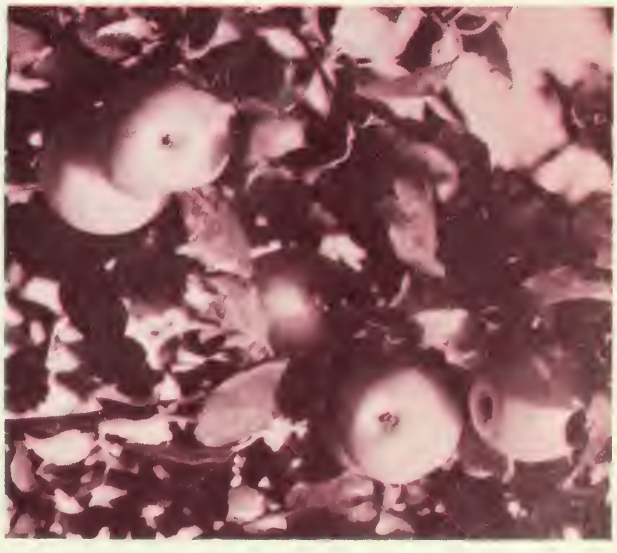
# Tree fruits for the Prairie Provinces

Agriculture Canada

Publication 1672/E





Canada

CONVERSION FACTORS

| Metric units | Approximate conversion factors | Results in: |
|---|---|---|
| LINEAR | | |
| millimetre (mm) | x 0.04 | inch |
| centimetre (cm) | x 0.39 | inch |
| metre (m) | x 3.28 | feet |
| kilometre (km) | x 0.62 | mile |
| AREA | | |
| square centimetre ($cm^2$) | x 0.15 | square inch |
| square metre ($m^2$) | x 1.2 | square yard |
| square kilometre ($km^2$) | x 0.39 | square mile |
| hectare (ha) | x 2.5 | acres |
| VOLUME | | |
| cubic centimetre ($cm^3$) | x 0.06 | cubic inch |
| cubic metre ($m^3$) | x 35.31 | cubic feet |
| | x 1.31 | cubic yard |
| CAPACITY | | |
| litre (L) | x 0.035 | cubic feet |
| hectolitre (hL) | x 22 | gallons |
| | x 2,5 | bushels |
| WEIGHT | | |
| gram (g) | x 0.04 | oz avdp |
| kilogram (kg) | x 2.2 | lb avdp |
| tonne (t) | x 1.1 | short ton |
| AGRICULTURAL | | |
| litres per hectare (L/ha) | x 0.089 | gallons per acre |
| | x 0.357 | quarts per acre |
| | x 0.71 | pints per acre |
| millilitres per hectare (mL/ha) | x 0.014 | fl. oz per acre |
| tonnes per hectare (t/ha) | x 0.45 | tons per acre |
| kilograms per hectare (kg/ha) | x 0.89 | lb per acre |
| grams per hectare (g/ha) | x 0.014 | oz avdp per acre |
| plants per hectare (plants/ha) | x 0.405 | plants per acre |

**PUBLICATION 1672E,** available from Communications Branch, Agriculture Canada, Ottawa K1A 0C7.


Cat. No. A53—1672/1982E ISBN: 0-662-11923-1
Revised 1982 Reprinted 1983 5M—9:83

Aussi disponible en français.

This publication replaces Publication 1222, *Tree Fruits for the Prairies*, by J.W. Morrison, W.A. Cumming and H.J. Temmerman.

# Contents

# Tree fruits for the Prairie Provinces

W. G. Ronald and H. J. Temmerman
Research Station, Morden, Manitoba

## Summary

The rigorous climate is a limiting factor when you try to grow tree fruits on the prairies. You may increase your chances of success by.

- choosing the best site possible
- growing hardy cultivars recommended for your area
- taking special care in planting the trees
- providing shelter and irrigation
- following a suitable program of pruning, spraying, and cultivation
- protecting young trees against mice and rabbits.

Under the best conditions the hardy crab apples, applecrabs, apples, and plums yield well in the farming areas of the prairies. Enthusiastic growers may plant hardy apricots, sour cherries, and pears for trial.

## Introduction

Growing fruit on the prairies has been a challenge since the days of the prairie settlement. Early explorers and settlers found a variety of native fruit, including high bush-cranberries, plums, saskatoons, and small-fruited cherries. The lack of native apples, apricots, pears, and improved cherries and plums stimulated the first breeding work, which has given rise to the newer adapted cultivars listed in this publication. Hardy plant introductions, mostly from northeast Asia, have provided the basis for many of these developments in hardy prairie tree fruits.

The prairie orchards on research stations, universities, and farms demonstrate that with good management fruit crops of high quality can be grown. A key ingredient for success is the use of the best adapted cultivars for the particular locality. Irrigation, shelterbelts, and other good management practices help to improve the natural conditions in the area.

## Weather

The climate of the Prairie Provinces is generally semiarid with long, cold winters and short, warm summers. The main limitations on growing tree fruits are scanty rainfall, extremes of temperature, strong winds in all seasons, and a short frost-free period.

Sunshine is more than adequate. It is an advantage in summer because it ripens and colors fruit. In winter sunshine often causes exposed tree trunks to sunscald and blister. The dehydration and freezing that ensues destroys plant tissue. Cracks in the bark formed by such damage increase the chances of invasion by summer disease organisms that may kill the trees.

Hail may damage growing fruits in July and August. When severe, it causes bruises, scars, and blemishes that spoil the appearance and lower the quality of the fruits.

Southern Alberta has a special weather problem. In winter, chinook winds cause rapid changes in temperature. The alternate freezing and thawing kills trees. In early spring, when the trees are no longer dormant, the chinooks cause buds to swell and begin new growth. Later frost may kill them.

Prairie weather has some advantages. Diseases are not usually serious because the low humidity reduces the growth and spread of harmful fungi. There are few insect pests because of the cold winter.

### Rainfall

Lack of rainfall need not limit fruit production. When drought threatens, irrigation can save young trees and prevent damage to older ones. It is important to provide water when establishing the trees. Tap water is satisfactory, but many farmers now have dugouts for impounding water.

A total of 50 cm of water annually is needed to grow an apple crop, and few areas of the prairies receive this much from rain and snow. Some parts of Manitoba receive about 50 cm, but in most of the prairies the total is 40 cm or less. However, the rains usually come in May, June, and July and provide up to 25 cm of water when it is most needed. Fruit trees may grow and do moderately well without irrigation, but providing water increases the yields.

### Temperature

Fruit trees can withstand high summer temperatures providing they have sufficient water. Low temperatures seriously limit their growth. Winterkilling is usually caused by a combination of freezing, drying, and other factors, rather than by low temperatures alone. Late spring frosts, which occur in most years, lower yields by killing blossoms and buds. The safe period for vigorous growth of fruit crops is usually from May 24 to September 7 and averages about 100 days. Sharp fall frosts before the trees are hardened may cause serious injury to the trunk and damage to


FIG. 1. Zones in decreasing order of suitability for growing tree fruits (see text for an explanation).

the tips of branches. Periods of mild temperatures in winter may cause trees to become susceptible to winter damage in subsequent cold periods.

## Wind

Drying winds in all seasons make it impractical to attempt to grow fruit trees without providing shelter. Strong winds in the heat and drought of summer and often in winter increase evaporation and cause trees to dry out. High winds destroy branches and blossoms and in the fall blow fruit from the trees.

## Zones

The Prairie Provinces are divided into zones to help growers choose fruit trees suitable for their locality (Fig. 1). Precipitation, frost-free periods, minimum winter temperatures, and rapid temperature fluctuations are factors in determining zonation areas. Zones are numbered from 1 (most favorable) to 6 (least favorable). Additional subdivisions A to C are used to recognize special climatic or soil features. The natural conditions that delineate the zones may be modified by irrigation, shelterbelts, and urban development. Within each zone, soil conditions may have a wide effect on the suitability of the locality for fruit production.

Zone 1 is the most favorable for growing fruit because of its high precipitation, a long frost-free period, and the presence of natural shelter.

Zone 2 has lower winter temperatures and a shorter frost-free period than Zone 1. Subzones 2A, 2B, and 2C are less favorable than Zone 2

because of drought and rapid winter temperature fluctuations caused by chinook winds. Supplemental moisture and shelter are particularly beneficial in these subzones.

Zone 3 has climatic conditions similar to Zone 2 but is often characterized by less favorable soil conditions. Subzones 3A and 3B are colder and drier than Zone 3.

Zone 4 has moderate precipitation and lower winter temperatures than the preceding zones.

Zone 5 consists of northern areas with short growing seasons and cold winter temperatures. Subzones 5A, 5B, and 5C are less favorable than Zone 5; Subzone 5C is subject to drying chinook winds.

Zone 6 is a northern area or one with a high altitude, where the least favorable conditions are found for growing fruit on the prairies.

## Selecting cultivars

To be successful in growing tree fruits, choose plants with great care.

- Be sure to select cultivars that are hardy in your area. Many cultivars developed on the prairies are adapted to the winters, but those popular in Ontario or British Columbia do not survive.
- Have a second cultivar for pollination.
- Try to choose good-quality cultivars that yield well, but be prepared to sacrifice quality for hardiness when shelter and moisture are limited.

### Hardiness

Hardiness, the ability to withstand low temperatures, is very important. Cultivars that have survived on the prairies for many years are considered hardy. Although they may be damaged by abnormal frosts, they have a good chance of surviving.

Frost can injure trees in several ways; it may damage them partly or kill them completely. Frost kills growing, succulent tissues, and young trees often have their tips killed when the new growth does not harden off before fall frosts.

During winter, frosts may kill tender trees to the snow line. When frosts are abnormally severe and prolonged, they may split the trunks and kill the roots. Alternate freezing and thawing kills roots. After a period of drought, trees with damaged roots are unthrifty and subject to disease in the summer and to further injury the next winter. Flower buds are more tender than leaf buds. They may be killed by low temperatures during the winter, which is a common occurrence with apricots, or by late spring frosts. Although the trees are dormant, they continue to respire a little, and drying by extreme cold or a combination of cold and wind may severely damage or even kill them.

The use of hardy stembuilders and procedures to reduce sunscald are discussed in later sections of this publication.

## Pollination

Fruit trees generally do not set fruit well unless pollinizing trees are provided. For fruit to set, the trees must bloom and the flowers must be fertilized by pollen. Only a few cultivars are self-fertile, that is, capable of fertilizing the ovaries of their own flowers with their own pollen. Most are self-sterile and must have pollen from another cultivar for fertilization to take place. Some are partly self-fertile and set a few fruits, but compatible pollinizers are needed to get good yields.

To ensure adequate supplies of pollen, have at least two appropriate fruit cultivars in blossom at the same time. Pollen from various apples, crab apples, and applecrabs can pollinate other cultivars of this group but not other kinds of fruit such as plums and pears. Similarly, plums and cherry–plums can pollinate one another. The blossoming dates for most commercial apples and crab apples overlap enough for cross-pollination to take place. Native plum selections, related hybrids, and most Japanese-type plums also bloom together. Late-blooming plum cultivars need late-flowering pollinizers and here some sand cherries are useful.

If you live in a district where various cultivars are growing, pollen from your neighbor's trees may be suitable, but remember that pollination is done by insects, mostly bees. Cold weather, rain, and spring winds, common in the prairies, hinder long flights of insects and prevent them from visiting the flowers. Topworking a few branches of bearing trees with scions of a pollinizer can also provide the necessary pollen.

## Cultivars

The listed cultivars have performed well in prairie plantings and are available from commercial nurseries. For information about other cultivars, check your provincial fruit recommendations or inquire at the research stations and the horticulture department of your university. A table summarizing the following recommendations appears at the end of this publication.

### Crab apples, applecrabs, and apples

Many crab apples, applecrabs, and apples are grown on the prairies (Fig. 2). Orchardists and enthusiastic growers of fruit trees have selected worthwhile seedlings and named them; many of these have regional recognition only. Plant breeders have developed many standard apples and crab apples that are now widely grown in the prairies (Fig. 3).

Crab apples are generally less than 5 cm in diameter. They vary in flavor, taste, and use. Some are suitable for jelly, others for canning and freezing, and still others as small dessert apples. Crossing crab apples and standard apples has produced useful hybrids called applecrabs. They are large crab apples that taste like apples.

**Crab apples** Dolgo (Russian parentage): Fruit ripe in early September, about 3 cm, an attractive bright red; excellent for jelly. Tree useful as an ornamental, very hardy. Cultivar developed at the Experiment Station, Brookings, SD, 1917; recommended for all zones.

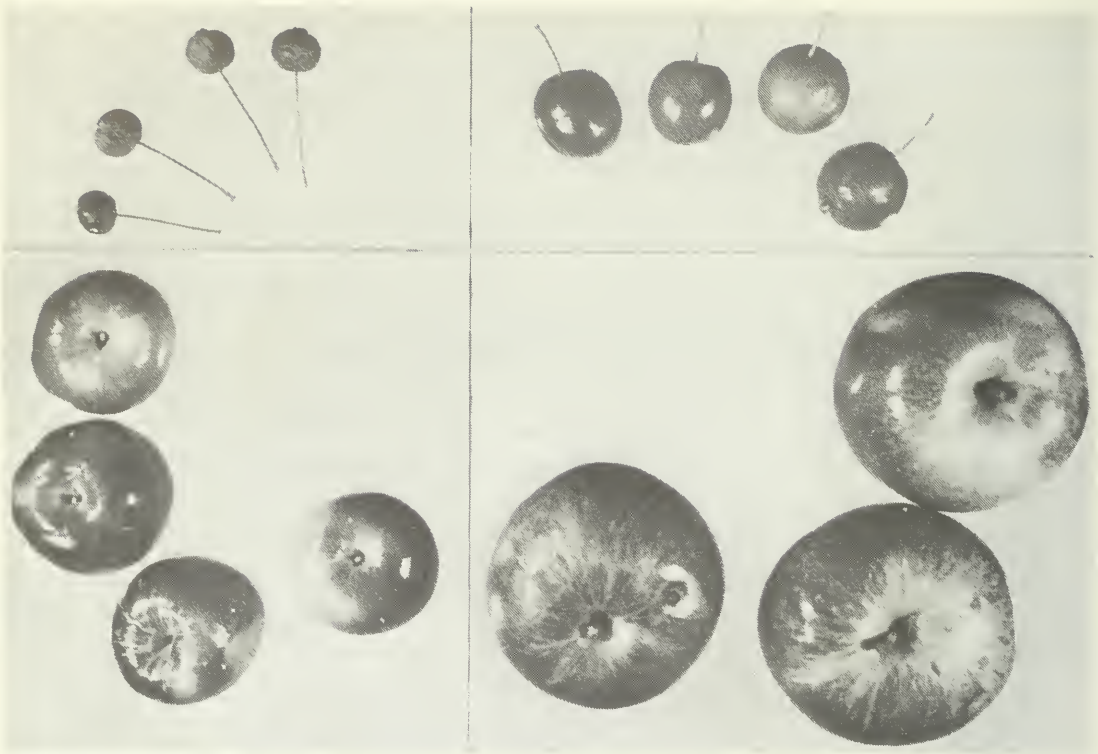


FIG. 2. Cultivars that represent the improvement in size of hardy apples for the prairies. *Upper left: Malus baccata,* Siberian crab apple. *Upper right:* Dolgo, a crab apple, 1917. *Lower left:* Kerr, an applecrab, 1952. *Lower right:* Luke, an apple, 1961.

FIG. 3. Excellent crops of large, good-quality apples can be grown in suitable areas of the prairies. *Above:* Goodland.

**Applecrabs** Chestnut (Malinda seedling): Fruit ripe in early September, about 5 cm, attractive reddish bronze, excellent for eating and as a spiced apple. Cultivar developed at the Fruit Breeding Station, University of Minnesota, 1946; recommended for trial.

Dawn (Columbia × Melba): Fruit ripe in early August, about 4.5 cm, light crimson, good for eating and cooking. Cultivar developed at the University of Saskatchewan, 1959; recommended for Saskatchewan.

Kerr (Dolgo × Haralson): Fruit ripe in late September, about 4.5 cm, attractive solid dark purple red, good for eating and as jelly, excellent for canning, good for keeping. Cultivar developed at the Experimental Farm, Morden, Man., 1952; recommended for all provinces.

Renown (Repka Kislaga seedling): Fruit ripe in early September, about 3.5 cm, yellow splashed with red, good for eating. Cultivar developed at the Experimental Farm, Indian Head, Sask., 1936; recommended for nothern zones.

Rescue (Blushed Calville seedling): Fruit ripe in late August, about 3.5 cm, almost solid dull red over yellow, good for eating but goes mealy quickly. Cultivar developed at the Experimental Farm, Scott, Sask., 1936; recommended for all provinces.

Shafer (Rescue × Trail): Fruit ripe in early September, about 4.5 cm, yellow, blushed with red; flesh yellow, tender and slightly coarse, sweet and pleasant for eating, good in quality. Cultivar discovered by W. Shafer, Poplar Point, Man.; introduced by the Research Station, Morden, Man., 1963; recommended for trial.

Trail (Northern Queen × Rideau): Fruit ripe in late August, abc 3.7 cm, pale yellow, splashed and striped with orange red, good for eating. Cultivar developed at the Central Experimental Farm, Ottawa, Ont., 1913; recommended for favorable zones in all provinces.

**Apples** Battleford (Russian apple seedling): Fruit ripe in mid-September, 6–7.5 cm, striped and mottled red over pale yellow; fair for cooking. Cultivar discovered by W. Somerville, North Battleford, Sask.; introduced by Boughen Nursery, Valley River, Man., 1934; recommended for all provinces.

Breakey (Blushed Calville seedling): Fruit ripe in early September, 5–6.5 cm, striped bright red over yellowish green, excellent for eating, good for cooking. Cultivar developed at the Experimental Farm, Morden, Man., 1935; recommended for all provinces.

Carroll (Moscow Pear × Melba): Fruit ripe in early September, 6–7.5 cm, mottled and streaked bright red over creamy green, excellent for eating, good for sauce. Cultivar developed at the Experimental Farm, Morden, Man., 1961; recommended for trial in favorable zones in all provinces.

Collet (parentage unknown): Fruit ripe in late September, 6–7.5 cm, medium red over creamy green, good for eating, excellent for cooking. Cultivar discovered by V. Collet, Notre Dame de Lourdes, Man.; introduced by the Experimental Farm, Morden, Man., 1961; recommended for favorable zones in all provinces.

Godfrey (Patten seedling): Fruit ripe in mid-October, 5–6.5 cm, splashed bright red over pale green, fair for eating, good for cooking, good for storing. Cultivar developed at the Experimental Farm, Morden, Man., 1931; recommended for trial in favorable zones.

Goodland (Patten Greening seedling): Fruit ripe in mid-September, 6–8 cm, washed red over creamy green, excellent for eating and cooking, good for storing. Cultivar developed at the Experimental Farm, Morden, Man., 1955; recommended for all provinces.

Haralson (Malinda seedling): Fruit ripe in mid-October, 6–7.5 cm, greenish yellow almost completely overlaid with red, fair for eating and cooking, excellent for storing. Cultivar developed at the Fruit Breeding Station, University of Minnesota, 1922; recommended for favorable zones in all provinces.

Harcourt (parentage unknown): Fruit ripe in late August, 5 cm, blushed bright red, mild, with pleasant flavor. Cultivar developed at the University of Alberta, 1955; recommended for Alberta.

Heyer 12 (Russian apple seedling): Fruit ripe in late August, 5–6 cm, straw-colored, good for pies and sauce but breaking down quickly after ripening. Tree suitable for dry areas, extremely hardy. Cultivar developed by A. Heyer, Neville, Sask.; recommended for all provinces.

Luke (parentage unknown): Fruit ripe in early October, 7.5–9 cm, mottled dark red over green, fair for eating, good for cooking, good for storing. Cultivar discovered by J. Luke, Rosthern, Sask.; introduced by the Experimental Farm, Morden, Man., 1961; recommended for favorable zones in all provinces.

Miami (Anisim seedling): Fruit ripe in mid-September; 5–6.5 cm, creamy green well-washed with red, good for eating, fair for cooking. Cultivar developed at the Experimental Farm, Morden, Man., 1959; recommended for favorable zones in all provinces.

Norland (Rescue × Melba): Fruit ripe in mid-August, 6–7 cm, greenish yellow striped with heavy dark overlay, good for eating and cooking, good for storing. Cultivar selected at the Experimental Farm, Scott, Sask.; introduced by the Prairie Fruit Breeding Cooperative, 1979; extremely hardy, recommended for all provinces.

Parkland (Rescue × Melba): Fruit ripe in mid-August, 6–7 cm, greenish yellow with light red overlay, good for eating and cooking, good for storing. Cultivar selected at the Research Station, Lacombe, Alta.; introduced by the Prairie Fruit Breeding Cooperative, 1979; hardy, recommended for all provinces.

Patterson (Columbia × Melba): Fruit ripe in late August, about 6 cm, blushed red over greenish yellow, excellent for eating, good for storing. Cultivar developed at the University of Saskatchewan, 1960; recommended for Saskatchewan.

Unity (parentage unknown): Fruit ripe in early September, 6–7.5 cm, striped red over creamy yellow, fair for eating, good for cooking. Cultivar discovered by Elder Jack, Adanac, Sask.; introduced by John Lloyd, Unity, Sask.; recommended for northern zones.

Westland (Heyer 12 × Dr. Bill): Fruit ripe in late August, 7–8 cm, greenish yellow with medium red overlay, fair for eating, good for cooking, fair for storing. Cultivar selected at the Horticultural Research Centre, Brooks, Alta.; introduced by the Prairie Fruit Breeding Cooperative, 1979; extremely hardy, recommended for all provinces.

Plums, cherry–plum hybrids, and sand cherries

The plums that can be grown on the prairies originated in several ways. Some were selected from native wild plums. Other hardy cultivars were selected from the Japanese plum introduced from Manchuria. Several are hybrids that have the good quality of the Japanese plum and the hardiness of the native Canadian or American plum (Fig. 4).

Hybrids between these plums and the low-growing sand cherry have larger, sweeter, and better-flavored fruit than the true sand cherry but are not so hardy. They are called cherry–plum hybrids.

FIG. 4. Hardy plums yield well. *Above:* Pembina.

When selecting plum cultivars, consider all the factors in relation to your area. Trees that lack somewhat in hardiness yield well in most years.

**Plums and plum hybrids** Bounty (Assiniboine seedling): Fruit ripe in late August, about 3.5 cm, dark red; flesh orange yellow, good for canning. Cultivar very hardy, developed at the Experimental Farm, Morden, Man., 1939.

Dandy (Assiniboine seedling): Fruit ripe in late August, about 2.5 cm, yellow, blushed bright red; flesh yellow, good for canning. Cultivar very hardy, developed by Boughen Nursery, Valley River, Man., 1934.

Elite (parentage unknown): Fruit ripe in late August, about 4 cm, dark red. Cultivar introduced by the University of Saskatchewan, 1960.

Grenville (Burbank × *Prunus nigra*): Fruit ripe in late August, about 5 cm, dark scarlet; flesh golden, good for eating. Cultivar developed at the Central Experimental Farm, Ottawa, Ont., 1932.

Norther (Assiniboine seedling): Fruit ripe in early August, about 3.5 cm, bright red; flesh yellow, fair for eating. Cultivar developed at the Experimental Farm, Morden, Man., 1943.

Patterson's Pride (parentage unknown): Fruit ripe in late August, about 4.5 cm, dark red. Cultivar introduced by the University of Saskatchewan, 1960.

Pembina (*P. nigra* × Red June): Fruit ripe in late August, 4–5 cm, red with heavy bluish bloom; flesh bright yellow, excellent for eating, fair for canning. Cultivar developed at the Experiment Station, Brookings, SD, 1917.

Prairie (parentage unknown): Fruit ripe in late August, about 4.5 cm, dark red, somewhat freestone. Cultivar introduced by the University of Saskatchewan, 1960.

Ptitsin 5, 9, and 10 (*P. salicina*, Manchurian origin): Fruit ripe in early August, 2.5–3.5 cm, greenish yellow; flesh light green, good for jam. Cultivar introduced by the Experimental Farm, Morden, Man., 1939.

Redglow (Burbank × Jewel): Fruit ripe in late September; about 5 cm, rich dark red; flesh yellow, excellent for eating, good as jam or preserves. Cultivar developed at the Fruit Breeding Station, University of Minnesota, 1949.

Tecumseh (Shiro × Surprise): Fruit ripe in mid-August, about 3.5 cm, bright red with bluish bloom; flesh yellow, good for eating. Cultivar developed at the Experiment Station, Brookings, SD, 1918.

**Cherry–plum hybrids** Compass (sand cherry × Minor plum): Fruit ripe in mid-September, about 2.5 cm, dark purple red; flesh yellowish, excellent for jelly, good for canning. Cultivar developed by H. Knudson, Springfield, MN, 1896.

Dura (Sapa seedling): Fruit ripe in late August, lasting on the trees into October, about 3.5 cm, dull green blotched with purple; flesh red, excellent for canning. Cultivar developed at the Experimental Farm, Morden, Man., 1942.

Manor (Sapa seedling): Fruit ripe in early August, 2.5–3 cm, dark purple red; flesh dark red, excellent for canning. Developed at the Experimental Farm, Morden, Man., 1945.

Opata (sand cherry × Gold plum): Fruit ripe in late August, 2.5–3 cm; greenish covered with reddish purple; flesh yellowish green, good for preserves. Cultivar developed at the Experiment Station, Brookings, SD, 1908.

Sapa (sand cherry × Sultan): Fruit ripe in late August, about 2.5 cm, purple with bluish bloom; flesh dark purple, excellent for canning and for jam. Cultivar developed at the Experiment Station, Brookings, SD, 1908.

**Sand cherries** Brooks (selected strain of native sand cherry): Fruit ripe in mid-August, about 2 cm, dark purple; flesh yellowish green, good for jam. Cultivar developed by the Provincial Horticultural Station, Brooks, Alta., 1934.

Manmoor (selected seedling of native sand cherry): Fruit ripe in early August, about 2.0 cm, purple black; flesh greenish, excellent for canning. Cultivar developed at the Experimental Farm, Morden, Man., 1929.

Cherries

Sweet cherries are not hardy enough for the prairies. Some of the Morello-type sour cherries may be grown for trial. The Mongolian or dwarf bush cherry and the Manchu or Nanking cherry are both reasonably hardy and productive (Fig. 5). The fruits are small and rather acid but are suitable for pies and jelly.

FIG. 5. Manchu cherry: *Prunus tomentosa*

Mongolian cherry (selected seedlings of *Prunus fruticosa*): Fruit ripe in late July, up to 1.2 cm, light to dark red, excellent for jelly. Bush producing many suckers and an abundant crop.

Manchu cherry (*P. tomentosa*): Fruit ripe in late July to mid-August, about 1.2 cm, white to currant red; flesh creamy to pink, fair for jelly.

## Apricots

Only hardy forms of the Siberian and Manchurian apricots and hybrids from these are successful. Even with these types the flower buds are often damaged by intense cold or are induced to develop prematurely in warm periods in early spring only to be killed by late frosts. Good crops of apricots (Fig. 6) have been grown at Morden, Man.; Brooks, Alta.; and Saskatoon, Sask.

M 604 (Scout × McClure): Fruit ripe in early August, 4–5 cm, golden yellow, becoming darker and reddish, good for eating and cooking. Cultivar developed at the Experimental Farm, Morden, Man., 1946.

Scout (Manchurian apricot seedling): Fruit ripe in early August, about 4 cm, bronze gold, blushed with red, good for canning and jam, fair for eating. Cultivar developed at the Experimental Farm, Morden, Man., 1937.

FIG. 6. A branch of Scout apricot with a heavy crop of fruit.

## Pears

Strains of Manchurian and Siberian pears are hardy enough for the prairies, but most have fruits that are small, gritty, and useful only for canning. Some have fruits that are palatable when fully ripe. The new cultivars that have been developed by hybridization with *Pyrus communis* have better quality.

Golden Spice (parentage unknown): Fruit ripe in mid to late September, about 5 cm, medium yellow, lightly blushed with dull red, good for canning and for spicing, fair for eating. Cultivar developed at the Fruit Breeding Station, University of Minnesota, 1949.

John (Aspa × Siberian pear): Fruit ripe in late September, about 7.5 cm, greenish yellow, fair in quality. Cultivar developed at the University of Saskatchewan, 1960.

Pioneer 3 (Jargonelle seedling): Fruit ripe in late September, about 5 cm, greenish yellow, blushed with dull red, good for canning. Cultivar developed by A. L. Young, Brooks, Alta., 1936.

Tait Dropmore (Patten pear seedling): Fruit ripe in mid-September, about 4 cm, greenish yellow, blushed with dull crimson, good for sauce. Cultivar developed at Skinner's Nursery, Dropmore, Man.

Ure (Tait Dropmore × (Beierschmitt × Bartlett)): Fruit ripe in mid-September, about 5 cm, greenish yellow, good for eating and canning. Cultivar developed at the Research Station, Morden, Man., 1978.

## Saskatoons

Saskatoons are a native crop throughout the prairies and plentiful supplies were once harvested from native stands. Interest in cultivated plantings has been stimulated by the loss of native habitats and by the increasingly common crop failure of native plants. The Research Station at Beaverlodge, Alta., has been instrumental in publicizing the value of saskatoons and improving the quality of cultivars. Generally, hardiness is not a limiting factor in saskatoon production; cultivars developed in Saskatchewan and Alberta should do well in all areas of the prairies. In addition to the three cultivars described below, Parkhill, Success, and Thiessen are worthy of trial.

Honeywood (*Amelanchier alnifolia* seedling): Bush productive, large-fruited; fruit pleasant-tasting, borne in clusters of up to 15 berries. Cultivar developed from northern Saskatchewan seedlings by Honeywood Nursery, Parkside, Sask.; introduced by Lakeshore Tree Farms Ltd., Saskatoon, Sask., 1973.

Pembina (*A. alnifolia* seedling): Fruit quality superior in taste and size compared with native plants. Cultivar developed from northern Alberta seedlings by Beaverlodge Nursery, Beaverlodge, Alta., 1932.

Smoky (*A. alnifolia* seedling): Plant productive; fruit large, with a flavor nearly as good as Pembina. Cultivar developed from northern Alberta seedlings; introduced by the Research Station, Beaverlodge, Alta., 1956.

## Establishing the trees

### Choosing a site

It is extremely important to have a suitable site for an orchard (Fig. 7). The following factors are the most important: soil, air drainage, slope of land, exposure, nearness to the house, accessibility of water, and provision for a windbreak.

Fruit trees can grow on many kinds of soil but do best on fertile, well-drained soil. Avoid low spots and areas with alkali. Soil that has grown good crops of cereals or has been used as a garden is suitable. When in doubt, have a sample of your soil analyzed at a soil-testing laboratory in your province.

Air needs to drain away from the orchard. Do not plant fruit trees in a hollow because cold air drains into low areas and the trees and fruit there are more likely to be damaged by frosts. The sides of a valley are suitable, but the bottom is not.

Level land is better than rolling or sloping land because it is easier to cultivate and is less susceptible to water erosion. Rolling land and steep slopes are hard to irrigate. Sloping land may be used when it faces to the north or northeast because such exposures incur less freezing and thawing in spring. The land stays cool later in spring, which delays the onset of growth and thus minimizes damage to buds by spring frosts. Trees are sunscalded less on north and east slopes.

FIG. 7. A well laid out orchard, 8 years old and starting to bear. It has a protective field shelter and the land between the trees is cultivated.

An orchard near the house is easy to look after and beautifies the landscape. Rabbits are easy to control when you can watch the orchard. A suitable place to locate the orchard is at one end of the garden. A dugout or a reliable well that can be used for irrigation also favors a site near the house, where the water supply is usually located.

In an urban garden you may have little choice of sites, but fruit trees can be part of the ornamental planting. When they are planted near large trees, however, they get too much shade and not enough moisture. Avoid windswept corners. Determine whether the topsoil in your garden consists only of a thin layer covering subsoil excavated from the basement. If so, work well-rotted manure into the soil and follow other practices to improve it. Take special care in planting to place the roots in good topsoil. Do not expect trees to thrive when the soil in which you place them contains lime dumped by house plasterers.

## Shelter

It is impractical to attempt to grow fruit trees unless shelter is provided. In urban areas board fences, hedges, or temporary snow fences can be used. Buildings provide shelter, but don't plant your trees too close to them. On a farm you must plant a windbreak or shelterbelt unless there is a natural shelter of bushes and trees. Besides protecting against desiccation by hot, drying winds in summer and cold winds in winter, the shelterbelts trap snow and provide breeding places for pollinating insects.

FIG. 8. Dense rows of spruce and caragana make an efficient shelter and snow trap to protect the orchard.

By reducing the force of the wind, shelterbelts prevent damage to trees and loss of fruit at harvest.

For best results, plant a row of fast-growing deciduous trees and a row of spruce or pine. The deciduous trees provide temporary shelter in a few years and the evergreens will give greater protection for many years. Plant more than one row of evergreens when you have the space. Space spruce 2.5 m apart in the row and allow 4.5 m between rows. Conifers may be difficult to establish in the dry areas of the prairies, but they provide valuable shelter when they are successful. The best deciduous trees for temporary shelter are caragana, lilac, laurel or sharp leaf willow, and Siberian elm. Rows of corn or sunflowers left standing help to catch snow and protect young trees.

Snowdrifts in the lee of a shelter may be heavy enough to break branches or even the main trunks of the trees. To minimize this hazard, make a snow trap by leaving a wide space between your fruit trees and the windbreak, or plant an additional row of caragana 10 m inside your windbreak (Fig. 8). Rhubarb, asparagus, and other vegetables do exceedingly well in the snow-trap area.

## Time to plant

Plant fruit trees in early spring when they are still dormant. There is less danger of trees drying out in the cool, moist soil. Evaporation is low, growth is slow, and conditions are ideal for establishing the young trees.

## Buying nursery stock

Buy trees of recommended cultivars, preferably from a reputable nursery in your area. It is wise to deal with local firms because they have available the cultivars hardy for your area on hardy rootstocks. Purchase thrifty 1- or 2-year-old trees. Many gardeners purchase trees in the fall and heel them in over the winter to avoid delays in planting in the spring.

To heel in nursery stock, dig a trench about 40 cm deep, with one side sloping at 30 degrees. Place the trees in the trench with the trunks on the slope. Water well and fill in with at least 30 cm of soil. Work fine soil around the roots, tramp well, and place extra soil on the trunks for further protection. Protect the trees against mice and rabbits.

## Spacing

The distance needed between trees depends mainly on the fertility of the soil and the availability of moisture. With wide spacing the trees grow larger and yield better than with narrow spacing. When planting trees in a garden, allow enough space for plenty of air and sunlight to reach them. In orchards, plant apples, crab apples, applecrabs, pears, and apricots at least 7.5 m apart; plum trees 6 m; and cherry–plum hybrids and sour cherries 4.5 m. Give individual saskatoon plants a spacing of 2.0 m between centers; with hedgerows allow 1.5 m within rows and 2.5 m between rows. To avoid competition from large trees and to reduce injury from snowbanks, plant fruit trees at least 12 m from the windbreak.

An easy method for laying out an orchard is to plant trees on the corners of squares or rectangles. Rows, both on the square and on the diagonal, formed in this way make the orchard easy to cultivate and spray.

To estimate the number of trees required per hectare, divide 10 000 by the product of the distance between rows times the distance between trees within a row. For example, for an orchard with trees planted 6 m apart in rows 7.5 m apart, you need $\frac{10\,000}{7.5 \times 6}$, or 222, trees per hectare.

## Planting

Trees bought in the spring must be kept cool and moist until you plant them. Dig the planting hole 60–70 cm square and 45 cm deep or big enough to contain the roots when they are spread out (Fig. 9). Pile the

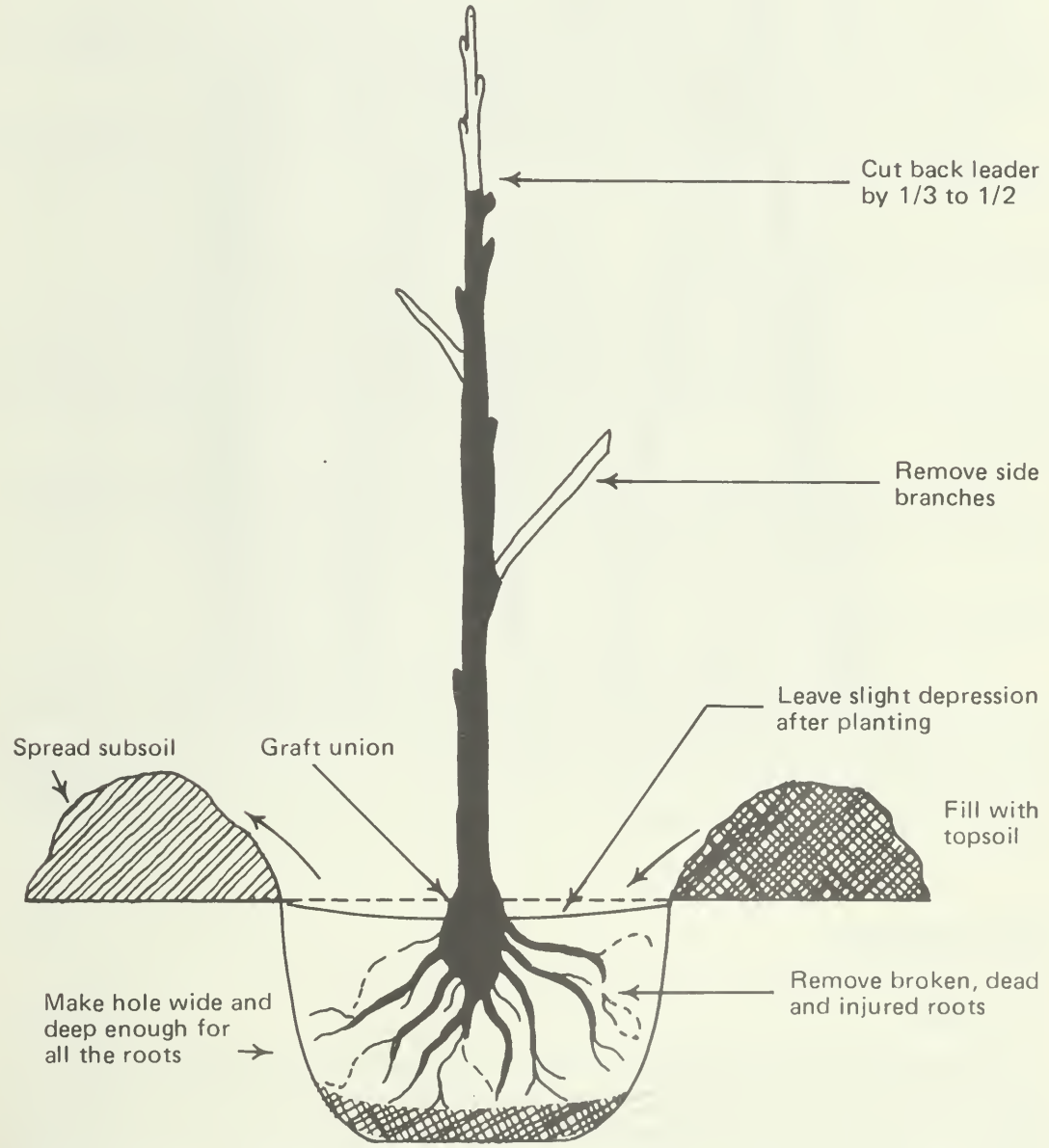



FIG. 9. How to plant a 1-year-old budded apple tree.

fertile topsoil at the side of the hole and spread the subsoil over the field. Place the tree in the hole with the graft union at ground level. Have the strongest root pointing to the west as an anchor against prevailing winds. Fill the hole with fine topsoil and work it in around the roots. Tramp firmly around the tree and leave a shallow depression. Water well and fill the depression with loose soil to form a mulch against evaporation. When you have only a few trees, support them with stakes that can remain for the first few years. Use strips of burlap or rubber to tie the trees to the stakes. Do not use twine because it cuts into the bark.

Prune back the newly planted trees by a third because the root system has been injured and cannot support full growth. When the tree is a 1-year-old whip only slight cutting is necessary, but when the tree is 2 or 3 years old more care is needed because the final shape of the tree depends on this critical pruning. The section on pruning provides more advice on this subject.

Replace the small identification tags with wooden, aluminum, or other permanent labels. Wire wrapped around a branch eventually cuts into the bark and should be changed every year.

A commercial plastic tree guard around the stem of a newly planted tree helps to protect the trunk from rodents and from mechanical and winter damage.

### Planning and records

For an urban garden, you do not need a ground plan for the few trees you plant, but you should record the names of the cultivars and the rootstocks, the ages of the trees, and the year of planting. Label the trees carefully.

For an orchard, make a plan of the site and keep careful records of each tree, noting the row and tree numbers, the plant identity in the rows, and other information suggested for the urban garden.

### Replacing trees

Fruit trees, even with good management, grow old and unproductive. It is wise to plant some new trees every 5 years. This renewal keeps the orchard productive and provides trees of various ages so that some are likely to survive the severest winters. If you are growing crab apples successfully, introduce a tree or two of good-quality apples for trial.

## Management

### Pruning

On the prairies, prune and train to form low-growing trees with strong scaffold branches close to the ground. Prune carefully to help the trees develop strong frameworks, which can bear the load of fruit and resist damage from windstorms or heavy snow. Pruning is also necessary

to remove diseased and dead wood, to get rid of sprouts and suckers, to prevent crowding in the centers of the trees, and to renew old trees.

Repair broken branches or cut out diseased wood at any time of the year, but do the annual pruning in early spring when the trees are dormant. You need a strong pruning knife, a secateur, a pair of loppers, and a pruning saw (Fig. 10). Keep the tools clean and sharp. Make the cuts as clean and neat as you can. Remove branches by cutting them off flush with the trunk. Do not leave stubs that may not heal.

FIG. 10. Pruning tools: choice of saws, a secateur, a pruning knife, and a pair of loppers.

## Apples and pears

After the tree has made 1 year's growth, pruning is important to shape it.

The modified central leader system of pruning is the commonest on the prairies. Select two or three branches as permanent scaffolds, including, when possible, the bottom one on the southwest side to protect the trunk from sunscald. Choose wide-angled branches (Fig. 11) that are

FIG. 11. Crotch angles: *left,* narrow and weak, subject to breakage and crotch injury; *right,* wide and strong.

about 30 cm apart on the trunk; prune out the other branches. Prune back the permanent branches by a half and head back the leader to balance the tree (Fig. 12).

When the tree is 3 years old, or 2 years after planting, choose one or two more main scaffold branches. Aim for five to eight wide-angled main branches. Thin out side branches on the scaffolds and prune side and scaffold branches back to half the previous season's growth. Cut the leader back to promote a low-growing tree (Fig. 13). After this shaping, only corrective pruning such as cutting out sprouts or damaged and ingrowing branches is needed because any heavier pruning delays fruiting.

### Plums and apricots

The modified central leader system is the best one to use. Let the main leader grow freely for 2 or 3 years before pruning it. Then keep it headed back. Choose four to eight wide-angled scaffold branches and remove suckers or weak and broken side branches. Cut back long, vigorous branches. Aim for a symmetrical tree with stout branches.

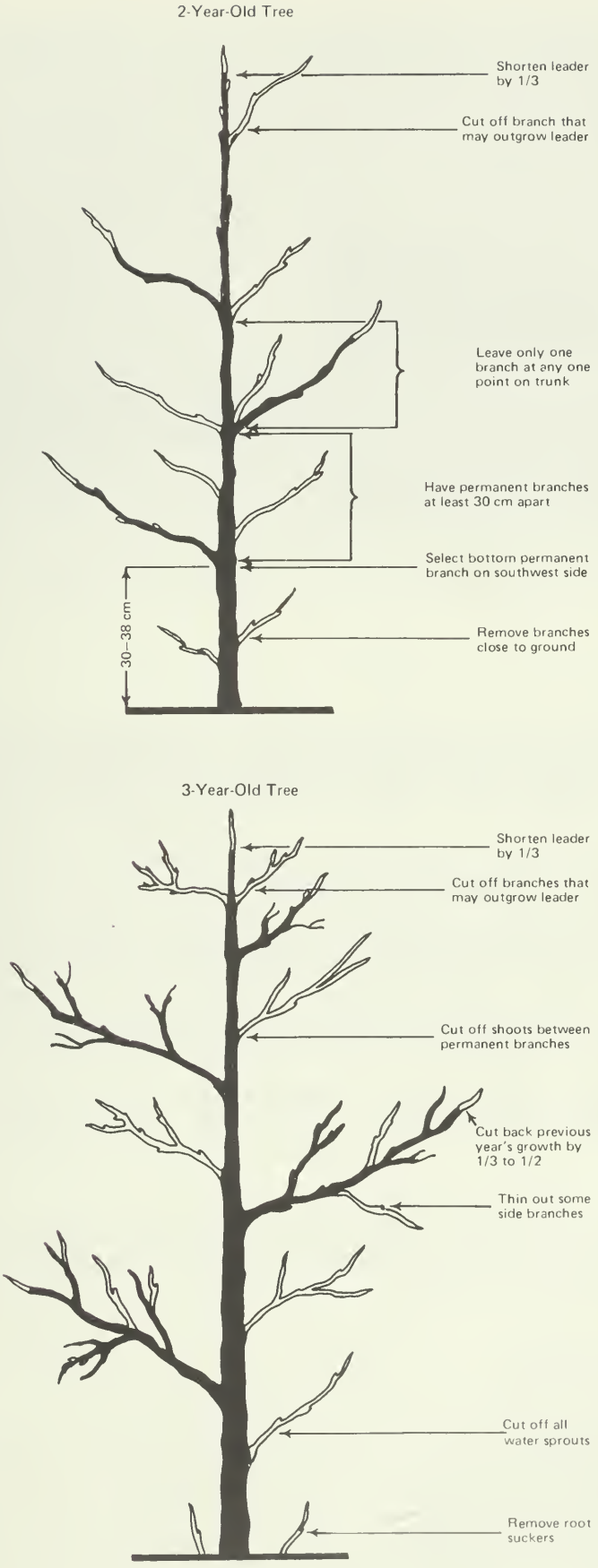



FIG. 12. How to prune young trees.

FIG. 13. Careful pruning results in well-shaped trees. *Left,* a 3-year-old seedling; *right,* the same tree 5 years later. Note the wide crotch angles.

Do not prune plum and apricot trees too severely at one time. Large wounds do not heal easily and the trees respond better to a light pruning from year to year.

### Sand cherry and cherry–plum hybrids

These trees may be pruned more severely than the others because they bear their best fruits on young wood. After they bear for 3 years, cut the wood back close to the ground to promote the growth of new, strong whips. Heavy pruning keeps the bushes low and decreases the danger of winter injury.

Do not allow cherry–plum hybrids to grow into upright trees; keep them as bushes.

### Saskatoons

Young plants require little pruning other than to shape them into a desired form. Older plants can be extensively thinned or cut back to promote new growth.

## Treating wounds

Large untreated wounds, over 2.5 cm across, may allow rotting organisms access to the tree. Small clean cuts heal rapidly without a wound dressing. For covering large wounds, asphalt–water emulsions are available commercially. Other suitable dressings are: white lead and linseed oil mixed as a thick paste, shellac, melted paraffin, and grafting wax. Treat injuries caused by hail or high winds immediately.

## Propagating

Because flowers on fruit trees are cross-pollinated, seedlings grown from seed do not have the same characteristics as the parent. To propagate a particular cultivar, vegetative propagation by budding or scion grafting is necessary. Scions or buds of several cultivars placed on one tree develop into branches that are true to type.

Budding is the most popular propagation method among nurserymen who produce trees for sale. It is also used to topwork main stems or branches of young trees. Scion grafting is normally used in topworking older trees. It is a convenient method for rebuilding or rejuvenating an old tree, or changing one to a better cultivar. Scions may also be bridge grafted to repair damaged trees such as those girdled by mice or rabbits.

For a successful graft, the growing regions of the two parts must be brought together and held firmly in place until they unite and grow as one. The growing region, known as the cambium, is just under the bark. Make appropriate cuts through the bark to bring the cambiums of the bud or scion and the host together. The following procedures (Fig. 14) are the most common.

### Budding

Budding is the placing of a single dormant bud and its surrounding bark on the cambium of a different stock. The shield or T-budding method is the most popular.

Budding is done in late July and early August with budwood cut from the current season's growth. At the base of each leaf on these terminal shoots is a dormant bud. To prepare for budding, trim off the leaves and leave about 1.0 cm of each petiole to use as a handle. Be sure to keep the bud sticks moist.

To start the budding operation, make a T-shaped cut at the selected place on the branch so that the top of the T and the downstroke are about 2 cm long. Make both cuts through the bark to the wood but not into it. With a twist of the budding knife where the two cuts meet, lift the corners of the bark to form a V-shaped opening.

Cut a bud from the bud stick by taking about 3 cm of bark with the bud and as little wood as possible. Insert the bud in the T-shaped cut and push it into place. Cut off the bark on the bud above the T to allow the bud to fit closely to the stock. Then wrap the bud with rubber strips or raffia to hold it tightly against the stock until the union takes place. Rubber strips keep a constant pressure, expand with the stock as it grows, and eventually rot. Raffia must be removed after a month. Usually the bud has united with the stock at the end of 2 weeks. The petiole drops off and the bud remains dormant for the rest of the season. The next spring it grows.

When you bud a seedling rootstock, cut off the stock 5 cm above the bud the following spring. When a bud has been used for topworking, remove the branch above the bud and other close buds that may weaken its growth.

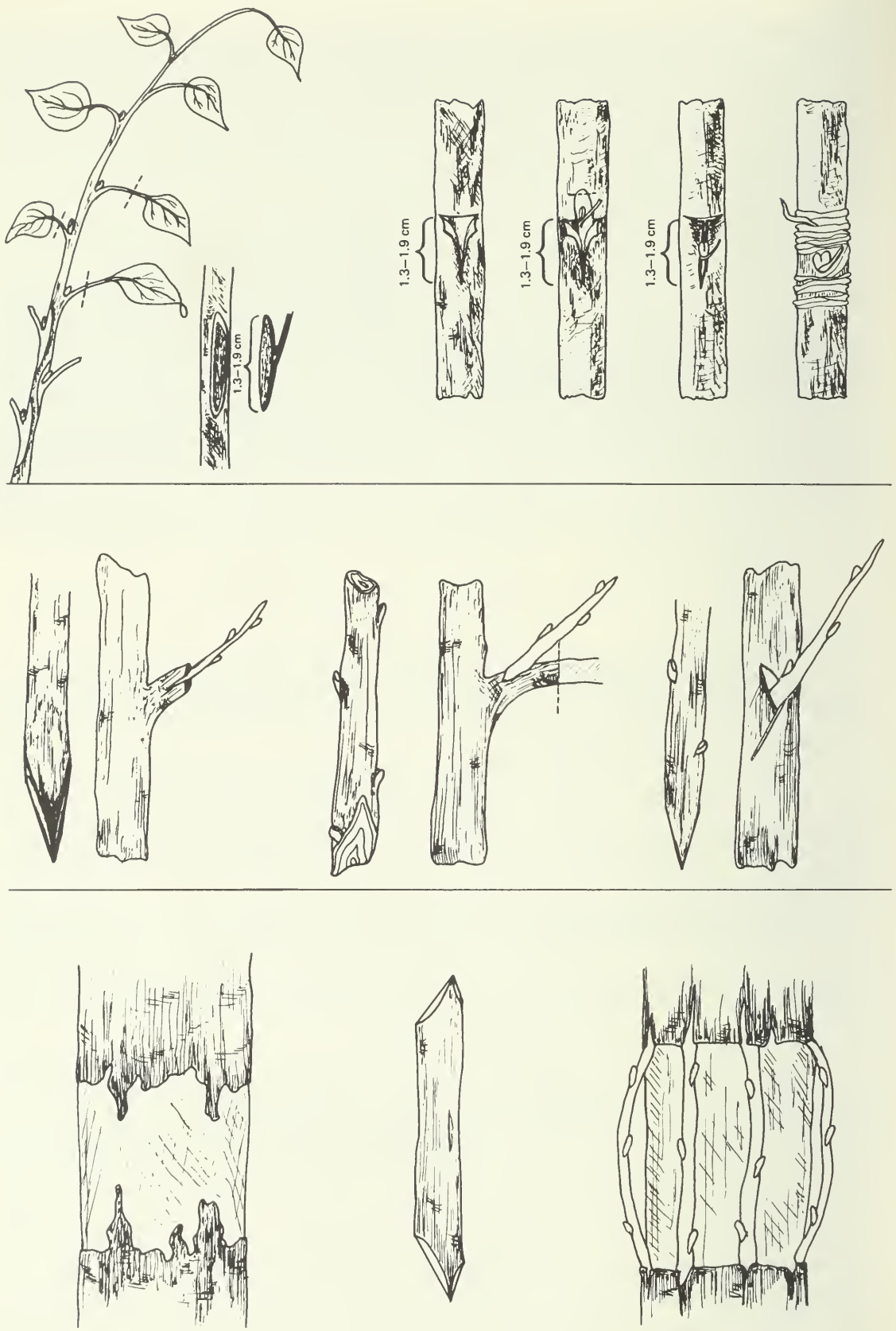



FIG. 14. Budding, scion grafting, and bridging. *Top*, steps in budding, from the bud stick to the wrapped bud. *Middle, left to right*, cleft graft, stub graft, and inverted L graft. *Bottom*, bridge grafting to repair damage by mice or rabbits.

### Scion grafting

In scion grafting the cambium layers of the scion and the host must be brought together and held there until they unite. Scions, or pieces of last year's growth with 6 to 10 buds, are cut in the winter when the trees are dormant. Grafting is usually done in the spring when growth starts and the sap is running.

The method commonly used is cleft grafting. Carefully select the branches to be topworked so that the grafts are well distributed throughout the tree; cut the branches off square. Make a cleft in the stub end of each branch and insert the scion so that the cambium layers meet. Remember to taper the end of the scion and provide as much surface as possible for union of the growing parts. Coat the graft with wax.

Bridge grafting is a special technique for grafting scions, used to repair trees girdled by mice or rabbits or damaged during careless cultivation. Scions are placed in the bark to bridge the gap and provide a way for the sap to flow. To restore a tree satisfactorily requires skilled grafting so you may wish to seek advice before attempting it.

### Grafting waxes

Many kinds of grafting waxes are commercially available. When you cannot buy one in your area, the ordinary paraffin wax used for sealing jams and jellies provides some protection.

## Stembuilders

The trunk and main branches of a fruit tree are the parts most susceptible to frost damage. Studies at the Research Station at Morden showed that most injury to the trunk and main branches can be avoided by a method of training and budding known as stembuilding. This method involves budding a desirable apple on the frame of a very hardy crab apple. Select wide-angled branches on the stembuilder that are about 30 cm apart and spaced uniformly around the main trunk. Narrow-angled branches are removed because they are subject to winter injury and breakage under heavy loads of fruit. All branches that reach 1 cm in diameter can be budded in August. General instructions for budding are given in the section on propagating. In this particular technique, however, the bud is placed on the top side of the branch about 15–20 cm from the main trunk. Try to choose the first bottom branch at least 35–45 cm above ground level and on the southwest side of the trunk to prevent sunscald. Five to seven wide-angled, topworked branches, including the leader, are needed to finish the complete budding in 3 years (Fig. 15). Only normal pruning and the removal of suckers is then necessary. A mature stembuilder trunk of the crab apple cultivar Nertchinsk is shown in Fig. 16.

From the results obtained at the Station, the following cultivars are recommended as hardy stembuilders.

Anaros (Antonovka seedling): No injury occurred on the frame or on topworked apple branches after the 1966 and 1967 test winters, and trees

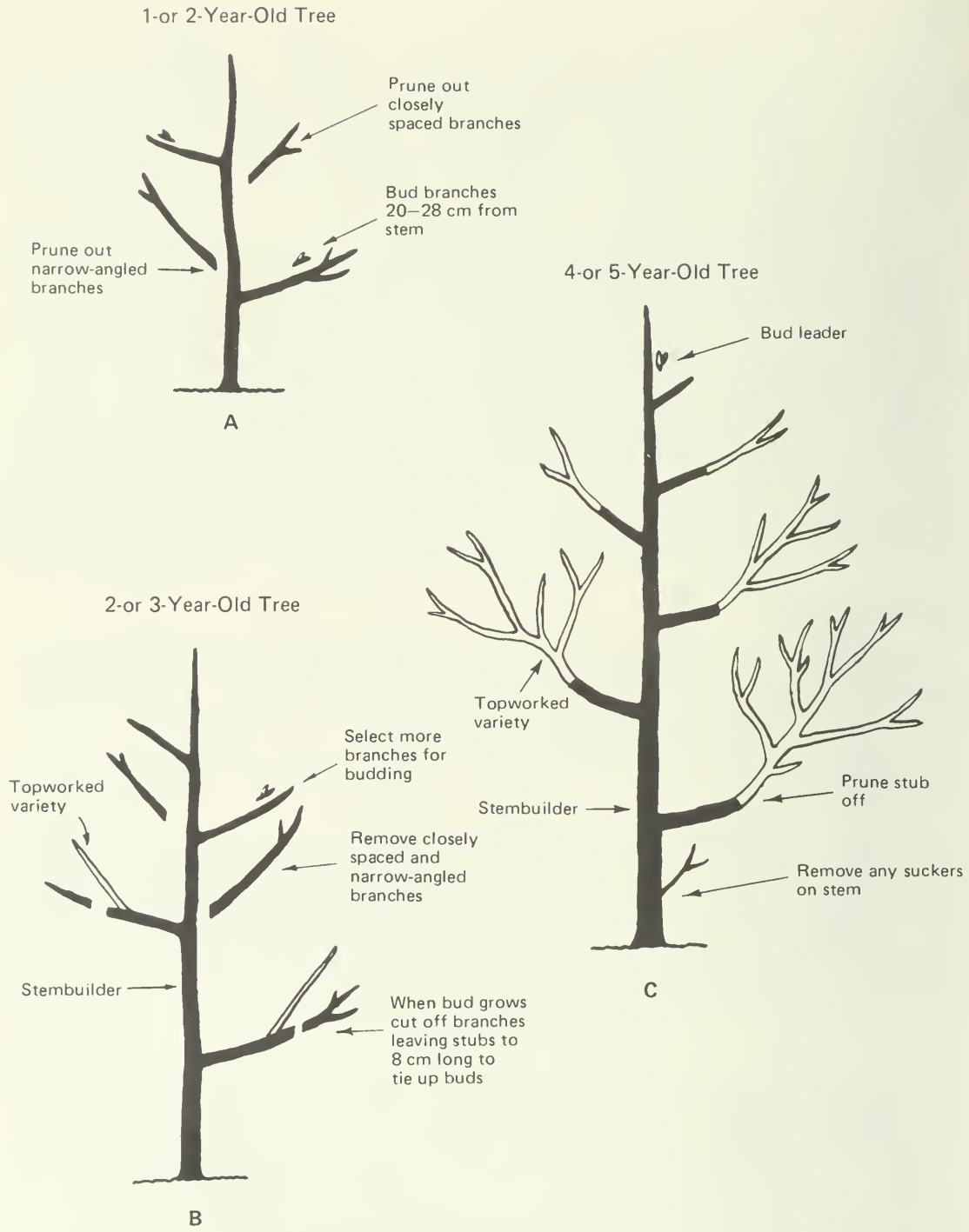



FIG. 15. Using a stembuilder to develop hardy trees of good-quality apples.

on this framework have produced the highest yield of fruit to date. This cultivar has been used in Ontario and Quebec. Limb breakage under heavy loads of fruit can be reduced by choosing wide-angled branches for topworking. This stembuilder is a vigorous stock.

Kerr (Dolgo × Haralson): This applecrab produces wide-angled branches and is a promising choice as a hardy semivigorous stembuilder for topworking.

FIG. 16. Stembuilder trunk of Nertchinsk with proper placement of branches.

Nertchinsk (*Malus baccata*): This dwarf selection of Siberian crab apple was collected in Manchuria. Used as a stembuilder, it dwarfs the topworked apples and produces low-headed trees that are less likely to be winter injured. They are easier to spray and pick than the standard-sized trees. The trees are hardy and productive. This stembuilder has proven compatible with all apples topworked.

## Cultivation

Cultivating regularly is desirable in prairie orchards because moisture is usually low. Cultivation conserves moisture by killing weeds. It also maintains good aeration and stimulates the activity of the soil organisms. It destroys some insect pests by exposing the pupae.

In wet years, it is best to stop cultivation by the end of July to allow growth to slow down and the trees to harden for winter. Because rainfall

is generally low in August, however, it may be practical to cultivate lightly until September to conserve moisture.

Shallow cultivation is important. Cultivate only 5–8 cm deep so that you don't injure the roots near the surface. Use machinery with care to prevent damage to the trees. A hoe or shovel is useful in an urban garden, but be sure to cultivate shallow and often.

## Irrigation

Water trees during the growing period when the weather is dry. Growth begins in May and reaches its peak in July when the fruit is developing. It is particularly important to keep the trees growing vigorously when the fruit is filling and the buds for the next year's crop are being formed.

Water sparingly from August to October to allow the trees to harden for the winter. A good watering after the leaves drop is sometimes necessary to prevent the trees from drying out in the winter. Because trees are not surface feeders, soak the ground under them thoroughly with each watering. Water newly planted trees carefully until they are established.

## Fertilizers

Most garden soils are fertile and have a balanced supply of nutrients, but sometimes the soil is low in some plant nutrient. In poor soil the trees do not grow well, the leaves are not dark green and healthy looking, and the fruits are small. Trees that have been bearing heavily for several years may require some feeding.

Well-rotted manure provides the necessary nutrients. If you use fertilizers for your garden or lawn, put some under your trees as well.

Spread the fertilizer on the ground under the tips of the branches, away from the trunks. Broadcast 500 $cm^3$ of 16–20–0 or 14–14–7 for every 9 $m^2$ and work it lightly into the soil; the trees should soon regain their normal color. Do not fertilize in early fall because the trees need to harden before winter.

When a soil test shows that some major element is lacking or that the soil is either strongly acid or alkaline, apply the appropriate amendment so that the trees can grow satisfactorily.

## Cover crops and mulches

In farm orchards, use cover crops and green manures to keep the soil fertile by adding organic matter to it. Although a cover crop is helpful, most prairie orchards are cultivated regularly because soil moisture is usually low. Whenever possible use well-rotted manure for organic matter.

A cover crop of fall rye, oats, barley, or peas planted in late July serves three purposes. It absorbs nutrients and moisture, slowing down growth of trees and helping them to harden in the fall; it provides some pro-

tection for roots in the winter; and it catches snow and holds it until spring. One serious disadvantage of a cover crop or a straw mulch is the increased danger of damage by mice.

Grass has been successfully used as a ground cover in established orchards at the Morden Station. With grass culture, herbicides are effective for vegetation control around the bases of the trees. Grass must be mowed short to remove cover for rodents.

## Thinning the crop

Under most conditions harvested fruits are larger and have better color when some young fruit are removed early from the trees. The rest of the fruit should be distributed evenly over the tree to prevent heavy loads from splitting or breaking the limbs. Thinning also reduces the strain on the tree caused by producing a crop every year. Overbearing may weaken the tree and leave it susceptible to winter injury.

Delay thinning until after the natural fall of apples in early June when they are about 2.5 cm in diameter. Blossom-thinning chemicals are not recommended for the prairies. Late spring frosts may kill the flowers at any time; the application of a chemical coupled with a late frost would result in a small crop.

## Harvesting

Because the fruits are perishable, pick and handle them carefully. Pick at the proper stage of ripeness to obtain the best quality. Allow all fruits except pears to ripen on the trees. Pick pears when the flesh is firm and store them at room temperature until fully ripe and soft.

Plums are ready to pick when they have a waxy bloom and the flesh feels slightly soft when pressed. Overripe plums are soft and juicy. For canning, plums may be picked when they are slightly immature.

There are several ways to tell when an apple is ripe. Check often during the period when the fruit is known to mature in your area. Color changes indicate maturity in most cultivars, and the darkening of the seeds is also an indication. When some fruits have dropped, others are probably maturing. Perhaps the best advice is to choose one or two apples, slice them to see whether all greenness is gone from the center, and taste them for sweetness. Generally, apples for storage should be picked a week before they are fully ripe.

Crab apples hang on the trees until well past ripeness. Sample them regularly to determine the best time for picking.

## Storing fruits

Apples are the only fruits that can be stored satisfactorily without special facilities. Preserve other fruits by freezing or canning.

For ideal winter storage of apples, the temperature should be 2–4°C. Because you are not likely to have a room at this temperature, use the coolest one available. Air is difficult to keep moist in the dry atmosphere

of the prairies, but you can increase the humidity in the storage room by placing pans or pails of water there or by sprinkling water on the floor. Ventilation is also important because apples give off some odors and absorb others from products stored with them.

## Controlling pests

Various pests such as insects, mites, mice, rabbits, and diseases may periodically affect tree fruits on the prairies. Fortunately, the harsh climate hinders some of the major orchard pests from becoming established. Good cultural practices and the protection afforded by natural predators often prevent outbreaks. Strong, healthy trees can withstand the onslaught of pests better than weak ones. Keep your orchard clean by disposing of fallen fruit and leaves and by burning pruned branches, especially diseased ones. Protect birds in or near the orchard because they help to control insect pests, mice, and rabbits.

### Cautions

When you use a pesticide, follow closely all the directions and cautions on the label, especially those on rates of application and on keeping the poison away from children. An interval is required between date of last application and harvest for some of the treatments. The interval varies with the material used, the number of applications, and the amount applied. The recommended interval must be maintained to avoid residues that would render the fruit unfit for use. For all spraying, follow the recommendations of your provincial insect and disease control bulletins.

### Sprayers

Many kinds of sprayers are available. For treating a few trees, a small knapsack sprayer is adequate. When water under pressure is available, a sprayer that attaches to the end of the garden hose is satisfactory. For treating many trees, a large, tractor-drawn power sprayer is required.

### Insects

For insects that eat foliage, such as cankerworms, tent caterpillars, tussock moths, webworms, and the pear sawfly, spray the trees thoroughly with a recommended chemical as soon as you see the insects or notice a loss of leaves. Sprays can also control the plum curculio; apply them when the fruit begins to form.

For insects that suck, such as aphids, plant bugs, and leafhoppers, spray as soon as you see the insects. For aphids that live inside curled-up leaves, such as the mealy plum aphid, anticipate their attack and spray as soon as the young leaves appear in the spring.

Scale insects are protected by their waxy cover for most of the year. They overwinter as eggs under the scales on the bark and hatch in the spring. About June 15, or when the lilacs begin to bloom, spray with a recommended chemical.

Mites

Mites belong to the spider family and are usually visible only through a magnifying glass. One group of these pests feeds on the undersides of leaves and is usually protected by fine silken webs. The leaves turn grayish and drop early. Another group forms long, cylindrical galls on the upper surface of the leaves, particularly those of plum. To control either group, spray as soon as the new leaves appear in the spring.

Diseases

On the prairies, fireblight is the most serious disease of apples and pears. Antibiotics have been reported to give partial control of the bacteria that cause fireblight. Removal of diseased branches, twigs, and overwintering cankers, and control of aphids and leafhoppers that may spread the disease, are recommended. When pruning diseased branches, make the cut at least 15 cm below the last point of infection. Carefully disinfect the tools after each cut and burn diseased wood and leaves immediately, if possible, or dispose of them with your regular garbage pickup.

Leaf spots, apple scab (Fig. 17), cedar-apple rust, and many other fungal diseases may become a problem and require chemical control.

FIG. 17. Severe apple scab on leaves and fruits.

Powdery mildew, which occasionally attacks the leaves of fruit trees and particularly cherry–plum hybrids, may be controlled by spraying at the first sign of infection. Repeat if necessary.

Plum pocket is a disease in which the plums become greatly enlarged and form irregular, hollow, conspicuous pouches. Destroy the diseased fruit and spray the dormant trees in early spring.

Black knot is distinguished by conspicuous, black, elongated galls on twigs and branches of plums. This fungal disease also occurs on native plum and chokecherry. Remove galls from the plum trees and from native plums and chokecherries growing near your orchard.

### Chlorosis

Lack of iron is a common nutritional problem on prairie soils. It causes leaves of fruit trees to turn yellow or whitish, a condition termed chlorotic, and may begin with only the leaves on one branch, or at the tops of branches, or in new succulent growth. When the deficiency is not corrected, the trees may eventually die or be too weak to withstand the cold winter. Usually there is plenty of iron in the soils, but in alkaline soils, those containing high amounts of lime, the iron exists in a chemical form that is not available to the plants. Trees need very little soluble iron, but this small amount is essential for the development of chlorophyll.

In home gardens or where only a few trees are chlorotic, add acid-reacting materials such as acid peat, sulfur, or acetic acid to the soil. Ferrous sulfate at 500 g for each 5 cm of trunk diameter corrects most conditions. Bore holes in the soil under the tips of the branches and fill them with the chemical, or spread it on the ground and water it into the soil. Commercial preparations called iron-chelated compounds are also available, which give rapid, short-term aid.

### Sunscald

Blistering and sunscalding of the bark on the southwest side of fruit trees is common in prairie plantings. In early spring the heat and light from bright sunshine, especially reflecting from the snow, stimulate some sap to move. Frost may then damage the tissues at night. Any injury to the bark provides access for disease organisms that can kill a tree. Covering the trunk and main branches with boards, building paper, aluminum foil, tree wraps, commercial tree guards (Fig. 18), or even a heavy coat of white latex paint (Fig. 19) reduces the damage.

### Mice and rabbits

Mice and rabbits cause heavy losses in prairie orchards. Mice chew the bark off at or near ground level and often girdle a tree and kill it. Rabbits trim off small branches and eat the bark from large branches and trunks.

**Mice** Several new repellents on the market protect the trees. It is best to paint them on with a brush. Regular cultivation and removing nesting places such as rubbish piles and long grass help to keep mice away.

FIG. 18. Young tree wrapped with a commercial tree guard to protect it from sunscald and rodents.

FIG. 19. Latex paint protects tree trunks from sunscald.

FIG. 20. Fine-mesh wire screen protects the trunk of a tree against rabbits.

Poisoned baits are effective, but use them with caution. To make the baits, place poisoned oats, chop, or carrot cubes in tin cans with tops bent in just far enough to let a mouse enter. Lay the cans on their sides at suitable locations throughout the orchard and cover them with boards or a little straw.

When you have only a few trees, protect them by encircling the bottom parts of the trunks with aluminum foil, cylinders of wire netting such as window screening, or commercial tree guards.

**Rabbits** Fencing with 5 cm poultry wire 1.2 m high keeps out rabbits. Snow fence or wire mesh placed around individual trees (Fig. 20) helps when you have only a few. Persistent shooting and trapping also help.

Repellents that protect trees against mice are also effective against rabbits.

## More information

The provincial departments of agriculture publish lists of recommended cultivars. These lists are brought up to date from time to time as new information is gathered or new cultivars are released.

## Helpful publications

*Diseases, Insects and Mites of Stone Fruits.* Agric. Can. Publ. 915. 60 pp. 1973.
*Fruit Tree Propagation.* Agric. Can. Publ. 1289. 56 pp. 1968.
*Hardy Fruits and Ornamentals from Morden, Manitoba.* Agric. Can. Publ. 1628. 31 pp. 1977.
*Hardy Stembuilders for Prairie Orchards.* Man. Dep. Agric. Publ. 460. 8 pp. 1971.
*Pruning and Training Fruit Trees.* Agric. Can. Publ. 1513. 32 pp. 1973.
*The Saskatoon.* Agric. Can. Publ. 1246. 10 pp. 1980.
*What You Should Know About Fruit Production.* Agric. Can. Publ. 1350. 12 pp. 1979.

## Recommended cultivars of tree fruits

| Tree fruit | Cultivars suited to Zones 1–3 | Cultivars suited to Zones 4–6 |
|---|---|---|
| Crab apples | Dolgo | Dolgo |
| Applecrabs | | |
| Early | Rescue | Dawn, Rescue |
| Midseason | Shafer, Trail | Renown |
| Late | Chestnut, Kerr | Kerr |
| Apples | | |
| Early | Breakey, Harcourt, Heyer 12 | Heyer 12, Patterson |
| Midseason | Battleford, Carroll, Goodland, Norland, Parkland | Battleford, Norland, Parkland, Westland |
| Late | Collet, Godfrey, Haralson, Luke, Miami | Unity |
| Plums | Grenville, Norther, Pembina, Prairie, Ptitsin, Redglow, Tecumseh | Bounty, Dandy, Elite, Norther, Patterson's Pride, Prairie, Ptitsin |
| Cherry–plums | Dura, Manor, Opata, Sapa | Dura, Manor, Opata, Sapa |
| Sand cherries and bush cherries | Brooks, Manmoor, Mongolian cherry, Manchu cherry | Brooks, Manmoor, Mongolian cherry, Manchu cherry |
| Apricots | M 604, Scout | Scout |
| Pears | Golden Spice, Pioneer 3, Ure | John, Pioneer 3, Tait Dropmore, Ure |
| Saskatoons | Honeywood, Pembina, Smoky | Honeywood, Pembina, Smoky |