Background

Amy Countryman's proposal to the City of Bloomington served as the catalyst for a Community Orchard idea coming together with land, funds and volunteers. The City donated land near the Willie Streeter Community Garden, across from the YMCA, and \$2000 to launch the project, but did not want to take on long-term maintenance or cost. Over one hundred community members attended an initial planning meeting. Many expressed the desire to live sustainably and develop community relationships. Out of a subset of these volunteers, came these governance ideas.

Goal

The goal of the community orchard is to grow food-producing trees that the community feels safe to eat, whose fruit is available without cost and the City of Bloomington does not feel obligated to manage.

Scope

While several in the Orchard Community have expressed support for many community orchard sites, the City's support has been extended specifically for the Winslow Woods site and is being run under the auspices of the City of Bloomington's Park and Recreation Urban Forester. Good governance and participation may provide support for further community orchard opportunities.

Governing Board

The Community Orchard Governing Board is comprised of 9 elected members. Decisions about the orchard are made by this group with input from the Orchard Community.

The board can create subcommittees. Any powers of the board can be delegated to a subcommittee. Any delegated powers can be revoked by the board.

Orchard Community

The Orchard Community is made up of volunteers that have contributed at least 2 hours to the orchard planning or maintenance or who have donated at least \$50 in a calendar year.

Volunteer hours are tracked on an honor system with any other community member verifying.

Election to Board

Any member of the Orchard Community is eligible to become a board member. In-person voting will take place at a Community Orchard Annual Meeting. Electronic and mail votes will be allowed up until the Annual Meeting.

Each member of the Orchard Community is allowed one vote. Children capable of making an informed and independent decision are eligible to vote. The candidates that receive the most votes are chosen to represent the orchard.

The standard term for a board member is two years. Board members can be reelected. In the

first election, the top 5 vote receiving candidates will be assigned 2-year terms and the next 4 vote receiving candidates will be assigned 1-year terms to avoid having all board seats come open at the same time.

Decision Making

Meetings in which decisions about the Community Orchard are made should be published in advance to the Orchard Community and open to public attendance. This includes both board meetings and subcommittee meetings. Meetings may or may not allow for public comment.

A quorum of 7 board members must be present for decisions to be made. Where technology allows for remote attendance, it is allowed. Decisions are approved if two-thirds of the board attendees vote in favor of the decision. Decisions can be made via email if board chooses to do so. There is no voting by proxy. Community input should be sought.

Commitment of Board

Board meetings will be held every other week during the planning of the orchard, moving to monthly after first planting.

If a board member misses two consecutive meetings without consent of the board, they are assumed to have voluntarily resigned and their board position becomes open for election. The newly elected person will serve the remainder of the vacated term.

Changing Governance

The Community Orchard may find that the governance rules need to change. Changes to governance will be made at Annual Meetings and voted on by Orchard Community with two-thirds approval.

The Community Orchard Governing Board can create temporary changes in governance rules in the time between annual meetings to meet the needs of good governance. These changes will be brought to the Orchard Community at large for a vote at the next annual meeting.

If the Orchard Community is unhappy with the actions of the Community Orchard Governing Board, they may, with signatures equal to 10 per-

cent of the attendees of the last Annual Meeting, call for a referendum to either change board members or governing rules.

Board Positions

The board should choose among its elected members at the first meeting after the Annual Meeting, someone to serve as the Facilitator, the Assistant Facilitator, the Secretary and the Treasurer.

The Facilitator is responsible for creating an agenda, convening the meetings, and facilitating the meetings to ensure they run smoothly. The Assistant Facilitator is responsible for the duties of the Facilitator when the Facilitator is absent and serves as the liaison to any subcommittee that does not have an appointed board member appointed as its liaison. The Secretary is responsible for communication of the meeting times to the Orchard Community, for recording meeting minutes and the votes of any meeting, and performing any board correspondence needed.

The Treasurer is responsible for paying for all items approved by the board and accounting for all monies spent.

The board is responsible to make sure communication to the community and financial accounting take place. This group can choose to do it themselves or ask someone to take care of these responsibilities.

Design

Design of an orchard that is sufficiently diverse and capable of producing with the minimum amount of intervention requires careful planning.

The board is encouraged to consult advisors that have knowledge in these areas.

Finance

A Community Orchard Fund has been set up within the Bloomington Tree Fund. Donations for a Community Orchard at Winslow Woods can be made to this fund.

Funds can be spent on anything that directly or indirectly supports the Community Orchard Goal. Expenditures should be approved by the board or its delegates.

Sources for Technical Advice

North Dakota State University Extension Service

The North Dakota State University (NDSU) Extension Service offers numerous resources to assist community orchards:

NDSU publications on managing fruit crops provide science-based, nonbiased information for orchards in our state.

The Master Gardener program can be a valuable source of technical advice and volunteer labor.

The Junior Master Gardener Program has resources to incorporate a youth education component to a community orchard.

The *NDSU Crop and Pest Report* provides regular updates on emerging pests and other issues related to fruit and other crops. The latest report is available at www.ag.ndsu.nodak.edu/aginfo/entomology/ndsucpr/.

Several NDSU regional Research Extension Centers conduct research on fruit crops and have demonstration plantings available for viewing. The center in Carrington has an extensive collection of fruits (especially small fruits), and the vineyard in Williston is well established.

These and additional resources from North Dakota State University can be accessed through local county educators and regional horticulture educators. Local NDSU Extension offices are listed online and in the government section of local phone books. Go to ag.ndsu.edu/extension/ for more information on the publications and programs offered by the university.

Other

The North Dakota Grape Growers Association is an active supporter of fruit production in the state. It has an impressive network of growers who can provide technical assistance and conduct educational meetings on a regular basis. They can be contacted at www.ndgga.org.

The Natural Resources Conservation Service offers assistance to community programs and individual growers who foster productive lands and healthy ecosystems.

Sustainable Agriculture Research and Education (SARE) offers grants and outreach programs to farmers and educators to advance sustainable farming systems.

Local city or county foresters are valuable resources.

Staffs at local garden centers and nurseries have experience in local gardening practices and pests.



Literature Cited

- American Community Gardening Association. 2011. Starting a community garden. www.communitygarden.org/learn/starting-a-community-garden.php.
- CDC (Centers for Disease Control and Prevention). 2009. State Indicator Report on Fruits and Vegetables, 2009: North Dakota Action Guide. Department of Health and Human Services. Washington D.C.
- Common Ground. 2011. Apple Day: Community orchards. www.commonground.org.uk/appleday/a-corc.html.
- Communities Take Root. 2011. Renewal is taking root. www.communitiestakeroot.com/Grow/.
- Eames-Sheavly, M., M.Pritts, et al. 2010. Cornell Guide to Growing Fruit at Home. Cornell Cooperative Extension. Ithaca, N.Y.
- Gough, R.E. 2007. Juneberries for Montana Gardens. Montana State University Extension. Bozeman, Mont.
- Hoover, E. and M. Zins. 2011. Fruits for Minnesota. University of Minnesota Extension. St.Paul, Minn.
- Roper, T.R. 2001. Rootstocks for Fruit Trees in Wisconsin. University of Wisconsin-Extension. Madison, Wis.
- Roper, T.R. and G.G. Frank. 2004. Planning and Establishing Commercial Apple Orchards in Wisconsin. University of Wisconsin-Extension. Madison, Wis.
- Roper, T.R., D.L. Mahr, and P.S. McManus. 2006. Growing Apples in Wisconsin. University of Wisconsin-Extension. Madison, Wis.
- Smith, B.R., D.L. Mahr, P.S. McManus, and T.R. Roper. 2007. Growing Raspberries in Wisconsin. University of Wisconsin-Extension. Madison, Wis.
- Smith, B.R. and T.R. Roper. 2005. Home Fruit Cultivars for Northern Wisconsin. University of Wisconsin-Extension. Madison, Wis.
- USDA (United States Department of Agriculture). 2009. 2007 Census of Agriculture Report. North Dakota State and County Data. Washington D.C.
- USDA (United States Department of Agriculture). 2011. North Dakota USDA Hardiness Zone Map. As shown at www.growit.com/bin/USDAZoneMaps.exe?MyState=ND.

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