12-1949

Marketing Montana Christmas Trees

Ben M. Huey
Northern Rocky Mountain Forest and Range Experiment Station

S. Blair Hutchison
Northern Rocky Mountain Forest and Range Experiment Station

Marketing Montana Christmas Trees

FOREWORD

Western Montana has a strong claim to the title "Christmas tree capitol of the world." Each year over three million Montana Christmas trees are shipped to occupy places of honor in homes all over the Nation, and in several foreign countries.

Like any other large business, the Montana Christmas tree industry is confronted with a number of problems that affect its long-time stability. To assist the industry, Montana State University School of Forestry and the Northern Rocky Mountain Forest and Range Experiment Station have been studying the production, marketing, and forest management problems. This is number two in a series of three bulletins presenting the results of these studies:

1. **Production of Christmas Trees in Western Montana,** which introduces the reader to the Christmas tree industry. It deals largely with production and the costs and returns aspects of the business, and answers many of the questions that a prospective tree grower might ask.

2. **Marketing Montana Christmas Trees,** which is an analysis of the marketing phase of the industry. The marketing system, tree quality trends, tree grading, prices, and freight costs are discussed in this report.

3. **Christmas Tree Management in Montana,** which will report the results of forest management experiments now in progress. Christmas tree cultural practices that will provide trees of improved quality will be stressed in this bulletin, which will not be issued until current studies are completed in about three years.

ACKNOWLEDGMENT

A number of people have helped materially in gathering the facts on Christmas tree marketing in Montana. Special thanks for such assistance are due Thain White and Don Weydemeyer, chairmen of the two Christmas tree associations; Les Goelzer, Paul Kirk, G. E. Wollaston, Frank Lockwood, Alvin Hofert, and the late A. J. Thomas of the Christmas tree concentrating companies; J. L. Aemisegger and H. E. Ahlskog of the Forest Service. A. L. Roe laid much of the ground work for the proposed grading rules. Ross A. Williams, K. P. Davis, T. A. Walbridge of the State University and M. B. Dickerman of the Northern Rocky Mountain Forest and Range Experiment Station gave helpful counsel in preparation of the report.

Marketing Montana Christmas Trees

By

BEN M. HUEY and S. BLAIR HUTCHISON

Northern Rocky Mountain Forest and

Range Experiment Station

Forest Service

U. S. Department of Agriculture

Published by
THE SCHOOL OF FORESTRY
Montana State University
Missoula, Montana

Bulletin 2
Dec. 1, 1949

CONTENTS

Photograph 1.—A CHRISTMAS TREE CUTTER.—The job of getting a Montana Douglas-fir for somebody's living room on Christmas day begins with the cutter who starts about the 10th of October of each year and works for about six weeks. The daily output of the cutters varies according to their abilities and the abundance of good trees on the cutting areas. On the average, one person can cut, trim, and yard about 125 trees in an eight-hour day.

Marketing Montana Christmas Trees

by

BEN M. HUEY and S. BLAIR HUTCHISON[1]

I. THE CHRISTMAS TREE INDUSTRY

Most American families feel that Christmas is not complete without a Christmas tree. One seventh of all the trees cut in the United States for this occasion come from Montana (5) (6)[2]. Half of the Douglas-firs covered with tinsel each Christmas are Montana grown. Production statistics for the Christmas tree industry are few but such as there are indicate that Montana leads all other states in output.

In addition to decorating a high proportion of American homes, Montana Christmas trees furnish a substantial and important income to the State. In 1948, 3.1 million trees were sold. Loaded on freight cars and trucks ready for shipment these trees brought more than a million dollars into Montana and provided an average gross income of roughly $450 to each of the 2,500 workers who helped harvest them.

The preceding dollar figures are even more impressive when one considers the nature of the local economy. Montana enjoyed a higher per-capita income in 1948 than most of the country. Yet, the western part of the State where practically all of the Christmas trees are produced, has its income deficiencies. The 1945 agricultural census shows that eight of the ten lowest ranking Montana counties from the standpoint of gross, per-farm income are in western Montana. In Lincoln county which lies in the northwest corner of the state the average gross value of livestock and crops per farm was only $1,345 in 1944. It is not surprising that half of the farm operators in this county worked off their farms that year for an average of 181 days each. Supplemental employment is necessary for many of them to enjoy a reasonable standard of living.

The farmers are not the only ones who need supplemental income. Industrially speaking, western Montana is still somewhat of a frontier. Its income possibilities have not been fully developed. This is particularly true in those localities where sawmills have come and gone.

The great need for supplemental income makes the Christmas tree industry important and valuable. It is nearly ideal in this respect

---

[1]Forester and Forest Economist, respectively, Division of Forest Economics, Northern Rocky Mountain Forest and Range Experiment Station, U. S. Department of Agriculture, Forest Service, Missoula, Montana.

[2]Numbers refer to references listed on page 24.

Photograph 2.—AN ABANDONED EUREKA SAWMILL—Christmas trees with stands ready for shipment from Eureka, Montana. The abandoned Eureka sawmill in the background cut itself out of pine timber in 1924. The mill has been razed since the picture was taken. Now Christmas trees from the logged-over forests are supporting a new industry.

for it conflicts to only a minor degree with other industries. Farmers have finished their harvests prior to the October-November Christmas tree season and are looking for work that will produce an additional income. This is also a slack season for some workers employed in forest protection and other outdoor occupations.

Many persons are employed cutting, sorting, baling, and tagging trees—including some housewives who pick up a few extra dollars between their household chores. Local truckers are kept busy hauling trees to the buyers' yards. Christmas trees furnish a return load for interstate truckers. The trees shipped by rail each year would fill a six-mile long train. Restaurants, hotels, cabin camps and other local businesses enjoy a heavier demand for their services than they otherwise would. Thus, the Christmas tree harvest brings rather widespread benefits to the people of western Montana.

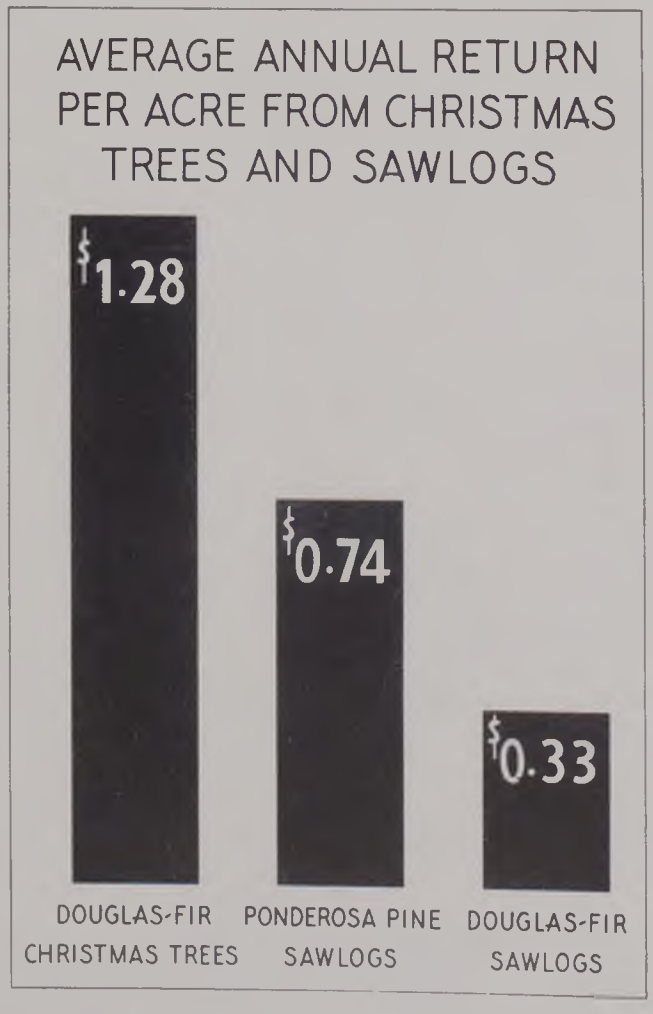

Figure 1.—Based on annual stumpage returns per acre, using 1948 stumpage values and charging no interest on invested capital. A minimum of management effort was assumed in the comparison. On a net return basis for logs and Christmas trees F.O.B. shipping point, the differential in favor of Christmas trees would be greater.

For many families the Christmas tree industry means the difference between a good living and a poor one. A rancher near Kalispell, for example, cut 5,000 trees in 30 days to earn $1,173 net in 1948—one third of his total income. Another farmer and his wife in Lake County cut 3,700 trees in 17 days to receive $913. For working eight additional days in baling and hauling the trees they boosted the figure to a little over $1,000. A rancher and a large tree producer near Kalispell shipped 10 cars of trees in 1948 valued at $11,000. There are many throughout the producing region who earn a third or more of their total income by cutting Christmas trees during less than one-sixth of the year.

At least one-half million acres of forest land in western Montana are by location and productivity well suited to growing Christmas trees. Such an area well managed could undoubtedly produce an annual Christmas tree harvest considerably higher than any year to date.[3] Most of this land is too steep, rocky, or infertile for agriculture. It will grow sawtimber stands, but the financial returns can in many instances be much greater if Christmas trees are grown. At current prices the annual returns from growing Christmas trees average about four times greater than from Douglas-fir sawlogs (figure 1). Moreover, Christmas trees provide a steady annual cash income.

When all things are considered, the Christmas tree industry is sufficiently valuable to make it worth while to grow trees suitable for this purpose. But there is more to the industry than just growing trees. Equally important is an efficient and effective marketing system which returns the maximum income to growers and workers and enables the industry to hold its own in competition with trees from other regions. What needs to be done from a marketing standpoint to achieve these objectives is the subject of the following chapters.

[3]The production possibilities are discussed more fully in bulletins 1 and 3 described in the foreword.

Photograph 3.—A CHRISTMAS TREE CONCENTRATION YARD—Most of the production is sold to 20 companies which operate concentration yards like the one pictured above. The concentrator pays a flat price per bale as the trees come into the yard; the number of trees per bale roughly compensating for the difference in size. It takes 8 two-foot trees to make a bale, 6 four-footers, 4 six-footers, 3 eight-footers, 2 10-footers or 1 twelve foot or larger tree. Shipping figures show that 4.4 trees per bale is the average for Montana.

Photo by Del's Studio

Photograph 4.—TRIMMING THE BALE—Christmas trees are sorted, tagged, and baled in the concentration yard after purchase. The bales are tied with binder twine to conserve shipping space and to reduce damage in transit. When tied, the tree butts are sawed square as shown above at a prescribed length and the bales piled. Expert balers, working from dawn to dusk, have tied as many as 600 bales, but the average baler ties from 150 to 200 bales in an 8-hour day.

Photograph 5.—**TREES READY FOR MARKET**—Once the trees are baled and the handles trimmed they are ready for shipping. With a few exceptions most Christmas trees are cut to fill orders taken well in advance of the season. Some of the concentrators send out salesmen immediately after the Christmas season to collect for the previous shipments and to take orders for the next year. Thus, supplying the Nation's Yule trees provides a year-long job for some people.

Photograph 6—**SHIPPING CHRISTMAS TREES**—Most of the three million Montana trees cut annually are shipped by train—about 1075 bales or 4750 trees are the average figures per car. Some of the Christmas tree concentrators sell to wholesalers who in turn distribute the trees to retailers. Other concentrators assume the wholesaling function themselves in selling direct to the retailer. Most of the trees are sold outright with the retailer taking any financial loss in unsold trees. Some concentrators sell their trees on a consignment basis where the buyer pays only for the trees he in turn sells.

Photo by Del's Studio

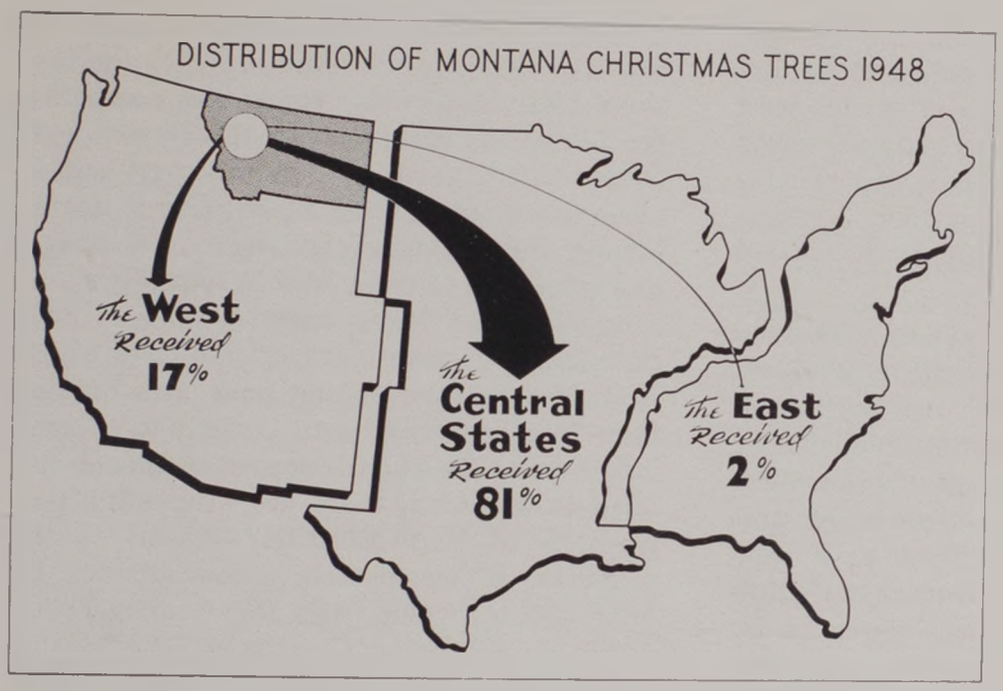

Figure 2.—Montana Christmas trees were shipped to 33 states in 1948, but four-fifths of them go to the Central States. Chicago is the principal city market. Most of the Montana trees shipped to the West go to the Rocky Mountain states. The West Coast supplied the major share of its own trees. Freight costs to eastern cities handicap Montana trees in competing with northern and eastern trees grown closer to these points.

The following states were the leading consumers of the 3,100,000 trees cut in Montana during 1948:

		Trees
1.	Illinois	584,000
2.	Iowa	375,000
3.	Missouri	243,000
4.	Texas	233,000
5.	Kansas	200,000
6.	Oklahoma	190,000
7.	Minnesota	185,000
8.	Nebraska	176,000
9.	Indiana	105,000
10.	Ohio	99,000

II. FACTORS RELATED TO MARKETING

As American farmers know too well the difference between good and bad years is more often dependent upon their success in selling their products than it is in growing them. Marketing is a vital part of most production. The Montana Christmas tree industry, engaged in a very competitive, high risk business and situated a long distance from the principal consuming centers, can rise no higher than its marketing system will allow. Before discussing how marketing methods might be improved this chapter will consider some of the more important factors related to marketing. They are: waste of trees, nature of the distribution system, price trends, freight costs, blight damage, and quality trends.

WASTE OF TREES

Christmas trees enter an extremely seasonal market. This, together with the fact that any conifer will eventually drop its needles after being cut, places them in the class of highly perishable commodities. Unsold firecrackers and valentines, which are likewise special occasion products, may be

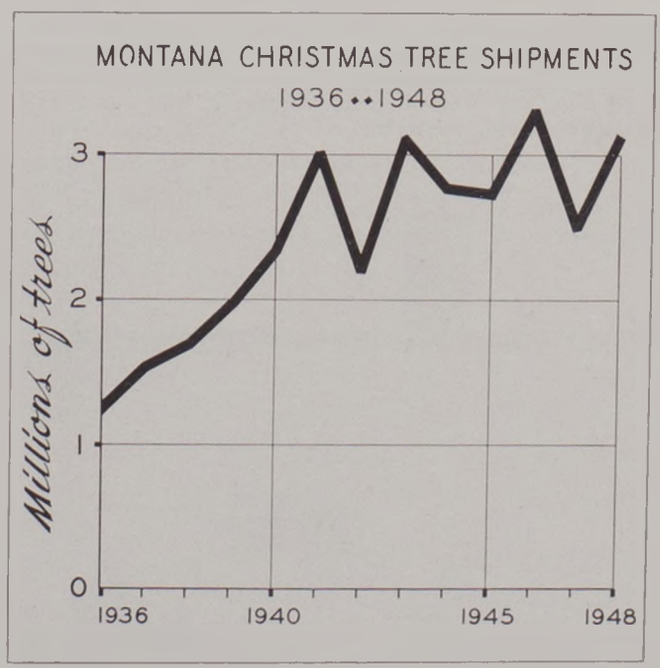

Figure 3.

saved for next year. But Christmas trees must either be sold by December 25 or discarded. Except for a few miscellaneous uses such as mulching gardens, decorating window boxes, and lining snow-covered airport runways, unsold Christmas trees have a negative value because it costs money to get rid of them.

The waste of Christmas trees can be divided into two classes: trees cut but never shipped, and trees shipped but which for one reason or another do not reach the consumer.

Waste in the first class results from several factors. Occasionally unseasonable snows prevent access to areas where trees have been cut but not removed. Growers have minimized this danger as much as they can by harvesting the more remote and higher altitude stands early in the season, leaving the more accessible areas to harvest later. But those cutters not having lands so well situated always face the weather problem, and until weather forecasting becomes more exact there will inevitably be seasonal losses.

Overproduction by cutters is sometimes a cause of waste, too. In periods of economic recession the difficulty of judging the prospective Christmas-time market may result in surpluses at the producer level. During recent years of prosperity, in which the demand has been high and the competition among buyers keen, the cutters have had few trees left on their hands. In 1947 and 1948 there were 20 or more companies competing for Montana trees. During these two years concentration yards for the most part kept in close touch with their cutters and cooperated among themselves, balancing out shortages and surpluses of trees of different sizes.

In the Lake States some companies have resorted to cutting black spruce trees in the first few months of the year and holding them in cold storage until Christmas, thereby lengthening the cutting season. Although untried in Montana, there are interesting possibilities in that direction as well as the reduction of waste from overproduction by holding the surplus trees under refrigeration until the following Christmas. The idea is fascinating, but for Montana trees the costs may be prohibitive.

Waste at the consumer end may be spectacular when individual markets become flooded. Fresno, California, experienced such a flood of Christmas trees one year when enough trees were offered on its markets to supply one for **each person** in the city. Sixty thousand trees came in and over half were left unsold (1). In 1937, 75 carloads (about 356,000 trees) were left unsold on the tracks in Chicago.

Lack of an accurate measure of the consumer demand and shipment of trees without prior orders are big factors in flooding individual markets. Some companies, having trees left after all of their orders are filled, ship out an extra car or several cars to picked destinations in the hope of making profitable last minute sales. To the extent that shippers select the right destination for such cars, the practice is profitable, but misjudging the market results in substantial losses and waste. Some such cars enter an already flooded market and are rerouted. These so-called "rollers" become distress shipments with the owner hoping to salvage his investment in other cities. Free-lance truckers, without advance orders, run the same risks and occasionally they contribute to a saturated market in a locality.

These spectacular, but occasional, Christmas tree losses do not, however, represent the bulk of the wastage. Most of it occurs in the

Photograph 7.—UNSOLD TREES ON CHRISTMAS DAY—Just how many trees remain unsold each Christmas varies from year to year and has never been accurately determined. The major loss occurs in the retail outlets all over the Nation. It is estimated that for every ten trees cut one is a marketing casualty.

few trees generally left over in the thousands of retail stores and lots all over the country. It has been estimated that the average loss at the retail level is from 5 to 10 percent of the trees shipped.

To reduce waste at the wholesale and retail level will not be a simple task. In the case of some other agricultural products the glutting of individual markets is avoided by market reporting services which indicate the current volume of incoming shipments. Such a reporting service for some of the larger Christmas tree markets might be helpful.

THE DISTRIBUTION SYSTEM

Four steps are common in marketing Christmas trees: 1. cutting and concentration, 2. shipment and sale to wholesalers, 3. wholesale distribution, and 4. retail distribution. There are, of course, several variations in the distribution pattern. In some instances an individual or company handles two, three, or four phases. The cost of producing and marketing the average Montana tree in 1948 was approximately as shown in table 1.

It is significant that the distribution costs for concentrating, wholesaling, and retailing make up about six tenths of the total price to the consumer. This is more or less in line with other commodities. It reiterates the importance of marketing in the Christmas tree business.

Numerous suggestions have been made for altering the present distribution system. Two of the most frequently suggested changes are the organization of producer cooperatives to carry on the marketing phase and the voluntary pooling of trees for sale to concentrators.

TABLE I. COST ITEMS IN THE RETAIL PRICE OF A MONTANA CHRISTMAS TREE MARKETED IN THE MIDWEST, 1948

Item	Cost per tree	Percent of total
	Dollars	Percent
1. Stumpage to landowner	.06	4
2. Cutting and yarding by cutter	.19	14
3. Hauling, processing, and loading	.11	8
4. Freight	.10	8
5. Concentrator and wholesaler's services	.35	26
6. Retailer's services	.54	40
Total price paid by consumer	1.35	100

In both instances the major objectives would be to increase the return to growers.

Producer cooperatives handling agricultural products have been organized in many sections of the country and are successfully marketing many commodities such as citrus fruits, grain, wool, and livestock. Minor products such as cranberries, maple syrup, and almonds are also being marketed cooperatively. Some of the more commonly cited advantages for such cooperatives are that they handle the products of small producers economically, facilitate standardization of a product (grading), and do effective trade promotion. However, the limited experience in cooperative marketing of minor forest products such as Christmas trees is not particularly encouraging. A study of forest products cooperative marketing associations in 1947 showed that from 1935 to 1944 at least 30 independent cooperatives were formed but that only 11 were known to be active in 1945 (4).

Such problems as adequate financing, capable management, membership participation, and small operating margins must be faced. Christmas trees, entering a highly seasonal market and having production limited to a two-month period, would raise additional operating problems for a cooperative association. Capital requirements would be for only a short period, thereby making it more difficult to raise operating funds at a low cost. Likewise, the management might not be fully occupied for the entire year. One way around that difficulty would be to handle other commodities in addition to Christmas trees to make a full-scale year-round operation. Possibilities along this line are many but as the business is diversified more capital and more facilities would be needed.

Pooling of trees for sale to concentrators or for shipment to wholesalers is another method of accomplishing, in a limited way, the same objective as a more or less formal cooperative. In a commodity pool a number of producers put their products together and offer them for sale as one unit. Such groups would have greater bargaining power, might benefit from having a larger volume of trees to offer to one buyer, and might make it possible to reduce certain production costs by enabling specialization in cutting, skidding, and

hauling. But pooling is not a simple tool either. Unless the product is graded, pooling must proceed on the basis that each person participating bring in produce of like quality. If such is not the case, then producers of poor quality trees will share the returns from the high quality trees and the producers of high quality trees would share the low returns from the poor ones. Adoption of grading standards is prerequisite to successful pooling of Christmas trees. In those localities where there is inadequate competition among concentration yards community pools offer some promise to producers. Such pools could offer carlot shipments to wholesalers.

Direct grower to consumer sales is a marketing method which has been tried to a limited extent. Each year some trees are shipped individually or in small lots direct from western Montana to retailers and consumers by express and mail.[4]

Such direct sales have many possibilities but it is probable that the larger volume of trees from this area will continue to move through concentrator and wholesaler channels.

[4]Physical limitations on trees packaged for mailing are that they shall not exceed 100 pounds or have a combined length and girth measure in excess of 100 inches.

TABLE 2. THE TREND IN CHRISTMAS TREE STUMPAGE AND CONCENTRATOR BUYING PRICES, 1935-1948

Year	Price paid for Christmas tree stumpage in national forest sales —per bale	Price paid by concentrator for cut trees (loose in woods) —per bale	Stumpage price as percent of total price paid by concentrator
	Dollars		Percent
1935	.053	.32	17
1936	.053	.32	17
1937	.053	.32	17
1938	.123	.34	36
1939	.123	.34	36
1940	.123	.38	32
1941	.119	.45	26
1942	.141	.70	20
1943	.158	.80	20
1944	.220	.80	27
1945	.220	.90	24
1946	.224	.85	26
1947	.246	.95	26
1948	.251	1.10	23

PRICE TRENDS

In recent years there has been a pronounced general upward trend in Christmas tree prices. Stumpage prices have been rising since the Christmas tree industry first got underway on a large scale in Montana. During the last eight years, prices of all commodities have been going up so the fact that Christmas tree prices have risen is not surprising. The price of larch-Douglas fir saw-timber stumpage has risen at about the same rate as the Christmas tree stumpage price. As in the case of sawlog stumpage the rise in price of Christmas tree stumpage partly reflects a marked increase in demand. During the last 12 years the annual output in Montana has increased from 1.2 to 3.1 million trees.

Concentration yard buying prices have likewise risen a great deal as table 2 shows. According to some oldtimers in the industry the price per bale (loose in the woods) in 1928 was about 16 cents. It rose to about 32 cents in 1935 and since has climbed to $1.10. Concen-

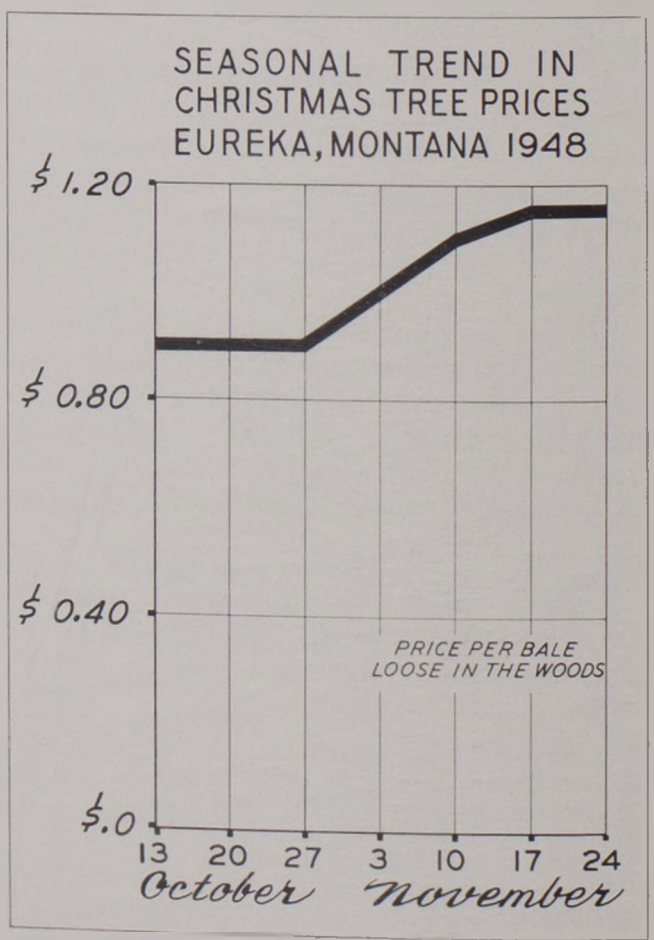

Figure 4.

trators were paying about seven times as much for trees in 1948 as they paid 20 years earlier.

Prior to 1940, when trees were more or less plentiful, there is said to have been relatively little variation in the price paid by concentration yards during the course of most seasons. Between 1940 and 1948, however, the trend from the beginning to the end of the season each year was upward. Figure 4 shows the trend at Eureka from the middle of October to the beginning of December in 1948. Table 3 shows that the seasonal trend at Kalispell and Libby followed the same pattern. In less competitive areas the prices were lower and fluctuated less during the season.

The seasonal climb, when it occurs, appears to be caused by the concern of concentrators over filling orders, particularly when the weather is unfavorable and the competition for cutters keen. Concentrators pay no more than necessary to start with, raising their offers as the situation requires. Cutters, on the other hand, tend to hold back in the expectation of price increases.

Up until its orders are filled the chief concern of every company is to get enough trees. This fact tends to discourage any lowering of prices toward the end of the season for fear it might disrupt the inflow of trees. Once a company fills its requirements there is no point in lowering prices. It simply stops buying. Nevertheless, there is a break at the end of most seasons which does not show up in figure 4. This occurs when the larger companies have completed their buying campaign. At that time the smaller outfits begin to pick up trees at bargain prices. Truckers take some of these trees, but even the trucker prices pass a peak as Christmas approaches and the risk to the trucker of not reselling the trees becomes greater. It was reported that the price to truckers at Missoula was about $1.75 per bale up to December 5, 1948, but after that date it dropped back to about $1.

TABLE 3. WEEKLY PRICES PAID BY CONCENTRATORS IN SELECTED PRODUCING AREAS DURING THE 1948 SEASON

Producing area	Price per bale of trees (loose in woods)						
	October			November			
	13	20	27	3	10	17	24
	Dollars						
Eureka	.90	.90	.90	1.00	1.10	1.15	1.15
Kalispell	.90	.90	1.00	1.00	1.15	1.15	1.15
Libby	.80	.90	.90	1.05	1.15	1.15	1.15
Missoula	.75	.75	.75	.75	.80	1.00	.75
Plains	.75	.80	.80	.80	.80	.80	.80
Polson	.95	.90	.90	.90	.90	.90	.90

At best the Christmas tree season is a short one which can be made shorter by unusually bad weather. These time limitations add an element of urgency to the situation and make for a highly competitive condition. There is a tendency for the cutters to hold back in the beginning of the season in hopes of getting a higher price later as concentrators begin to be concerned about filling their orders. On the other hand, there is some effort by concentrators to present a solid front in starting the price out as low as possible. These, of course, are no more than customary bargaining positions in a competitive market. However, because the season is a short one, there is a more than normal need to reduce to a minimum the confusion and sparring for position.

FREIGHT COSTS

One of the main handicaps to the full development and use of the natural resources in the Northern Rocky Mountain states is the distance of the region from the large consuming centers. Whether development of the Montana Christmas tree industry has been materially retarded by the distance factor is

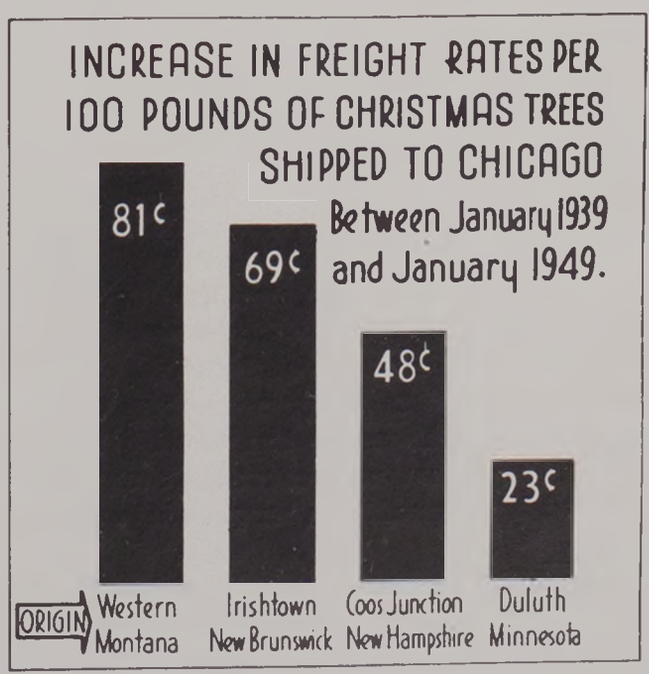

Figure 5.

hard to say. Certainly, however, freight cost is a major item in the marketing of Montana trees. In the central states, where eight-tenths of the Montana trees are sold, one-sixth of the price paid by the wholesaler is for freight.

Like other costs freight rates have gone up in recent years. Table 4 shows the rate from Montana to Chicago went up $1.05 per 100 pounds between March 1938 and September 1949. This rise of 84 percent was considerably less than the increase in other production costs. (See table 2.)

Rate increases since 1938 have been proportionately about the same throughout the Nation. Since the freight cost for Montana trees to the central states has been, for the most part, higher than from the other major production centers the net effect of the raises has been to increase the rate disadvantage per unit of weight. Figure 5 on the preceding page shows how the disadvantage to the Chicago market has increased.[5]

In addition to the freight handicap, Montana trees face increasing competition from trees grown in plantations close to the market centers. The cost of plantation-grown trees is usually higher than for forest-grown trees. But when freight is added to the cost of forest-grown trees, the total cost may exceed that of trees grown in plantations. With the introduction of mechanical planters and other cost-saving methods, Montana trees may be hard-pressed to compete with the quality and cost of trees grown in plantations.

Although there have been some claims that rate increases have adversely affected the Montana industry, production figures do not show it. Just what influence the rate changes will have on the long-time competitive position of this producing area remains to be seen. The recent prosperous years with their unusually high demand for Christmas trees do not give a good measure of the effect of these increases. Nor can we jump to any conclusions as to what the effect will be during periods of lower demand because the competitive position is the result of a complex interplay of factors: production costs, freight costs, number of trees per car, quality of trees, and consumer preference. However, the fact that the Montana industry is at a freight rate disadvantage in the nine states which are its biggest customers and which bought 73 percent of its trees in 1948, makes freight rates a matter of great importance to the industry (see table 5). Moreover, primary producers located a long way from their markets generally suffer more than their closer-to-market competitors when prices are declining because of their proportionately greater freight costs.

The freight situation with regard to Christmas trees may be summed up as follows: 1. The freight cost for Montana trees is now about double what it was 10 years ago. 2. The rise in freight costs has been much less than the rise in producing costs. 3. The rise in rates so far has not prevented production of Montana trees from reaching the highest level on record. 4. It has been said that rate changes have brought Montana trees stiffer competition from trees from Canada and the east coast and to some extent have already altered the area where Montana trees can be marketed profitably. (5) In a period of declining prices the relatively rigid freight rate structure may prove more of a competitive handicap than in recent years.

CHRISTMAS TREE BLIGHT

In 1947 and 1948 defoliation and discoloration of Montana Christmas trees presented a marketing problem. Whether or not the blight causing this problem will continue in serious proportion is not known. Evidence indicates

TABLE 4. CHANGES IN FREIGHT RATES ON CHRISTMAS TREES SHIPPED FROM WESTERN MONTANA TO CHICAGO

Effective date of rate	Change made in rate	Rate per hundred pounds[1]
	Base rate[2]	1.25
3-28-38	Plus 10% of previous rate	1.38
1- 1-47	Plus 22½% of previous rate	1.69
10-13-47	Plus 10% of previous rate	1.86
1- 5-48	Plus 22½% over 1-1-47 rate	2.07
5- 6-48	Plus 25% over 1-1-47 rate	2.11
1-11-49	Plus 5% over 5-6-48 rate	2.22
9- 1-49	Plus 9% over 5-6-48 rate, canceling 1-11-49	2.30

[1]Not included in the rates is a 3-percent federal tax which became effective December 2, 1942.
[2]Base rate established shortly after World War I.

[5]The shipping points in figure 5 are the following rail mileages from Chicago: Eureka, Montana, 1,659 miles; Irishtown, New Brunswick, 1,510 miles; Coos Junction, New Hampshire, 948 miles; and Duluth, Minnesota, 469 miles.

however, that a few years of normal growth will restore trees that have been damaged by needle losses.

In 1947 for the first time in many years, a combination of climatic and biological factors caused the discoloration and premature loss of needles on a great number of trees. This blight was not easily recognized prior to cutting, with the result that many concentrators bought trees that soon turned color or shed their needles before Christmas. Thousands of dollars and much customer goodwill were lost in such trees. As soon as the concentrators grasped the situation, purchases were curtailed in certain areas with the result that the number of bales shipped from Montana dropped 24 percent from the 1943 peak year of production (5).

A fungus disease (Rhabdocline pseudotsugae) was mainly responsible for this "blighted" foliage condition (3). Several insects which are capable of causing similar damage were noted to be present also. The weather likewise had an important part in the development of the disease. A moist growing season is very conducive to the spread of the fungus, and the 1947 spring was unusually wet. Weather conditions immediately before and after cutting have an important bearing on the behavior of blighted trees and these conditions were also unfortunate during the fall of 1947.

There was a recurrence of heavy blight damage in 1948. However, fore-armed by experience, the cutters exercised greater care in selecting trees for removal. Production returned to previous levels largely as a result of greater confidence. Even so there were some complaints from wholesalers and retailers because of brown and shattered foliage. Shippers have found it extremely difficult to determine how much blight is allowable before the tree becomes unsalable.

Photograph 8.—A BLIGHTED CHRISTMAS TREE —Blighted trees are a serious threat to the Montana Christmas tree industry. The disease is associated with certain weather conditions and therefore may not be a perennial worry.

(Photograph by Bureau of Entomology and Plant Quarantine, U.S.D.A.)

TABLE 5. FREIGHT RATES FOR CARLOAD SHIPMENTS OF CHRISTMAS TREES BETWEEN VARIOUS PRINCIPAL SHIPPING POINTS AND DESTINATIONS, JANUARY 1949

Destination of shipment	Point of origin of shipment: Western Montana	Duluth, Minn.	Coos Junction, New Hamp.	Irishtown New Bruns.
	Rate per hundred pounds			
Chicago, Ill.	$2.22	$0.60	$1.29	$1.64
Memphis, Tenn.	2.25	1.52	1.97	2.99
Atlanta, Ga.	2.62	1.79	1.80	2.77
Des Moines, Ia.	2.13	0.97	1.79	2.63
Kansas City, Mo.	1.80	1.27	1.95	2.80
Dallas, Texas	2.11	1.80	2.49	3.36

It is important to develop understanding of the blight and means of identifying it, and to learn also just how much blight can be tolerated, in order that the reputation of Montana Douglas-firs will not suffer in the Nation's markets.

QUALITY TRENDS

Waste of trees, tree distribution, price trends, freight costs, and blight are all important problems of the Montana Christmas tree industry. It is easy to think of a situation where any one of these problems could become an extremely important issue. However, at the present time all of these problems are overshadowed by the one of quality. The matter of tree quality is so basic and so important to the welfare of the industry that major

emphasis in this report is placed on that problem. If the Montana industry produces and sells a better Christmas tree the other problems will be less significant.

An objective of the Christmas tree industry should be to please the ultimate buyer. To do this effectively, a study is needed of consumer habits and preference. This report does not go into consumer analysis, but rather emphasis is placed on providing trees of uniform quality with the quality expressed by grade identification.

It is generally agreed among men in the Montana industry that the quality of Christmas trees shipped out has declined over the years. Some have attributed this to the extremely heavy cut in certain areas—a rate of cut which is said to exceed the present capacity of the forests to produce good trees.

Whether these observations about declining quality are correct or not, there is no doubt that too many inferior trees are being shipped today. Specimens like the ones on the following page fall far short of qualifying for Christmas trees from the standpoint of symmetry, balance, density, and other quality criteria. Not many are as bad as these but a substantial percentage are poor enough to be hard to sell and to be a poor advertisement for the Montana industry.

Lack of quality is partly responsible for the failure of Montana Douglas-fir to hold its own in some markets. It has something to do with recent trial shipments of lodgepole pine to eastern markets. According to several buyers, trees from this region were first shipped to Chicago about 1930, and shortly thereafter western Montana supplied something like three-fourths of the Christmas trees sold in that city. Now, half or less of the trees used in Chicago are said to come from here. As mentioned previously, freight rates and competition with locally grown trees are said to be factors in the shift but some operators feel strongly that the declining quality of the trees has also contributed to the trend. They say that western Montana producers have been unable to supply heavy, bushy, high quality trees in the number desired. Significantly enough, several companies have expressed a preference to ship Montana Douglas-fir to localities where there is little competition with species from other regions.

The Christmas tree industry became established and expanded in Montana because the young Douglas-firs here are admirably suited for this purpose. The future of the industry depends upon the continued desirability of trees shipped. Though mass produced, Christmas trees are sold one by one and are picked over by householders seeking the best their money can buy. Uppermost in the retailer's mind is the hope that his trees will satisfy critical buyers and move at a good price. Therefore, the most important thing the Montana industry can do to help itself is to produce better trees and maintain better quality control.

Production of higher quality trees is a marketing as well as a timber management problem. The man who on the average cuts superior trees may get a somewhat higher price than his neighbors, but so far as the rank and file of cutters are concerned a tree is a tree. The poorest acceptable trees in a truckload sell to the concentrator for the same price as the best trees. In other words, the cutter has relatively little incentive to produce anything better than a minimum quality tree. One of the first steps, therefore, in the direction of improving quality is to introduce price differentials which take quality into account, encourage the growing of good trees, and discourage the cutting of poor ones. What might be done along that line will be discussed in the following chapter.

Photograph 9. — INFERIOR QUALITY CHRISTMAS TREES—Four examples of the very low quality Christmas trees sometimes shipped out of Montana. The pictures were taken in Montana Christmas tree yards during the 1948 season. Many low quality specimens like these reaching the market adversely affect the future of the Montana industry.

III. A PROGRAM FOR IMPROVING MARKETING

The preceding pages pointed out that the most pressing problem of the Montana industry appears to be the matter of quality. This chapter will discuss some of the more important things which might be done in connection with marketing to improve quality and to turn the better quality to the advantage of the local industry.

ADOPTING TREE GRADES

Undoubtedly the main weakness in the marketing of Montana Christmas trees is the smallness of the incentive offered cutters to produce better trees. A first step in improving that situation is the establishment of a pricing system related to the quality of the individual tree. That in turn leads to the question of a grading system to measure tree quality. At present the industry lacks quality standards.

Grading of Christmas trees has been discussed for a number of years. While almost everyone agrees that it is desirable in principle, many are skeptical about its practicality. There are two reasons for this skepticism: firstly, the job of grading a product so variable as Christmas trees is difficult. Secondly, concentrators and cutters alike have not been certain what effect grading might have on their competitive positions.

There appears to be little foundation for the claim that grading of Christmas trees is impossible. Certainly there are other products now being graded which are much harder to classify. Tea, for example, is judged by the appearance, twist and smell of the dry leaf; the color, brightness, and odor of the infusion; the color, thickness, strength, pungency, and flavor of the liquid. The potency of digitalis is measured by the length of time required for sample dosages to kill frogs. Christmas trees may not be the easiest things to grade, but they are certainly not the hardest. As a matter of fact, grading of a sort is now practiced by the industry. The culling out of poor trees is nothing but grading. Those companies which confine their purchases to the very best trees are applying their own stringent grade standards.

The most important difficulty with Christmas tree grading is that the tree classes cannot be precisely defined. Grading trees is not like shaking peas through a sieve where the dividing line between those which go through and those which do not is quite distinct. In Christmas tree grading the quality being measured is appearance. To a limited extent, appearance can be measured mathematically but in the main it is something which must be described in broad descriptive terms. The problem is somewhat similar to that encountered in apple grading, where such terms as "perceptibly blushed cheek," "fairly well formed," and "slight blemishes" are used. Christmas tree grading has its complications but it is feasible.

A grading system for Montana Douglas-fir trees is certainly needed. The marketing of Christmas trees is many years behind the marketing of most agricultural products. Grading of Montana potatoes, for example, began 26 years ago. If the Montana Christmas tree industry is to make progress and improve its position, it must come to grips with the quality problem which in turn requires a measure of quality. The principal need to start with is for the concentrator to buy from the cutter by grade. One major difficulty is that wholesalers and retailers in general demand all top quality trees. That is an order which never can be filled. Wholesalers and retailers undoubtedly are well aware of that and would welcome the assurance that a certain percentage of their trees would be top quality and that none would be below a minimum acceptable grade. Thus, the marketing of Montana trees to wholesalers and retailers would undoubtedly be improved by the establishment of a "Montana standard" for outgoing shipments. To meet the standard a carload or truckload of Christmas trees would have to contain as a minimum a certain percentage in each of the top grades and no culls. State regulations require that most horticultural crops be grade-labeled when shipped out of Montana. The same rules would be desirable for Christmas trees. In other words, each car or truckload should be labeled as to the quality

of trees therein, or that the shipment contains a "Montana standard" pack, or that it is ungraded.

Inasmuch as Christmas tree grading involves a large element of personal judgment and because there are twilight zones between tree grades rather than sharp distinct lines, the grading will require the training of graders as in the case of most agricultural products. The mechanics of applying the Christmas tree grades could very well follow the pattern used in grading agricultural products. To protect whatever rules are adopted from misuse, they should be made official standards by the State in the manner prescribed by the legislature. The legalized grades would be permissive but not mandatory. That is, no one would be required to sell his trees by grade, but if he chose to sell by grades he would have to conform to them strictly. Qualified graders could be licensed in the various yards and be subject to checking inspections as with other products.

Another approach would be to establish a state law requiring that all trees bought within the state for commercial sale be purchased by grade. The general plan of operation would be the same in either case.

The grading of trees would introduce an additional cost. The grader might be employed by the State, the concentrator, or the Christmas tree association. In the case of other horticultural commodities shipped under grade labels from the state, the inspection is made by horticulturists employed by the State Department of Agriculture, and the shipper pays the inspection fee to the state treasurer. Lumber inspectors, on the other hand, are often employed by the various lumber associations. Their job is to check on the grading done by company employees. There are many possible arrangements for the payment and control of graders that could be adapted to the Christmas tree industry either as a state or association function.

No matter how effectively trees are graded at the producing end of the marketing process, the effort will be wasted unless the grade differential is maintained through to the ultimate consumer. Usually trees move to market fast enough and are protected in transit to assure good condition on arrival. However, trees which meet a grade specification for condition and appearance at concentration yards may deteriorate in shipment due to exposure in open cars, unfavorable weather, delays in car movement, and rough handling. Such factors may result in loss of needles, branches, and an accumulation of dirt and soot. Damage resulting from shipping problems could be taken care of, when necessary, by re-grading at wholesale or retail markets.

A SUGGESTED GRADING RULE

Christmas tree grading may be done in different ways. The Northern Rocky Mountain Forest and Range Experiment Station has developed a four-class system, based on the appearance of each tree from several different angles (2).

Grade No. 1 or premium includes trees with defects so minor as not to detract from the appearance of the tree from any point of view.

Grade No. 2 or standard trees are less-than-perfect trees which when placed against a wall present a pleasing appearance.

Grade No. 3 or utility trees are imperfect trees which are satisfactory when placed in a corner and tinselled.

Cull trees are those trees which because of one or more major defects are of unsatisfactory appearance from any point of view.

In more technical terms the grade of each tree is based on five quality factors—density, balance, taper, deformity, and foliage. Although length is not a quality factor, it is important that there be standardization of tree length classes.

STANDARD LENGTH

Length shall be measured from the bottom whorl to the end of the leader or, if the leader is spikelike, to a reasonable point on the leader. On spikelike leaders the "reasonable point" of measurement shall be the point at which the tip of the longest branch in the top whorl touches the main stem when bent upward. Trees up to and including the six-foot class shall have a six-inch handle (six inches

of stem below the bottom whorl). For every one-foot increase in length class above six feet the handle shall be increased one inch.

Length class	Range of length above the bottom whorl	Trees per bale
2	2 to 3	8
4	3 to 4½	6
6	4½ to 6½	4
8	6½ to 8½	3
10	8½ to 10½	2
12	10½ to 12½	1

DENSITY

On the opposite page are four trees which so far as can be seen from the photographs differ mainly in the matter of density. Some people prefer very dense trees but others would rather have less dense ones, feeling that they show off the decorations better. For that reason trees of both heavy and medium density (photographs A and B) will qualify for grades 1 and 2 so far as density is concerned. Tree C is of light density and can for that reason be rated no higher than grade 3.

The tree in photograph D is of **open** density and for that reason is a cull.

Frequently trees have a different density at the top than they do at the bottom. Such trees must be judged by their over-all or average appearance. If a tree has a marked variation in density that variation will be considered as a **deformity.**

BALANCE

Perhaps the most important factor degrading Christmas trees is lack of balance. A tree with good appearance on one side may look scraggly from another point of view. For the purpose of grading, each tree has four quarters or faces. In the most desirable trees these faces are all full and well balanced; there are no gaps or protruding branches. Each face has three segments: the bottom branches, the middle and the tip. An important gap or unduly long branches in any one of the segments of a face makes that face a defective one.

Photographs A and B on page 20 show two trees which fall considerably short of having a perfect balance. Only the extreme cases can be shown pictorially but a general rule to remember is that on a complete face the branches cloak the stem with no important gaps or protrusions.

Grade 1 trees must have four complete or perfect faces.

Grade 2 trees may have one defective face.

Grade 3 trees may have two defective faces.

Any tree with more than two defective faces is a cull.

TAPER

Douglas-fir trees differ widely in their rate of taper from the tip to the extremities of the lower branches. Seldom are trees too wide but they may be narrower than the ultimate consumers appear to want. Photograph C on page 20 shows a tree of **normal** taper, and photograph D a narrow or **candlestick** tree. If the general shape of a tree, on its best side, forms a cone whose base is 40 percent or more of its height, that tree has **normal** taper. If the base of the cone is less than 40 percent of its height, the tree has **candlestick** taper.

A **candlestick** taper degrades a tree one grade below what it otherwise would be.

DEFORMITY

Three classes of deformity are recognized:

Minor deformities include slight crooks and forks in stem or leader which are not particularly noticeable, nor do they affect the appearance of the tree.

Noticeable deformities include fern-like, weak branches; multiple leaders, woody bases; crooks in stem or leader; marked variation in density; and broken leaders, sufficient to detract somewhat from appearance but not to a major degree. Two deformities in this class are shown in photographs A and B on page 21.

Major deformities include all deformities which seriously hurt the appearance of the tree. See photographs C and D.

A **noticeable deformity** will degrade a tree one grade below what it otherwise would be. A **major deformity** will cull a tree.

A. Heavy density

B. Medium density

C. Light density

D. Open density

Photograph 10.

A. Lopsided

B. Blanks in Crown

C. Normal Taper

D. Candlestick taper

Photograph 11.

NOTICEABLE DEFORMITY
A. Crook

NOTICEABLE DEFORMITY
B. Woody base

MAJOR DEFORMITY
C. Forked stem at base

MAJOR DEFORMITY
D. Multiple leader

Photograph 12.

FOLIAGE

The severe discoloration and loss of needles due to needle blight in certain localities during 1947 and 1948 make it necessary to take account of this damage in grading.

A tree shall be considered **healthy** if close examination shows only occasional spots on the needles and or very few needles missing in the foliage. All grade 1 and 2 trees must be in this condition.

An insect or disease damaged tree with not enough needle damage to cause discoloration of the tree and with only enough blank spots or prospective blank spots to detract slightly from its appearance will be classed as **infected**. An **infected** tree will be graded no higher than number 3.

The term **blighted** shall include the presence of needle spots or off-color foliage sufficient to cause noticeable discoloration. It shall include the absence or prospective loss before Christmas of enough needles to give the foliage a mangy appearance.

Color variations in Douglas-firs range from blue-green, through gray-green to yellow-green. These variations are so subtle that they will not in the absence of needle blight be considered in grading.

To qualify in grades 1, 2, and 3, trees must be fresh and clean. Dried out and dirty trees shall be classed as culls.

The proposed Christmas tree grades are summarized in table 6.

DEVELOPING CONSUMER PREFERENCE

At the same time that attempts are being made to improve the quality of the Christmas trees shipped from Montana the demand for these trees can be increased with a judicious promotional effort. That a well-known trade name has advertising value is generally recognized. Such names as Sunkist, Land O'Lakes, and Eatmore are outstanding proof of this fact. Montana Christmas trees might become more widely known and demanded if a distinctive trade name were adopted. Such a trade name, supported by advertising stressing the quality of Montana graded trees, would in the long run help widen the outlet for these trees.

Perhaps the most effective way for capitalizing on a trade name is through the use of an industry-wide tree tag. Most concentrators now attach tags to their trees but these tags only identify the shipper, not the originating area nor the quality. An additional tag featuring the trade name might well be attached to all trees. Such a tag would help build up in the consumer's mind the idea that good trees come from Montana, and thereby create a

TABLE 6. PROPOSED GRADES FOR MONTANA DOUGLAS-FIR CHRISTMAS TREES

FACTOR	Each grade must possess the indicated characteristics			CULL
	No. 1 PREMIUM	No. 2 STANDARD	No. 3 UTILITY	Any one of following factors will cull a tree
Density	Medium or denser	Medium or denser	Light or denser	Open
Taper	Normal or Wider	Normal or wider. Candlestick taper allowed if tree is otherwise Grade No. 1	Normal or wider. Candlestick taper allowed if tree is otherwise Grade No. 2	Candlestick,if tree is otherwise Grade No. 3
Balance	4 complete faces	3 or more complete faces	2 or more complete faces	3 defective faces
Foliage	Healthy, fresh, and clean	Healthy, fresh, and clean	Infected or healthy, but fresh and clean	Blighted, dirty, or dried
Deformity	Minor.	Minor. Noticeable deformity allowed if tree is otherwise Grade No. 1	Minor. Noticeable deformity allowed if tree is otherwise Grade No. 2	Major. Noticeable, if tree is otherwise Grade No. 3

consumer preference. An example of the type of tag suggested is shown in figure 6.

Such tagging is perhaps as good a means as can be devised for advertising and developing good will for the Montana product. To accomplish these purposes, however, the product delivered must be all that it is claimed to be. The industry would need to take steps to set up the mechanism for assuring that the trees are of the quality indicated. Likewise, if the tag is to say that the cutting is according to good forestry practices, which is certainly desirable, standards defining good forestry should be set up and the use of the tag by persons not meeting the requirements of these standards should not be allowed.

GROWER ASSOCIATIONS

For a long time Montana's Christmas tree industry was in some respects a ship without a rudder. There was no coordinated attack on the problems nor any effective means of getting such action. Two grower associations have been organized in recent years in western Montana: the Rocky Mountain Douglas-fir Development Organization at Dayton, and the Montana Christmas Tree Association at Eureka. Both of these associations as yet are small, having a combined membership of about 100 growers. But they are attempting to furnish local leadership which is so essential to successful group action. In the long run it would probably be better to have just one strong organization. A strengthened, consolidated Christmas tree association, including the majority of the industry, probably would be the most effective means of effectuating any program for improving the situation.

At the least, a western Montana Christmas tree association might serve as an informal clearing house of ideas on production and marketing. It could take the lead in sponsoring pooling and cooperative marketing where feasible, organizing a trade promotion campaign, and taking such other action as might be beneficial to growers. One of the main contributions a strong grower association could make at this time would be to secure the adoption of grading rules aimed at raising the quality of trees shipped.

An effective association could, of course, do good outside the marketing field. There is much to be done in the way of improving timber growing practices on Christmas tree lands. In cooperation with the Western Pine Association's "Tree Farm" movement and with the assistance of public forestry agencies, a strong association could take the lead in guiding the industry toward better management practices. The management problem on Christmas tree land is currently being studied by the Northern Rocky Mountain Forest and Range Experiment Station and will be discussed in a later publication.

Industry associations have accomplished much in other fields in improving the quality of products and promoting orderly marketing. An effective association could do much to help the Christmas tree industry in that respect.

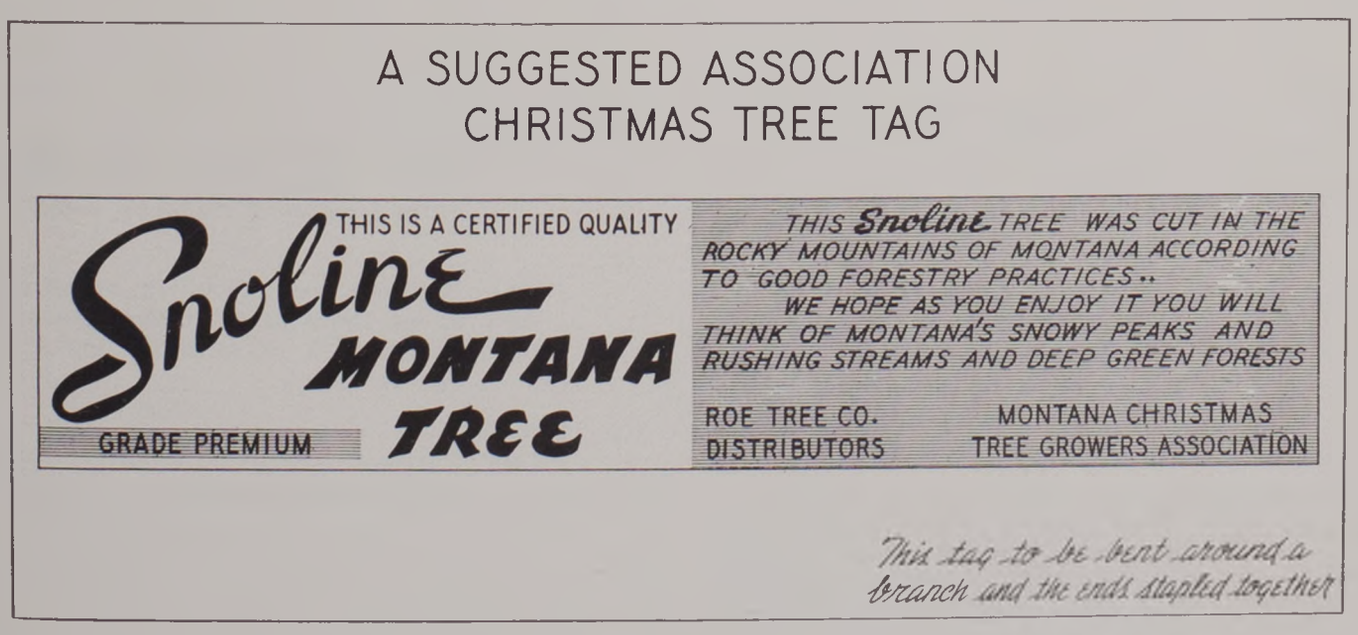

Figure 6.

IV. SUMMARY

The Christmas tree industry, like every other industry, can be improved. For one thing an even stronger effort should be made to hold waste to a minimum. There is some opportunity to increase grower income by cooperative marketing. The instability reflected by the wide range of prices during the short season can be eliminated by developing a better working relationship between grower and concentrator. Close attention should be given to the effect of freight costs on future markets. Fewer blighted Christmas trees should be shipped.

All of these factors deserve attention but foremost is the matter of tree quality. A large share of the trees shipped from Montana are poor to the point of being a detriment to the reputation of Montana trees. It is hard to see how the Montana Christmas tree industry can hold its own in a competitive market unless something is done about quality. In the final analysis that means that Christmas tree growers who now do little more than reap must get down to tree farming. It means more than that, however. Growers will not have the maximum incentive to produce better trees until the price they receive takes quality into account. In other words, the present flat price by concentrators should be replaced by variable pricing, with the variations related to quality. That calls, first of all, for acceptance of grading rules. It calls further for the establishment of a strong grower association to promote grading and other measures designed to improve quality. As a corollary to a quality improvement program, the producers and shippers might attempt an advertising program to maintain a strong demand for the high quality Montana tree.

REFERENCES CITED

(1) Hunt, J. C.
1944 Christmas tree rackets. American Forests Magazine. December.

(2) Hutchison, S. Blair and Huey, Ben M.
1949 Suggested Montana Douglas - fir Christmas tree standards. Northern Rocky Mountain Forest and Range Experiment Station. Station paper No. 18, 13 pp., illus. Mult. March.

(3) Roe, A. L.
1948 What caused "blight" on Christmas trees in the northern Rockies. Northern Rocky Mountain Forest and Range Experiment Station. Research note No. 65, 5 pp. Mult. July.

(4) U.S.D.A., Forest Service
1947 Forest cooperatives in the United States. Report 6 from a reappraisal of the forest situation, 18 pp. August.

(5)
1941 to 1949 Northern Rocky Mountain Forest and Range Experiment Station. Research note Nos. 12, 19, 30, 34, 37, 40, 50, 59, and 71. Mult.

(6) Sowder, A. M.
1949 Christmas trees—the industry. Trees, the Yearbook of Agriculture. U.S.D.A.