SECRET TREASURES IN THE FORESTS

OREGON STATE BOARD OF FORESTRY
D. L. PHIPPS, Acting State Forester
SALEM, OREGON
1951
Secret Treasures in the Forest

Edited by Lynn F. Cronemiller assistant state forester in collaboration with John B. Woods, Jr., deputy state forester; Chas. H. Ladd, senior farm forester; Alvin Parker, E. D. Hanneman and A. H. Sasser, farm foresters; C. W. Maus, protection assistant and W. S. Phelps, resident forester.

Artist: Hugh Hayes, State Forestry Department

Bulletin No. 14

OREGON STATE BOARD OF FORESTRY
Dwight L. Phipps, Acting State Forester
Salem, Oregon
Oregon’s forest income is not limited solely to saw logs, pulpwood, poles, piling and fuel. There are minor products that contribute to the livelihood of a segment of the population. These products mean not only an income to the worker but fill specific needs of industry. Some are vital to the health of individuals and contribute to the welfare or pleasure of a vast population. There are cascara, digitalis and other medicinal plants for the ailing, and Christmas trees and floral products for reverence and pleasure.

These minor forest products are little known, not entirely because of their lack of importance but because Oregon’s multi-billion board-foot timber volume and its harvest overshadows them. These minor products are divorced from the regular logging job in most cases. There is no relationship except in a few instances such as the tannin industry where bark gathering and logging may go hand in hand. Even in instances of this kind, they are separate activities and carried on by different individuals.

There is a diversity of jobs in the work. They may be seasonal, they may approach a 12-months’ job or they can carry over for a period of years as would be the case where the individual established his own plantation instead of depending upon the natural forest for his product. It can be a source of income for the seasonal worker, extra income during spare hours, employment for the student during the summer months or it will approach a continuous income for the individual who seeks this kind of work and will adapt his activities to current available products.

There is little information available as to the economic importance of the minor products but the value has been placed as high as $5,000,000 annually in Oregon. It is quite apparent that it is becoming increasingly important. Dealers have established agencies at several cities throughout western Oregon and during active harvest of the seasonal products arrangements are made for periodic pickup. It is an expanding and competitive business and the dealers are recognizing this.
The modern style of Christmas tree, as seen in the homes of today with its colored lights and shining ornaments, was slow in development. It is almost entirely the creation of Christian thought and sentiment, originating with the German people. The earliest lighted tree on record was in 1604 at Strassburg, Germany.

The earliest authentic record of such a Christmas tree in this country dates back to 1834 at Philadelphia. A German doctor, Constantin Hering, and his teacher friend, Frederich Knorr, found the Christmas of 1833 rather bleak. The next year they decided to make a change, so they ferried across the Delaware river, found fir trees in New Jersey and brought them back to the City of Brotherly Love. This caused quite a stir among the populace. The doctor appointed evenings when his patients and friends could come and see his lighted Christmas tree. Dr. Hering had the satisfaction of having introduced this beautiful custom to Philadephia.

There is mention of a Christmas tree in the yuletide festivities of old Fort Dearborn in 1804. The now extinct Fort Dearborn magazine published an unsigned article on this subject in 1920. More authoritative evidence is needed before this can be called the first Christmas tree in the United States. The search for the first American Christmas tree is still wide open.

Nationwide Market Picture

There are over 20,000,000 trees cut annually in the United States for the Christmas trade. Even before World War II, this nation
was spending about $25,000,000 every year for trees and other Christmas decorations.

The bulk of the annual cut comes from young trees on forest lands that have been logged over and restocked by nature. A large percentage of this cut is supplied by a very few states, mainly those along the Canadian border. The state of Montana’s output has exceeded 3,000,000 trees for one season. The three leading species of the annual cut in the United States are the true firs, Douglas fir and spruce. The prairie states in the middle west, Texas, southern California and other nontimbered sections are the principal recipients of the large annual shipments. Several thousand Christmas trees also go to Hawaii and other islands every year.

Christmas tree production has entered the category of big business. Many foresters recognize this as a logical crop to grow on the poorer site lands not capable of producing good saw timber. In years hence, the annual demand will be supplied from plantations on such lands.

**Christmas Tree Plantations**

The Christmas tree plantations of this country had their start in the eastern states where population and demand were heavy. The earliest plantation of any size known to this writer was the 20-acre tract established by Menno Gerber of Wayne County, Ohio, in 1914. Several more growers have entered this field of endeavor in that region. The state of Pennsylvania has nearly 40,000 acres in Christmas tree production. Today, this industry is finding its place in the Northwest where there is larger acreage and cheaper lands. Due to these conditions and the greatly improved transportation facilities, there is no doubt that this region will supply the bulk of this nation’s annual demand for Christmas trees in the near future.

Christmas trees in well-managed plantations have many definite advantages over those restocked by nature. Listed below are some of the main advantages:

1. A larger variety of species and age classes for market demands.
2. Accessibility during harvest and all seasons.
3. Proximity to market.
4. Each tree can be a high grade, symmetrical tree.
5. Cultural practices can be applied during the entire year.
6. Trees can be safeguarded from fire, livestock, pests and theft.
7. Better able to supply by-products such as wreaths, evergreen rope, boughs, etc.
These advantages are reflected in greater stumpage value per tree and greater returns to the owner.

**Planting Site Requirements**

The proper site is a prime requisite in growing Christmas trees for market. In choosing a piece of ground for this purpose, the following points should be carefully considered:

1. Land should be of low value and of sufficient acreage to fit the market's annual demand or owner's needs.
2. The ground must be well drained and *non-alkaline*.
3. The soil should have low fertility.
4. The plantation should be located where it can be protected from pests, theft, fire, grazing and other sources of destruction.
5. The location of the plantation should be accessible to the owner during all seasons of the year.
6. Climatic conditions, including elevation, should be conducive to the growing of the desired species of trees.
7. Existing vegetation on the tract should be of such a type as not to hinder the growth or shape of the Christmas trees.
8. The Christmas tree plantation should be as near as possible to existing market outlets.

All of the eight points mentioned above are highly important. It can readily be seen that a plantation lacking any one of these points might be unsuccessful from the investment standpoint.

**Choice of Species**

Choosing the proper species that will grow and meet the market demands is of great importance in the planning of the plantation. The characteristics of an ideal Christmas tree are enumerated below:

1. Good color; dark, lustrous or slate green.
2. Compact crown; bushy appearance.
3. Symmetrical shape; fairly wide crown.
4. Ability to retain needles for a reasonable time after cutting.
5. No unpleasant odor.
6. Limbs that are able to support ornaments and other decorations.
7. Pliable branches that can be tied compactly for shipment, and regain original shape when untied.
The species recommended for Christmas tree production in the Northwest region are:

1. Douglas fir (both eastern and western Oregon varieties.)
2. The true firs:
   a. White fir
   b. Grand fir
   c. Noble fir
   d. Silver fir
   e. Shasta fir
3. Scotch pine
4. Norway spruce
5. Lodgepole pine
6. Sitka spruce (along the coast only).

It is recommended that more than one species be tried because often one will do well where another species will not grow satisfactorily on the same piece of ground.

Source of Seedlings and Seed

Most of the species desirable for Christmas tree plantation are grown at the Oregon Forest Nursery, located on highway 99W about six miles north of Corvallis. This nursery is operated by the state forestry department to supply tree seedlings for all types of reforestation, including farm woodland planting. The seedlings grown by the state are good, healthy, graded trees well adapted for Christmas tree plantation.

The growing of Christmas tree planting stock from seed is a difficult task and is not recommended unless the grower is experienced and well versed in this line of endeavor. It will also mean waiting two or three years before the trees are equal in size to the nursery seedlings. The cost of seed varies by species from $5.00 per pound for true firs to $8.00 per pound for Douglas fir. The average number of noble fir seed per pound is 14,600, whereas Douglas fir seed averages 42,000 seeds per pound.

The Planting Job

In western Oregon, the seedlings may be planted at almost any time during the winter. It is recommended, however, that the work be done from late February to April 1. During this period there is little danger of freezing weather which would cause frost heaving. In the eastern part of the state, spring planting only is
advised. When the trees are received from the nursery they should be removed from the bundle and heeled in the ground where they are protected from the sun and winds. By keeping the soil moist the trees will keep well until spring growth begins.

Planting the seedlings is quite simple. Labor costs will not exceed two cents per tree. One man can plant 100 trees per hour on average ground. The same care should be given the young tree as is given to a young fruit tree. One word of warning is

**PRUNING FOR BETTER CHRISTMAS TREES.**

**Prune Here**

**Prune Here**

Pruning Young Trees Helps Obtain Full, Shapely Christmas Trees
necessary in connection with all evergreen tree seedlings. The roots of these trees should never be allowed to dry out during planting. Keep them covered with wet burlap or immersed in a mud bucket while planting. The planting tool can be a hazel hoe, grub hoe, mattock or shovel. Dig a hole sufficiently deep so that the roots can be placed into it without folding or crowding. A discoloration on the seedling stem indicates the ground line and proper depth. Pack the soil firmly around the roots. After the hole is filled, firm the soil by stepping on it.

**Spacing the Seedlings**

Careful thought should be given to the proper spacing of the trees before the planting operation begins. The grower must be guided mainly by the size of Christmas tree that meets the market demand. It is practical to plant evergreen seedlings with a $3 \times 3$-foot spacing when the grower expects to remove every other one for a small table type of Christmas tree. This method will give the remaining trees sufficient space to develop into the larger size of product. The tree sizes in the most demand by the Christmas trade are those from six to eight feet high. Trees of this size should be spaced at not less than six feet apart between trees and rows. Too close spacing may also force height growth at the expense of side development. This would result in low grade Christmas trees. Foresters agree that it is better to err on the side of wider spacing than too close spacing.

Listed below are the numbers of trees per acre for various spacings:

**NUMBER OF TREES PER ACRE FOR VARIOUS SPACINGS**

<table>
<thead>
<tr>
<th>Rectangular Planting</th>
<th>Spacing Feet</th>
<th>No. Trees Per Acre</th>
<th>Spacing Feet</th>
<th>No. Trees Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3 \times 3$</td>
<td>4840</td>
<td>$5 \times 8$</td>
<td>1089</td>
<td></td>
</tr>
<tr>
<td>$3 \times 4$</td>
<td>3630</td>
<td>$6 \times 6$</td>
<td>1210</td>
<td></td>
</tr>
<tr>
<td>$3 \times 5$</td>
<td>2904</td>
<td>$6 \times 7$</td>
<td>1037</td>
<td></td>
</tr>
<tr>
<td>$3 \times 6$</td>
<td>2420</td>
<td>$6 \times 8$</td>
<td>908</td>
<td></td>
</tr>
<tr>
<td>$4 \times 4$</td>
<td>2722</td>
<td>$6 \times 10$</td>
<td>726</td>
<td></td>
</tr>
<tr>
<td>$4 \times 5$</td>
<td>2178</td>
<td>$7 \times 7$</td>
<td>775</td>
<td></td>
</tr>
<tr>
<td>$4 \times 6$</td>
<td>1815</td>
<td>$7 \times 8$</td>
<td>778</td>
<td></td>
</tr>
<tr>
<td>$4 \times 8$</td>
<td>1361</td>
<td>$8 \times 8$</td>
<td>681</td>
<td></td>
</tr>
<tr>
<td>$5 \times 5$</td>
<td>1742</td>
<td>$8 \times 10$</td>
<td>545</td>
<td></td>
</tr>
<tr>
<td>$5 \times 6$</td>
<td>1452</td>
<td>$9 \times 9$</td>
<td>538</td>
<td></td>
</tr>
<tr>
<td>$5 \times 7$</td>
<td>1245</td>
<td>$10 \times 10$</td>
<td>436</td>
<td></td>
</tr>
</tbody>
</table>
Triangular Planting

<table>
<thead>
<tr>
<th>Spacing on Side of Equilateral Triangle (Feet)</th>
<th>No. Trees Per Acre</th>
<th>Spacing on Side of Equilateral Triangle (Feet)</th>
<th>No. Trees Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5590</td>
<td>7</td>
<td>1027</td>
</tr>
<tr>
<td>4</td>
<td>3145</td>
<td>8</td>
<td>786</td>
</tr>
<tr>
<td>5</td>
<td>2013</td>
<td>9</td>
<td>621</td>
</tr>
<tr>
<td>6</td>
<td>1398</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The grower can either plant all the area available for Christmas trees at one time or plant a rotation that will supply the number of trees required to meet his annual demand. For example: Plant one acre per year (1,000-1,500 trees), for eight years on a tract of eight acres. At this time, the first year's planting should be ready for market and be replanted the following spring.

Management of the Plantation

Taking care of the young trees from planting until harvest is time well spent. It will pay off in many ways, including a better grade of product and good insurance for the grower's investment.
Weeds, grass and brush should not be allowed to handicap the small trees. If the plantation is in an area of limited rainfall during the growing season, some cultivation each summer is necessary to eliminate competition of weeds and grass. The hardwood brush should be removed before planting. However, some brush may resprout and persist. This brush may be cut down and a commercial poison applied to the cut stump to prevent further growth. After a few growing seasons, probably two or three, further competition by weeds and grass can be removed by mowing. Too much cultivation should be avoided because height growth may be forced at the expense of crown compactness. This would result in poor quality Christmas trees.

Some pruning may be necessary after three or four years growth. There will be some trees that are growing too fast. This will vary by species. Pruning will make them better grade trees. This may be done at any time of year except on the pines. The pines should be pruned during the middle of the summer because of the bud development peculiar to this genus. One man can prune about 50 trees per hour. Some pointers on pruning are outlined below:

1. Use sharp pruning shears.
2. Do not prune during the year that the tree is to be harvested.
3. Begin pruning a tree just as soon as the leader gets out of proportion to the laterals.
4. Keep terminal growth to about one foot per year.

Instead of replanting after harvest, some growers are practicing vegetative reproduction or stump culture. This is done during harvest by cutting the Christmas tree above the first or second whorl of live branches. The healthiest limb of the whorl is left to grow into another Christmas tree on the same stump. The success of this method has been rather varied but it is worth a trial.

It is possible that trees grown in this manner will require more pruning and care than planted seedlings. The cost of this additional labor may be prohibitive and will warrant replanting with nursery-grown seedlings. However, a tree grown from stump culture will be ready for market about two years before a nursery seedling.

Other management practices of prime importance to the grower are protection measures. The greatest hazards to a plantation are fire, grazing and theft. The perimeter of the plantation area should be completely fenced to keep out livestock. Along this fence, notices should be posted at frequent intervals to the effect that trespassers
will be prosecuted. To safeguard the area from fire it is suggested that a fire trail be constructed along the fence that surrounds the tract and through the area if its size warrants it. These fire trails can also serve as access roads and should be maintained annually to provide good fire breaks.

In some areas disease, insects, and rodents may cause considerable damage. If a grower should encounter this type of problem, it is suggested that he consult his local representative of the state forestry department or extension service. Both agencies employ trained men who can help on such matters and provide control measures.

**Harvesting the Trees**

At this point the plantation has advanced to the stage where it will begin to pay off. A Christmas tree becomes merchantable whenever there is a market for it. It may be a three-foot table tree or the more common 6 to 8-foot type. The grower must study and gamble a bit on the current prices that he may get for the various grades of trees to determine whether it is more profitable to market a small tree or let it grow into a larger product. If his plantation is of an age where the trees must be thinned out he must sell some small ones to give the remaining trees room to develop. There is no doubt that table trees are more easily harvested and offer a quick turnover on the investment. The grower must be guided by the market prices and his own limitations.

The time to harvest also requires some thought and decision. The cutting should be delayed until after the first or second frost when the trees have hardened off. At this time the needles are less apt to fall and the trees will remain fresh for a longer period of time. When the trees are cut several weeks prior to Christmas, they should be stacked in a cool, shaded place with the butts in contact with the soil. In sections of the state where heavy snowfall and low temperatures occur, early cutting is advised. Temperatures below 20 degrees above zero cause the branches to become so brittle that they are sure to break when the trees are stacked together. Heavy snow on the ground would make the costs of harvesting prohibitive.

Harvesting methods may vary with each grower. Efficient harvesting will depend largely upon the grower’s own ingenuity. It will help greatly if the trees to be cut are tagged in advance on large plantations. The grower should inspect each tree to decide whether it should be sold this year or later. The tags may show
the height of tree, name of grower and purchaser, etc. The tags will be good advertising and enable the grower to employ inexperienced cutters for the harvest. Tags also help on the inspection regulations of out-of-state shipments. Whether or not bundling, grading, sorting, and other operations are required will depend upon the shipping method and type of orders.

Selling Trees

The safest rule to follow in marketing is “do not cut a tree until it is sold.” Christmas tree marketing is perhaps the most disorganized and uncontrolled enterprise in this country. It accounts for the big bonfires of unsold trees shortly after Christmas. There are several factors that contribute to this waste. The principal causes are the limited marketing season, consignment selling to retailers and poor quality trees. Selling has many variations. The grower is limited only by his own ingenuity. He has two general methods of being sure that all trees cut are sold, selling directly to the public and selling wholesale.

When the Christmas tree plantation is near a center of large population, selling directly to the customer should be tried. A little advertising will go a long way toward making the plantation generally known to the public. City people will drive out to the country for a Christmas tree just as they will for eggs, apples and other farm produce. The grower may even contrive a means by which a customer can pick out and cut his own tree. This method would appeal to a lot of people. They would soon get into the habit of coming back every year. Other ways of direct selling would include setting up retailing points in neighboring towns and cities and taking orders for home delivery. Some growers are trying the mail order house angle, and shipping the packaged tree via parcel post.

Most of the larger growers of Christmas trees sell their crops wholesale. Selling by stumpage and consignment should be avoided. The large wholesale companies will often contract for a grower’s crop nearly one year in advance. One of the largest buyers has stated that an unlimited quantity of high quality trees grown on this coast can be absorbed by the larger shippers. From railroad to the retailer the trees are usually handled by the large companies operating on a nationwide basis. These distributors often help finance the grower and accept the risk in shipping the perishable crop to an uncertain market. The distributor usually handles
the sorting, baling, tagging and loading at the receiving station or
railhead.

The grower has a better way of selling wholesale if he has a
middleman in the city who will handle his trees exclusively on a
commission basis. When this source is close at hand, it is not
necessary for the retailer to stock up very heavily. It would be easy
for the retailer to telephone the grower for more trees when needed.
The grower and retailer should work out a fair distribution of the
selling price. The grower has gone to every expense except that
of the final sale. It would seem that he is entitled to at least 60
per cent of the sale price.

Christmas Tree By-products

Many producers of Christmas trees have found the so-called
by-products quite profitable. These items include: greenery for
door charms, wreaths, sprays, evergreen rope, mistletoe, and cones.
Except for the cones and mistletoe, most of these saleable items
can be made up from the waste limbs and culled Christmas trees.
The cones of the lodgepole and ponderosa pine seem to be in the
most demand. Scotch pine cone clusters are also favored. Mistle-
toe, which is found commonly on Oregon white oak is also in demand every Christmas.

The by-products are offered for sale along with the Christmas trees every year. The grower can produce these by-products even before his Christmas trees are merchantable. It would be advisable for a grower to save some of his pine trees so that they will reach cone producing age. This would apply to areas where there are no natural stands of such species. The pine seedlings could be planted along the exterior boundaries of the plantation to serve as windbreak protection to the plantation as well as a source of cones.

**Costs and Profits**

The costs involved and the profits to be derived from plantations of Christmas trees will vary with individual growers and sections of the state. There is an excellent opportunity for well-managed plantations to realize a good profit.

Most of the records of successful plantations come from the older plantations in the eastern part of the United States. There is mention of a grower in Ohio who planted 12,000 trees on four acres in 1927. Nine years later he began harvesting. At the end of another nine years he had cut 2,000 trees and received $1,200 for the stumpage, or an average of 60 cents per tree and $300 per acre. The grower reported that the Christmas trees alone yielded a seven per cent compound interest net and he still has a good stand of potential saw timber left in the residual trees. In Oregon, a grower should be able to do better than the eastern producers because of better growing conditions for trees. A plantation established solely for Christmas trees will bring a quicker gross return than one having a dual purpose.

The average costs of producing a Christmas tree from the seedling to a sold product at the shipping point are itemized below:

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Cost per Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting costs</td>
<td>$.015</td>
</tr>
<tr>
<td>Management and taxes</td>
<td>$.025</td>
</tr>
<tr>
<td>Harvesting costs—Tagging, cutting, skidding and transport</td>
<td>$.090</td>
</tr>
<tr>
<td>Selling costs—Sorting, baling, loading, miscellaneous</td>
<td>$.200</td>
</tr>
<tr>
<td><strong>Total costs per tree</strong></td>
<td><strong>$.330</strong></td>
</tr>
</tbody>
</table>
The average wholesale selling prices for various sizes of Douglas fir Christmas trees at the shipping point are:

<table>
<thead>
<tr>
<th>Sizes</th>
<th>Price Per Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 feet</td>
<td>$ .20-$ .30</td>
</tr>
<tr>
<td>3-4 feet</td>
<td>.25-.35</td>
</tr>
<tr>
<td>5-6 feet</td>
<td>.40-.60</td>
</tr>
<tr>
<td>7-8 feet</td>
<td>.70-.90</td>
</tr>
<tr>
<td>9-10 feet</td>
<td>1.00-1.25</td>
</tr>
<tr>
<td>11-12 feet</td>
<td>1.50-2.50</td>
</tr>
</tbody>
</table>

The stumpage value of Christmas trees, that is, when the trees are sold on the stump, has averaged from $ .06 to $ .10 per tree in this region.

**Shipping the Christmas Trees**

Railroad transportation of Christmas trees may be arranged with the local freight office. Cars should be ordered well ahead of shipping time and a favorable location for loading spotted. Rates, temperature, loading techniques, ventilation, and travel time should also be checked. The average freight car’s minimum load is 24,000 pounds. There are about 1,000 bundles or 4,000 trees to a carload. Each bundle contains an average of four trees, weighing approximately 24 pounds, for Douglas fir species.

Shown below is a chart guide for bundling and weights for Douglas fir trees:

<table>
<thead>
<tr>
<th>Number Trees Per Bale</th>
<th>Approximate Sizes of Trees</th>
<th>Approximate Weight of Trees</th>
<th>Approximate Total Weight Per Bundle</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>2-3 feet</td>
<td>2 lbs.</td>
<td>16 lbs.</td>
</tr>
<tr>
<td>6</td>
<td>3-4 feet</td>
<td>3 lbs.</td>
<td>18 lbs.</td>
</tr>
<tr>
<td>4</td>
<td>5-6 feet</td>
<td>6 lbs.</td>
<td>24 lbs.</td>
</tr>
<tr>
<td>3</td>
<td>7-8 feet</td>
<td>12 lbs.</td>
<td>36 lbs.</td>
</tr>
<tr>
<td>2</td>
<td>9-10 feet</td>
<td>20 lbs.</td>
<td>40 lbs.</td>
</tr>
<tr>
<td>1</td>
<td>11-12 feet</td>
<td>30 lbs.</td>
<td>30 lbs.</td>
</tr>
</tbody>
</table>

Truck haul regulations will vary between farm trucks and trucks hauling for hire. In regard to the P. U. C. motor transportation code in Oregon for trucks under the farm exemption provision, Christmas trees are not considered a farm crop unless grown for such. If so grown, they can be transported to market by the farmer on his truck with “F” plates. No special license is required for taking the trees to California on Oregon farm plates. Operators hauling for hire, or hauling trees harvested from lands other than their own, must contact their local P. U. C. office. These same
operators, if hauling to California, must contact the California State Board of Equalization at Sacramento for the required permit.

Bills of sale certifying ownership may be requested at the California inspection station. Quarantine inspections are not made on cut Christmas trees at the state line except for white pine. This species may be infected by blister rust and could spread the disease, even as a cut tree. If white pine shipments do not have an inspection O.K., the trees will not be permitted in the control areas.
The cascara tree (*Rhamnus purshiana, De Condolle*) came to the knowledge of the white man when members of the Lewis and Clark expedition noted it on their journey through western Oregon. However, it is quite likely that the medicinal properties of the bark were known prior to that time since records indicate that the Mexican and Spanish priests of the 18th century used it and probably passed the information on to the Indians.

**The Tree**

The tree is found throughout a considerable area of this western country. It grows in limited areas in New Mexico and Arizona and extends northward through California and into British Columbia. It grows as far east as the Flathead Lake country of Montana. In Oregon it is found in all of western Oregon and in the Blue Mountains of eastern Oregon. Its commercial range is limited to northern California, western Oregon and Washington and southern British Columbia.

The tree grows to a height of 20 to 40 feet with a diameter of 6 to 15 inches. Exceptional trees have been found to be as much as 2 to 3 feet in diameter and 60 feet tall. When open grown, cascara has a short trunk and bushy crown. When it has to meet the competition of other forest trees it has a clear trunk and small crown.

The tree is not difficult to identify. During the winter it differs in one respect from other trees and this serves as a positive method
There are no bud scales for winter protection. The small leaflets give the impression of just breaking out for the initial spring growth. These leaflets are covered by rusty brown hairs. The full grown leaves are also distinctive although resembling the alder to some extent. The edges of the cascara leaves are very finely toothed while the alder has large blunt-toothed edges. The veins of the cascara leaf are very prominent, remarkably straight and parallel to each other. The leaves become more hairy and thicker as the southern extent of its range is reached. Branching is alternate. The fruit is a small black, pulpy berry that contains two or three hard, smooth, olive-green seeds.

The tree makes its best growth in the low river bottoms, along the borders of streams and on flats and benches where the soils are deep, rich and sandy or humus in nature. Abundant moisture is essential but the site must be well drained. The tree will grow elsewhere within its indicated commercial range but commercial production should not be undertaken on the poorer sites if other locations are available.

No attempt should be made to grow the tree outside its commercial range. In Oregon this is along the coast, throughout the Willamette valley and in the foothills of the Cascade mountains.
within the Willamette valley area. Elsewhere within the state the growth will be much too slow to make commercial bark production possible.

**The Plantation**

In planning the cascara plantation the grower should bear in mind that he is going into a project that is to carry over for a period of not less than 12 to 15 years before he gets a return on his investment. The initial costs and the annual carrying charges are just as great on the poorer sites as on the good ones. The choice of a location, together with the subsequent care, can mean the difference between a profit and a liability.

The plantation can be started either from the seeds or through the purchase of the one-year-old seedlings from the state forestry department. Starting from seed is not generally recommended for the amateur since the seeds are rather difficult to handle and germination is quite low. However, in case the individuals should care to go into the growing of seedlings, the berries should be gathered in the fall when ripe. This occurs sometime in August or early September. The berries can be either dried or de-pulped in water. Treatment during winter consists of stratification in moist sand. They should be planted in a garden spot in the spring, rather thickly in rows, with the rows 18 inches to 2 feet apart. They should be weeded, cultivated and watered throughout the summer. During the winter or early the following spring, before the growth starts, they can be planted at the site of the permanent plantation.

By far the easier method is to secure the seedlings from the Oregon forest nursery near Corvallis. A card to the state forester at Salem will bring a tree planting bulletin and order blänk or the seedlings can be secured by going directly to the nursery. Frequently the demands exceed the supply of seedlings and in such instances the supplies are rationed. For this reason it is advisable to get orders in early in the fall. However, production is being stepped up and it is expected that the state will be able to meet all normal demands in the future.

The minimum spacing recommended for field planting is 6 by 6 feet which will require 1,200 trees per acre. Spacing less than this will tend to crowd the trees and growth will be restricted. If plenty of space is available, the trees may be planted either 6 by 8 or 8 by 8. The wider spacing contributes to ease of cultivation where mechanical equipment is used.
Since the young trees grow very slowly in the shade, steps should be taken to cultivate the plantation prior to planting. If this is difficult because of rocks, stumps or other obstructions, the brush and other growth should be removed around each tree and the tree then mulched. After the tree gets above the low growth of ferns, grass and shrubs it does not require much care other than protection.

**Care of the Plantation**

Care in this early stage is important. The grower must not take the attitude that "this is just another forest tree" and will make good growth under the same conditions of growth as the tree in the forest. This definitely is not so. The cascara farmer must come to the realization that the new plantation—at least in its early stages—should receive care that approaches that given a young fruit orchard. This care pays dividends in accelerated growth.

Some pruning of lower branches may be necessary the first few years to produce long, clean-boled trees. If these branches are left, too much growth will go laterally at the expense of height. Pruning will also allow more room for cover crop cultivation.

Fire and trespass are two threats to the plantation. Every precaution should be taken to prevent fire from running through the plantation. Good fire lines should be constructed around the area, and if it is of any considerable extent should be broken into blocks. The bark is quite attractive to the trespasser, especially during years when prices are high or when there is a depression and jobs are scarce. For this reason plantations should be near habitation where they can be watched.

All kinds of stock find the cascara quite palatable and hence the plantation cannot be grazed. It is questionable whether it can be grazed even after the trees reach a size where they are not damaged by browsing. Trampling the ground will tend to damage the trees and slow the growth. The cascara should be considered as a single crop and the farmer reconcile himself to the fact that multiple use is out.

In an area where deer are plentiful the grower will definitely run into trouble and it may reach a stage where the project may have to be abandoned. The animals repeatedly browse the tender shoots and branches. Only a deer-proof fence will keep the animals out and this is a costly project. It means a 4-foot hog-proof fence with several strands of barbed wire above this.

Another threat to the plantation is the mountain beaver or
boomer, a rodent type of animal of a social nature that lives in the ground and is found widely scattered throughout the range of the cascara. This animal will cut all trees in the plantation and drag them to his underground den. No cascara plantations should be established in or near one of these colonies. Since the colonies are somewhat migratory with the seasons, they may invade a plantation. They can be trapped by placing steel traps in the dens. Some research work has been carried on in control through poisoning, but a successful formula has not yet been developed.

The Harvest

Complete information as to the amount of bark that can be expected from the plantation is not available. Most data has been secured by peeling native trees. This would result in a lower figure since the native trees are grown under somewhat adverse conditions and could not be expected to produce the amount of bark that would come from a plantation. However, it appears that the grower could expect a production of about 12 to 15 pounds per tree over a period of 15 years where the trees are planted on
a favorable site, properly spaced, and have been given reasonable care during the growing period.

At the time the first crop is harvested, the second rotation can be assured without replanting by following approved methods of peeling. The stumps should be cut to a height of about six inches and must not be peeled. The stump will then put out a number of sprouts and these can be thinned to the two or three that are the most vigorous. At a later period of the rotation, all except one of the sprouts can be removed and peeled. Eventually the area will have to be replanted since the stumps lose their vigor through repeated coppice.

The time of peeling will vary somewhat as to location and elevation but it usually starts in April and may continue as late as August. In removing the bark various types of knives or spuds are used. One of the most acceptable is made of spring steel and has a blade about seven inches long with a five-inch handle. The blade is a little over an inch in width. The end is rounded with a recurved point at one edge of this rounded point. This sharpened point is used for splitting the bark vertically to the trunk of the tree and also horizontally so that it can be removed in sheets about two feet or so in length. The spud end of the knife is used to remove the bark. Limbs down to a diameter of one inch should be peeled.

The bark should be placed in the shade or partial shade for drying. Too much direct sunlight tends to cause staining. It must be covered during the night, if there are heavy dews, or at all times during rain. Wet bark moulds quickly and results in serious degrade. The most suitable place is a large building where there is plenty of ventilation. Artificial heat is not necessary.

Bark may be sold either wet or dry. Loss of the green bark is about 50 per cent of the dry weight. However, the price is not proportionately the same. The individual purchasing the green bark is confronted with the added cost of drying, breaking and sacking. As an example, when dry bark is selling for 20 cents per pound, the price of the green bark runs about 8 cents per pound.

The market price of cascara has fluctuated greatly over the past several years, ranging as low as 6 cents about 10 years ago to as high as 30 cents in 1947. The average runs about 15 cents but may fluctuate during the season. Usually the individual who has a quantity of the bark can demand a better price than that paid to individuals dealing in only a few sacks.

However, the man who owns a plantation is not forced to sell
on a low market. If prices are not right the harvest can be postponed a year or more. If prices drop during the season after the bark is peeled, the cascara farmer can dry his bark and store until prices are right. Bark does not deteriorate with age. In fact it has to be seasoned for at least two years before used by the drug manufacturing firm.

Current output averages about 5,000,000 pounds of bark annually and has held at this figure for a number of years. There is considerable argument about the availability of the bark from native sources. Predictions made some years ago indicated that the supply was about exhausted. However it appears that the annual requirements are met through peeling the second growth cascara and this may continue indefinitely.
Oregon's forests contain many woods which carry natural designs of singular beauty making them especially desirable for industrial purposes and by individuals who follow handicraft as a hobby. Other woods are utilitarian in nature and meet specific requirements in wood characteristics that are limited to a single species. These woods include burls, figured logs, yew for bows and numerous others.

**Burls**

The most important of these specialty woods are the burls, an abnormal swelling or bulge that forms on the trunk or limbs of a tree. They are found on many different trees in the state but the only ones of any material importance commercially in Oregon are the broadleaf maple (*Acer macrophyllum*) and the myrtle (*Umbellularia californica*). At times the madrona (*Arbutus menziesii*) is collected for the burls as is the redwood (*Sequoia sempervirens*). However, the latter is a California product and does not appear in the Oregon trade. The cause of the burl formation in a tree is not definitely known, although numerous suggestions have been made. The fiber alignment is very irregular, which contributes to intricate and beautiful designs when the burl is cut. It has been suggested that burls may form from an injury or through the development of buds. Some individuals have induced burls by placing metal bands around trees or by repeated burning of a part of the stem of the tree.

The burl of commerce is usually formed on the trunk or base
of the tree. At times it may extend into the ground. The average size of the burls in the order of commercial importance for the various tree species runs as follows: Broadleaf maple 700 to 1,000 pounds, myrtle 1,000 to 1,200 pounds, madrona 1,500 to 2,000 pounds and redwood 2,000 to 3,000 pounds.

The major portion of the burls goes into veneers for furniture manufacture and cabinet making. A smaller and more specialized field utilizes some of the burls and also the figured logs, especially the myrtlewood. In this category is included a large variety of useful household articles such as salad and nut bowls, fork and spoon servers, trays, lamp stands, vases, ash trays, coffee tables and other articles. In addition, there are novelties such as carved animals, pencils, pin initials and many other creations. Whether a novelty or otherwise, it should be mentioned that gun stocks from myrtlewood are quite frequently in demand.

In discussing harvesting methods and marketing techniques, The Timberman of April 1947, stated that “burl” merchandising might be called the jewelry branch of the forest products trade. Burls, source of fancy veneer for furniture and cabinet makers, are never dispensed in vulgar terms of board feet, but rather by the pound. Like precious stones, burls are where you find them. To discover them requires a lot of prospecting and to get them re-

GOOD QUALITY MAPLE BURL
quires a bit of mining. They have to be studied before cutting into flitches, so that every possible valuable veneer may be recovered from the irregular shaped mass of wood.

“Let it be said . . . . . . that the burl business is not part-time business for an amateur, which explains why there are fewer recognized burl houses on the Pacific coast than there are fingers on one hand. Without a thorough knowledge of what constitutes a commercially valuable burl, an inexperienced producer might spend many hours of back-breaking toil on a lumpy tree growth only to learn later that it is worthless, except as fire wood. The fruits of many days of misguided effort may be seen in the lofty cull pile at a Portland burl yard.”

These statements are endorsed and emphasized by the Portland burl buyers and they have recommended certain procedure to be followed, especially by the amateur. Contact should first be made with the buyer or the dealer and an experienced man will be sent out to inspect the trees and check the burl material, indicating that which is acceptable. Prices will be quoted on the basis of either stumpage or delivered at the yard. All prices are by the pound as previously indicated.

In general the burls are graded on the basis of shape, size and presence or absence of defects which would show up in the veneer. Most buyers specify a minimum weight of 500 pounds for an individual burl. However, burls of excellent quality and weighing as little as 350 pounds have been accepted. By dimensions a minimum size burl should be approximately two feet high and nearly three feet in diameter. A minimum of two feet between the creases in the burl is another requirement. There must be as least 14 inches of sound usable wood.

**Figured Logs**

Figured logs have a curly or wavy grain of fairly uniform nature. In this classification the buyers have recognized several trade names which include the following:

Quilted. Sometimes referred to as blister logs. Found in the maple and has a fairly uniform grain producing a quilted design resembling the design of the quilts of the olden days.

Fiddleback. Included in this are “curly” logs which are quite similar. Occurs in maple. Logs have a short or narrow wavy grain with a close spacing between the wavy (undulated) grain. Veneer from this type of logs produces fiddlebacks as the name indicates. It is also used in furniture.
Cluster. Maple or myrtle logs having fairly even distribution of clusters, or burl-wood bumps, protruding from the surface of the log and extending quite deeply into the wood. Between bumps the surface of the log is fairly smooth and often has the fiddleback figure between the bumps. Veneer from this type of logs has a design of the burl with somewhat even or figured grain between.

The bird’s-eye maple is not included in any of the western designs. This type of material is obtained only from certain varieties of the eastern maples. The term “bird’s-eye” should not be used in connection with the Oregon maple.

Figured logs are usually cut to a length of 8½ feet if possible. This is especially true of the logs carrying the quilted or fiddleback designs. Shorter lengths may be taken with some as short as 4 feet where it is a good type of cluster log. Minimum diameters range from about 18 inches for the quilted logs to a minimum of about 20 inches for the cluster logs.

Archery Stock

The western yew (Taxus brevifolia) is more in demand for archery stock than any other wood. The tree is quite widely distributed in the state but the best bows are made from wood
that is grown in the higher elevations where the tree growth is slow and hence results in a close-grained product.

Specifications for archery billets are as follows: They must be 3 feet 8 inches in length and 1½ inches in thickness and 2½ to 3 inches in width. Staves are 7 feet long with the same width and thickness as the billets.

Port Orford cedar seems to be the principal species used for the arrows. Some dealers list the cedar with hardwood footings. The arrows are made of specially selected wood and must be straight grained.

**Miscellaneous Woods**

Some of the miscellaneous wood products include material for rustic furniture, baskets and similar uses as well as inlay work. In the rustic use are included the willow, madrona, cherry and at times peeled Douglas fir poles and other species. Inlay work is largely in the nature of a hobby and requires vari-colored woods that will take a good finish. Experts along this line state that Oregon woods are not sufficiently varied in shades and colors to meet all the requirements of the expert and they have to go to outside regions to get the proper woods.
Climatic conditions in the western part of Oregon contribute not only to a dense growth of large trees but also to an understory of shrubs and other plants which are coming more and more into prominence through demands of the florist trade. These include the ferns, huckleberry, salal, branches of the cedars and other forest growth.

**Sword Fern**

The principal one of these is the sword fern. It makes its best growth in the dense fir, hemlock and spruce forests west of the summit of the Coast Range, although suitable fronds do grow in the forests of the Willamette valley area. It will extend at times into the hardwood stands of alder and maple. The amount of available fern is tremendous. It is found on thousands of acres of Oregon's western timbered lands and its annual growth is far beyond the current annual demands. Only a fraction of one percent of the area is covered by the fern picker, yet the output runs into thousands of bundles annually.

The fronds have been in demand by the florists for many years. At no time does there appear to have been an oversupply on the part of the pickers. In the days of the depression it kept individuals and families busy and enabled them to make a livelihood although the prices were low. With improved economic conditions and increased prices, the experienced picker has found his income above that of the average wage earner. He has been able to make $15 and better a day.
The professional fern picker attempts to select an area that is close to transportation. Carrying the bundles out of the woods on a pack board or wrapped in burlap can be a slow and tedious job if the operation is far from a road. It also takes time that could be more profitably spent in picking the fronds. The picker attempts to get exclusive rights to an area and this can often be accomplished through permits from private landowners or from public agencies. At other times they erect fictitious “No Trespassing” signs and erect gates on old unused access roads. Control of a sufficiently large area makes it possible for the picker to plan his activities on nearly a year long basis in such a manner that the annual harvest will not deplete his growing stock.

The harvest starts in the fall after the summer growth has ended. Bright tips about 25 inches long are selected from each root stock. The lower three inches is stripped for ease in handling. Bundles contain 50 fronds but 2 to 5 additional are always included to take care of any culls. Bundles are carried to a road where they are picked up by the dealer or his agent or are delivered to a designated central agency in the general area. The fern must not be allowed to dry out and hence must be protected while enroute to the central packing plant. At the plant the bundles are...
inspected and packed 500 to the case. They are shipped under refrigeration to florists throughout the nation.

No great amount of research has been carried out to determine how the fern area should be managed. Information available has been secured from pickers who have tried to carry on their activities so that there is a continued production. The fern is a perennial plant which produces fronds from an underground root stock. It appears that as many as 25 per cent of the fronds can be removed without damaging the crop. This means that four or five fronds can be removed from each plant. Usually that is as many as can pass inspection.

Proper harvesting methods indicate that the fern in limited shade should be cut during the early part of the season. Cutting under the hardwoods comes next and this should be completed before the falling leaves stain the fern. Those in the dense forest shade can be harvested last. By following this plan the work can be continued until the late winter months.

Huckleberry

The coastal type of evergreen huckleberry is coming more and more into demand for the floral trade as a filler for floral pieces. Large quantities are shipped each year to the markets of the nation and especially to the eastern seaboard. Acceptable sprays can be cut only from the huckleberry that is grown in the dense shade of the west coast forests. The best specimens are found within a few miles of the coast on the western slope of the Coast Range and especially in the southwestern Oregon area.

Only the flat undamaged sprays are collected. They must be 25 to 30 inches in length and collected during the fall of the year after the spring growth has hardened off or in the spring before it starts. The picker bundles the sprays and sends them to the packing shed where they are sorted, weighed and gathered into smaller bundles of standard size and weight. They are thoroughly moistened, packed and shipped to the user.

Harvesting the huckleberry does not damage the shrub but is in the nature of a beneficial pruning. It stimulates the plant to produce better sprays.

Miscellaneous

The widely scattered salal of western Oregon is becoming popular with the florist. It is used for practically the same purposes as the huckleberry and its harvesting procedure is practically the same.
The best sprays come from the deep shade where smooth, undamaged oval leaves are produced.

Some of the cedars are also used as a florist’s green or packed in special boxes for the Christmas trade. Some firms turn out gift boxes with various kinds of greenery in them as well as cones and other Christmas decorations.
Several decades ago many individuals and family groups living in or near the coastal forests of the northwest were able to add to their income by selling hemlock bark to the local tannery or to agents dealing in some of the miscellaneous products of the western forests. In those days there was an active demand for vegetable tannic acid, not only locally but by out-of-state customers. Hemlock bark had long been the best source of the product.

The source of supply in those days was no problem. There was a lot of hemlock of all sizes and it was accessible. It was not considered a valuable tree species. The trade had definite objections to it as lumber, and spruce went to the paper mills for pulp. The hemlock was a forest weed. As a result, the bark peeler did not have to be at all careful about property lines.

With the passing of time these conditions changed and the collection of hemlock bark gradually passed out of the picture. There were two contributing factors. First was the law of trespass which was invoked when hemlock came into demand primarily as a pulp- ing species and also as lumber. Second was the problem of accessibility. Pack transportation was slow and costly. A substitute appeared in the shape of the product of the quebracho tree of South America.

Today there is but one tannery in Oregon, located at Dallas, that uses vegetable tannin in its work. It derives its product from Douglas fir bark. This is due to force of circumstances. A shortage of hemlock bark as a source of tannin led the company to investigate the possibility of using Douglas fir bark. Through tests
carried out by eastern chemists it was found that Douglas fir bark was rich in the extract and compared favorably with hemlock. The company immediately switched to the fir and has been using it since then. The annual requirements are about 100 tons of bark.

Considerable research has been carried on at the Oregon Forest Products Laboratory at Corvallis in the recovery of various chemicals from second growth Douglas fir bark. This work confirmed the earlier findings that it was a valuable source of tannic acid. The laboratory reported that the amount of the extract varied with the thickness of the bark, age of the tree and its location on the trees. The most favorable source was the bark from the upper part of the younger trees. The laboratory also reported that the bark was a valuable source of wax.

In discussing its findings the laboratory reported that the amount of actual tannin that could be recovered annually from timber cut in Oregon would exceed the annual consumption in the United States. This has been placed at approximately 150,000 tons.

The bark may be a by-product of other logging activities such as piling or poles, salvage from second growth logs before they go to the mill or from tops left in the woods. Bark from logs that have been in the millpond or streams is not acceptable since the extract leaches out in water.

The demand for tannic acid does not come from the leather industry alone. About half the output goes to the petroleum industry where it is used for control of mud around drill points. This demand is one of the contributing factors of the tremendous imports of the products of the quebracho tree. It is hoped that through active promotional work, the industry will be induced to use the home product from Douglas fir bark.

Peeling is a simple matter when the sap is up. The bark can be cut down the trunk of the tree and then around the tree at four foot intervals. It can be readily removed in the four-foot lengths with a spud. A sharpened spade will do very well. The sections can then be stacked on end against the tree or stumps and logs for two or three weeks for drying. The bark can be tested by the fracture test. A clean break indicates it is ready to be delivered. Five or six large piles will yield a ton of dry bark. If peeled from logs it will require about 2,000 board feet of logs to produce a ton of bark.

After the raw bark is processed through a chipping and boiling process there is a residue left which varies in size from a powdery form to pieces an inch square. In recent years a market has devel-
oped for this material and it is in great demand by nurserymen and gardeners for mulching. The price has raised from 50 cents a cubic yard a few years ago to a present price of $3. The firm is unable to meet the demand.

Emphasis is placed upon the fact that there is a limited market for the bark at the present time and no activities along this line should be undertaken unless the harvest has assurance of a market.
In recent years there has been a tremendous demand for coniferous forest tree seed, especially the Douglas fir, and this has resulted in an excellent market for cones. The demand has been occasioned through the immense state forest land rehabilitation project that has been instituted by the state forestry department and also through the seedling requirements of the industrial concerns that have embarked upon the tree farm program.

Good seed years in the forests of the state do not occur each year. They vary from three to five years and may go as long as seven years. Usually there is a cone crop in limited areas every year. Because of this annual variation in the cone crop the agencies engaged in reforestation attempt to stock-pile large quantities of seed during the bumper years in order to carry them over the lean years. This is especially true of the state forestry department where the annual Douglas fir requirements may reach as much as five or six tons of seed. Thus the cone picker can always be assured of a market.

Cone picking is a seasonal job. It usually begins in the valleys about the middle of August and ends in the higher elevations by the first of October. Seasonal conditions may cause some variations. However, before beginning work the cone picker should contact the dealer or his agent. Specifications and instructions are issued indicating the kind of cones desired, location of agents, where cones are to be delivered, prices and other information.

Tests must be made of the individual Douglas fir trees prior to
picking. Where considerable cone deformity is noted or pitch is running from the cones, the tree should be discarded since this indicates infestation by the cone borer. Cutting tests must also be made. Not less than 10 cones should be cut longitudinally down the center as a test for seed maturity and worm infestation. The meat of the seed should be solid. If in the milk or dough stage the seed is not ripe and the cones should not be picked. At least four of the cut seeds should show white meat. If less than four, the yield will be too small to justify costs of seed extraction and cleaning. If wormy, the worms will show in the central axis of the cone. If half the cones are infected the tree should be discarded unless the cut shows seven or more seeds. The yield will in that case be sufficient to justify picking in spite of the infestation.

Cones may be picked from standing trees, gathered from squirrel caches or collected from felled trees in logging operations. Open grown trees usually bear the most heavily and because of the long crown are easy to climb. Cones may be picked by hand or with the aid of special tools with recurved blades attached to long handles. Squirrel caches are frequently the source of large quantities of cones. These are found along logs or under tree roots or at times on the ground where they fall as the squirrels cut them from the branches.

The Douglas fir cones are packed in two-bushel sacks. Sacks must be sewed, not tied, since the dealers pay only for the full two bushels. They can be taken to the local agent or if they are to be stored for a period of time the sacks must be piled in a dry place where the air can circulate freely about them. Close piling or storing in a damp place causes them to mould. This greatly reduces the viability of the seed and cones will not be accepted by the dealer.

Smaller cones such as the cedars can be stripped from the standing trees by hand or the limbs removed and the cones stripped by mechanical contrivances. This is the customary procedure with the hemlock. The branches are pulled through a series of teeth similar to a rake but set sufficiently close to remove the cones. Sometimes it is possible to spread canvas on the ground to catch the cedar and hemlock seed as warm weather causes the cones to open.

The prospective cone collector should contact state, federal or private sources before undertaking any of the work. Information as to species desired, location of pickup stations and other information relative to collections and markets can be secured.
Cutover and otherwise denuded forest lands of western Oregon have long been a favorite summer location for the owner of bee colonies. The fireweed is the primary nectar-producing flower in the areas. The apiarist of the Willamette valley finds that the nectar flow in the valley flowers has just about ceased by the time the fireweed is in blossom. The migration to the mountains serves to extend the season by several months.

However, it appears that the fireweed as a producer of honey may eventually pass out of the picture. Bee specialists of the department of agriculture state that in areas where honey production was good 10 years ago, the production is now going down and if the tendency continues, the fireweed may go out of the picture within the next 4 or 5 years. Today the apiarist is looking for other sources for honey.

No research has been carried out along these lines but it is thought that the tremendous increase in the insect population that attacks the fireweed may be a contributing factor. It has been found that the insects attacking the plant have increased manyfold in the past 10 years and this coincides with the reduction in the flow of nectar. However, in spite of this gradual reduction in the flow of honey from the fireweed, the apiarists still take their colonies to the woodlands. They depend on other plants that come into bloom as well as the fireweed.

The main factors that normally influence the flow of honey in the plants are temperatures and moisture. The best honey flow is during periods of warm days and cold nights. It will almost cease during periods of wet weather and will not recover for several days following a rain.

In distributing the various colonies throughout the forested area, care should be taken in the location of one group in relation to another. The bee will normally travel a maximum distance of about 1½ miles from the hive. Hence the colonies should not be
placed closer than four miles to each other. The hives within each colony should be spaced from two to three feet apart.

One of the worst predators that the bee man must face is the bear. The animal is quite prevalent in the western part of the state. Where trouble is encountered the services of a government trapper may be secured who will trap the offender. At other times the bee man takes the matter into his own hands and traps or shoots the bear. At times poisoned honey is used. Some claim that the electric fence is effective.

Special use permits are issued by the state forester to apiarists who desire to place colonies on state lands. A nominal charge is made for the service. Priorities are granted to old users who are in good standing. Inquiries relative to permits can be made at the nearest forestry department office.
The forests of Oregon contain many plants that have a medicinal value, some of them of considerable importance, such as cascara and digitalis. Others, like the root of the Oregon grape, are of less importance. The value of some of the products is such that crude drug companies are continually in the market for the raw products.

One of the most important of the medicinal plants is the foxglove (Digitalis purpurea), the plant from which the well known heart medicine, digitalis, is derived. The foxglove is a native of Europe and was brought to America as an ornamental. Here it escaped from cultivation and is now found throughout the western part of the state on open sidehills, creek bottoms and around meadows.

The cutting season begins in September and continues through June. The leaves should be cut at the juncture of the leaf and stem. Long stems and butts cannot be used. In late spring when the center stalk appears, the stalk should be left since it contains th flowers and eventual seed crop. If the plant is carefully cut it is often possible to get two or three crops during the year.

The leaves are packed in burlap sacks with the picker's name attached for delivery to the agent or plant. During warm weather the sacks must be delivered promptly before spoilage sets in. In cool weather the leaf can be stored safely for two or three days. Storage must be in a shady spot.
The demand for the plant is such at the present time that it is suggested that a study be made of the possibility of commercial plantations instead of depending entirely on the wild stock. Experimental plantations have indicated that the yield is much larger than in the case of natural growth.

DOUGLAS FIR PITCH

Gathering crude pitch from the old growth Douglas fir of the west coast has been quite an industry in the past, especially during the depression days when jobs were scarce. Lately, however, there has been little activity, although the demand remains steady and there is always a market for the product.

This activity consists of boring a hole low down at the base of the tree with the hole slanting downwards in order that the pitch may run out. A hollow pipe is inserted and the pitch caught in a container, usually a five-gallon tin. The pitch occurs in pockets or pitch seams in the tree and a single tree may produce up to
100 gallons of the product, although that amount is exceptional. Experts are able to tell with some degree of accuracy as to the trees that are likely to produce pitch. This is by the size of the tree, shape of the butt, looks of the bark, presence of decay and other exterior appearances.

The pitch is processed and used in paints, for medical purposes and as a substitute for Canada balsam in optical work.

MISCELLANEOUS

The secondary products of the forest do not end with those included in this publication. Wild fruit is of localized importance. The trailing, cutleaf and Himalaya blackberries are much in demand, some for home use and some for sale to the canneries. The cutleaf blackberry is of considerable importance in some areas where it is found growing quite extensively along the edge of the forest, in meadows, along roads and fence rows. Cannery trucks make regular runs in season to pick up the berries at established stations.

The Klamath plum is another fruit that is considered a great delicacy and demands premium prices in the markets as jam or preserves. However, the production is limited since the tree is restricted in its range. It is found only in the Klamath area on exposed ridges in and adjacent to the timbered areas. A few nurserymen are now propagating the plant. The wild huckleberry of the coastal area can be found in many grocery stores. The huckleberry of the Cascade and Blue mountains has long been a favorite and is gathered in large quantities for both home and commercial use.

Many medicinal plants are found in the woods. The root of the Oregon grape is listed by crude drug dealers. Even the bulb of the ladyslipper is in demand. For many years woodsmen and loggers have crushed the leaf of the prince’s pine in water and used it for rheumatism and heart trouble. This low evergreen shrub is now purchased by drug dealers.

Tree moss is also marketed but not so extensively as several years ago. At one time it was used as the background of floral pieces to cover the wire frame and also because of its absorbent nature. It held water and kept the flowers fresh. Today it is used in hanging baskets, as packing material in shipping cut flowers and to some extent for the shipment of shrubs.
HOW TO PLANT A TREE

Waste no time getting trees in the ground after arrival from nursery.

Trees should be "heeled in" preferably in the family garden where they can receive care until planted.

Insert mattock—lift handle and pull. Make hole big enough for roots.

On the day of planting keep roots damp with wet moss or by dipping in a puddle like this.

Place tree in hole at correct depth. This depth is shown by collar mark on stem. Spread roots out and pack with moist soil.

Pack soil firmly around seedling.
PERMITS

The individual who contemplates going into the business of harvesting minor forest products should first familiarize himself with the trespass laws of the state and also those dealing with certain permits that are required before work can be started.

Oregon trespass laws are quite severe. The illegal removal of forest products from the lands of another comes under two separate classifications. These are innocent and intentional trespass. The former includes cases where the individual unknowingly gets on the land of another. The latter is where the individual intentionally takes forest products from the land of another.

Where innocent trespass is concerned, the injured party can collect on the basis of double the unit value of the product as it exists in the natural state in the forest. Where it is established that the trespass is intentional, the penalty is three times the value of the product.

These points bear out how essential it is that permission be secured from the owner before any work is started. Land ownership information can be secured at the various county seats or from the state forester in Salem. However, the Salem office cannot always give the address of the owner.

Harvesting Permits

The Oregon Code also requires a permit for harvesting timber or other forest products for commercial purposes from any lands in the state.

For lands west of the summit of the Cascade mountains, the harvesting permit is issued in combination with the permit which is required to operate power-driven equipment on or within one-eighth mile of forest lands. For lands east of the summit of the Cascade mountains, the harvesting permit alone is required.

The term “forest tree product” does not include fern or the forest shrubs such as huckleberry, salal, Oregon grape, foxglove, etc. It does, however, include those products such as Christmas trees, cascarra, bark (when harvested from live trees), cedar and other tree boughs, burls and cones, and permits are required before harvesting is begun.
Forest Fee and Yield Tax Act

Finally, the land involved may be classified under the Oregon forest fee and yield tax law which requires payment of 12½ per cent of the unit value of the products prior to severing from the land. This information relative to the classification status can be secured from the office of the state forester or from the county in which the lands are located.

If classified, a permit is required which sets forth the nature of the products to be removed and fixes the unit price of such products. The law applies to “all forest products” which means any product that is severed from the soil. In other words it means standing timber, either living or dead, cascara bark, burls and similar items.

The harvesting and operating permits can be secured through the state forester at Salem. Application blanks will be sent upon request. In all cases the individual must indicate the legal description of the land from which the forest products are to be removed.

THE FARM FORESTER

Five technical foresters, designated as farm foresters, have been employed cooperatively by the state forestry department and the U. S. forest service and assigned to specifically limited districts in the state. Two are located in Salem and can be reached through the office of the state forester. The third has his office in the post office in Oregon City, the fourth is located in Eugene at the county court house, and the fifth is in the court house at Hillsboro.

These men extend to the farmer the same service in connection with the farm woodlands that the county agent extends in connection with agricultural problems. This will include advice on tree planting, selection of species and similar matters concerning the young plantation. It also includes advice on the management of the existing woodlands. The farmer can get information on the proper methods of harvesting, an approximation of the amount of timber that might be available for cutting, character of the products mostly in demand, markets, and similar matters.

The farm foresters will give advice to farmers and forest product operators located in Columbia, Multnomah, Washington, Clackamas, Yamhill, Marion, Polk, Linn, Benton and Lane counties. Elsewhere technical service can be obtained by contacting the district
The minor products of the forest have become of increasing importance over the years. This is recognized through established plantations of Christmas tree and cascara seedlings and increasing demands for planting stock. Digitalis seed is listed and is going into commercial plantations. It is entirely possible that the potential value of other forest products will come to light as more knowledge is gained or as the demand increases. It becomes another phase of the multiple use of the forests.

CONCLUSION

The minor products of the forest have become of increasing importance over the years. This is recognized through established plantations of Christmas tree and cascara seedlings and increasing demands for planting stock. Digitalis seed is listed and is going into commercial plantations. It is entirely possible that the potential value of other forest products will come to light as more knowledge is gained or as the demand increases. It becomes another phase of the multiple use of the forests.
PROTECT THEM FROM FIRE!