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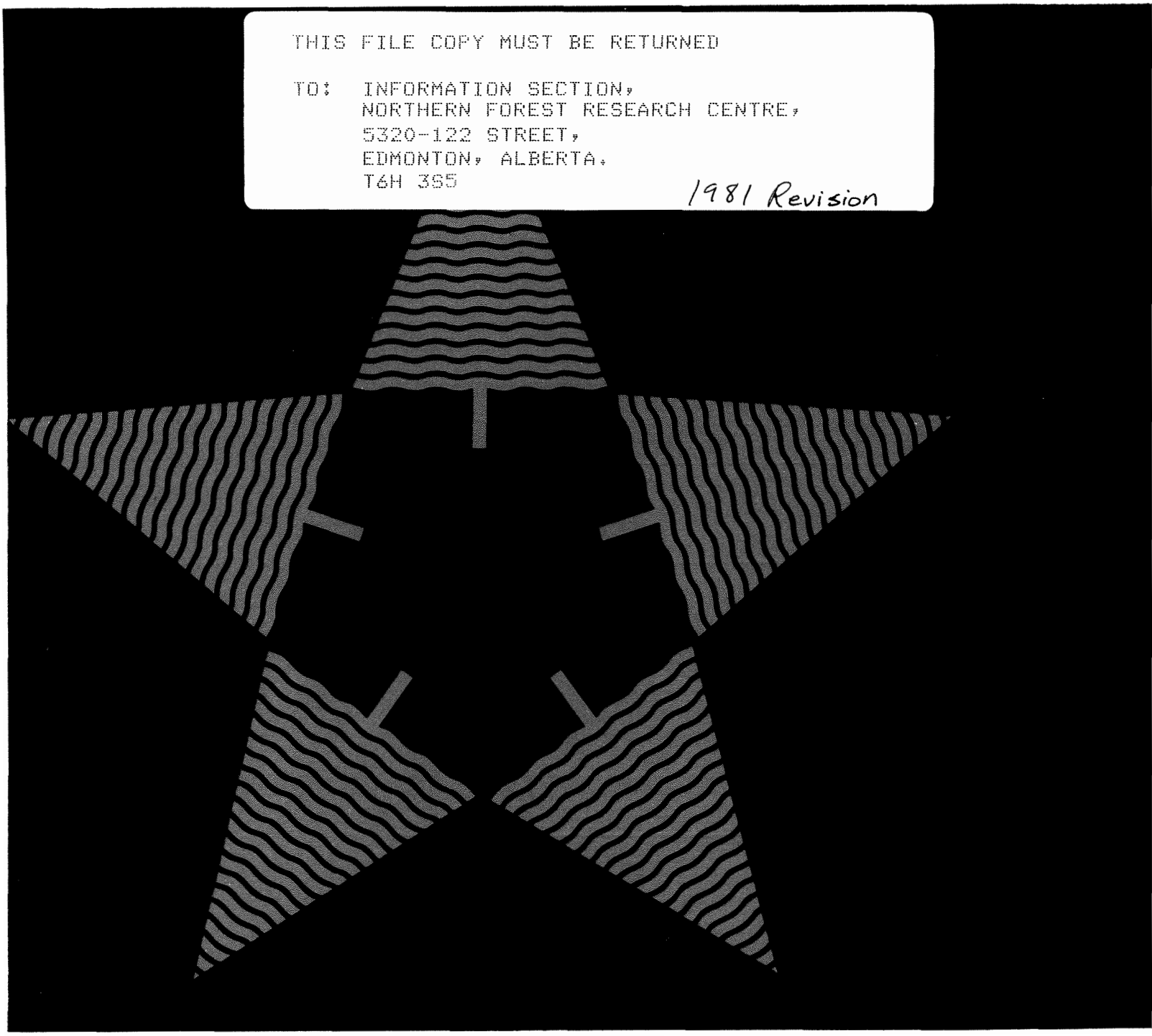
an introduction to christmas tree growing in canada

by W. M. Stiell and Chas. R. Stanton

1981 Revision



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Introduction à la culture des
arbres de Noël au Canada

Contents

Today's markets demand a quality product.

Introduction

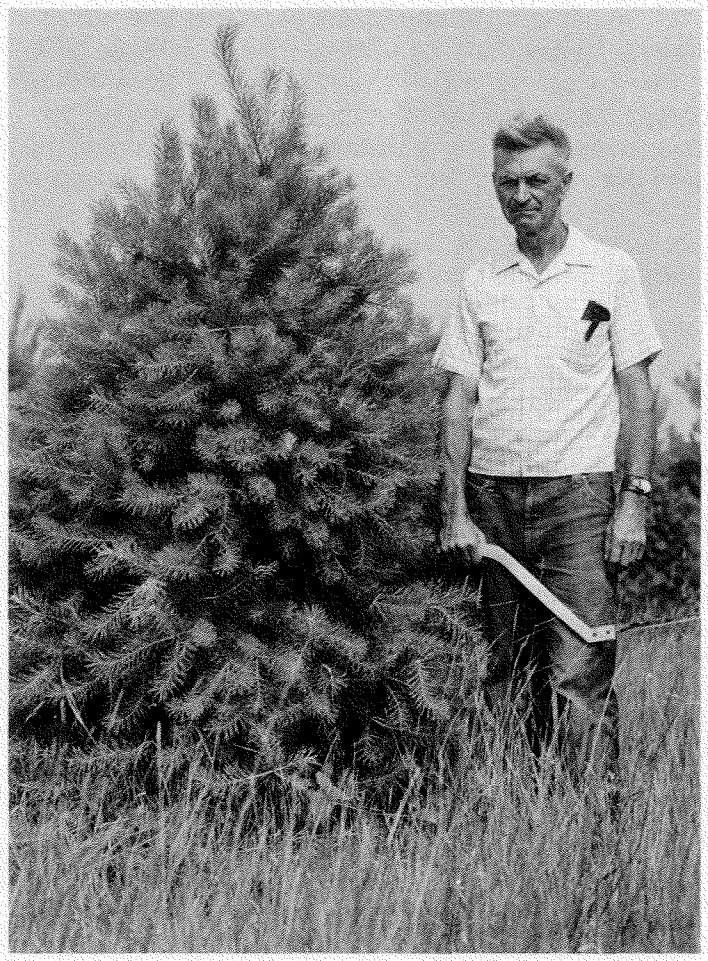
This publication is for people seeking a broad, general knowledge of Canada's Christmas tree industry. It is also for those who are having first thoughts about going into the business for themselves. It is not directed to established growers or to those seeking detailed information on specific aspects of production of Christmas trees. For people with a general interest in the topic, it is hoped that it will answer most of their questions; for the prospective grower, it simply provides a general introduction with leads to other publications and organizations capable of supplying the detailed information that is necessary for successful entry into the industry.

Helpful publications are available.

You owe it to yourself . . .

If you are thinking of growing and marketing Christmas trees for profit, you owe it to yourself to check out all available sources of information first. Remember to consult the last section of this publication, "If You Wish to Know More . . .".

Christmas tree production and marketing are becoming increasingly complex because of the growing demand for quality trees. The early method of selecting and cutting trees from the untended native forest no longer meets modern market requirements. Emphasis is shifting to the plantation operation and to the management of natural stands specifically for Christmas tree production. Be aware that you will need much specialized knowledge together with a variety of technical skills to cope with these changes. A sound appreciation of business practices will be a distinct advantage, too.



Specialized knowledge and careful culture are needed to produce quality Christmas tr es.

About the industry...

What is the Christmas tree industry worth to Canada? How does its future look? What species are grown? How serious is the competition from artificial trees? These, and many other questions spring to mind when one starts to think about the Christmas tree business. Unfortunately, statistics are lacking or incomplete in some areas, and it is not always possible to provide the fullest answers. However, a number of important facts can be set down.

Export sales are the mainstay of Canada's Christmas tree industry. In 1980, just over 2.3 million trees with a value of $9.4 million were exported. About 95 percent of these went to the United States with the balance being shipped chiefly to countries in and around the Caribbean.

The relative importance of Canada's provinces as exporters of Christmas trees in 1980 is seen at a glance in the bar graph.

Precise information on exports by species is not available, but it is clear that balsam fir is the leader, followed by Douglas-fir, and then the spruces and Scots pine.

The trend in exports shows clearly in the accompanying graphs. From 1972 to 1980, the number of trees exported dropped by 59 percent. This occurred mostly in the first 2 years, and since then exports have been fairly stable. The corresponding sales value rose by 130 percent because of the steadily increasing price per tree during the period.

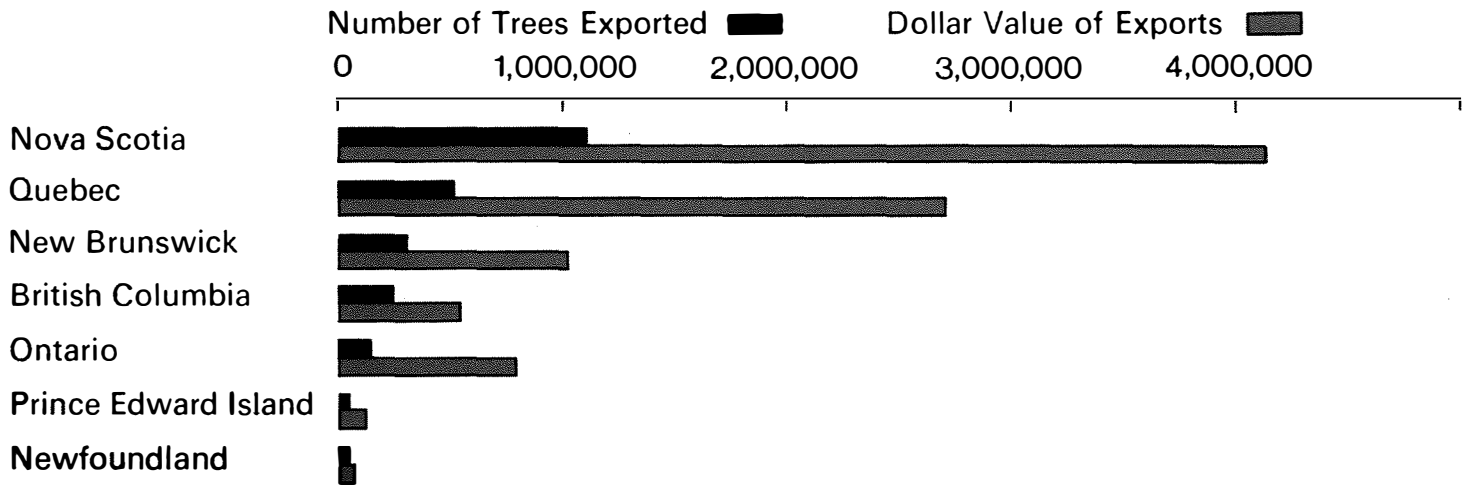
The decline in exports is explained, in part at least, by strengthening competition from artificial trees in the United States together with the development and growth in that country, of an extensive plantation-based Christmas tree industry. The current United States demand for carefully cultured and shaped plantation trees has special significance for Canadian wild tree exports.

In Canada, we lack reliable figures on our own production and consumption of Christmas trees. In 1969 about 40 percent of Canadian families were thought to purchase natural trees, and about 33 percent artificial trees. A recent study in metropolitan Toronto shows a marked decline in

Canadian Christmas Tree Exports 1980

by Province of Lading

Source: Statistics Canada

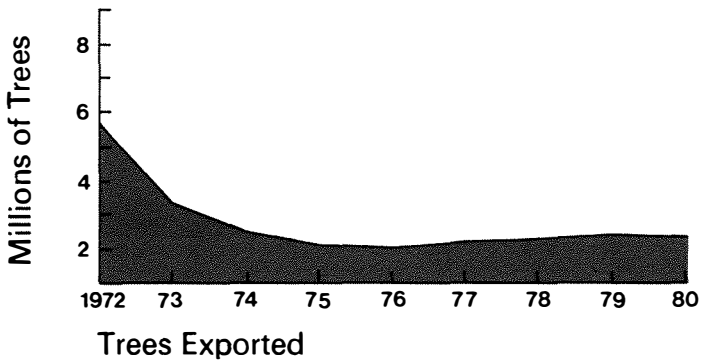


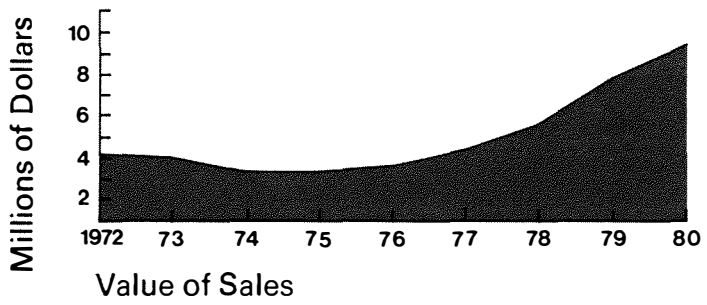
families purchasing natural trees, to 24.7 percent in 1980, while families with artificial trees increased to 41.1 percent. Projecting these changes across the country would suggest that domestic consumption of natural trees is in the order of 1.5 million annually.

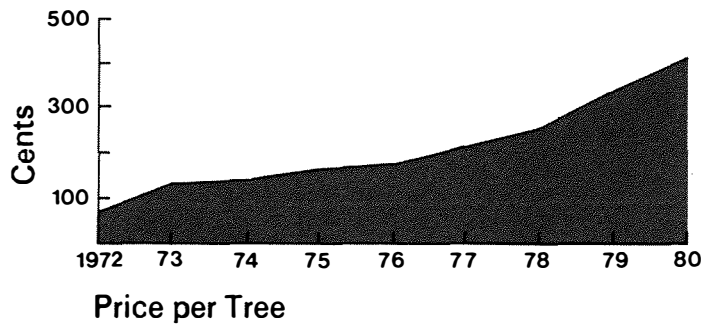
To provide better information for growers supplying the domestic market, there appears to be a need for standardized surveys conducted at regular intervals across all of Canada.

Canadian Christmas Tree Exports 1972-1980

Source: Statistics Canada







As a business venture . . .

Today's accent is on the production of *quality* Christmas trees. Failure to appreciate this point may lead to a stand being rejected by a buyer or worse, a retail lot that is still heavily stocked on December 26. The stand that is passed over may eventually yield pulpwood or other products, but in the Christmas tree business there is nothing more financially final or forelorn than cut but unsold trees on the day after Christmas.

Prospects for the man who expects to cash in on a small corner of land with a crop of trees that nature alone has grown are becoming progressively dimmer.

Also on the production side, the trend is towards greater mechanization in planting, cultural practices, harvesting, and packaging. Merchandising an attractively packaged product is becoming increasingly important. The Christmas tree business is now more demanding of capital than in the past.

For larger growers particularly, labor may present problems. Seasonal help is not always available and profits have suffered because the selling price of trees has not kept pace with the steady increase in wage rates.

Competition between growers, and with artificial Christmas tree producers, is a real factor which must be faced. Artificial trees are looking, and even smelling, more like the real thing. Already, they appear to have captured about one-third of Canada's urban market and sales are expanding. Increases in production of artificial or cultured trees by the United States could further depress the export market.

Besides the inevitable business risk of falling prices, a grower may also have to contend with such things as adverse weather, insects or disease, theft, fire, or animal damage. However, if he is prepared to accept the hazards of market fluctuations and the vagaries of consumer preference, information and professional advice are available to help him cope with most of the other problems he is likely to encounter.

Seasonal labor needs can present problems.

What is a good Christmas tree?

A variety of Christmas tree species are produced across Canada mainly according to their natural occurrence in a particular region or locality. British Columbia supplies Douglas-fir and Alberta produces lodgepole pine. The Maritimes, Quebec, and, to a lesser extent, the Prairies are the chief sources of balsam fir and spruce. Ontario is the principal producer of plantation-grown Scots pine. Less important for Christmas trees are red pine, red spruce, Norway spruce, and Austrian pine.

Irrespective of species, it seems that most buyers are looking for evergreens with dense deep-green or blue-green foliage. They want trees with compact, symmetrical, tapered form; trees that will hold their needles indoors and whose branches will readily support ornaments; and trees that have a fragrant smell and come in the 5½-to 8-foot height range.

Some species exhibit the desired natural characteristics to a greater degree than others. For example, Scots pine holds its needles well but sometimes lacks depth of color. Spruces, on the other hand, tend to lose their needles quickly but exhibit the more intense greens or blue-greens that are in demand. Such problems leave something to the ingenuity and inventiveness of the competitive grower as witness the action of some Scots pine producers in spray painting their trees to achieve the desired shade of green.

Official Christmas tree grading standards, the adoption of which is optional to growers, are now established for Ontario, New Brunswick, and Quebec. In each of these provinces, three grades are assigned according to a tree's degree of excellence in such features as taper, density, freshness, and freedom from damage.

Grower acceptance of grading standards is not universal. Top grade trees may be shipped to a buyer and arrive at their final destination in less than top grade condition. Such situations are a normal hazard of handling and transportation but, nevertheless, have led to suggestions that top grade trees were not shipped in the first place. Some growers prefer the buyer to decide by inspection in the field if the trees offered for sale are the quality he desires.

A well-shaped Douglas-fir from interior British Columbia.

A white spruce with low market potential.

Dense foliage and symmetrical, tapered form make this balsam fir a prizewinner.

	Balsam Fir	Douglas-Fir	White Spruce	Black Spruce	Red Spruce	Red Pine	Lodgepole Pine	Scots Pine
Usual type of production	Natural and Plantation	Natural and Plantation	Natural and Plantation	Natural	Natural	Natural and Plantation	Natural	Plantation
Dominant Canadian markets	Eastern Canada	Western Canada	Eastern Canada	Manitoba & Eastern Canada	Maritimes	Ontario	Alberta	Ontario and Prairie Provinces
Export markets	Most favored for export with wide U.S. markets.	Ranks second for export with wide U.S. markets	Popular in Northeastern & New England States.	Minor market in the Lake States.	Minor market in New England & Northeastern States.	Very minor market in Northeastern & Lake States.	Essentially no export market.	Considerable demand in Mid-western, Lake, and Northeastern States.
Needle-holding ability	Excellent	Good	Poor	Poor	Poor	Good	Good	Excellent
Color quality	Good	Good	Good	Good	Fair	Good	Good	Fair to Good
Some possible pests	Balsamwoolly aphid, Spruce budworm, Balsam twig aphid.	Cooley spruce gall aphid, Douglas-fir tussock moth, Needle cast and needle midges.	Eastern spruce gall aphid, Spruce budworm, European spruce sawfly.	Spruce needle miner, Spruce leaf rust.	White pine weevil, European spruce sawfly, Spruce budworm, Eastern spruce gall aphid.	Red-headed pine sawfly, European pine shoot moth, Scleroderris canker.	Needle miners Pitch nodule moths, Pine needle scale, Dwarf mistletoe, Needle cast, Scleroderris canker.	European pine shoot moth, Lophodermium needle cast, Red-headed pine sawfly, white pine weevil, Root collar weevil, Deer, Porcupines, Pine grosbeaks, Scleroderris canker.

Basic information on Canada's main Christmas tree species

Cutting rights or growing your own?

Probably the simplest approach to the Christmas tree business has been the acquisition of cutting rights in natural stands owned privately or by governments. Essentially this is just a selective harvesting operation with the cutter paying the owner a stumpage fee (that is, an agreed upon amount for the standing trees). This type of venture seldom produces quality trees and is decreasing in importance. On the other hand, where a natural stand is managed specifically for Christmas tree production, quality trees can be developed and harvested.

Planting trees and managing them intensively through to marketable size is, however, the best and quickest way to produce Christmas trees of consistent high quality. This approach also permits a choice of species best suited to site conditions and to projected market requirements. It is more expensive and more demanding of skill and knowledge, but, with the growing demand for better trees, it can be expected to assume greater importance in the future.

Christmas trees are also produced by stump culture in some parts of Canada. In this procedure an initial tree is harvested by cutting the stem a few inches above a good whorl (ring of branches). The branches left on the stump continue to grow and start to turn upwards. With careful management one or more of these branches may be converted into an acceptable Christmas tree. They are referred to as turn-ups or limb trees. New shoots may also spring from the stump or branches, and because of their more erect habit at the outset, these have better potential as Christmas trees than the turn-ups.

Stump culture has good and bad points. True, extra trees may be harvested from the one stump and they will grow more rapidly than young or newly planted stock which lacks a comparable established root system. Nevertheless, there is no guarantee that good trees will always result from this procedure. Even with care it is sometimes impossible to produce the desired shape of tree and there is a marked tendency for a turn-up to have the added drawback of a curved handle (that is, the ten inches or so of butt that fits into the Christmas tree stand). The only species whose branches turn upwards directly enough to be worthwhile are the true firs and Douglas-fir. Stump culture is not recommended for spruces and pines.

If you plan to plant . . .

A planting operation may be a simple, straightforward matter where the grower wishes to raise trees on a small plot of land that would otherwise remain idle. On the other hand, if regular annual harvests from a relatively large tract are the objective, there is a need for greater planning and for subdivision of the area for the rotational planting that is required. By following such a system, there should be little variation in labor, planting stock requirements, and numbers of trees harvested year to year.

Land and Soil

In selecting land for Christmas tree production, a grower should look for fairly level to slightly rolling sites free of stones and stumps that could obstruct planting, and free of heavy brush that would mean costly clearing.

Well-drained sands are suitable for pines, but for the spruces and true firs, which are more demanding of nutrients, a sandy loam texture is desirable. Growers of Douglas-fir Christmas trees in the interior of British Columbia make good use of drier, low-quality forest land to produce profitable crops of slow-growing, bushy trees. In general, less fertile soils will be slower to produce a tree although its natural density will, in most cases, be closer to the desired standard. More fertile soils, on the other hand, will produce a saleable tree more rapidly but greater attention may be needed in shaping the tree and controlling competing vegetation. Thin soils over bedrock, coarse sands and gravels, heavy clays, and excessively wet or alkaline soils should be avoided.

Site Preparation

Premium-quality Christmas trees cannot be produced in the face of competition from other vegetation. Before any trees are planted the site needs to be cleared of brush or trees. This may be accomplished by mechanical or chemical means, but it must be done. Herbaceous vegetation can be controlled by herbicide spraying along the proposed tree row sites or by cultivation. Keeping the area around the trees free of vegetation not only looks after the matter of competition but also removes cover that may harbor destructive rodents such as rabbits and mice.

Planting Stock

Potential growers should check carefully into the matter of availability and price of planting stock from both provincial and commercial nurseries. For example, British Columbia provincial nurseries do not provide stock for the Christmas tree industry while Quebec makes it available free of charge. Quebec further assists by loaning planting machines to growers at no cost. In cases where government nurseries do sell Christmas tree stock, there is no guarantee that it will be cheaper than that available from commercial outlets.

Nurseries can produce both seedling and transplant stock. A tree that the nursery refers to as 2-2 has grown two years as a seedling, been transplanted, and grown a further two years. This four-year-old transplant is larger, more vigorous, and more expensive than a seedling. The type of planting stock favored by growers varies. For example, with balsam fir, four- or five-year-old transplants are often used whereas with Scots pine two- or three-year-old seedlings are commonly planted because they are large enough to survive and grow satisfactorily.

In some cases a grower may elect to raise his own stock from seed. This provides an opportunity to select and plant material having the best potential for Christmas trees. However, it should be realized that young seedlings re-

"Heeled-in" trees must be kept moist pending final planting.

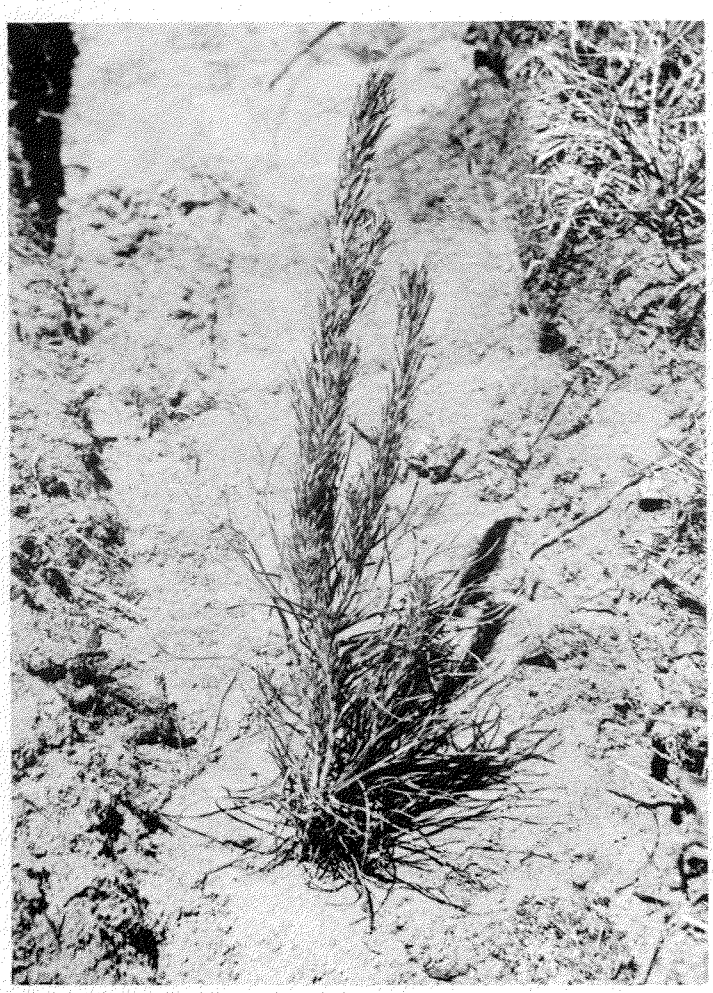
quire much attention, and nursery work is both exacting and time consuming.

Handling and Storage of Planting Stock

While trees are in transfer from the nursery or in subsequent storage, a grower should pay heed to the jingle:

Hot and dry will surely die,
Moist and cool's the planter's rule.

Provided they are stored in a shaded, cool, moist place, trees may be left for a few days in



The tree should be planted to the same depth as it grew in the nursery.

Furrow planting, while reducing vegetative competition, can also hamper access and provide runways for small, destructive wildlife.

their shipping containers. Thereafter, if final planting is not feasible, the stock should be unpacked, bundles broken open, and the trees placed against each other along the sloping side of a shallow, v-shaped trench. Soil is then tramped down firmly around the roots and the area kept well watered and shaded throughout the storage period. This process of "heeling-in" provides satisfactory storage of trees for several weeks, but the sooner they are permanently planted after removal from the nursery the better will be survival and growth.

Planting

Planting is usually a spring operation taking place as soon as the snow has gone and the soil can be worked. Fall planting, following autumn rains, may be more convenient in some cases, but on heavy or bare soils there is a definite risk of frost heaving which often kills trees.

Size of area usually determines whether planting will be done by hand or machine, although in some cases local conditions, such as stoniness, may call for hand planting on a site otherwise suited to a machine operation.

Adequate spacing is essential in plantation operations.

In hand planting, tree roots should be spread out in the slit or hole made by the planting tool and the soil heeled in firmly around them. Once planted, the tree should stand upright, and the depth of planting after compaction should equal that at which it grew in the nursery. These same operations are carried out automatically by a properly operated planting machine.

Under open field conditions and in light soils, a two-man crew should be able to plant 1,500 to 2,000 trees per 8-hour day. A three-man machine operation (including the tractor driver) should handle up to 8,000 trees per 8-hour day.

Spacing

The temptation to plant more trees per acre than recommended must be firmly resisted if a quality product is the objective. In selecting the optimum spacing, a grower needs to consider the desired tree height at harvest time as well as the species he is raising. For example, experience suggests that 5 ft. x 5 ft. spacing is adequate for balsam fir whereas Scots pine require 6 ft. x 6 ft. or perhaps more depending upon the final shape of tree the grower seeks to produce. A difference of a foot in spacing makes a notable change in the number of trees per acre. A spacing of 5 ft. x 5 ft. allows 1,742 trees, 6 ft. x 6 ft. permits 1,210, and 7 ft. x 7 ft. reduces the number to 889.

You have to help them grow!

The application of appropriate management techniques to both natural stands and plantations is essential to achieve continuing production of the best possible Christmas trees.

Thinning and Cleaning the Stand

To help achieve good form and color, a tree must have, throughout its life, plenty of light on every side from the lowest branch to the leader. In plantations, correct spacing gives a head start to this end, but in natural stands thinning is the first step.

Thinning is the selective removal of inferior and superfluous trees to allow proper spacing for the more promising individuals, especially those approaching Christmas tree size.

Competition from hardwood trees, shrubs, and even grass can quickly reduce the amount of light and moisture available to Christmas trees with adverse effects on their growth, shape, and color. Where such competition threatens, an operator must be prepared to clean both natural stands and plantations using cutting, mowing, cultivating, or herbicide spraying techniques.

Shaping the Tree

Thinning and cleaning operations provide a good start towards achieving a quality product, but for the best returns a grower must also give attention to the important matter of shaping his trees. This is now accomplished mainly by the process of shearing which consists of cutting back the leader as well as the tips of the longer branches. Shearing reduces height growth, develops a more conical form, and produces new clusters of shoots which make the tree bushier.

During the years of more rapid growth, after a tree's root system has become established, shearing may be required annually. Spruces and firs may be sheared at any season except during the start of growth in the spring. For pines, however, it is important to carry out the operation just before height growth ceases for the year. This ensures the best response in terms of shoot growth. Shearing takes about one minute per tree using a long-bladed knife or hedge shears.

Pruning Christmas trees (that is, removing the lowest branches flush with the stem) to help improve shape has largely been replaced by the shearing operation. However, sometimes overtall, fast-grown spruces and firs, which have had no shaping treatment, may be heavily pruned as a first step towards conversion into acceptable Christmas trees. In such cases, the lower two-thirds to one-half of the tree's branches are pruned. This retards height growth and the remaining crown produces denser foliage. Some shearing may be needed subsequently to produce the final desired product.

Fertilizers

Fertilizing Christmas trees may prove helpful in establishing the crop and in producing more vigorous trees with luxuriant foliage and good color. But fertilizing trees is far from a simple matter. A grower needs to be able to distinguish fertility problems. Poor color in needles may be caused by a lack of nutrients but on the other hand insects or disease may be responsible. A decision to fertilize must take account of such things as soil type, local features of drainage, and the species grown. On a poorer sandy soil, for example, the true firs, Douglas-fir, and spruce may respond favorably to fertilizers, but applications to Scots pine on most sites are likely to have little value.

The grower must also consider the economics involved; the cost of the fertilizer plus the labor (and possibly equipment) to apply it.

Well-qualified guidance should be sought to ensure that the best decisions are made concerning all aspects of fertilizing the Christmas tree crop.

A special long-bladed knife or hedge shears are used in shearing trees.

And Christmas trees have enemies . . .

Growers must be constantly alert to protect the crop against man-made and natural hazards.

Security

Security against theft of Christmas trees should be kept in mind especially at the time a potential grower is looking for a suitable natural stand or a plantation site. Areas easily seen from well-travelled roads should be avoided.

Christmas tree plantations tempt others besides the passing motorist who just wants a tree for his own use. Today's larger growers particularly, face the possibility of major losses at the hands of the well-organized, well-equipped thief who makes off with trees by the truckload lot. The good services of neighbors and local police should be sought to help keep an eye on plantations over the harvest period.

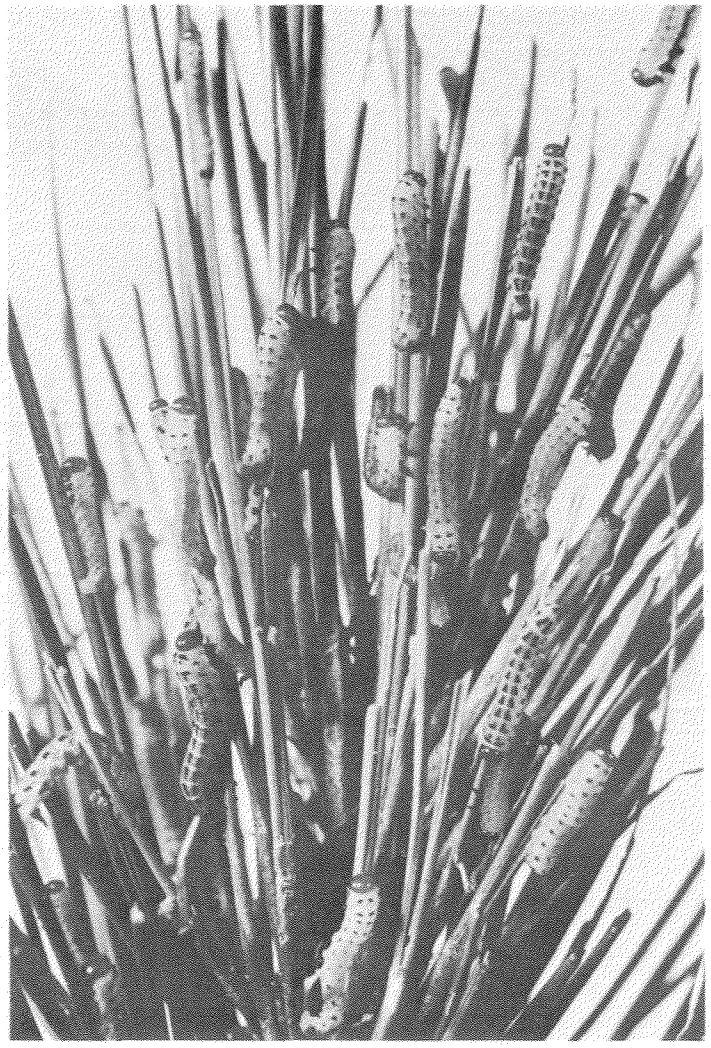
Weather

One of the tougher problems is weather. Severe drought can produce off-color foliage or even kill trees which are in early stages of establishment. Hail, sleet, and snow may cause serious breakage, winter "burning" may discolor needles, and late spring frosts may brown new shoots and lead to poor development. Apart from avoiding frosty sites, little can be done to protect the crop from the weather. Fortunately, however, most weather-damaged trees survive, and, with further growth and the benefits of shaping, they may still become marketable products, albeit a year or so later than expected.

Insects and Diseases

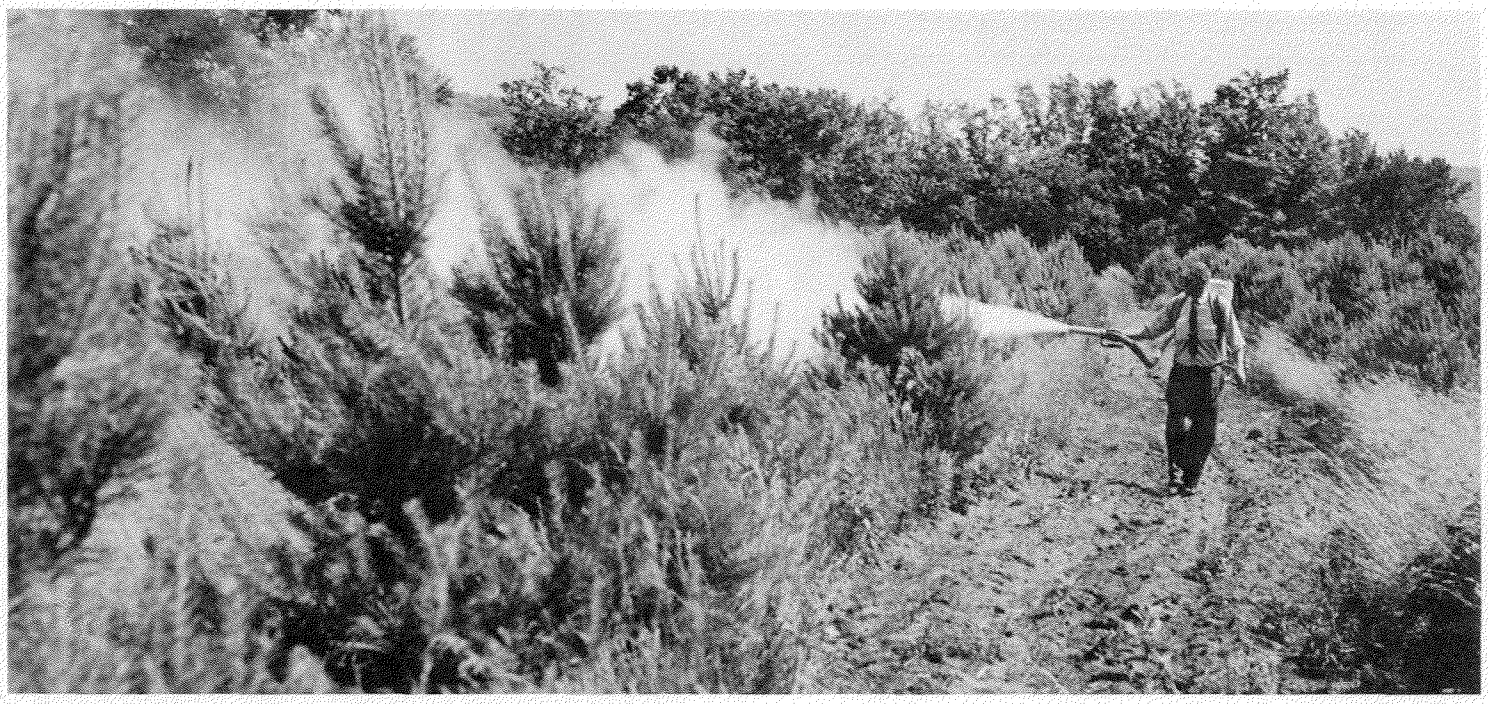
Insect epidemics can cause ruinous damage to Christmas trees in a matter of a few days. The grower must learn to recognize the appearance and effects of the insects he is likely to encounter. He needs to know the best means (usually sprays) for their control. He should also inspect his trees weekly during the growing season and take recommended counter measures swiftly once an insect attack is recognized.

While a few diseases will attack vigorous, healthy trees, most will not. Where infection does occur the best means of control is sanitation, that is, the removal and destruction of affected trees or stumps. In general, there are no practical, direct sprays effective against disease organisms.



Red-headed pine sawfly larvae feeding on red pine.

Growers should be alert to any local insect control regulations that may have a bearing on Christmas tree production and marketing. For example, pine Christmas trees produced in certain parts of Ontario and destined for specified areas in the United States require fumigation or



Prompt action is required when insects threaten the crop.

spray treatment to control the spread of the cereal leaf beetle which is known to hibernate in pine trees. Also, in British Columbia, planting of balsam fir is prohibited as a step in controlling balsam woolly aphid, and other regulations require the dipping or spraying of all pines transported out of the Vancouver Forest District to safeguard interior pine stands against the European pine shoot moth.

Fire

The catastrophe of fire in a Christmas tree stand needs no elaboration. Fireguards, kept free of inflammable vegetation by discing, are necessary around each stand and should also subdivide larger areas. Brush, produced by cultural operations, should be scattered or burned during the winter, and the purchase of some basic fire suppression tools such as backpack fire pumps, shovels, and rakes is a good investment. The grower should also be acquainted with any local fire control organizations that may be able to assist in case of emergency. The possibility of securing fire insurance for the Christmas tree crop may also be well worth investigating.

Weed-free fireguards should subdivide the stand.

Animal Problems

Wildlife and domestic livestock may damage or destroy Christmas trees by browsing, girdling, trampling, or, in the case of grosbeaks, by bud feeding. Domestic animals may be excluded from stands by fencing, but other approaches are needed to combat wildlife such as deer, elk, rabbits, porcupines, squirrels, mice, and birds. Poison baits may be useful against some animals but potential ecological dangers must be carefully assessed. Depending upon the specific animal problem encountered, shooting, trapping, noise-making, or the use of chemical repellents may each have a place.

Good harvesting, wise marketing, and a Happy Christmas!

A Time to Reap . . .

Time of harvest depends upon the market being supplied, the species grown, and, in some cases, snowfall and temperature. The objective is to supply the freshest trees by cutting as close as possible to the time of marketing. Trees for export are usually shipped by early November to allow time for delivery and ultimate distribution to retail lots. Harvesting of spruces, however, is delayed as long as possible because these species shed their needles more readily following cutting. Earlier harvesting may be needed in some areas to avoid heavy snow and low temperatures which may hamper access and cause branch breakage problems especially for pines which become particularly brittle at temperatures below freezing.

Trees to be harvested are often tagged with easily seen colored strips of plastic or cloth well before cutting operations start. This ensures that only the correct trees are harvested and lets the work proceed quickly and efficiently.

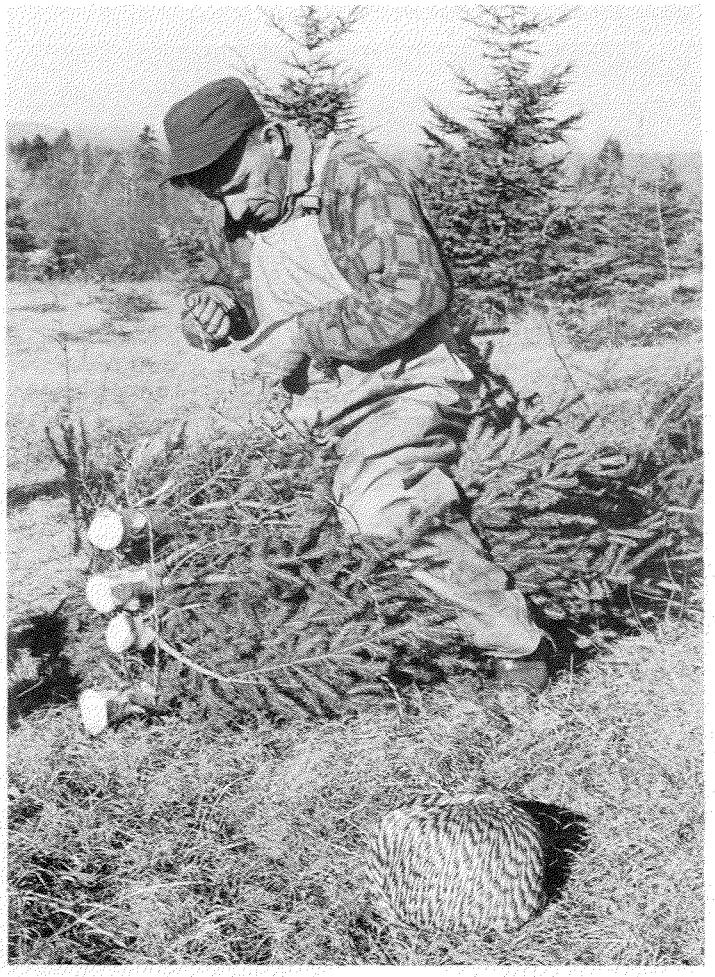
The saw, rather than the axe, is the preferred tool for cutting Christmas trees. Hand bow saws, lightweight chain saws, and the one-man power circular saw attached to the end of a boom are all used. Chain saws are popular although considerable back bending is required by the operator. The circular saw solves that problem, but it is sometimes difficult to control when foliage blocks the operator's view and he fails to place the saw guide firmly against the stem.

For ease and speed of handling, protection against breakage, and particularly for space saving in transit, growers usually compress their trees by some type of baling operation before shipping them any distance. Hand-tied, multi-tree bales may be used, but individual trees may also be machine-tied with twine or machine-wrapped in a plastic net stocking.

Chain saws are popular and efficient harvesting tools.

Once prepared for shipping, trees are piled and stored in easily accessible, shady locations protected from the wind. Storage in direct sunlight may lead to discoloration of foliage, and exposure to wind will cause drying-out and premature needle fall.

Machine baling speeds harvest operations.



Many trees are still hand-tied in multi-tree bales.

Baling saves space during transit and protects trees against breakage.

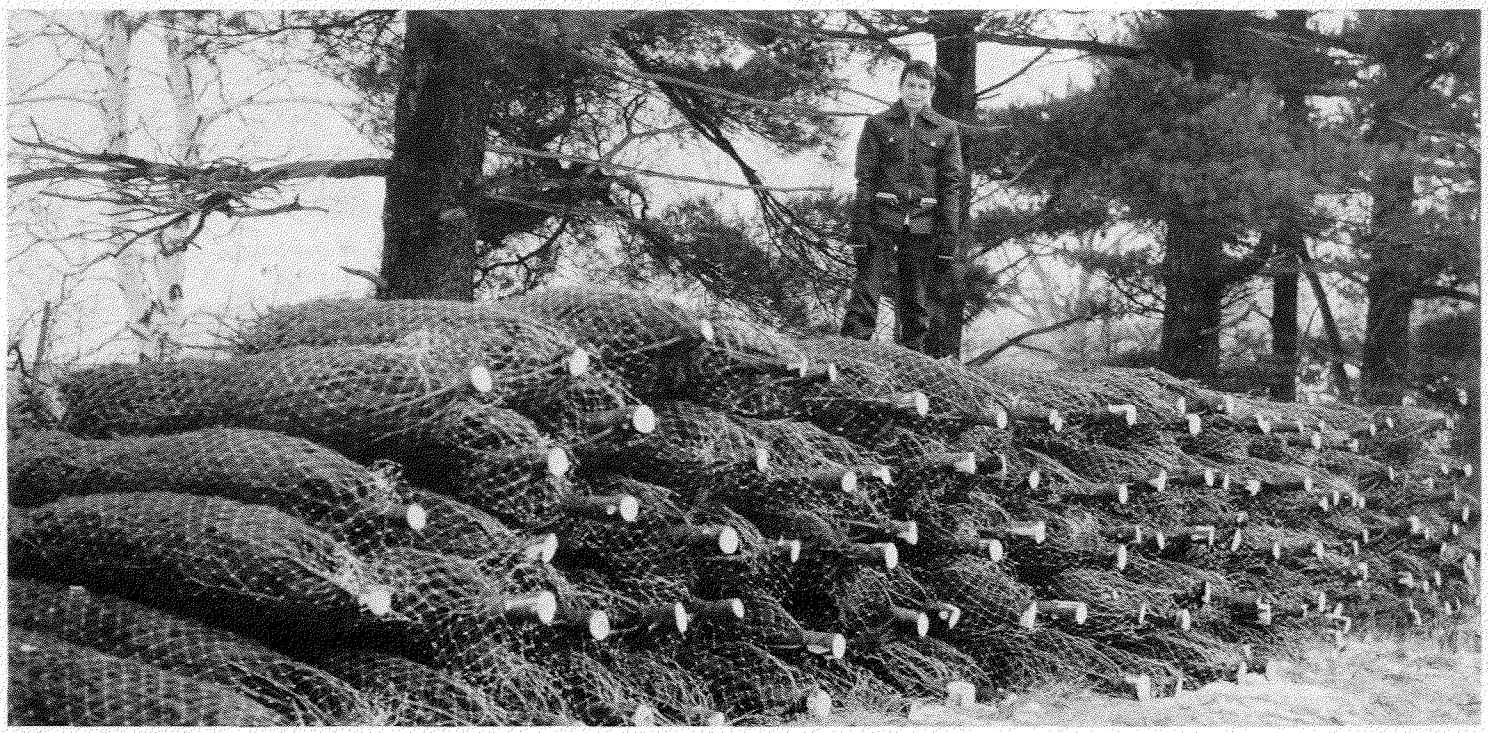
Machines are available which wrap trees in a plastic net stocking.

And a Time to Sell . . .

The knowledge, effort, and care which the grower has applied to the raising of his trees should now pay off. Just how good the returns will be depends, in a measure, upon how he shapes up as a businessman/salesman.

Retail selling is likely to be the most profitable venture especially for the smaller grower with a local market. If he is located reasonably close to an urban center, he may elect to run a "choose-and-cut" operation where people select and cut their own trees. This eliminates harvesting costs, problems of transportation, and cut but unsold trees. However, the owner must be prepared to advertise and to provide service constantly for two to three weeks before Christmas. He should recognize the risk of substantially reduced sales arising from adverse weather coinciding with his short selling period.

Storage in a sheltered spot helps prevent drying-out and premature needle fall.



For many city folk a visit to a choose-and-cut operation . .

Keeping an unobtrusive eye on the buyers makes good sense in terms of crop protection. An old barn with seats, a roaring fire in a king-size fireplace, a sleigh ride, and even a cup of coffee for the customers will do much to bring them back again.

Most retail selling, however, takes place in the cities on vacant lots, parking lots, at service stations, and so on. Arrangements for rental of a strategically located, adequately sized sales space need to be concluded well ahead of selling time. Thought should also be given to parking facilities. The good salesman will see to it that his trees are placed upright, are easily inspected, and clearly priced. A well-lit, brightly decorated, efficiently organized and advertised Christmas tree lot will undoubtedly add to the success of the enterprise. Christmas decorations such as holly, mistletoe, trailing club-moss, bundles of evergreen branches, or even small spray-

. . .is a happy Christmas ritual.

Attractive signs, well-displayed trees, and attention to customer convenience all help to increase retail sales.

painted trees may be stocked as added attractions.

The large Christmas tree producers, the exporters, and growers in more remote areas generally sell their trees wholesale. Arrangements for disposal of trees need to be concluded by July or August. A sales contract should be executed and partial payment made at signing with the balance payable on delivery. A good contract will clearly establish such items as ownership of the trees by the grower, the number of trees involved by species, size, or grade; details of cutting, baling, or wrapping; transport and delivery, prices, and details of payment.

A load of 700 trees ready for shipment to a distant market.

Time taken to seek out reputable buyers is also well spent.

For the larger grower who agrees to deliver to a distant market, a contract with the carrier setting down the responsibilities of the shipper, the carrier, and the consignee is a sound business procedure.

The grower for the wholesale market must decide just how far he wishes to go in presenting his product to a purchaser. He can, of course, sell on the stump or, at the other extreme, he may deliver individually wrapped trees to the buyer at a distant market point. Selling on the stump may present problems of slash disposal or damage to remaining trees. Sale on delivery means more work and responsibility for the grower and he must be certain that there is fair recompense for this in the selling price.

Christmas tree growers' associations in Canada provide assistance to their members on many matters pertaining to the growing and marketing of Christmas trees.

If you wish to know more . . .

Contacts in the Provinces

Newfoundland

Newfoundland Department of Forest Resources and Lands
Building 810, Pleasantville
St. John's, Newfoundland

Newfoundland Forest Research Centre
Canadian Forestry Service
Department of the Environment
Box 6028, St. John's, Newfoundland
A1C 5X8

(There are no Christmas tree growers' associations in Newfoundland)

Prince Edward Island

Forestry Division
P.E.I. Department of Agriculture and Forestry
Box 2000, Charlottetown, Prince Edward Island
C1A 7N8

Maritimes Forest Research Centre,
Canadian Forestry Service,
Department of the Environment,
Box 4000, Fredericton, New Brunswick
(Provides service to Prince Edward Island)

(There are no Christmas tree growers' associations in Prince Edward Island)

Nova Scotia

Nova Scotia Department of Lands and Forests
Toronto-Dominion Bank Building
1791 Barrington Street, Box 698
Halifax, Nova Scotia
B3J 2T9

Maritimes Forest Research Centre
Canadian Forestry Service
Department of the Environment
Box 4000
Fredericton, New Brunswick
E3B 5P7
(Provides service to Nova Scotia)

Lunenburg County Christmas Tree Producers' Association
99 High St.
Bridgewater, Nova Scotia
B4V 1V8

Musquodoboit Valley Woodlot Owners' Association
Christmas Tree Commodity Group
R.R. #4, Middle Musquodoboit
Halifax County, Nova Scotia
B0N 1X0

Atlantic Christmas Tree Council
P.O. Box 459
Amherst, Nova Scotia
B4H 1X0

Christmas Tree Council of Nova Scotia
P.O. Box 519
Halifax, Nova Scotia
B3J 2R7

The Nova Scotia Woodlot Owners and Operators Association
P.O. Box 204
Bridgewater, Nova Scotia
B4V 2W8

North Eastern Christmas Tree Association
R.R. #1, St. Andrews
Antigonish County, Nova Scotia
B0H 1X0

Cape Breton Christmas Tree Producers' Association
c/o N.S. Department of Lands and Forests
R.R. #3, Sydney, Nova Scotia
B1P 6G5

New Brunswick

New Brunswick Department of Natural Resources
Centennial Building
Fredericton, New Brunswick

Maritimes Forest Research Centre
Canadian Forestry Service
Department of the Environment
Box 4000
Fredericton, New Brunswick
E3B 5P7

Belleisle Christmas Tree Producers' Association
R.R. #3, Sussex, New Brunswick
E0E 1P0

Nashwaak Christmas Tree Cooperative Limited
Stanley, New Brunswick
E0H 1T0

Three Frontiers Christmas Tree Producers' Association
R.R. #1, St. François, New Brunswick
E0L 1J0

Miramichi Tree Growers' Co-op Limited
Ludlow, New Brunswick
E0C 1N0

Carleton-Victoria Christmas Tree Producers' Co-op Limited
R.R. #2, Arthurette, New Brunswick
E0J 1C0

Petitcodiac Christmas Tree Co-op Limited
R.R. #2, Petitcodiac, New Brunswick
E0A 2H0

Baker Lake Forest Management and Christmas Tree Producers' Corporation
Baker Lake, New Brunswick
E0L 1C0

Baker Brook and St. Hilaire Forest Management and Christmas Tree Producers' Corporation
R.R. #1, St. Hilaire, New Brunswick
E3V 3K3

Miscou Christmas Tree Producers' Association
Centre de Miscou, New Brunswick
E0B 1Y0

The Sapins Verts Cooperative Limited
Notre Dame des Erables, New Brunswick
E0A 2G0

St. Isidore Christmas Tree Producers' Co-op Limited
R.R. #2, St. Isidore, New Brunswick
E0B 2L0

Grand Falls Christmas Tree Co-op
R.R. #4, Grand Sault, New Brunswick
E0J 1M0

Portage River Christmas Tree Producers' Cooperative Association Limited
P.O. Box 92
Rivière du Portage, New Brunswick
E0C 1Y0

Cain Point Christmas Tree Producers' Co-op Limited
R.R. #2, Tabusintac, New Brunswick
E0C 2A0

Newcastle Christmas Tree Co-op Limited
66 Tweedie St.
Chatham, New Brunswick
E1N 1X3

Claire-Fontaine Christmas Tree Producers' Limited
Kouchibouguac, Kent County, New Brunswick
E0A 2A0

The North Kent Christmas Tree Producers' Co-op Limited
P.O. Box 169, R.R. #1,
Richibouctou, New Brunswick
E0A 2M0

Bouctouche Christmas Tree Producers' Association Co-op Limited
113 Brichmount Dr.
Moncton, New Brunswick
E1C 8E5

St. Croix Christmas Tree Producers' Association Inc.
P.O. Box 97
McAdam, New Brunswick
E0H 1K0

Woodstock Christmas Tree Growers' Association
P.O. Box 1602
Woodstock, New Brunswick
E0J 2B0

Ste. Anne Forest Management and Christmas Tree Producers' Corporation
Ste. Anne, Madawaska County, New Brunswick
E0L 1G0

South Sunbury Christmas Tree Producers' Co-op Limited
Hoyt, New Brunswick
E0G 2B0

New Brunswick Christmas Tree Council Co-op Limited
R.R. #3
Fredericton, New Brunswick
E3B 4X4

Northeast Christmas Tree Producers' Regional Council Inc.
R.R. #2, St. Isidore
Gloucester County, New Brunswick
E0B 2C0

Quebec

Quebec Department of Lands and Forests
Parliament Buildings
200B chemin Ste. Foy
Quebec, Quebec
G1R 4X7

Laurentian Forest Research Centre
Canadian Forestry Service
Department of the Environment
Box 3800, Ste. Foy, Quebec
G1V 4C7

Quebec Christmas Tree Growers' Association Inc.
R.R. #2, Downey Street
Lennoxville, Quebec

Ontario

Forest Resources Branch
Ontario Ministry of Natural Resources
Queens Park, Toronto, Ontario
M7A 1W3

Great Lakes Forest Research Centre
Canadian Forestry Service
Department of the Environment
Box 490, Sault Ste. Marie, Ontario
P6A 5M7

Christmas Tree Growers' Association of Ontario Inc.
234 Delhi Avenue
Downsview, Ontario
M3H 1A8

Algoma Christmas Tree Growers' Association
150 Sharon Crescent
Sault Ste. Marie, Ontario

Manitoba

Forest Division
Manitoba Department of Mines, Natural Resources and Environment
Box 10, 1495 St. James Street
Winnipeg, Manitoba
R3H 0W9

Canadian Forestry Service
Department of the Environment
800 — 275 Portage Avenue
Winnipeg, Manitoba
R3B 2B3

(There are no Christmas tree growers' associations in Manitoba)

Saskatchewan

Forestry Branch
Saskatchewan Department of Tourism and Renewable Resources
Provincial Office Building
Prince Albert, Saskatchewan
S6V 1B5

(There are no Christmas tree growers' associations in Saskatchewan).

Alberta

Alberta Forest Service
Alberta Department of Energy and Natural Resources
Petroleum Plaza, 9915 — 108 Street
Edmonton, Alberta
T5K 2C9

Northern Forest Research Centre
Canadian Forestry Service
Department of the Environment
5320 — 122 Street
Edmonton, Alberta
T6H 3S5

(There are no Christmas tree growers' associations in Alberta)

British Columbia

The Provincial Horticulturist
British Columbia Department of Agriculture
Parliament Buildings
Victoria, British Columbia

The District Agriculturist
British Columbia Department of Agriculture
Room 205, 33780 Laurel Street
Abbotsford, British Columbia
V2S 1X5

British Columbia Forest Service
Parliament Buildings
Victoria, British Columbia

Pacific Forest Research Centre
Canadian Forestry Service
Department of the Environment
506 West Burnside Road
Victoria, British Columbia
V8Z 1M5

East Kootenay Tree Growers' Association
Grasmere, British Columbia
V0B 1R0

Contacts in Ottawa

For information on Canadian export markets, names and addresses of Canadian Christmas tree producers and dealers:

Primary Wood Products Division
Forest Products Group
Department of Industry, Trade and Commerce
235 Queen Street
Ottawa, Ontario
K1A 0H5

For statistical information on the Christmas tree industry, mainly with respect to exports:

External Trade Division
Statistics Canada, Tunney's Pasture
Ottawa, Ontario
K1A 0T6

General Reading and Reference

AMERICAN CHRISTMAS TREE JOURNAL
Published quarterly by the National Christmas Tree Growers' Association Inc.
Individual annual subscription rate for Canadians $12.00 (U.S.)
Address: 225 East Michigan Street
Milwaukee, Wisconsin 53202, USA

This journal is an excellent source of current information on growing and marketing Christmas trees. While it is generally slanted to the United States grower, it does carry some articles on the Canadian industry. Since 1968, it has published annually in its May issue a helpful Christmas Tree Marketing Bibliography gleaned from about 20 publications. The topics covered are not restricted to marketing as the title suggests, but cover a wide range of subject matter of direct interest to the grower.

ARCADIAN TECHNICAL MANUAL FOR CHRISTMAS TREE GROWERS
1966, 128 pp., illus., by Lester E. Bell and Donald P. White. Published by Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York, N.Y. 10006 (available in libraries only).

Lester E. Bell is Professor of Forestry and Extension Specialist at Michigan State University. Donald White is also a Professor of Forestry at Michigan State University. This is a well-illustrated handbook. It is thorough and authoritative and, although directed to United States readers, it contains much material useful to the Canadian grower.

TREE TALK
Mimoegraphed newsletter published by DuPont of Canada Limited, Montreal. Editorial Consultant: Sam Manetta, P.O. Box 10, Pontypool, Ontario.

This free publication reports useful topical information on the Canadian Christmas tree industry as well as relevant material from the United States. Its "Traders Corner" carries advertisements for buying and selling Christmas trees and Christmas tree properties.

ATLANTIC CANADA: LAND OF CHRISTMAS TREES
1978, 12 pp., illus., (also in French), Department of Industry, Trade and Commerce, Ottawa, Ontario.

This brochure describes the Christmas Tree industry and provides excellent information and illustrations of the different grades of Christmas trees.

INSECTS OF EASTERN PINES
Departmental Publication No. 1313, 1973, 126 pp., illus., (also in French), by A.H. Rose and O.H. Lindquist. Available from Canadian Government Publishing Centre, Department of Supply and Services, Hull, Quebec K1A 0S9.

Through a series of flow chart keys and color illustrations, this handbook provides an eminently practical means of identifying insects, birds, and mammals that damage native and introducted pines (including Scots pine and Austrian pine) growing east of the Rockies in Canada.

THE KNAPSACK MIST BLOWER AND ITS USE FOR CONTROL OF INSECTS PESTS AND WEEDS IN CHRISTMAS TREE STANDS
Information Report M-X-24, 1971, 29 pp., illus., by J.C. Boynton and C.C. Smith. Available from Maritimes Forest Research Centre Fredericton, New Brunswick E3B 5P7.

Because instructions for using mist blowers in forestry operations are not readily available, even from manufacturers, this manual has particular value. It provides data on four models of mist blower, suggests the kinds and formulations of insecticides and herbicides to use, outlines application techniques, and covers safety precautions.

COMMON INSECTS & DISEASES OF BALSAM FIR CHRISTMAS TREES
Publication 1328 (Revised), 1981, 60 pp., illus., (also in French). Available from Maritimes Forest Research Centre, Canadian Forestry Service, P.O. Box 4000, College Hill, Fredericton, New Brunswick E3B 5P7.

This manual describes the principal insects and diseases attacking balsam fir Christmas trees. Methods to control these pests are given.

GREMMENIELLA (SCLERODERRIS)
DISEASE OF CONIFERS
1979, 8 pp., leaflet, by H.L. Gross and C.E. Dorworth. Department of the Environment, Canadian Forestry Service. Available from Great Lakes Forest Research Centre, Sault Ste. Marie, Ontario.

Selected References by Provinces

Nova Scotia

INSTRUCTIONS FOR GRADING CHRISTMAS TREES
Bulletin No. 15, 1958, 10 pp., illus., by L.S. Hawboldt, Nova Scotia Department of Lands and Forests.

SHEARING FIR CHRISTMAS TREES
Bulletin No. 33, 1969, 29 pp., illus., by G.L. Saunders, Nova Scotia Department of Lands and Forests.

HIGHER CHRISTMAS TREE PROFITS BY FERTILIZING BALSAM FIR?
Extension Note No. 42, 1967, 10 pp., by Gary L. Saunders and Leroy L. Wright. Nova Scotia Department of Lands and Forests.

Note: See also CHRISTMAS TREE MANAGEMENT IN THE MARITIME PROVINCES, PARTS 1 & 2 in New Brunswick section.

New Brunswick

NEW BRUNSWICK CHRISTMAS TREE GRADES AND LICENSING OF CHRISTMAS TREE BUYERS
1963, 18 pp., illus. Published by New Brunswick Department of Agriculture in cooperation with the University of New Brunswick, the Canadian Forestry Association of New Brunswick, and the Maritime Lumber Bureau.

CHRISTMAS TREE MANAGEMENT IN THE MARITIME PROVINCES, PART 1: CULTURAL PRACTICES
Information Report M-X-15, 1968, 30 pp., illus., by J.W. McLeod. Available from Maritimes Forest Research Centre, Fredericton, New Brunswick.

CHRISTMAS TREE MANAGEMENT IN THE MARITIME PROVINCES, PART 2: COMMON INSECTS AND DISEASES AND THEIR CONTROL
Information Report M-X-20, 1969, 55 pp., illus., by C.C. Smith and W.R. Newell. Available from Maritimes Forest Research Centre, Fredericton, New Brunswick.

PLANTING FOR CHRISTMAS TREES
Departmental Publication No. 1083, 1964, 9 pp., illus., by J.W. McLeod. Available from Canadian Forestry Service, Department of the Environment, Ottawa.

Quebec

STANDARD CHRISTMAS TREES
BNQ 0632-901, 1970, 9 pp., illus., bilingual, Bureau de Normalisation du Québec, Ministère de l'Industrie et du Commerce, Québec.

RAPPORT ANNUEL. L'ASSOCIATION DES PRODUCTEURS D'ARBRES DE NOEL DU QUEBEC INC.
1969. 31 pp., Quebec Christmas Tree Growers' Association Inc., Lennoxville, P.Q.

UNE POLITIQUE PLANIFIEE POUR LA CULTURE DES ARBRES DE NOEL
1971, 13 pp., Quebec Christmas Tree Growers' Association Inc., Lennoxville, P.Q.

Ontario

TRIMMING SCOTCH PINE TO IMPROVE CHRISTMAS TREE QUALITY
1964, 8 pp., by E.F. Johnston, Timber Branch, Ontario Department of Lands and Forests.

SOME ASPECTS OF THE CHRISTMAS TREE INDUSTRY OF ONTARIO
1967, 26 pp., by E.F. Anderson, Timber Branch, Ontario Department of Lands and Forests.

GROWING CHRISTMAS TREES IN ONTARIO
PLF-B-11-10M, 1969, 33 pp., illus., Timber Branch, Ontario Department of Lands and Forests.

THE PRODUCTION OF CHRISTMAS TREES IN ALGOMA
Information Report O-X-165, 1972, 33 pp., illus., by J.E. MacDonald. Available from Great Lakes Forest Research Centre, Sault Ste. Maire, Ontario.

FOREST TREE PLANTING
Bulletin No. C-5-10M, 1969, 60 pp., illus. Timber Branch, Ontario Department of Lands and Forests.

THE CHRISTMAS TREE MARKET OF METROPOLITAN TORONTO
Article in American Christmas Tree Journal, 1970, Vol. 14, No. 4, p. 15-21, by D.P. Drysdale and I.A. Nausedas

THE METROPOLITAN TORONTO CHRISTMAS TREE MARKET IN 1980
1981, 11 pp., by I.A. Nausedas. Timber Sales Branch, Forest Resources, Ontario Ministry of Natural Resources in co-operation with the Ontario Christmas Tree Growers' Association.

Manitoba

THE CHRISTMAS TREE MARKET METROPOLITAN WINNIPEG 1968
Information Report MS-X-13, 1969, 27 pp., illus., by P.G. Douglas, A.G. Teskey, and R.M. Waldron. Available from Northern Forest Research Centre, Edmonton, Alberta.

British Columbia

CHRISTMAS TREE CULTURE
Management Note No. 6, 1971, 14 pp., illus. Available from Information Division, British Columbia Forest Service, Victoria, British Columbia.

CHRISTMAS TREE FARMING
Publication B. 16, 7 pp., British Columbia Forest Service, Victoria, British Columbia.

Photo credits

P. 9: P.E. Ewert, District Agriculturist, Abbotsford, B.C.

P. 10 (right): Santos F. Padilla, 526B. South Union Street, Burlington, Vermont 05401.

P. 18 (right): Department of Natural Resources, New York State College of Agriculture and Life Sciences.

Frontispiece p. 2, p. 14, p. 15 (right), p. 20, p. 21, p. 26 (left): Ontario Ministry of Natural Resources.

P. 22, p. 23 (upper left), p. 23 (right): Information Canada Phototheque.

P. 15 (left), p. 18 (left): Canadian Forestry Service (Sault Ste. Marie).

P. 4, p. 5, p. 8, p. 10 (left), p. 16, p. 19, p. 23 (lower left), p. 24 (both), p. 25 (both), p. 26 (upper and lower right), p. 27: Canadian Forestry Service (Ottawa).