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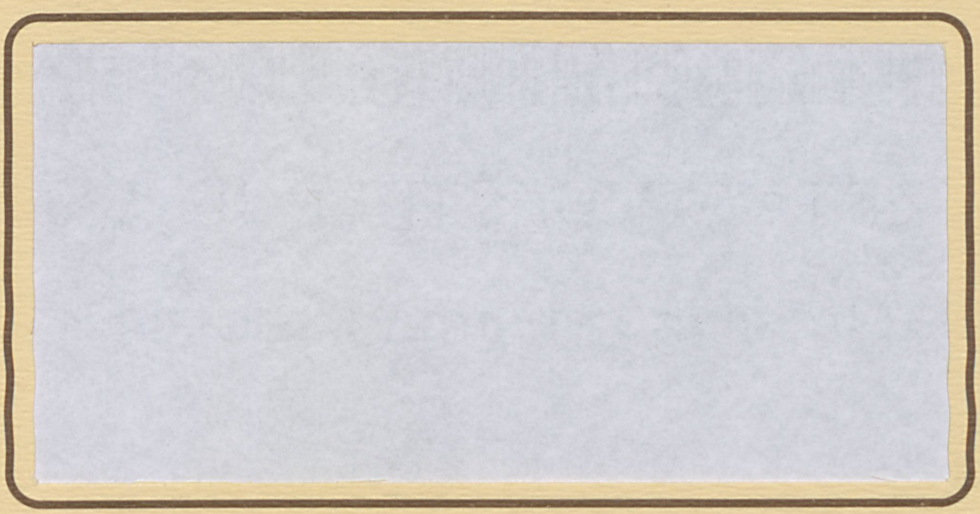

PROJECT REPORT

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Alberta
FORESTRY, LANDS
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Forest Industry Development

Department of Rural Economy
Faculty of Agriculture and Forestry
University of Alberta
Edmonton, Canada

Growing Christmas Trees in Alberta
A Market Analysis and Feasibility Study

Dan Needham, William Phillips, Paul Woodard
and Luis Constantino*
Project Report No. 91-08

A Final Report

to

Forest Industry Development Division,
Alberta Forestry Lands and Wildlife

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* Dan Needham is a Graduate Research Assistant, Dept of Rural Economy, University of Alberta; William Phillips is Professor and Chair, Dept of Rural Economy, University of Alberta; Paul Woodard is Professor, Forest Science, University of Alberta; and Luis Constantino is Senior Research Economist, World Bank and Adjunct Professor, Dept of Rural Economy, University of Alberta.

Edmonton October 1991

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EXECUTIVE SUMMARY

In order to analyze the Christmas tree market in Alberta and assess the feasibility of growing Christmas trees in Alberta for domestic consumption, it was necessary to question participants at all levels of the market, from consumers through to producers. After employing various methods, such as mail surveys and personal interviews and after consulting secondary sources, the required information was assembled and incorporated in this report.

Data on consumption of Christmas trees in Alberta were obtained from questionnaires which were mailed to both residential households and commercial establishments. It was estimated that both types of Alberta consumers together spent approximately 7 million dollars purchasing natural Christmas trees in 1990. Fifty-four percent of Alberta households and 19% of commercial establishments, that displayed Christmas trees in 1990, displayed natural Christmas trees. There were indications that more of each type of consumer would have purchased natural trees if their concerns about the convenience (or lack thereof), safety and environmental aspects of natural Christmas trees had been adequately addressed. Responses indicated that more natural trees would have been purchased if good quality, Alberta-grown Christmas trees had been made available.

This report also contains descriptions of both the household and the commercial consumers of natural and artificial Christmas trees and their other opinions and concerns. It was found that households that purchased natural trees had, as a rule, more children and lived in detached houses. They also tended to be wealthier households and these respondents had a slightly higher level of post secondary education than the average respondent. Retail and service industries were the dominant segment of commercial consumers who displayed trees of any sort (natural or artificial).

Based on the opinions and concerns of respondents, there are some marketing recommendations provided in the report that suggest ways of making a fresher and more convenient ("less messy") product available. Commercial consumers would be likely to buy more natural trees if they were available in November and if these customers could be assured that the trees would maintain their needles and colour.

To cover the retail market, 100 of the 270 known Christmas tree retailers in Alberta were interviewed in order to ascertain the extent of their operations, including quantities, prices, species, operating costs and methods, as well as their concerns, opinions and expectations about the industry. The majority of retailers sampled were operating in or around the larger centres of Edmonton and Calgary, although Red Deer retailers were interviewed as well.

The typical retail outlet is described, along with mean operating costs and employee levels. Independent, profit-oriented outlets had higher operating costs with wages to pay, while service clubs and charities relied heavily on volunteer help and donated sites.

There were signs of market concentration among the profit-oriented retailers who made up 70% of the retail market. Many of these retailers as well as service clubs and charitable organizations, that also sold Christmas trees, shared concerns about the quality of the product and business practices that were employed. Of particular note was the support expressed for the creation of some sort of Alberta Christmas Tree Association or Cooperative.

At the wholesale level, it was found that 32 wholesalers and brokers, from British Columbia, Alberta, Manitoba, and the United States, supplied nearly all of the 300,000 trees sold in Alberta in 1990. As a result of out of province purchases, nearly 2.6 million dollars left the province in that same year.

Wholesale prices for and quantities of Christmas trees are provided, as well as a geographic breakdown of wholesale sources, by species. Wholesale prices ranged from a low of $.71/ft, for Douglas-fir, to $3.58/ft, for Noble fir. Regional suppliers tend to specialize in the provision of one or several particular species. For example, B.C. suppliers provided over 40% of the B.C. fir Christmas trees in Alberta and almost 53% of the Douglas-fir, while Montana suppliers provided over 55% of the wild spruce.

In addition, there were indications of some links between the out of province wholesalers and the retailers in Alberta. For example, one wholesaler supplied trees to: all of the cooperatives in Calgary; Boy Scouts in both Calgary and Edmonton and; one of the multi-outlet retailers which operated in both major cities; as well as to many of the independent retailers in Edmonton.

The demand for natural trees in Alberta in 1990 was estimated by extrapolating the data obtained from consumers, retailers and wholesalers to provide the reader with the authors' opinion of the size and state of the Christmas tree market in Alberta, as it was in 1990. Discrepancies between consumer-based figures and retailer-based figures were identified and adjustments were made in order to arrive at a final estimate.

Eight economic models of Christmas tree production scenarios were developed and discussed as they relate to the existing and potential markets for 300,000 and 500,000 trees respectively. The results of these 8 different production scenarios indicate that there is potential for profitable Christmas tree production in Alberta under certain circumstances. The production of most climatically compatible species of Christmas trees on a hobby farm or as a windbreak on existing farms has the potential to be a profitable enterprise. Other situations, such as growing Christmas trees as a primary crop, are potentially profitable if the more expensive species are grown. This is particularly true if the grower retails his or her own trees, especially if the grower develops a "choose and cut" operation, or if an association were formed that could minimize the distribution costs. These future tree farms could also provide ornamental trees as landscaping material or seedlings for other producers.

ACKNOWLEDGEMENTS

This project was made possible by funding from the Forest Industry Development Division under contract between Alberta Forestry Lands and Wildlife and the University of Alberta. The authors wish to acknowledge project support and input from Al Brennan, Brian Karaim and Rod Simpson of the Division. As well, the authors wish to thank the Timber Management Branch of the Alberta Forest Service, for providing the number of Christmas tree cutting permits, and Norm Graham and all of the civic employees, who provided information about the number of business licenses issued to retailers across the province, and Peter Woloshyn of Alberta Agriculture. Processing of survey results and report preparation were aided significantly by Judy Boucher, Clare Shier, Jim Copeland, Wendy Williamson, Elizabeth Bruce and Sharon Hammond of the Department of Rural Economy. A special thanks goes to Dorian Needham who helped immeasurably, particularly in the opening, sorting, counting and numbering of the returned questionnaires. Finally, the authors are grateful to the large number of anonymous Christmas wholesalers, retailers and consumer survey respondents without whose cooperation and interest this project would not be possible.

GLOSSARY

Species

Species names used in the report are all trade names except those coined by consumers. Trade names are presented below with their correct or assumed Latin names.

Trade Name	Latin/Species Name
Noble fir	Abies procera
Austrian fir	Abies lasiocarpa
Grand fir	Abies grandis
Sheared fir	Pseudotsuga menziesii *
Balsam fir	Abies balsamea
B.C. Fir	Pseudotsuga menziesii *
Douglas-fir	Pseudotsuga menziesii
Jack pine	Pinus banksiana
White pine	Pinus monticola
Lodgepole pine	Pinus contorta
Scots pine	Pinus sylvestris
Norfolk Island pine	A. Heterophylla
Black spruce	Picea mariana
Wild spruce	Picea glauca *
Blue spruce	Picea pungens
White spruce	Picea glauca

* Most likely

Other Terms

Choose and Cut Operations are those operations where the consumer comes to the site and pays a fee to choose and cut his or her own Christmas tree or trees.

Commercial or Institutional Consumers are establishments that are organized to provide consumer services, whether for profit or not.

Household Consumers are groups of persons who reside together for non-commercial reasons.

Loss-leaders are items offered for sale at less than cost to promote further purchases.

Primary Education includes grades 1 through 13.

Retailers are those establishments that sell trees to consumers (both household consumers and commercial or institutional consumers).

INTRODUCTION

Purpose

This project was designed to assess the potential for developing a Christmas tree growing industry in Alberta. There are two important considerations that must be addressed if this assessment is to be of value; first is an investigation and analysis of the demand for Christmas trees by Alberta households and other consumers. This is a basic understanding of market situation in Alberta that could potentially support Christmas tree production in Alberta. The second element is an analysis of supply in terms of production feasibility - can Alberta growers compete in the present market for Christmas trees?

Prior to this project there was some evidence, from the successful creation of such industries in other provinces, indicating that Christmas tree growing in Alberta could become a successful and profitable industry. Christmas tree production could add an element of diversification to farming; contributing to cash incomes with reduced competition for farm labour and other resources. Increased diversification of this kind can increase income stability and reduce the risk associated with multi-enterprise endeavors.

Successful Christmas tree industries have been developed in Saskatchewan and several other provinces. Most Christmas trees sold in Alberta are imported from British Columbia, Manitoba, Saskatchewan, and the United States. Based on earlier data from a market survey carried out in Saskatchewan, the Christmas tree market potential for Saskatchewan's total population of one million was in the order of 120,000 trees annually. It was postulated that the market potential in Alberta, particularly in Edmonton and Calgary, could be substantially larger. To illustrate, it was postulated that, at an average retail value of $25 per tree, sales in Calgary and Edmonton alone could reach well over $3 million. It was against this hypothesis that this project was undertaken.

Objectives

Prior to this project, the evidence available on Christmas tree sales and marketing in Alberta was very sketchy and further research was necessary to objectively assess the market potential for this industry. The objectives addressed herein are as follows:

1. to determine the size of the Christmas tree market in larger population centers in Alberta including sales volumes and values for natural and artificial trees;
2. to examine the degree of substitution between artificial and natural Christmas trees with respect to market trends, consumer preferences, volumes, and prices;
3. to determine the socio-economic background of consumers buying trees (income class, education, family size, age class, dwelling type, etc.) and the characteristics of Christmas trees which consumers prefer (species, size, smell, live versus cut trees, natural versus artificial trees, etc.);
4. to identify the main sources of Christmas trees (e.g. imports from the United States, British Columbia, Saskatchewan, etc. and local supply - industry harvesting from Crown lands, local production, etc.);

5. to determine the means by which Christmas trees are marketed and distributed, the sizes of retail chains and the extent retailers are tied to long-term contracts with suppliers;
6. to analyze the profitability of Christmas tree farming in Alberta given market size, tree prices and production costs and;
7. to provide preliminary insight into types of farms/enterprises for which Christmas trees could be profitable (e.g. trees from small or large acreages, trees associated with woodlots, with farming and with windbreaks, and likely sensitivity of production locations relative to market centers).

The objectives listed above dictated the methods used in the undertaking of the study as well as the content of this report. Surveys and interviews, as well as secondary sources, were used to gather the required information that is presented in this report; the organization of which is described below.

Organization of the Report

There are six main components to this report which describe the market, from consumer demand and present retail and wholesale conditions through to potential Albertan production of Christmas trees. A seventh section, contained in the final appendix, relates to the undertaking of this study.

The first two sections deal with the household and commercial consumer responses to the respective mailed questionnaires. Household consumer responses to questions about attitudes and purchasing habits in regards to Christmas trees are explored, then commercial establishments are examined in the same light.

The third section examines Christmas tree retailer responses to a series of personal interviews that were carried out in December of 1990. Retailers were questioned about their inventories, wholesale purchasing habits and thoughts about the present and potential market.

The fourth section is a study of the wholesale market.

Prices, volumes, and the market structure are examined in the fifth section on market demand which synthesizes the information gathered in the first four sections.

The sixth section is a production feasibility analysis which contains eight general and basic models of Christmas tree production under a broad range of assumptions. In the conclusion to this sixth section, the profitable production scenarios are described, as is the need for further study and refinements to the modelling exercise. These refinements and needs for further study are necessary if accurate business plans are ever to be created and a successful industry is ever to be developed.

The seventh and final section, in appendix E, outlines the procedures and methods used in this study and can be ignored without any loss of continuity.

HOUSEHOLD CONSUMERS

Households consume the vast majority of Christmas trees sold in Alberta. As such, extensive surveying of Alberta households was imperative if the demand side of the market was to be understood. Identification and information about past habits, present consumption and future plans of consumers was elicited by means of a mailed questionnaire. The household consumer survey results, which form the basis of this section of the report, are reported in detail in appendix A.

Identification of Household Consumers

The majority of respondents (72%) reside in a detached house, have an average of just over 8 years of formal education and 2.59 years of post secondary education. Almost 20% had at least one family member aged 6 years or less; 30% had at least one family member aged 12 years or less and 41% have at least one family member aged 18 years or less. Just over 20% of the households had a combined income of between $50,000 to $69,999 and 76% had a combined income of between $30,000 and $99,000 (Table 1).

Most households celebrated Christmas by having a Christmas tree (85%), giving gifts (95%), having a special meal or baking (88%), sending cards (84%) and hanging stockings (61%). Many also indicated that they took part in outdoor activities (28%), visited family (41%), socialized (24%) and took part in church related activities (19%). Most households also displayed a wreath (or wreaths), most often artificial (Appendix A, Table 12).

The respondents' attitudes towards, or opinions about, the safety of and the environmental aspects of natural Christmas trees were notable and varied. About the safety of a natural tree, compared to its artificial counterpart, only 5% thought the natural tree was safer while 42% indicated that they thought that it was less safe. Almost 26% thought they were equally safe. Less than 1% could not decide and the rest had no opinion (Appendix A, Table 13).

Regarding the environmental impact of natural trees, the opinions were more divided; over 26% thought that a natural tree was more environmentally friendly than an artificial tree, 34% thought otherwise, while 6% thought they were equally friendly or unfriendly and 8% indicated that they could not determine the environmental impact. Over 25% had no opinion. Those who thought that natural trees were more environmentally friendly indicated that they thought so, because (in order of importance):

1. Nursery grown trees are o.k.
2. Artificial trees are bad.
3. Natural trees are just better.
4. Thinning natural tree stands is beneficial

While those who thought otherwise indicated that artificial trees were more environmentally friendly because (once again in order of importance):

1. Cutting down natural trees is bad.
2. Artificial trees are re-usable.

3. Artificial trees are just better.
4. Too many natural trees are wasted.
5. Natural trees are not biodegradable.
6. Even nursery grown trees are environmentally unfriendly

(Appendix A, Table 13).

Christmas Tree Display Habits in 1990

Over 82% of the households surveyed did display a Christmas tree during the 1990 holiday season. Of these, 50% displayed a natural tree, 4% displayed both a natural and an artificial tree and 46% displayed an artificial tree (Appendix A, Table 24). Table 1 provides the reader with a breakdown of socio-demographic characteristics of consumers by Christmas tree display habit.

Households That Did Not Display a Tree in 1990

A lesser portion of households, that did not display a tree in 1990, than the overall population, live in a detached house (51%). One third live in an apartment. They have on average 7.9 years of primary education and 2.97 years of post secondary education. Only 7% have at least one family member aged 6 years or less. Only 9% have at least one family member aged 12 years or less and only 15% have at least one family member aged 18 years or less. There are remarkably fewer children in these households than in the overall population. The majority of these households had a combined income of between $30,000 and $69,000 (Table 1).

These households indicated that they did not display a tree in the 1990 holiday season because (in order of importance):

1. They were away for Christmas.
2. There were no children in the household.
3. It was too much trouble
4. The home was too small.
5. A tree was too expensive.
6. Of environmental concerns.
7. Of illness, age or a death in the family.
8. Of religious reasons.
9. They do not celebrate Christmas.
10. Of safety concerns.

(Appendix A, Table 17)

The vast majority of the households that did not display a tree in 1990 have displayed a tree in the past and over 40% did display a tree as little as two years prior to this past Christmas season. More than half indicated that they were planning to display a tree in the future. Of these, nearly 67% were planning to display a natural tree in the future.

Table 1

Table of Frequencies of Tree Display Habits By Housing Type, Education, Age of Children and Income

Housing (percent)	All Respondents	No Tree	Artificial Tree	Natural Tree
No Answer	1.0%	2.2%	0.8%	0.7%
Low Rise	8.2%	22.9%	5.0%	5.2%
High Rise	4.5%	10.4%	4.4%	2.4%
Mobile Home	2.4%	3.5%	26.%	1.9%
Double House	3.6%	4.3%	3.8%	3.2%
Row House	8.0%	6.1%	9.2%	7.8%
Detached House	72.2%	50.6%	74.3%	78.9%
Education (years)	Mean	Mean	Mean	Mean
Formal	8.29 (5.38)	7.90 (5.38)	8.80 (5.09)	7.98 (5.58)
Post Secondary	2.59 (2.78)	2.97 (3.11)	2.23 (2.68)	2.76 (2.69)
Children (number)				
1 or more ≤ 6	18.9%	7.4%	19.6%	22.8%
1 or more ≤ 12	29.7%	9.5%	31.1%	36.3%
1 or more ≤ 18	40.9%	14.7%	43.7%	48.8%
Income (1990 dollars)				
At Least 70% have an income between	30,000-99,999	30,000-69,999	30,000-99,999	30,000-199,999
Mean income	30,000-49,999	25,000-39,999	30,000-49,999	40,000-69,999

Standard Deviations in Brackets.

Households That Displayed an Artificial Tree in 1990

The majority of households that displayed an artificial tree in 1990 are remarkably similar to the overall population. Three-quarters (74%) live in a detached house, have, on average, 8.80 years of primary education and 2.23 years of post secondary education. Close to one-fifth have at least one family member aged 6 years or less; 31% have at least one family member aged 12 years or less; and 44% have at least one family member aged 18 years or less. The majority of these households had a combined income of between $30,000 and $69,999 (Table 1).

These households indicated that they chose to display an artificial tree, rather than a natural tree, because (in order of importance):

1. There was less mess involved.
2. There is no need to shop each year.
3. Of safety concerns.
4. Of the ease of setting up an artificial tree.
5. Of cost considerations.
6. Of environmental concerns.
7. Of personal preference.
8. Of size considerations.

(Appendix A, Table 25)

They have used an artificial tree for an average of 10 seasons and have used the same artificial tree for an average of 8 seasons. Over 72% indicated that they switched to an artificial tree, from formerly using a natural tree, because (in order of importance):

1. There was less mess involved.
2. There were no disposal problems.
3. There is no need to shop each year.
4. Of safety considerations.
5. Of the ease of setting up an artificial tree.
6. Of environmental concerns.
7. Of personal preference.
8. Of size considerations.
9. They would be away for the holidays.

(Appendix A, Table 29)

In order to determine if the concerns, that were anticipated to be voiced about the safety of natural trees, were justified, the households were asked to indicate if they had ever had any safety problems with their artificial tree. The problems experienced with artificial trees are tabulated in Appendix A, Table 30. A small percentage (0.4%) of those who

displayed an artificial tree experienced problems with smoke or fire and 0.4% experienced melting plastic around the tree lights. An equal number had their tree knocked over by children as did another 0.4% who had their tree knocked over by pets.

Households That Displayed a Natural Tree or Both Natural and Artificial Trees in 1990

More of the households that displayed a natural tree in 1990, than the overall population, live in a detached house (79%). They have, on average, less primary education (7.98 years) than does the overall population but more (2.76 years) post secondary education. They also have considerably more children. Almost one-quarter (23%) have at least one family member aged 6 years or less, compared to 19% for the entire population. Similarly, 36% have at least one family member aged 12 years of less and 49% have at least one family member aged 18 years or less. These households also had a greater combined income, of $30,000 to $199,999, than did the overall population (Table 1).

These households indicated that they chose to display a natural tree because (in order of importance):

1. Of tradition.
2. They just want a real tree.
3. Of the fragrance.
4. They dislike artificial trees.
5. A natural tree is biodegradable.

(Appendix A, Table 39)

Over 68% indicated that they have always had a natural tree and almost 21% of the respondents said that they had returned to using a natural tree after trying an artificial tree.

Purchases of Natural Trees in 1990

The typical natural tree displayed in 1990 cost $20.15 and was just over 6 feet tall. It was most often purchased by a male member of the family or by several family members. This same person (or these same persons) often purchase the tree every year. More than 85% of the trees were purchased, rather than cut or received as a gift, and almost half were purchased at a commercial seasonal lot. Nearly a quarter were purchased from a seasonal lot operated by a charitable organization or service club. The person (or persons) purchasing the tree most often shopped at only one outlet, only occasionally looking at two or more lots and rarely making more than 3 stops in their search for a tree. Very few households displayed more than one tree (Appendix A, Tables 31 to 37 and Table 42).

Most purchases were made on weekends falling on or just after mid-month payday. The purchaser looked for these characteristics (in order of importance):

1. Shape.
2. Fullness.
3. Height.
4. Freshness.

5. A straight stem.
6. A good price.
7. A particular species.
8. A particular shade of green.
9. A fragrant tree.

(Appendix A, Table 49)

Most (91%) were satisfied with their purchase but those who were dissatisfied were disappointed that (in order of frequency of complaints):

1. The needles fell off too early.
2. The clean up was troublesome.
3. There was no tree bag provided.
4. The tree looked better on the lot.
5. The tree was so difficult to set up.
6. The tree was so expensive.
7. The stem was bent.
8. A good tree stand was not available.
9. The stem was too thick.
10. The tree lacked fragrance.

(Appendix A, Table 51)

In order to determine if the anticipated concerns about safety problems with natural trees were justified, the respondents were asked to indicate if they had ever had a safety problem with their natural tree. The responses from households that displayed natural trees showed that less than 3% had ever experienced a problem. Only 0.34% had ever had a problem with fire or smoke, compared to .4% of the households with artificial trees who had had similar problems. There were, however, more problems with natural trees falling over (1.67% compared to 0.8%). The other problems were related to stepping on needles (0.34%) or developing a rash from the needles (0.17%). Two respondents (or another 0.34%) indicated that they had experienced some other, unspecified problem (Appendix A, Table 63).

The results that the household consumer questionnaire provided were used to meet the second and third objectives, which were to determine the characteristics of household consumers and the characteristics of the Christmas trees that determine their demand and the substitution between natural and artificial trees. This section provides an accurate snapshot of the 1990 market, with characteristics of household consumers (broken down by purchasing habit) and each type of consumer's opinion (about the characteristics of the tree which they choose to display) listed. As well, their recollections of past substitutions are also listed.

The household consumer questionnaire was also used to gather some of the information needed to meet the first objective. It was used, in conjunction with the retailer interviews, in order to more accurately estimate the market size, including sales volumes and values. This data, though gathered in part from household consumers, is presented in the section entitled "Market Demand".

Household Consumer Marketing Recommendations

Households have some concerns about natural trees. The mess associated with a natural tree and the difficulty of setting up such a tree are very significant factors in the decision process.

In order for the market for natural trees to reach its potential, the product will have to be of the highest and freshest quality and it will have to become a more convenient product as well. It is evident that there are several steps that can be taken in order to achieve these goals.

These are:

- the provision of tree bags,

- the development and marketing of an easy to use Christmas tree stand with a large water carrying capacity and

- the promotion of an Alberta grown product of a uniform high quality.

In addition, a coordinated effort to show the public just how safe and environmentally friendly a natural Christmas tree is, in relation to its artificial counterpart, would likely prove valuable. In regards to the safety aspect, it is evident from the results of this study that, except for the problems with the needles from natural trees and the instability of some natural tree stands, natural trees can be at least as safe as their artificial counterparts. This is especially true if the trees are fresh when bought and watered regularly. It should be pointed out, also, that the smoke from the combustion of an artificial tree is likely very toxic. As far as assessing the environmental impact, their biodegradability and the oxygen production associated with the growth of natural trees should be compared to the disposal problems and byproducts associated with artificial trees.

As long as the product is available, the portion of the population that is already prone to displaying a natural tree will continue to do so, except for those who believe that the use of an artificial tree is better for the environment. The portion of the population that does not presently display a tree, but plans to in the future if a "good quality Alberta grown Christmas tree" were available, is very significant and every effort should be made to provide the product that is desired.

COMMERCIAL CONSUMERS

In order to assess the entire number and types of Christmas trees consumed in Alberta, the commercial and institutional consumers needed to be included in the survey process. According to Compusearch (1990) there is approximately one such entity for every ten households in Alberta; so this group is a significant portion of the total number of tree consumers. The information gathered from the commercial consumer questionnaire, which is discussed below, is tabulated , in detail, in appendix B.

Identification of Commercial Consumers

The variability amongst commercial or institutional consumers is much greater than among households. So it is not as easy to describe a typical commercial consumer as it is a typical household consumer. The largest component within this sample segment, however, was devoted to supplying services (45%), while the only other significant group was the retailers who comprised nearly 22% of the sample (Appendix B, Table 4).

The majority of the sample segment indicated that their establishments were located in office buildings (33%), plazas (18%), warehouses (15%) and malls (14%). The only other significant location type indicated was a detached building (10%) but offices or businesses located in the household did comprise a notable 4% of the entire sample (Appendix B, Table 5).

It is safe to assume that a good portion of the large service sector and the significant retail sector are located in office buildings, plazas and malls, while the industrial and manufacturing sectors, that together comprise more than 14% of the sample, occupy most of the warehouse space.

Commercial Consumer Purchasing Habits

Just over half of the respondents indicated that they displayed an artificial Christmas tree. Only 11% indicated that they displayed a natural tree, while 38% of the respondents did not display a tree of any sort. Not surprisingly, the retail and service industries, followed by industry, schools and manufacturing, were the largest consumers of both natural and artificial Christmas trees, as indicated in Table 2.

The important reasons given for not displaying a tree are: that the building is too small and; that displaying a tree is too much trouble (Appendix B, Table 6). Most respondents (54%) who did not display a tree in 1990 indicated that they never had displayed a tree and 64% indicated that they never would. Those who had displayed a tree in previous years indicated that it had been 3 or 4 years on the average since they had displayed a tree (Appendix B, Tables 7 and 8).

Table 2

Frequencies of Commercial Consumer Types That Did Display a Natural or Artificial Christmas Tree

Consumer Type	Number Who Displayed Tree	Percent
Services	49	43.36
Retailers	21	18.58
Industry	10	8.85
Schools	9	7.96
Manufacturing	6	5.32
Clinics	5	4.43
Other	13	11.50
TOTAL	113	100.00

Natural vs Artificial Trees

Of those establishments that did display a tree, more than 80% indicated that it was an artificial tree and over one-third had switched from displaying a natural tree previously. Once again, the main reasons given were that a natural tree was too troublesome or difficult to set up. Close to 13%, though, did indicate that they would switch to a natural tree if a "good quality Alberta grown", Christmas tree was available (Appendix B, Tables 9, 12, 13 and 14).

Establishments That Did Display a Natural Tree (or Both Natural and Artificial Trees)

The reasons that these establishments displayed a natural tree are varied; ranging from just wanting a natural tree for their customers' and the staff's enjoyment to appreciating that it was biodegradable. The most important reason, though, was the fragrant nature of a natural tree (Appendix B, Table 19).

The average price paid was $14.24 for a 7-foot tree, considerably less than was paid by household consumers. The tree was purchased earlier (43% were purchased in November), most often by the boss or manager (52%) (Appendix B, Tables 15, 18 and 20).

The commercial consumer questionnaire was modeled after the more extensive household consumer questionnaire so that it too would provide some of the means to meet the first three objectives of this study. These objectives were to assess the size of the market and the determinant product and consumer characteristics.

As was the case with the results of the household consumer questionnaire, the third objective, that relates to characteristics of both the consumer and the product, was met in its entirety through the use of a consumer survey. But in order to meet the first two objectives, the information gathered from retailers (their stated sales volumes) was also necessary. The first two objectives are met, in their entirety, by the application of the results from both of the consumer surveys as well as the retailer interviews and these results are discussed in the section entitled "Market Demand".

Commercial Consumer Marketing Recommendations

Given that the vast majority of trees displayed in commercial establishments were artificial, because a natural tree was too troublesome and difficult to set up, and that many of the natural trees displayed were obtained in November, we suggest that natural tree growers and retailers will have to provide a less troublesome product that will have to be available very early in the Christmas season.

As the troublesome nature of a natural tree encompasses the difficulty in obtaining, setting up, maintaining and disposing of the product, these problems have to be addressed.

The ability to pre-order a natural tree (that will maintain its freshness) and to obtain an easy to use tree stand with a large water carrying capacity would surely help natural tree sales. Provision of a tree bag and or a disposal or refund service would also enable retailers to sell to both the consumers who normally use an artificial tree as well as those consumers who normally do not display a tree. A delivery service would likely also be beneficial to sales.

As there seems to be some support available for an Alberta grown product, as indicated in Appendix B, Tables 14 and 17, the retailers should indicate that their product is indeed Alberta grown. Growers will have to ensure that their product can maintain its high quality for the duration of the Christmas shopping season.

RETAILERS

The reasons for interviewing the Christmas tree retailers were two-fold. The first reason was to determine the structure of the retail industry and the second, though no less important, reason was to ascertain the size of the Christmas tree market in terms of species, volumes and prices (both wholesale and retail). The results obtained with the latter purpose in mind serve to flesh out the results obtained in the consumer survey and are listed in their entirety in appendix C.

The section on the present market structure will therefore be broken into two parts to reflect the dual purposes of the retailer study. The section immediately following, entitled "Retail Market Structure", will concentrate on: the physical structures of Christmas tree retail outlets; methods of obtaining and selling trees; and market concentration. Following the section on market structure will be a section entitled "Market Size" that will provide a summary of the volumes and prices as well as geographic sources of the trees sold in Alberta. An additional section, dealing with "Market Trends" completes the analysis of Christmas tree retailers in Alberta.

Retail Market Structure

The Macro View

The Christmas tree retail market is mostly comprised of small outlets; many owned by one of several families that dominate the market, particularly in Edmonton and Calgary but also in some of the smaller centres. In addition, some service clubs, such as the Boy Scouts, and some wholesalers have multiple outlets that operate on a co-operative or franchise basis, but there are several retail stores that offer Christmas trees as loss-leaders.

Each type of group has concerns about the others. The service clubs and charitable organizations are very concerned about both the commercial retailers, who supposedly sometimes misrepresent themselves as service clubs or charitable organizations, and the large retail chain stores, that sell trees as loss-leaders and undercut the rest of the retailers. The independent owner-operated retailers are also concerned about undercutting by the chain stores but also have concerns about fly-by-night operators who flood the market; this drives prices down and results in wasted inventory. They are also concerned about the market concentration, particularly in Edmonton where one family owns 26 outlets. The budding family monopolists have their own concerns as well. Thievery from employees and competition from the large chain stores tops their list of concerns. For a more complete list of retailer concerns see Appendix C, Table 40.

A great many retailers have a genuine interest in improving the market situation and many are in favour of an Albertan source of trees, as well as of a Christmas Tree Retailers and Wholesalers Association; 66% said that they were in favour of such an Association and almost 64% indicated that they would join one. Four wrote, in the comment area at the end of the interview sheet, that they wanted a copy of this report and many more inquired, during the interview process, as to where they could obtain a copy.

It is a truth, universally acknowledged amongst tree retailers, that the business is difficult and many of the retailers are in want of a reliable source of good quality trees.

The Micro View

The typical retail outlet is well known to most Albertans. The outlets are always near a busy thoroughfare, have plenty of parking available and usually a trailer, shack or motorhome serves as an office. The trees are displayed, most often, in an upright position and the lot is lit by strings of white or colored lights.

Almost 70% of the outlets represent themselves as independent profit-oriented retailers while service clubs and special interest groups operate nearly half of the remaining 30% of the outlets. The owner of the retail outlet rarely relies on tree sales for his or her livelihood and hires 2 or 3 full or part-time employees (Appendix C, Tables 11 and 12) to assist, as the hours are long, averaging over 80 hours per week in the month of December (Appendix C, Table 15). The average owner has been in business for 8 years (Appendix C, Table 10). Service club outlets usually have more personnel on hand as they are all volunteers and so wages are nonexistent.

Most often (83% of the time) all of the inventory is displayed on the lot but occasionally there are more trees in a van nearby (if, as is not often the case, the retailer shipped his or her own trees). Only 6% of the trees sold in Alberta in 1990 were grown or cut by the retailer and less than 5% were grown locally.

There are potential inroads into the marketplace for Alberta Christmas tree growers, depending on prices and quality. In Appendix C, Table 22, the attributes that would lead the retailers to switch to Alberta grown trees are ranked in order of importance.

Concerns with quality were expressed often. Almost 74% of the retailers supported the notion of an Alberta standardized grading system that would provide benefits to themselves.

Operating expenses varied considerably. Service clubs and charitable organizations operate almost at zero cost, often on their own or on a donated lot. They rely heavily on word-of-mouth or repeat customers rather than extensive signs or other forms of advertising. Commercial retailers, on the other hand, pay up to $6,000 for a one-month lease (with utilities and license fees included) and up to $3,000 for advertisements. On the average, for all types of retailers, the average site lease, license and utility costs are $1,400 and mean advertising costs are close to $500 (primarily spent on signs).

A number of other items are also marketed at these outlets, including tree stands, tree bags, boughs, wreaths, cones, ornaments, tree lights and even artificial trees on occasion. The retailers seem to understand the nature of their market niche. Only 28% indicated that they thought that the artificial tree was harmful to their business. Nearly half (47%) offer free gifts or coupons to their customers; most by offering future discounts, intended to bring the customer back next season. Most also offer advice on tree maintenance, set-up and safety, but rarely is this advice in a written form.

Sale volumes are greatest on the weekends closest to mid December, not surprisingly just after the mid month payday. But sales are significant throughout the 3 weeks prior to Christmas (Appendix C, Table 39).

Market Size

Although the interviewers were instructed (and made every attempt) to have the retailers supply as many details as possible about the numbers and prices of each species sold at the particular location, many retailers, particularly those not associated with service clubs or charitable organizations, were reluctant to provide such information. As there was some divergence between estimates of the market size determined by consumer responses (that were biased in the opposite direction than those determined by retailer responses) it was necessary to extrapolate from both sources with the evident biases in response from each party in mind. See the footnote below Table 3.

From such extrapolation, the market size was estimated to be in the area of 300,000 trees, valued at $3,000,000 at the wholesale level and $7,000,000 at the retail level. Nearly $2,600,000 was estimated to have left the province for wholesale purchases of Christmas trees.

The estimates of volumes and values are listed in Table 3.

Market Trends

When asked about market trends, the retailers indicated that the quantity demanded for most species was increasing, rather than decreasing, with wild spruce as the only exception. Furthermore, it was indicated that the quantity demanded of the more expensive trees such as Scots pine and sheared and balsam fir was increasing rather than remaining constant.

Appendix C, Table 30 provides a schedule of the retailers' opinions about demand shifts.

Along with the information gathered from both of the consumer surveys, the information gathered from interviewing the retailers provided the authors with the means to estimate the true market size and so meet the first objective. The section entitled "Market Demand" contains this estimate. The fifth objective, to determine the means by which Christmas trees are marketed and distributed and the size of retail chains, etc. was partially met through this interview process and only needed to be fleshed out with information gathered from the wholesalers in regards to some of the distributional issues.

Table 3

Scaled* Estimates of Numbers of Trees (and Prices) Sold in Alberta in 1990

Species	Minimum Number	Maximum Number[1]	Est. or Actual Wholesale Price/Foot	Est. Retail[2] Price/Foot
B.C. Fir	53,944	74,818	.87	3.00
Douglas fir	36,742[3]	56,651	.71	3.12
Natural fir				
TOTAL	90,686	131,469	Mean (.79)	Mean (3.06)
Sheared fir	8,7493	12,620	2.21	4.24
Grand fir	4,628	4,858	3.05	7.56
Noble fir	1,698	2,209	3.58	9.22
Balsam fir		2,679		
Specialty fir				
TOTAL	15,075	22,366	Mean (2.95)	Mean (7.01)
Wild spruce	45,561	76,090	1.00	4.23
White spruce		2,144		3.33[4]
Blue/Black spruce	780	18,974	3.13	6.27
All spruce				
TOTAL	46,341	97,208	Mean (2.07)	Mean (4.61)
Jack pine	310	4,935	1.25	2.46
White pine	1,945	33,180	3.31	6.66
Lodgepole pine	3,828	7,039	1.02	2.17
All Natural pine				
TOTAL	6,083	45,154	Mean (1.86)	Mean (3.76)
Scots pine	60,829[3]	60,956	2.82	6.06
TOTAL All Species	219,014	357,153		

* Retail estimates scaled up by 25%, consumers scaled down by 15% to conform with assumptions made in market demand section.

1 Known estimate plus share of unknown species (share = retail share estimate).

2 Weighted average of 2 · retail average and 1 · consumer average.

3 Consumer estimate is lower and retail estimate is higher.

4 No retail estimate available.

WHOLESALING

Identification of Wholesalers/Brokers

Table 4 lists all of the wholesalers and/or brokers that were identified by the author or listed as suppliers by the retailers who were interviewed. Although there are 32 listings, because of incomplete information supplied by the retailers, some listings may be repeats.

Prices

Eleven known wholesalers were solicited for a 1990/91 price list in order to obtain wholesale prices for various species of Christmas trees. Five replies were received, of which four provided the requested information.

Mean prices, in dollars per foot as well as standard deviations, are presented in Table 5. Prices range from an average of $3.58 per foot for Noble fir to $0.71 per foot for Douglas fir. These data were compared with prices paid by retailers and most of the prices provided in Table 5 are less than those comparable prices given by retailers. However, differences were generally less than one standard deviation in magnitude.

Wholesale Market Structure

The wholesale industry serving Alberta is dominated by several United States firms. These firms are very well established. For example, Company A notes on their brochure that they have been in existence "since 1880" and Company B, based in California and Washington, indicates that it has a "national sales force."

These larger U.S. firms offer various services to retailers. These include lines of credit and guides to operating a successful retail Christmas tree lot. They also offer add-on profit opportunities including balers, plastic netting, display kits, tree food and tree bags. Some of these firms are also members of the Northwest Christmas Tree Association, Salem, Oregon.

Some indication of the Canadian and United States Wholesalers' retail clientele is given in Table 6. An indication of Alberta retailed trees, by geographic sources, is provided in Appendix C, Table 41.

A potential Alberta Christmas Tree growing industry must not only compete with out-of-province producers but face a wholesale market dominated by a few wholesalers as well. If market access is found to be restricted to some degree by existing wholesalers, then an Alberta Growers Wholesale and Distribution Agency may need to be established. It should be noted, as well, that the Christmas tree wholesaling function is often supplemented by support services and complementary products.

The wholesaling section of this study was completed in order to meet the parts of the fifth objective, which deal with the ties between retailers and wholesaler and the distribution issues, as well as to identify the main sources of trees which is the fourth objective.

Table 4

NW Tree Wholesalers by Location, 1990

Firm No.	Name	Location
1.	Company A	Olympia, Washington, USA
2.	Company C	Richmond, British Columbia, CAN
3.	Company A.1 (affiliate?)	Winnipeg, Manitoba, CAN
4.	Company F	Jaffray, British Columbia, CAN
5.	Unknown	Unknown, British Columbia, CAN
6.	Company E	Calgary, Alberta, CAN
7.	Company G	Invermere, British Columbia, CAN
8.	Company A.1 (affiliate?)	Regina, Saskatchewan, CAN
9.	Company H	Windermere, British Columbia, CAN
10.	Company I	Ealeywell, Montana, USA
11.	Company J	Unknown, Montana, USA
12.	Unknown	Unknown, Oregon, USA
13.	Company B	Tacoma, Washington, USA
14.	Company C.1 (affiliate?)	Nanton, Alberta, CAN
15.	Unknown	Nanton, Alberta, CAN
16.	Unknown	Ft. Steel, British Columbia, CAN
17.	Company K	Invermere, British Columbia, CAN
18.	Unknown	Unknown, North Carolina, USA
19.	Company L	Invermere, British Columbia, CAN
20.	Company M	Edmonton, Alberta, CAN
21.	Company D	Richmond, British Columbia, CAN
22.	Company N	Cranbrook, British Columbia, CAN
23.	Company O	Kalispell, Montana, USA
24.	Company C.1 (affiliate?)	Canal Flats, British Columbia, CAN
25.	Company D.1 (affiliate?)	Richmond, British Columbia, CAN
26.	Company P	Port Orchard, Washington, USA
27.	Company Q	Vancouver, British Columbia, CAN
28.	Company R	Shelton, Washington, USA
29.	Company S	Shelton, Washington, USA
30.	Company T	Gig Harbor, Washington, USA
31.	Company U	Caldwell, Idaho, USA
32.	Company V	Boise, Idaho, USA

Table 5

Wholesaler Christmas Tree Price* List by Species, 1990

Species	Price in Dollars Per Foot	
	Mean	Standard Deviation
Noble fir	3.58	0.51
White pine	3.31	0.41
Black spruce	3.13	--**
Grand fir	3.05	0.07
Scots pine	2.82	0.43
Sheared fir	2.21	0.66
Balsam fir	1.76	--**
BC fir	0.87	--**
Douglas fir	0.71	0.05

* Most prices are F.O.B., but one wholesaler offers delivered trees (to Alberta) at a lower price than is offered by all the rest.

Source: Project Survey Responses (n=4).

** n=1, hence no standard deviation calculated.

Table 6

Selected Christmas Tree Wholesaler Links to Retailers, Alberta, 1990

Wholesale Firm	Retail Agencies Served by Wholesale Firm
Company A	A major service club in Edmonton, All Calgary cooperatives, Calgary Boy Scouts (some), A retail tree dealer with outlets in both Edmonton and Calgary
Company A.1 (affiliated Company A)	Edmonton Boy Scouts (some), an academic institution's Forest Society, Edmonton Independents (some)
Company C	A major retailing company in Calgary, Boy Scouts (some), Independents (some)
Company D	Furniture store, Grocery store
Company E	A tree lot chain with 6 locations in Alberta
Company F	Boy Scouts (some), Independents (some)

Source: Project Survey Results.

MARKET DEMAND

Estimating the Present Market

Determining the exact size of the natural Christmas tree market in Alberta has proven to be a very difficult task. It was hoped that the results of the retailer interviews and the consumer surveys would validate each other. However, errors caused by non response (from all of the parties) have resulted in disparities between the responses from the two categories of interviewees or respondents. The retailers were very reluctant to provide accurate numbers of trees, particularly the larger commercial retailers. This has resulted in an under estimate, in the opinion of the authors, of the total number of trees estimated from information given by the retailers. This is attributable to two causes: the smaller outlets, particularly those operated by service clubs, provided the desired information, while the larger outlets often did not, so that when the total numbers were extrapolated, they reflected this downward bias; in addition, it is assumed that the larger outlets under reported their sales which also resulted in a similar downward bias. On the other hand, it is also likely that the consumers who did display a tree would return their surveys more often than those who did not. This, in turn would result in an upward bias of the consumer indications.

The evidence supports all three of these assumptions as is evident in Tables 7 and 8. Estimates made from consumer responses are much higher than those made from retailer responses.

Table 3 (shown previously) shows the results of estimates made with all three assumptions in mind and reflects the opinions of the authors about the size of the Christmas tree market in Alberta. Table 9 provides a good indication of the dollar values of both the wholesale and retail markets as well as an indication of how much revenue left the province in 1990.

The Market Potential

Given the responses by both household and commercial consumers, it was possible to determine the market potential. Figure 1 shows that if all of the consumers who said that they might, did indeed, purchase a natural tree, the number of trees sold would swell to upwards of 500,000 trees.

The results of all of the study procedures employed were used in this section in order to complete the meeting of the first and fifth objectives, which deal with the size and extent of the Christmas tree market in Alberta.

Given the size of the present and potential market, as well as the amount of revenue leaving the province to provide for the demand for natural Christmas trees, growing Christmas trees in Alberta (if it can be done in a cost effective manner) will be a beneficial enterprise for both the growers themselves and the provincial economy. To that end, the following section provides an economic analysis of 8 Christmas tree growing operations of different types, made under various assumptions.

Table 7

Number of Trees Displayed as Indicated By Households and Commercial Establishments, By Species

Species	Number (Household)	Number (Commercial)	Estimated Number/Prov. (Household)[1]	Estimated Number/Prov. (Commercial)[2]
B.C. Fir*	104		65,569	
Scots pine	71	2	44,763	795
Douglas fir	28	5	17,653	1,988
Wild spruce*	110	3	69,352	1,193
Blue spruce	33	3	20,806	1,193
White pine	60	1	37,828	398
Lodgepole pine	10	1	6,305	398
Sheared fir*	8		5,044	
Grand fir	6		3,783	
Noble fir	3		1,891	
Balsam fir	5		3,152	
Norfolk pine	3		1,891	
Cedar	2		1,261	
White spruce	4		2,522	
Scots fir*	1		630	
Green spruce*	7		4,413	
Jack pine	9		5,674	
Austrian fir	0		0	
Unknown	156	7	98,353	2,783
Wild & White spruce*	114		71,874	
Scots fir & pine*	72		45,394	
All Species	620	22	390,891	8,748

* Trade names or names coined by consumers.

[1] Number · Index (based on Compusearch estimate of 834,740 households/prov.) of 630.47.

[2] Number · Index (based on Compusearch estimate of 72,764 establishments/prov.) of 397.62.

Table 8

Comparison of Retail and Consumer Estimates of Number of Trees Displayed and Mean Prices, By Species (Including Trees Cut on Crown Land With Permits)

Species	Retailer Data (Number)	Retailer Data (Mean Price/Foot)	Consumer Data (Number)	Consumer Data (Mean Price/Foot)
B.C. Fir*	43,155	3.25	65,569	2.51
Scots fir & pine*	21,519	6.48	46,188	5.22
Douglas fir	45,321	3.20	19,641	2.97
Wild spruce*	111	5.5	70,545	1.68
Blue spruce	624	7.39	21,999	4.04
White pine	1,556	8.26	38,226	3.46
Lodgepole pine	3,062	2.45	6,703	1.62
Sheared fir*	10,096	3.50	5,044	5.71
Grand fir	3,702	8.12	3,783	6.43
Noble fir	1,358	9.80	1,891	8.06
Balsam fir		8.00	3,152	1.94
Norfolk pine			1,891	6.00
Cedar			1,261	5.28
White spruce			2,522	3.33
Scots fir*			630	2.29
Green spruce*			4,413	2.13
Jack pine	248	2.75	5,674	1.87
Austrian fir		6.00	0	
Unknown			101,136	3.35
Wild & White spruce*			71,874	
Scots pine (retail stores)[1]	34,057			
Wild spruce* (permits)	23,765			
Trees (no permits)[2]	21,666			
TOTAL	210,240	5.77 (2.49)	399,639	3.77 (1.91)

* Trade names or names coined by consumers

[1] Estimated from consumer indications that 4.08% purchased at retail stores that did not provide estimates.

[2] Estimated from consumer indications that 47.69% of trees were cut on private land.

Table 9

Wholesale and Retail Market Size (Final Estimate) With Indications of How Much Money Left the Province in 1990

Species	Mean Retail Value[1]	Mean Wholesale Value[1]	Dollars that Left Province[2]
Natural fir	$ 2,039,382.90	$ 526,507.35	$ 458,061.39
Specialty fir[3]	787,384.23	331,352.85	328,039.32
All spruce	1,985,282.70	891,439.29	668,579.47
Indigenous pine	577,953.36	285,902.46	142,951.23
Scots pine	2,214,051.30	1,030,301.10	999,392.07
TOTAL	7,064,054.50	3,065,503.10	2,597,023.50

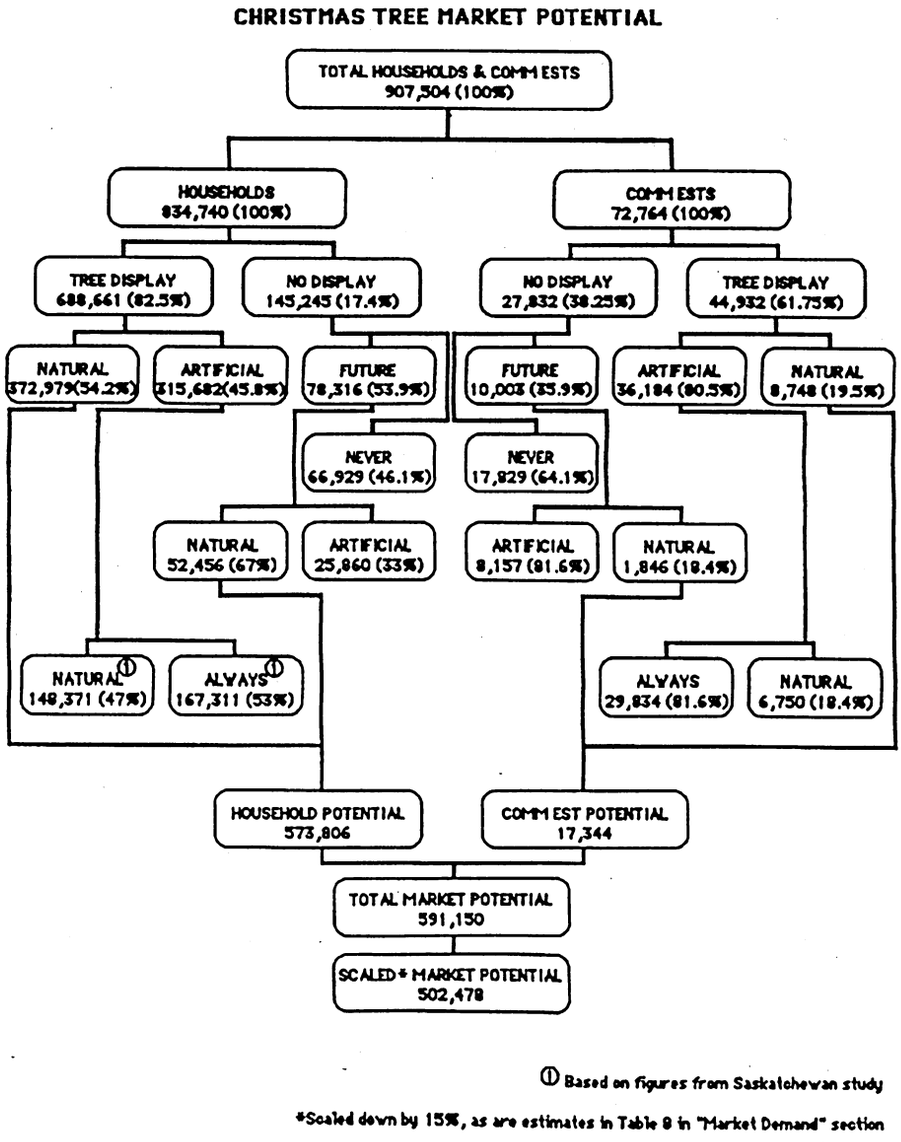
[1] Based on mean value of minimum and maximum values indicated in Table 7 and average 6' tree.

[2] Based on figures in Appendix C, Table 42.

[3] Sheared, Grand, Noble and Balsam.

Figure 1

1990 Alberta



① Based on figures from Saskatchewan study

*Scaled down by 15%, as are estimates in Table 8 in "Market Demand" section

NOTE: "Always" indicates that the consumer will always purchase an artificial tree.

PRODUCTION

Overview

The purpose of this section of the report is not to provide a manual on how to grow Christmas trees, but rather to examine, in a general way, the economic feasibility of growing in Alberta. The models below reflect this goal and the authors recommend that interested parties consult the literature on the biological aspects of growing Christmas trees (Hill 1989) as well as performing their own specific analysis of the feasibility of growing Christmas trees under the conditions which they will face.

The economic feasibility of growing and selling Christmas trees depends greatly on production costs. It is generally accepted that these costs will vary greatly between production strategies (growing protocols) and the quality of the growing environment available to various producers. In our analysis, we use production data from Saskatchewan (Saskatchewan Christmas Tree Growers' Association Cooperative, no date) and production costs that are known to apply to agricultural production in Alberta (Alberta agriculture 1991 a,b) to produce representative but theoretical production models.

The results of these models and the algorithms and constants used to produce these results are fully described in appendix D.

In general, we believe that: lodgepole, white pine, Scots pine, Douglas-fir, balsam fir and white spruce are all suited to growing conditions found throughout Alberta. Based on the economic models, the higher valued white and Scots pines are the preferred species. The other species could also be grown in a cost effective manner in Alberta, but only if the grower retailed his or her own product. Fortunately, according to retailer estimates of demand trends, the demand is increasing for more expensive species. Hence, both pine tree species, which are highly valued, are easily sold in this province.

Models

The following assumptions were made in order to develop the models presented:

For all models,

1. The length of time required to bring a tree to marketable size is 8 years;
2. One acre can support 1,000 trees at 6' X 6' spacing (allowing for access and development);
3. Scots pine is of a similar value to White pine and was chosen arbitrarily to represent a high value product. Further, the wholesale price for Scots pine can be used as a rough estimate for the retail price of the other lower valued species;
4. The prices used in the projections are at 75% of the estimated value of a 6 ft. tree to account for variability in size and quality and to allow for transportation costs and;
5. Mortality is 3% over an 8 year rotation (or a survival rate of 99.63% per year). Although mortality is closer to 3% /yr, it was assumed that the producer would replant to make up for the mortality.

Table 10

Specific Assumptions for Production Models

	Model Number							
Assumption	1	2	3	4	5	6	7	8
Regulated Plantation - one acre is planted each year for 8 years	X		X		X	X	X	
One Shot Plantation - eight acres are planted in year 1		X		X				X
The Grower is His/Her Own Retailer - Scots pine retail price is $27.00 for a 6-foot tree	X		X		X		X	X
The Grower Produces for the Wholesale Market - Scots pine wholesale price is $17.00 for a 6-foot tree		X		X		X		
Large Farm - produces only Christmas trees so land, labour and capital at 100% of estimated cost	X	X						
Small Farm - produces other crops as well so land, labour and capital at 75% of estimated cost			X	X				
Christmas Trees as Windbreak - on existing farm so land and capital at no cost (labour at 75%)					X	X		
Hobby Farm - where Christmas trees are not principle activity so land, labour and capital at zero cost							X	X

The specific assumptions which apply to each model are listed on the first page of each model (appendix D) and are also summarized in Table 10 (for ease of reference).

The basic model was constructed on a "Microsoft Works" spreadsheet and the process was developed as follows. Rows were created, labeled 1 through to 8, to signify the eight initial years of production. Then columns were labeled according to the pertinent activity, input requirements and output levels. The appropriate functions were assigned to each cell so as to coordinate the activities, input and output levels.

In essence, the appropriate number of acres were prepared, planted, weeded, sheared, coloured and harvested at the appropriate time within the ether environment of a computer. Costs of these activities and the associated inputs were tabulated as were the revenues from outputs.

The final three columns, labeled: Total Costs; Total Revenues and; Net Revenues, receive the dollar costs, gross revenues and net revenues, respectively, for each year and the bottom cell of each column was assigned a net present value function in order to convert the series of costs and revenues to current dollar figures.

Then each model's inputs were varied according to the assumptions listed in Table 10. Net revenues varied accordingly and are listed in Table 11 along with rate of return figures.

Results

Given the results of the eight models, in Table 11, there is potential for growing Scots pine as a wholesaler or a retailer and lodgepole pine as a retailer under any of the aforementioned sets of assumptions, except on a regulated plantation where the activity excludes other crop production and land, labour and capital rates are 100% of estimated costs. This is according to the assumption that the wholesale revenues from Scots pine are the same as the retail revenues from lodgepole pine. However, when the trees are grown on a larger scale nursery, on less valuable land, a frugal producer on such a regulated, exclusive plantation could possibly realize a profit.

Conclusions

An examination of the results of these production models reveals that producers, under the appropriate conditions, can wholesale Scots or white pine at $2.75 to $3.00 per foot which is within the present range of prices. Specialty firs such as balsam fir would seem to be potentially profitable products as well if the producer can realize some economies of scale and limit costs, as balsam fir is commonly sold at $3.50/ft. This is particularly true under the assumptions of models 7 and 8 (regulated and one-shot, own retailer hobby farms, respectively) as well as (to a lesser extent) under the assumptions of model 5 (a windbreak plantation producing for the retail market).

It should be noted again that these models are quite simple and further information on the requirements of each species and on the particular circumstances that would face each producer is required in order to create accurate business plans. In addition, sensitivity analysis, carried out by varying the interest rate and mortality rate used in the models, will provide a more accurate assessment of the range of potential outcomes that might be faced by producers engaged in such a long term project.

Also, these models do not account for other revenue sources. Well shaped, healthy conifers can be sold as landscaping material. Six foot tall Scots pine may return as much as $275 (wholesale) or $350 (retail). In addition, smaller trees may be sold as Christmas trees or as ornamentals, thus enabling producers to recoup costs over a shorter time period.

Table 11

Costs, Net Revenue and Rate of Return* for 8 Scots Pine Christmas Tree Production Models (1991 Dollars)

Model Number	Costs (NPV)	Net Present Revenue (NPV)	Rate of Return (% per year)
1	$75,824.23	- $3826.02	Loss
2	$80,278.95	$17,871.12	2.54
3	$58,430.56	$13,567.66	2.64
4	$61,822.41	$36,327.66	5.95
5	$26,140.12	$45,858.09	13.50
6	$26,140.12	$19,192.09	7.12
7	$ 6,249.54	$65,748.68	35.73
8	$ 6,452.80	$91,697.27	40.53

* Rate of Return $= 1 - \left(\$\sqrt{\frac{(costs + net\ revenue)}{costs}} \right)$

It is interesting to note the consistently higher returns to one-shot tree plantations. The reasons for the higher returns are:

1) The shorter time until a large revenue is realized as well as,
2) a shorter period over which expenses must be carried.

However, assuming the producer does not want to retain the carrying costs and leave the plantation to grow further, such a "one-shot" plantation would likely face "one-shot" marketing problems (not inherent to the annual marketing activities associated with regulated production).

There is also the potential for farmers to grow seedlings as a cash crop to supply the Christmas tree industry and the forest industry. Horizontal integration (ie: providing moving and replanting services) may add to the profitability as well.

While the vertical integration between producers and wholesalers (or brokers) did not enable the authors to provide precise market margins between those entities, the results of the modelling exercises contained in this report do reveal that more expensive species of Christmas trees can be produced at a cost that will allow producers to wholesale such trees at a competitive price. Under the assumptions in models 7 and 8, and to a lesser extent

under the assumptions in model 5, the same can be said for some of the less expensive species. The creation of an Alberta Christmas Tree Growers Cooperative would facilitate the ability for growers to produce their trees at an even lower cost.

Because of the vertical integration that exists between producers and wholesalers and, even in some instances, between producers and retailers, the calculated mark-up or market margins in Table 42 (Appendix C) must be interpreted carefully. The market margins for the nursery grown Christmas trees can be interpreted as the market margins between producers or wholesalers and the retailers. Although the wide range, from 191% for Noble fir to 261% for grand fir, indicates that brokers may be capturing some of the returns by supplying trees to the retailers. The aggregation of the data required to provide general prices and quantities, as well as the reticence on the part of retailers to provide information about their suppliers, prevents us from determining the size of the broker to retailer margins. However, it is likely that the lower margins (near 190% to 210%) indicate the presence of brokers, while those in the range of 220% to 260% indicate that the producers or wholesalers have managed to provide trees for the retailers without the intervention of brokers.

On the other hand, the existence of very high mark-ups in the same table, for Douglas fir and wild spruce in particular, would seem to indicate that these non-nursery grown trees have made their way on to the retailers' lots without the aid of either wholesalers or brokers. Therefore, these large market margins, in the range of 350% to 550% for Douglas fir and wild spruce, respectively, are in effect producer to retailer market margins.

For the returns to the potential Albertan producers to be maximized, the producer or wholesaler to retailer market margins should be captured. The creation of an Alberta Christmas Tree Cooperative, between growers and retailers, would be beneficial to the industry, thus enabling the cooperative to capture the market margins. This sort of vertical integration would also aid the entry of Alberta-grown trees into the local market.

While the simple models, presented here, show that an Albertan Christmas tree producing industry could be viable and would be beneficial to the economy of the province, much work needs to be done before an efficient industry can be described or established. This is particularly true in regards to the biophysical issues. Trial and error process is an expensive way to learn how to grow trees under the specific climactic and edaphic conditions that Albertan producers will face. Much information is available on how to successfully grow trees in Alberta, but more needs to be done if growing protocols are to be optimal. Also, mechanisms need to be in place to make the applicable knowledge available to nursery growers.

In addition, agricultural practices and equipment need to be applied, in conjunction with the improved knowledge of tree growth, to the production of Christmas trees. Joint collaboration, between foresters and agricultural specialists, is therefore required as well. In turn, the forest industry will likely benefit from these knowledge gains.

Objectives six and seven have been dealt with and met in the undertaking of this portion of the study. Christmas tree farming in Alberta has been examined in a preliminary manner and found viable, under certain circumstances and conditions.

There is great potential for augmenting farm income by growing Christmas trees as a secondary crop, particularly as windbreak. In addition, the hobby farmer who wishes to wholesale, retail or offer "choose and cut" Christmas trees can realize a very tidy return on his or her investment, especially if the operation is located near to a major centre.

Given that over 2.6 million dollars are estimated to have left the province for purchases of Christmas trees and given the soft market for other agricultural products, creation of a Christmas tree industry would in turn be beneficial to the province. A present market demand for approximately 300,000 trees and a potential market demand for over 500,000 trees served by, at present, approximately 32 suppliers indicates a market that is open to the addition of more Albertan Christmas tree producers.

It is hoped that this report will encourage potential Alberta producers by providing a close estimation of the Christmas tree market in 1990 and an indication of market trends, based on retailers' opinions, as well as the feasibility of growing Christmas trees in Alberta.

APPENDIX A - HOUSEHOLD CONSUMERS

Table A-1

Household Surveys

Number of surveys mailed out	5,100
Number undelivered	
Reasons:	
Moved	90
Unknown Reasons	28
Deceased	3
Unclaimed	2
Address Incomplete	2
Total Number Delivered	4,974
Number Returned/Completed	1,324
Percent Response Rate	26.62%

Table A-2

Frequency of Response Rates, Geographic Breakdown

Location	Number of Surveys Mailed[1]	Completed & Returned	% Response	Number of Households*
Lethbridge	200	16	8.00	21,990
Calgary	2,300	664	28.87	237,510
Red Deer	200	42	21.00	19,925
Edmonton	2,100	489	23.29	218,025
Sherwood Park	100	34	34.00	12,085
Grande Prairie	100	18	18.00	9,715
Ft. McMurray	100	32	32.00	10,725
Unmarked	--	29	--	--
TOTAL	5,100		Mean 23.60 St. D. 9.00	529,965

* Compusearch figures.

[1] Based on ratio of number of households in district compared to the total number of households in the total sample area.

Table A-3

Frequency of Housing Type

Housing Type	Frequency	Percent
No Answer/Not Applicable	13	1.0
Low Rise Apartment	109	8.2
High Rise Apartment	60	4.5
Mobile Home	32	2.4
Double House	48	3.6
Row House	106	8.0
Detached House	956	72.2
TOTAL	1,324	100.0

Table A-4

Frequency of Primary Education in Years

Years	Frequency	Valid Percent
No Response	384	--
5	1	.10
6	2	.20
7	2	.20
8	16	1.20
9	26	2.00
10	67	5.10
11	78	5.90
12	661	49.90
13	87	6.60
TOTAL	1,324	100.00

Mean = 11.68 Standard Deviation = 1.03

Table A-5

Frequency of Post Secondary Education in Years

Years	Frequency	Percent
0	458	34.6
1	124	9.4
2	171	12.9
3	104	7.9
4	205	15.5
5	64	4.8
6	87	6.2
7	45	3.4
8	22	1.7
9	9	.7
10	9	.7
11	7	.5
12	24	1.8
TOTAL	1,324	100.0

Mean = 2.596 Standard Deviation = 2.776

Table A-6

Frequencies of Households With Number of Members Less Than 6 Years Old

Number of Members	Frequency	Percent
0	1,074	81.1
1	150	11.3
2	82	6.2
3	18	1.4
TOTAL	1,324	100.0

Table A-7

Frequencies of Households With Number of Members Less Than 12 Years Old

Number of Members	Frequency	Percent
0	931	70.3
1	185	14.0
2	149	11.3
3	50	3.8
4	9	.7
TOTAL	1,324	100.0

Table A-8

Frequencies of Households With Number of Members Less Than 18 Years Old

Number of Members	Frequency	Percent
0	782	59.1
1	225	17.0
2	207	15.6
3	89	6.7
4	16	1.2
5	5	.4
TOTAL	1,324	100.0

Table A-9

Frequencies of Households With Number of Members Less Than 30 Years Old

Number of Members	Frequency	Percent
0	491	37.1
1	271	20.5
2	342	25.8
3	155	11.7
4	44	3.3
5	18	1.4
6	3	.2
TOTAL	1,324	100.0

Table A-10
Frequencies of Households By Size

Number of Family Members	Frequency	Percent
0	116	8.8
1	340	25.7
2	325	24.5
3	209	15.8
4	220	16.6
5	90	6.8
6	14	1.1
7	7	.5
8	3	.2
TOTAL	1,324	100.0

Mean = 2.344 Standard Deviation = 1.519

Table A-11

Frequencies of Income Categories

Income Category	Frequency	Percent
No Answer	57	4.3
4,999 or Less	9	.7
5,000 to 9,999	27	2.0
10,000 to 14,999	34	2.6
15,000 to 19,999	38	2.9
20,000 to 24,999	56	4.2
25,000 to 29,999	77	5.8
30,000 to 39,999	181	13.7
40,000 to 49,999	195	14.7
50,000 to 69,999	281	21.2
70,000 to 99,999	228	17.2
100,000 to 199,999	124	9.4
200,000 and Over	17	1.3
TOTAL	1,324	100.0

Table A-12
Frequencies of Methods of Celebrating

Method of Celebrating	Frequency	Percent
Having a Christmas Tree	1,120	84.6
Having Flowers Instead of Trees	99	7.5
Having Stockings	806	60.9
Having a Special Meal or Baking	1,166	88.1
Sending Cards	1,107	83.6
Giving Gifts	1,251	94.5
Vacationing in the Sun	52	3.9
Skiing, Tobogganing or Skating	369	27.9
Caroling	151	11.4
Did Not Celebrate in Any of These Ways	20	1.5
Other Methods (Based on Comments)		
Socializing		24.0
Church Activities		19.0
Drinking		3.0
Visiting Family		41.0
Long Distance Telephoning		1.0
Travelling in Canada		8.0
Christmas Concert		1.0
Volunteering		1.0

Percentages do not sum to 100 due to multiple responses and smaller "comment" sample size.

Table A-13

Frequencies of Beliefs/Comments About Natural Tree Attributes Compared to Those of Artificial Trees (Safety and Environmental Concerns)

Belief/Comment	Frequency	Percent
Natural Tree is Safer*	68	5.1
Natural Tree is Equally Safe*	343	25.9
Natural Tree is Less Safe*	551	41.6
Natural Tree is More Environmentally Friendly*	345	26.1
Natural Tree is Less Environmentally Friendly*	451	34.1
Other Unstructured Comments:		
Natural Tree is Equally Environmentally Friendly/Unfriendly		6.45
Cutting Natural Trees is Bad		43.54
Natural Trees are Better		4.84
Artificial Trees are Bad		5.91
Artificial Trees are Better		1.07
Will Switch to Artificial		1.07
Cannot Determine Environmental Impact		8.06
Natural Trees are Not Biodegradable		.54
Nursery Grown Trees are O.K.		9.14
Artificial Trees are Re-Usable		8.06
Too Many Natural Trees are Wasted		3.76
Have Norfolk Pine Tree		.54
Cannot Decide Which is Safest		.54
Thinning Natural Forests is a Good Practice		1.61
Nursery Trees are Environmentally Unfriendly		.54

Percentages do not sum to 100 due to multiple responses and smaller "comment" sample size.

* Structured response.

Table A-14
Frequencies of Households Displaying a Wreath (or Wreaths)

Display	Frequency	Percent
Yes	879	66.4
No	427	32.3
No Answer	18	1.4
TOTAL	1,324	100.0

Table A-15
Frequencies of Wreath (or Wreaths)

Type	Frequency	Valid Percent
Artificial	572	65.59
Natural	174	19.95
Both	126	1.45
No Answer	7	--
TOTAL	879	100.00

Table A-16
Mean Price Per Wreath

Mean = 12.08 Standard Deviation = 18.10

Table A-17

Frequencies of Reasons Why a Tree Was Not Displayed

Reason	Frequency	Percent
Too Much Trouble	57	26.68
Too Expensive	35	15.15
Illness, Age, Death in Family	16	6.93
Home Too Small	56	24.24
Tenant Restrictions	7	3.03
No Children in Household	67	29.00
Religious Reasons	15	6.49
Do Not Celebrate Christmas	13	5.63
Away for Christmas	108	46.75
No Adequate Stand Available	2	.87
Too Far To Go To Get Tree	2	.87
No Transportation Available	5	2.16
Retail Hours Inconvenient	2	.87
Safety Reasons/Concerns	10	4.33
No Live Potted Tree Available	8	3.46
Environmental Reasons	29	12.55
Do Not Like Christmas Trees	2	.87
Messy, Needles Fall Off	1	.43
Worked Over Holiday Period	1	.43

Totals do not sum to 231 or 100% due to multiple responses.

Table A-18

Frequencies of Years Since a Christmas Tree Was Displayed, By Respondents Who Indicated No Tree Displayed in 1990

Years	Frequency	Valid Percent
First Christmas Together	10	4.63
1 Year	65	30.09
2 Years	25	11.57
3 or More Years	72	33.33
Never Had a Tree	44	20.37
No Answer	15	--
TOTAL	231	100.00

Table A-19

Frequencies of Households That Did Not Display a Tree in 1990 That Indicated That Displaying a Tree is Planned for the Future

Tree in Future	Frequency	Valid Percent
Yes	117	53.92
No	100	46.08
No Answer	14	--
TOTAL	231	100.00

Table A-20

Frequencies of Type of Tree Indicated, By Households That Did Not Display a Tree in 1990, For Display in Future

Type	Frequency	Valid Percent
Natural	71	66.98
Artificial	35	33.02
No Answer	11	--
TOTAL	117	100.00

Table A-21

Frequencies of Responses, By Households That Did Not Display Trees in 1990 But Indicated That They Were Planning to Display a Natural Tree in Future, to the Question "Would You Give Preference to a Good Quality, Alberta Grown Tree?"

Preference	Frequency	Valid Percent
Yes	65	81.25
No	4	5.00
Do Not Know	11	13.75
No Answer	37	--
TOTAL	117	100.00

Table A-22

Frequencies of Responses, By Households That Did Not Display Trees in 1990 But Indicated That They Were Planning to Display a Natural Tree in Future, to the Question Willing "A Good Quality, Alberta Grown, Live Potted Tree?"

Type	Frequency	Valid Percent
Yes	43	52.44
No	12	14.63
Do Not Know	27	32.93
No Answer	35	--
TOTAL	117	100.00

Table A-23

Frequencies of Willingness-to-Accept-Compensation to Change Habits From Not Displaying to Displaying a Natural Tree, as a Percentage of Tree Price

	Compensation				
Change Habit	5%	10%	15%	20%	Row Total
Yes	20	18	19	19	76 (32.9)
No	17	22	19	19	77 (33.3)
No Answer	13	28	15	22	78 (33.8)
TOTAL					231

Table A-24
Frequencies of Type of Tree(s) Displayed by Households

Type	Frequency	Percent
Natural	551	50.41
Both Natural and Artificial	41	3.75
Artificial	501	45.84
TOTAL	1,093	100.00

Table A-25
Frequencies of Reasons Why an Artificial Tree Was Displayed

Reason	Frequency	Percent
Personal Preference	551	50.41
No Mess	386	78.6
Safety Considerations	309	62.9
Ease of Setting Up	308	62.7
Cost	285	58.0
No Need to Shop Every Year	323	65.8
Size Considerations	135	27.5
No Disposal Problems	358	72.9
Environmental Reasons	282	57.4
Away for Holidays	49	10.0
No Adequate Natural Tree Stands Available	8	1.6
Too Far to Go to Get Natural Tree	10	2.0
No Transportation to Get Natural Tree	20	4.1
Inconvenient Hours at Natural Tree Retailer	1	.2
No Live Potted Tree Available	8	1.6
Other Reasons	8	1.6

Totals do not sum to 1093 or 100% due to multiple responses.

Table A-26

Frequencies of Years That Households Have Displayed Artificial Trees

Years	Frequency	Percent
0	3	.6
1	32	6.4
2	28	5.6
3	41	8.2
4	17	3.4
5	45	9.0
6	17	3.4
7	20	4.0
8	22	4.4
9	2	.4
10	83	16.6
11	4	.8
12	20	4.0
13	9	1.8
14	6	1.2
15	55	11.0
16	4	.8
17	2	.4
18	6	1.2
20	47	9.4
21	3	.6
22	5	1.0
23	3	.6
24	1	.2
25	12	2.4
26	2	.4
27	3	.6
28	1	.2
30	8	1.6
TOTAL	501	100.0

Mean = 10.365 Standard Deviation = 7.107

Table A-27

Frequencies of Years That Households Have Had the Same Artificial Tree

Years	Frequency	Percent
0	1	.2
1	45	9.0
2	42	8.4
3	55	11.0
4	30	6.0
5	70	14.0
6	25	5.0
7	22	4.4
8	21	4.2
9	2	.4
10	71	14.2
11	4	.8
12	14	2.8
13	8	1.6
14	6	1.2
15	36	7.2
16	1	.2
17	2	.4
18	1	.2
20	26	5.2
21	2	.4
22	2	.2
23	3	.6
24	1	.2
25	7	1.4
26	1	.2
27	1	.2
30	2	.4
TOTAL	501	100.0

Mean = 7.902 Standard Deviation = 6.085

Table A-28

Frequencies of Households That Displayed an Artificial Tree, That Switched Preference From Natural to Artificial

Switched	Frequency	Valid Percent
Yes	359	72.53
No	136	27.47
No Answer	6	--
TOTAL	501	100.00

Table A-29

Frequencies of Reasons Why Households Switched Preferences From Natural to Artificial Trees

Reason	Frequency	Percent
Personal Preference	115	33.4
No Mess	256	74.4
Safety Considerations	219	63.7
Ease of Setting Up	201	58.4
No Need to Shop Each Year	227	66.0
Size Considerations	97	28.2
No Disposal Problems	231	67.2
Environmental Reasons	199	57.8
Away for Holidays	24	7.0
No Adequate Natural Tree Stands Available	6	1.7
Too Far to Go to Get Natural Tree	7	2.0
No Transportation Available	8	2.3
Inconvenient Hours at Natural Tree Retailer	1	.3
No Live Potted Trees Available	10	2.9
Other Reasons	8	2.3

Totals do not sum to 501 or 100% due to multiple responses.

Table A-30

Frequencies of Problems Experienced with Artificial Trees

Problems	Frequency	Percent
None	493	98.4
Smoke/Fire	2	.4
Pets Knocked Tree Over	2	.4
Lights Melted Plastic	2	.4
Children Knocked Tree Over	2	.4
TOTAL	501	100.0

Table A-31

Frequencies of Household Members Who Obtained Natural Christmas Tree

Family Member	Frequency	Percent	Male*	Female*
Respondent	226	38.18	120 (65.57)	63 (34.43)
Respondent's Spouse	52	8.78	25 (65.69)	13 (34.21)
Respondent's Parent	10	1.69	--	--
Two or More Family Members	273	46.11	--	--
Other Relative	12	2.03	--	--
Friend	19	3.21	--	--
TOTAL	592	100.00	--	--

* Mean Male Purchasers = 65.68 Standard Deviation = .156

* Mean Female Purchasers = 34.32 Standard Deviation = .156

Percentages in Brackets.

Table A-32

Frequencies of Constancy of Christmas Tree Purchaser

Constancy	Frequency	Valid Percent
Same Person(s) Each Year	425	73.40
Changes Each Year	143	24.70
Do Not Know	11	1.90
No Answer	13	--
TOTAL	592	100.00

Table A-33

Frequencies of Type of Retail Outlet or Location Where Natural Tree was Obtained

Type/Location	Frequency	Percent
Commercial Seasonal Lot	276	45.77
Charitable Organization's Lot	127	21.06
Garden Nursery	35	5.80
Woodlot	11	1.82
Retail Store	66	10.95
Cut in Woods	68	11.28
Received as a Gift	11	1.82
Pre-Ordered (Before Dec. 1, 1990)	9	1.49
TOTAL	603	100.00

Note: 11 responses are erroneous as there were only 592 natural tree households.

Table A-34

Frequencies of Types of Charitable Organization

Type	Frequency	Valid Percent
Service Club	40	39.60
Church	14	13.86
School	3	2.97
Other	6	5.94
Forest Society (U of A)	2	1.98
Boy Scouts	34	33.66
Kiwanis	2	1.98
Not Indicated	26	--
TOTAL	127	100.00

Table A-35

Frequencies of Garden/Nurseries Where Trees Obtained

Outlet	Frequency	Percent
Jackson's	4	11.4
Sunnyside	1	2.9
Golden Acres	7	20.0
Others	23	65.7
TOTAL	35	100.00

Table A-36

Frequencies of Retail Store Where Trees Were Obtained

Outlet	Frequency	Percent
Superstore	10	15.2
Save-On-Foods	9	13.6
Woodwards	1	1.5
IKEA	19	28.8
Calgary Co-op.*	12	18.2
Food-For-Less	1	1.5
Unknown/Other	14	21.2
TOTAL	66	100.0

* Considered as a seasonal retail outlet throughout rest of the report.

Table A-37

Frequencies of Trees Cut on Private and Public Lands

Type	Frequency	Valid Percent
Private	31	47.69
Public	34	52.31
Unknown	3	--
TOTAL	68	100.00

Table A-38

Frequencies of Kilometers Travelled in Order to Obtain Tree From Private or Public Lands

Kilometers	Frequency	Percent
0	12	17.6
2	3	4.4
4	1	1.5
5	1	1.5
7	1	1.5
10	3	4.4
15	1	1.5
20	2	2.9
25	1	1.5
27	1	1.5
42	1	1.5
50	7	10.3
60	4	5.9
70	3	4.4
72	1	1.5
80	4	5.9
90	1	1.5
100	5	7.4
110	2	2.9
125	1	1.5
150	5	7.4
160	2	2.9
192	1	1.5
200	2	2.9
300	2	2.9
800	1	1.5
TOTAL	68	100.0

Mean = 79.265 Standard Deviation = 112.845

Table A-39

Frequencies of Reasons Why a Natural Tree Was Displayed

Reason	Frequency	Percent
Tradition	446	77.0
Just Want Real Tree	447	77.2
Fragrance	411	71.0
Biodegradable	208	35.9
Like Live Potted Year Round	12	2.1
Dislike Artificial Trees	306	52.8
Like to Cut Own Tree	1	.017
Natural Trees Good For Economy	1	.017
Artificial Trees Are Bad	1	.017

Totals do not sum to 592 or 100% due to multiple responses.

Table A-40

Frequencies of Satisfaction With Service Received From Tree Outlets Indicated

Satisfied	Frequency	Valid Percent
Yes	481	95.06
No	25	4.94
No Answer	86	--
TOTAL	592	100.00

Table A-41

Frequencies of Reasons for Dissatisfaction With Service Received From Retailer

Reason	Frequency	Valid Percent
No Price Seen	1	11.11
Product Was Dry or Dead	6	66.67
No Service	2	22.22
No Reason Given	16	--
TOTAL	25	100.00

Table A-42

Frequencies of Number of Outlets Searched For Tree, By Household

Number of Outlets	Frequency	Valid Percent
1	364	69.87
2 or 3	144	27.64
3 or More	16	3.07
No Answer	71	--
TOTAL	592	100.00

Table A-43

Mean Price and Mean Height (ft.) of First Tree Obtained, By Species

Species	Price	Standard Deviation	Height	Standard Deviation
B.C. Fir	16.78	8.09	6.69	1.56
Scots pine	32.37	12.48	6.20	1.12
Douglas fir	20.44	9.27	6.89	1.42
Wild spruce	10.80	9.10	6.44	1.63
Blue spruce	28.65	16.55	7.10	1.89
White pine	23.56	17.77	6.81	1.85
Lodgepole pine	11.20	6.51	6.90	.99
Sheared fir	35.00	5.97	6.13	.64
Grand fir	49.33	9.73	7.67	2.73
Noble fir	48.33	15.28	6.00	.00
Balsam fir	13.60	11.24	7.00	1.41
Norfolk pine	30.00	42.43	5.00	1.41
Cedar	47.50	24.75	9.00	4.24
White spruce	25.00	19.15	7.50	3.00
Scots fir*	16.00	.00	7.00	.00
Green spruce*	17.00	17.18	8.00	2.45
Jack pine	12.44	8.03	6.67	1.22
Unknown	18.53	16.33	5.53	2.25
TOTAL	20.15	15.25	6.35	1.87

* Non-Existent Species (Names Coined by Consumers).

Table A-44

Mean Price and Mean Height (ft.) of Second Tree Obtained, By Species

Species	Price	Standard Deviation	Height	Standard Deviation
B.C. Fir	6.71	3.73	4.00	1.63
Douglas fir	20.00	.00	7.00	.00
Wild spruce	12.75	10.50	5.00	2.16
Blue spruce	20.00	28.28	7.50	.71
White pine	9.20	9.68	4.60	1.95
Norfolk pine	60.00	.00	5.00	.00
Green spruce*	8.00	.00	7.00	.00
Unknown	.17	2.25	.07	.63
TOTAL	.62	4.22	.24	1.16

* Non-Existent Species (Name Coined by Consumers).

Table A-45

Mean Price and Mean Height (ft.) of Third Tree Obtained, By Species

Species	Price	Standard Deviation	Height	Standard Deviation
B.C. Fir	10.00	.00	6.00	.25
Scots pine	15.00	.00	8.00	.00
White pine	18.00	9.90	6.00	.00
Green spruce*	7.00	.00	7.00	.00
TOTAL	.11	1.37	.07	.66

* Non-Existent Species (Name Coined by Consumers).

Table A-46

Mean Price and Mean Height (ft.) of Fourth Tree Obtained, By Species

Species	Price	Standard Deviation	Height	Standard Deviation
B.C. Fir	11.00	.00	6.00	.25
White pine	15.00	.00	6.00	.00
TOTAL	.04	.16	.03	.43

Table A-47

Frequencies of Numbers of Natural Trees Displayed, By Species

Species	1st Tree	2nd Tree	3rd Tree	4th Tree
B.C. Fir	95	7	1	1
Scots pine	70	1		
Douglas fir	27	1		
Wild spruce	106	4		
Blue spruce	31	2		
White pine	52	5	2	1
Lodgepole pine	10			
Sheared fir	8			
Grand fir	6			
Noble fir	3			
Balsam fir	5			
Norfolk pine	2	1		
Cedar	2			
White spruce	4			
Scots fir*	1			
Green spruce*	5	1	1	
Jack pine	9			
Unknown	156			
TOTAL	592	22	4	2

* Non-Existent Species (Names Coined by Consumers).

Table A-48

Frequencies of Date/Day When Natural Tree(s) Obtained

Date (December)	Day	Frequency	Percent
0	Friday	40	6.55
1	SATURDAY	12	1.96
2	SUNDAY		
3	Monday	7	1.15
4	Tuesday	5	.82
5	Wednesday	16	2.62
6	Thursday	8	1.31
7	Friday	14	2.29
8	SATURDAY	25	4.09
9	SUNDAY	10	1.14
10	Monday	61	9.98
11	Tuesday	6	.98
12	Wednesday	31	5.07
13	Thursday	4	.65
14	Friday	20	3.27
15	SATURDAY	141	23.08
16	SUNDAY	26	4.26
17	Monday	23	3.76
18	Tuesday	45	7.36
19	Wednesday	13	2.13
20	Thursday	52	8.51
21	Friday	17	2.78
22	SATURDAY	18	2.95
23	SUNDAY	4	.65
24	Monday	6	.98
TOTAL		611	100.00

Table A-49

Ranking of Characteristics Looked for by Consumers When Obtaining a Natural Tree

Rank	Characteristic	Score
		1=9 · Frequency
		2=8 · Frequency ...
1	Shape	2941
2	Fullness	2753
3	Height	2520
4	Freshness	2283
5	Straight Trunk	1794
6	Price	1706
7	Species	1399
8	Colour	1057
9	Fragrance	946

Table A-50

Frequencies of Satisfaction With Natural Tree

Satisfied	Frequency	Valid Percent
Yes	534	91.28
No	51	8.72
No Answer	7	--
TOTAL	592	100.00

Table A-51

Frequencies of Reasons For Dissatisfaction With Natural Tree Obtained

Reasons	Frequency	Percent
Price	4	8.0
Looked Better on Lot	13	26.0
Difficult to Set Up	6	12.0
No Adequate Stand Available	2	4.0
Needles Fell Off Early	38	76.0
Clean Up Was Troublesome	18	36.0
No Tree Bag Provided	14	28.0
Bent Truck	3	6.0
Truck Too Thick	1	2.0
Lacked Fragrance	1	2.0

Total percentage does not sum to 100 due to multiple responses.

Table A-52

Frequencies of Beliefs/Opinions About Where Purchased or Obtained Tree Originated

Place	Frequency	Valid Percent
Alberta	168	43.52
Saskatchewan	1	.26
B.C.	159	41.19
U.S.A.	54	13.99
Other	4	1.04
Unknown	210	--
TOTAL	596	100.00

Table A-53

Frequencies of Respondents Who Indicated That They Watered Their Natural Tree Regularly

Watered Regularly	Frequency	Valid Percent
Yes	559	94.43
No	24	5.57
No Answer	9	--
TOTAL	592	100.00

Table A-54

Frequencies of Respondents Who Thought That Their Natural Tree Had Been Sprayed With a Fire Retardant Substance

Fire Treatment	Frequency	Valid Percent
Yes	30	5.24
No	301	52.62
Do Not Know	241	42.13
No Answer	20	--
TOTAL	592	100.00

Table A-55

Frequencies of Disposal Methods for Removal of Natural Trees

Method	Frequency	Valid Percent
Regular Garbage Pick-up	142	24.83
Special Tree Pick-up	334	58.39
Taken to Collection Site	37	6.47
Bonfire	15	2.62
Firewood	31	5.42
Live Tree Kept	3	.52
Returned to Outlet	*10	1.75
No Answer	20	--
TOTAL	592	100.00

Table A-56

Frequencies of Trees Returned to Outlet for Refund

Place	Frequency	Valid Percent
Yes	*10	100.00
No	0	--
TOTAL	10	100.00

Table A-57

Frequencies of Response to Question: "Would You be in Favour of a Christmas Tree Disposal/Pick-up Service?"

Response	Frequency	Valid Percent
Yes	548	95.30
No	27	4.70
No Answer	17	--
TOTAL	592	100.00

Table A-58

Frequencies of Loyalty to Natural Christmas Trees, as Indicated

Loyalty	Frequency	Valid Percent
Always Have a Natural Tree	10	100.00
Tried Artificial But Returned to Natural	119	20.66
Have Both Kinds	45	7.81
Just Changed to Natural	19	3.30
No Answer	16	--
TOTAL	592	100.00

Table A-59

Frequencies of Opinions About Whether Young Children Would Enjoy a Small Natural Christmas Tree of Their Own

Children Would Enjoy One	Frequency	Valid Percent
Yes	301	52.26
No	114	19.79
Do Not Know	161	27.95
No Answer	16	--
TOTAL	592	100.00

Table A-60

Frequencies of Natural Tree Purchasers Who Indicated That They Would Purchase an Alberta Grown Tree if it Was Offered

Response	Frequency	Valid Percent
Yes	459	81.24
No	26	4.60
Already Buy Alberta	80	14.16
No Answer	27	--
TOTAL	592	100.00

Table A-61

Frequencies of Willingness-To-Pay For a Good Quality Alberta Grown Tree as a Percentage of Price

Willing to Pay	5%	10%	15%	20%	Row Total
Yes	88	75	59	66	
No	40	52	74	97	
No Answer	6	11	12	12	41
TOTAL					592

Table A-62

Frequencies of Respondents Who Displayed a Natural Tree Who Would Be Willing to Purchase an Alberta Grown Live Potted Christmas Tree

Purchase	Frequency	Valid Percent
Yes	235	40.94
No	149	25.96
Do Not Know	190	33.10
No Answer	18	--
TOTAL	592	100.00

Table A-63

Frequencies of Problems Experienced With Natural Trees

Problems	Frequency	Percent
None	575	97.13
Smoke/Fire	2	.34
Tree Fell Over	10	1.67
Rash From Needles	1	.17
Stepped on Needles	2	.34
Other Injury	2	.34
TOTAL	592	100.00

APPENDIX B - COMMERCIAL CONSUMERS

Table B-1
Survey Information

Number of surveys mailed out	488
Number of surveys undelivered	--
Number of surveys returns & completed	183
Percent Response Rate	37.5%

Table B-2
Geographic Breakdown

Location	Number of Surveys Sent	Number Completed and Returned	Number of Businesses
Lethbridge	24	6	1,791
Calgary	160	41	21,992
Red Deer	32	11	1,911
Edmonton	240	67	18,740
Sherwood Park	8	3	909
Grande Prairie	16	5	1,227
Fort McMurray	8	6	644
Unmarked	--	44	--
TOTAL	488	183	47,214

Table B-3

Frequencies of Christmas Display Habits

Tree Displayed	Frequency	Percent
Natural	21	11.48
Artificial	92	50.27
None	70	38.25
TOTAL	183	100.00

Table B-4

Frequencies of Types of Commercial/Service Industries

Type	Frequency	Percent
INSTITUTIONAL		
Bank	3	1.64
School	10	5.46
Church	4	2.19
Hospital	--	--
Nursing Home	--	--
Charitable Organization	2	1.09
Community League	1	.55
Human Services	1	.55
Clinic	6	3.28
Government Agency	3	1.64
Arts Organization	1	.55
Professional Organization	1	.55
Insurance Co.	1	.55
Media	1	.55
Unknown/Other	1	.55
COMMERCIAL		
Retail	40	21.86
Industry	14	7.65
Manufacturing	12	6.56
Services	82	44.80
TOTAL	183	100.00

Table B-5

Frequencies of Locations of Commercial Survey Respondents

Location	Frequency	Valid Percent
Mall	13	13.98
Plaza	17	18.28
Apartment Building	2	2.15
School	1	1.08
Office Building	31	33.33
Warehouse	14	15.05
Detached Building	9	9.68
Hall	1	1.08
Street Front	1	1.08
Home Office	4	4.30
Other	90	--
TOTAL	183	100.00

Table B-6

Frequencies of Reasons Why Trees Were Not Displayed

Reasons	Frequency	Percent
Too Much Trouble	24	37.5
Fire Regulations	4	6.3
City Bylaw	--	--
Building Too Small	27	42.2
Insurance Regulations	--	--
No Adequate Stand Available	2	3.1
Other	18	21.8

Percentages do not sum to 100 due to multiple responses.

Table B-7
Past Habits Re: Displaying Christmas Trees

Display Habit	Frequency	Natural	Artificial	Both
Never Display Tree	42	--	--	--
Once Displayed Tree	7	60.00%	40.00%	--
Sometimes Display Tree	15	16.67%	58.33%	25.00%
Often Display Tree	4	33.33%	66.66%	--
Had Always Displayed Tree	10	25.00%	75.00%	--
TOTAL	78	--	--	--

Note: 8 responses are erroneous, as only 70 respondents indicated that they did not display a tree.

Table B-8
Frequencies of Years Since a Christmas Tree Was Displayed, By Establishments That Did Not Display a Tree in 1990

Years	Frequency	Valid Percent
1	10	32.26
2	6	19.35
3	5	16.13
4	3	9.68
5	1	3.23
6	1	3.23
9	1	3.23
10	3	9.68
15	1	3.23
No Answer	39	--
TOTAL	70	100.00

Mean = 3.68 Standard Deviation = 3.53

Table B-9

Frequencies of Future Tree Display Plans

Display Tree in Future	Frequency	Valid Percent
Yes	23	35.94
No	41	64.06
No Answer	6	--
TOTAL	70	100.00

Table B-10

Frequencies of Type of Tree Displayed

Type	Frequency	Percent
Artificial	92	81.42
Natural	12	10.62
Both	9	7.96
TOTAL	113	100.00

Table B-11

Frequencies of Years That an Artificial Tree Has Been Used

Years	Frequency	Valid Percent
1	2	2.72
2	2	2.72
3	11	12.50
4	6	6.81
5	11	12.50
6	2	2.72
7	4	4.55
8	6	6.81
9	4	4.55
10	20	22.73
11	2	2.72
12	1	1.14
15	5	5.68
17	1	1.14
20	8	9.09
25	3	3.41
No Answer	4	--
TOTAL	92	100.00

Table B-12

Frequencies of Establishments That Have Switched From Natural to Artificial

Switched	Frequency	Valid Percent
Yes	28	34.15
No	54	65.85
No Answer	10	--
TOTAL	92	100.00

Table B-13

Frequencies of Reasons Why Establishments Switched From Natural to Artificial

Reasons	Frequency	Percent
Natural Tree Too Troublesome	18	64.29
Fire Regulations	3	10.71
City Bylaw	1	3.57
Natural Tree Set Up is Difficult	5	17.86
Insurance Regulations	1	3.57
Other Reasons	5	17.86

Note: Responses do not sum to 28 or 100% due to multiple responses.

Table B-14

Frequencies of Establishments that Would Switch to a Natural Tree if a Good Quality, Alberta Grown Christmas Tree Was Available

Reasons	Frequency	Percent
Yes	12	12.90
No	53	56.99
Do Not Know	28	30.11
TOTAL	93	100.00

Note: 1 response is erroneous, as only 92 respondents indicated that they displayed an artificial tree.

Table B-15

Frequencies of Purchasers of Natural Trees

Person	Frequency	Percent
Boss	7	33.33
Manager	4	19.05
Secretary	2	9.52
Clerk	6	28.57
Stock Person	1	4.76
Other	1	4.76
TOTAL	21	100.00

Table B-16

Frequencies of Trees That Were Thought to Have Been Sprayed With a Fire Retardant Substance

Fire Treatment	Frequency	Percent
Yes	1	4.76
No	10	47.62
Do Not Know	10	47.62
TOTAL	21	100.00

Table B-17

Frequencies of Willingness-To-Pay, As a Percentage of Price, For a Good Quality Alberta Grown Tree

Willing to Pay	5%	10%	15%	20%	Row Total
Yes	6	1	4	2	13
No	1	2	2	1	6
No Answer	1	0	0	1	2

Table B-18

Frequencies of Dates Natural Tree(s) Were Purchased

Date (December)	Day	Frequency	Percent
0	Friday	9	42.85
1	SATURDAY	1	4.76
2	SUNDAY	0	--
3	Monday	0	--
4	Tuesday	0	--
5	Wednesday	1	4.76
6	Thursday	0	--
7	Friday	0	--
8	SATURDAY	0	--
9	SUNDAY	0	--
10	Monday	2	9.52
11	Tuesday	0	--
12	Wednesday	0	--
13	Thursday	0	--
14	Friday	0	--
15	SATURDAY	4	19.05
16	SUNDAY	0	--
17	Monday	0	--
18	Tuesday	1	4.76
19	Wednesday	0	--
20	Thursday	1	4.76
21	Friday	1	4.76
22	SATURDAY	1	4.76
23	SUNDAY	0	--
24	Monday	0	--
TOTAL		21	100.00

Table B-19

Frequencies of Reasons Why Natural Tree(s) Chosen

Reason	Frequency	Percent
Tradition	12	57.1
Want Real Tree	12	57.1
Fragrance	14	66.7
Biodegradable	9	42.9
Dislike Artificial Trees	6	28.6
Staff Moral/Enjoyment	5	23.8
Customer Moral/Enjoyment	8	38.1
Other Reasons	2	9.2

Note: Totals do not sum to 21 or 100% due to multiple responses.

Table B-20

Mean Price and Mean Height (feet) of Natural Trees Displayed, By Species

Species	Mean Price	Standard Deviation	Mean Height	Standard Deviation
Scots pine	17.5	24.75	6.50	.71
Douglas fir	18.2	16.39	7.00	1.87
Wild spruce	--	--	8.67	5.51
Blue spruce	34.00	6.56	8.67	3.06
Lodgepole pine	6.00	--	5.00	--
White pine	--	--	8.00	--
TOTAL	14.24	16.60	7.09	2.93

APPENDIX C - RETAILERS

Table C-1

Location of Retailers
Frequency of Total and Those Interviewed

Location	Estimated* or True (T) Number	Number Interviewed	Percent Interviewed
Calgary	67	46	68.66
Cochrane	3	1	33.33
Edmonton	62	36	58.06
Red Deer	9	5	55.56
St. Albert	4	2	50.00
Sherwood Park	4	4	100.00
Grande Prairie	5		
Fort McMurray	4		
Leduc	3		
Camrose	3		
Hinton	3		
Edson	2		
Peace River	3		
Lacombe	2		
Lethbridge	9		
Medicine Hat	15		
Airdrie	6		
Drumheller	5		
Brooks	3		
Rest of Province*	58	3	5.14
TOTAL	270	100	35.93

* 1 each for North Central Centres of more than 3,000 population. 2 each for Southern Central Centres of more than 3,000 population. Based on personal communications with a large sample of civic authorities, as licenses are not required in such small centres.

T = number of licenses issued.

Table C-2

Frequency of Meters of Lights Used by Retailers for Display

Estimated Meters of Lights	Frequency	Percent	Valid Percent
5	3	3.1	4.9
6	1	1.0	1.6
7	1	1.0	1.6
8	5	5.2	8.2
10	3	3.1	4.9
12	1	1.0	1.6
15	4	4.1	6.6
20	6	6.2	9.8
25	3	3.1	4.9
30	11	11.3	18.0
32	1	1.0	1.6
40	3	3.1	4.9
48	1	1.0	1.6
50	7	7.2	11.5
60	1	1.0	1.6
75	1	1.0	1.6
100	4	4.1	6.6
150	3	3.1	4.9
200	1	1.0	1.6
300	1	1.0	1.6
No estimate (incomplete data collection)	36	37.1	--
TOTAL	97	100	100

Mean = 44.754 Standard Deviation = 52.627

Table C-3
Frequency of Display/Arrangement of Trees by Type

Type of Display	Number of Outlets	Percent of Outlets
Free Standing	70	72.16
Leaning Against Fencing	70	72.16
Bound/Baled	21	21.65
Leaning Against Ropes	19	19.59
Decorated with Tree Lights	6	6.19
Decorated, No Lights	3	3.09

* Totals not provided as retailers used more than one method of display.

Table C-4
Frequency of Tree Conditions at Retail Outlets

Condition of Trees*	Number of Outlets	Percent of Outlets
Flattened	21	21.6
Broken Branches	3	3.1
Good Condition	80	82.5

Totals are not provided as retailers may have trees in more than one condition.
* Subjective criteria on the part of the interviewer.

Table C-5

Frequency of Parking Spaces Directly Provided by Retailer

Estimated Number of Parking Spaces Provided	Frequency	Percent
2	2	2.1
3	1	1.0
4	2	2.1
5	5	5.2
6	3	3.1
8	8	8.2
9	1	1.0
10	6	6.2
12	1	1.0
15	3	3.1
20	3	3.1
25	2	2.1
30	2	2.1
45	1	1.0
50	2	2.1
60	1	1.0
100	3	3.1
250	1	1.0
500	2	2.1
1000	2	2.1
4000	1	1.0
No estimate or none provided	45	46.4
TOTAL	97	100.0

Mean = 157.173 Standard Deviation = 582.845

Table C-6

Frequency of Estimated Incidental Parking Spaces Available

Estimated Number of Incidental Parking Spaces	Frequency	Valid Percent
5	1	2.1
10	4	8.5
15	5	10.6
20	4	8.5
25	2	4.3
30	2	4.3
50	4	8.5
60	1	2.1
100	12	25.5
200	4	8.5
500	1	2.1
1000	1	2.1
1300	1	2.1
1500	3	6.4
2000	1	2.1
3000	1	2.1
No Estimate	50	--
TOTAL	97	100.0

Mean = 316.383 Standard Deviation = 630.479

Table C-7

Frequency of Retailer Categories of Retailers Interviewed

Category	Frequency	Valid Percent
Regional Chain	10	10.9
Independent Retailer	55	59.8
Service Organization	3	3.3
Special Interest Group	13	14.1
Seasonal Retailer	9	9.8
Other	2	2.2
No Indication	5	--
TOTAL	97	100.0

Table C-8

Frequency of Position of Person Interviewed

Position	Frequency	Valid Percent
Owner	32	35.2
Manager	32	35.2
Supervisor	6	6.6
Employee	21	23.1
No Answer	6	--
TOTAL	97	100.0

Table C-9

Frequency of Retail Activity or Occupation
(Responses to the Question: "Is this your principal occupation or activity?")

Response	Frequency	Valid Percent
Yes, This is Principal Activity/Occupation	9	12.5
No, This is Not Principal Activity/Occupation	63	87.5
Not Applicable or No Response	25	--
TOTAL	97	100.0

Table C-10

Frequency of Years as a Christmas Tree Retailer

Years	Frequency	Percent
1	13	13.4
2	8	8.2
3	3	3.1
4	6	6.2
5	3	3.1
6	4	4.1
8	3	3.1
9	1	1.0
10	10	10.3
11	1	1.0
12	1	1.0
14	2	2.1
15	4	4.1
17	1	1.0
18	2	2.1
20	1	1.0
25	1	1.0
30	1	1.0
31	1	1.0
35	1	1.0
No Answer or First Year	30	30.9
TOTAL	97	100.0

Mean = 8.045 Standard Deviation = 7.715

Table C-11

Frequency of Number of Full-Time Employees

Number of Full-Time Employees	Frequency	Percent
1	21	21.6
2	14	14.4
3	1	1.0
4	1	1.0
5	2	2.1
6	1	1.0
20	1	1.0
None or No Answer*	56	57.7
TOTAL	97	100.0

Mean = 2.244 Standard Deviation = 3.089

* Not applicable to service clubs or charitable organizations that rely on volunteer help.

Table C-12

Frequency of Number of Part-Time Employees

Number of Part-Time Employees	Frequency	Percent
1	7	7.2
2	13	13.4
3	4	4.1
4	2	2.1
5	1	1.0
6	2	2.1
10	1	1.0
11	1	1.0
28	1	1.0
None or No Answer	65	67.0
TOTAL	97	100.0

Mean = 3.719 Standard Deviation = 5.037

* Not applicable to service clubs or charitable organizations that rely on volunteer help.

Table C-13

Frequency of Length of Weekend/Holiday Hours of Operation Per Day

Hours/Day	Frequency	Valid Percent
8	3	4.1
9	6	8.2
11	5	6.8
12	44	60.3
13	9	12.3
14	2	2.7
16	1	1.4
17	1	1.4
24	2	2.7
No Answer	24	--
TOTAL	97	100.0

Mean = 12.151 Standard Deviation = 2.504

Table C-14

Frequency of Length of Weekday Hours of Operation Per Day

Hours/Day	Frequency	Valid Percent
2	1	1.4
3	1	1.4
5	2	2.8
6	2	2.8
7	1	1.4
8	1	1.4
9	4	5.6
11	5	6.9
12	45	62.5
13	4	5.6
14	2	2.8
16	1	1.4
18	1	1.4
24	2	2.8
No Answer	25	--
TOTAL	97	100.0

Mean = 11.597 Standard Deviation = 3.300

Table C-15

Mean Hours of Operation Per Week

Mean = 82.287

Table C-16

Frequency of Respondents Who Indicated That All of the Trees in Stock Were Displayed

Response	Frequency	Valid Percent
Yes, Whole Stock Displayed	58	82.9
No, Inventory is Larger than Display	12	17.1
No Answer	27	--
TOTAL	97	100.0

Table C-17

Frequency of Shipping Method to Bring Trees to Site

Method of Shipping	Frequency	Percent
Shipped Self*	20	20.6
Commercial Hauler	43	44.3
Other	4	4.1
No Answer	30	30.9
TOTAL	97	100.0

* This includes those retailers who distributed threes to their multiple retail sites.

Table C-18

Frequency of Retailers Who Grow Their Own Christmas Trees

Yes of No Grow	Frequency	Valid Percent
Yes	4	5.6
No	68	94.4
No Answer	25	--
TOTAL	97	100.0

Table C-19

Frequency of Retailers Who Thought a Christmas Tree Association Would Be Beneficial

Response	Frequency	Valid Percent
Yes, Beneficial	43	66.2
No, Not Beneficial	22	33.8
No Answer	32	--
TOTAL	97	100.0

Table C-20

Frequency of Retailers Who Indicated That They Would Join a Christmas Tree Association

Response	Frequency	Valid Percent
Yes, Join	39	63.9
No, Not Join	22	36.1
No Answer	36	--
TOTAL	97	100.0

Table C-21

Frequencies of Ranking of Attributes That Would Lead Retailers to Switch to an Alberta Christmas Tree Supplier

1= Most Important Attribute ... 9 = Least Important Attribute
0 Indicates No Response
Valid Percentage in Brackets
0 Indicates No Value

		Response								
Attribute	0	1	2	3	4	5	6	7	8	9
Better Purchase Price	68	19 (65.5)	4 (13.8)	3 (10.3)	2 (6.9)	1 (3.4)	0	0	0	0
Fresher Trees	77	3 (15.0)	9 (45.0)	6 (30.0)	2 (10.0)	0	0	0	0	0
More Fragrant Trees	82	0	3 (20.0)	2 (13.3)	2 (13.3)	2 (13.3)	4 (26.7)	1 (6.7)	1 (6.7)	0
Better Formed Trees	75	7 (31.8)	6 (27.3)	2 (9.1)	4 (18.2)	1 (4.5)	0	1 (4.5)	1 (4.5)	0
If Needles Kept Longer	79	2 (11.1)	3 (16.7)	4 (22.2)	2 (11.1)	4 (22.2)	2 (11.1)	0	1 (5.6)	0
Better Service	86	0	2 (18.2)	2 (18.2)	1 (9.1)	2 (18.2)	2 (18.2)	1 (9.1)	1 (9.1)	0
Better Delivery Service	87	1 (10.0)	0	2 (20.0)	1 (10.0)	1 (10.0)	0	3 (30.0)	2 (20.0)	0
Better Credit Terms	88	0	1 (11.1)	0	0	0	2 (22.2)	0	1 (11.1)	5 (55.6)
Better Packaging	89	0	0	0	0	1 (12.5)	0	2 (25.0)	2 (25.0)	3 (37.5)

Table C-22

Christmas Tree Attributes That Would Lead Retailers to Retailers to Switch to an Alberta Supplier (Ranked)

- Better Purchase Price
- Better Formed Trees
- Fresher Trees
- Better Needle Retention
- More Fragrant
- Better Service
- Better Delivery Service
- Better Credit Terms
- Better Packaging

Note: 1/97 retailers indicated that they already purchase their trees from an Alberta supplier.

Table C-23

Frequencies of Retailers Who Thought That an Alberta Standardized Grading System for Christmas Trees Would Benefit Retailers

Response	Frequency	Valid Percent
Yes, Beneficial	53	73.6
No, Not Beneficial	12	16.7
Did Not Know	7	9.7
No Answer	25	--
TOTAL	97	100.0

Table C-24

Frequencies of Retailers Who Thought That an Alberta Standardized Grading System for Christmas Trees Would Benefit Consumers

Response	Frequency	Valid Percent
Yes, Beneficial	39	54.9
No, Not Beneficial	23	32.4
Did Not Know	9	12.7
No Answer	26	--
TOTAL	97	100.0

Table C-25

Frequencies of Retailers Who Distribute Christmas Trees to Other Retailers

Response	Frequency	Valid Percent
Yes, Distribute	10	15.4
No, Do Not Distribute	55	84.6
No Answer	32	--
TOTAL	97	100.0

Table C-26

Mean Shipments, By Species of Christmas Trees Distributed by Retailers Who Responded "Yes" to Question A.13" "Do You Distribute Trees to Other Retailers?"

Species	Mean Number	Standard Deviation
BC fir	25050.00	35284.628
Scots pine	7000.00	--

Table C-27

Frequencies of Amounts Spent on Advertising by Retailers (1990 Dollars)

Dollars (1990)	Frequency	Percent
20	1	1.0
100	4	4.1
105	1	1.0
150	3	3.1
200	1	1.0
266	1	1.0
300	2	2.1
400	2	2.1
500	1	1.0
600	1	1.0
1000	2	2.1
1200	1	1.0
3000	1	1.0
0 or No Answer	76	78.4
TOTAL	97	100.0

Mean = 482.905 Standard Deviation = 666.429

Table C-28

Frequencies of Amounts Spent on Site Leasing and Utilities by Retailers (1990 Dollars)

Dollars (1990)	Frequency	Percent
100	2	2.1
200	3	3.1
210	1	1.0
400	3	3.1
450	1	1.0
500	2	2.1
550	1	1.0
600	1	1.0
850	1	1.0
900	1	1.0
950	1	1.0
1000	2	2.1
1200	3	3.1
1400	1	1.0
1500	1	1.0
2500	2	2.1
3000	1	1.0
3150	1	1.0
3750	1	1.0
4000	1	1.0
4200	1	1.0
6000	1	1.0
0 or No Answer	65	67.0
TOTAL	97	100.0

Mean = 1409.688 Standard Deviation = 1464.946

Table C-29

Frequencies of Responses to Question A.17: "Please Rank the Following Christmas Tree Characteristics According to What You, as a Retailer, Look for in the Purchase of a Good Quality Tree."

1 = most important ... 10 = least important
Valid percentages in brackets
0 indicates no value

Characteristic	Response										
	0	1	2	3	4	5	6	7	8	9	10
Freshness	72	10 (40.0)	7 (28.0)	4 (16.0)	0	2 (8.0)	1 (4.0)	1 (4.0)	0	0	0
Fragrance	82	1 (6.7)	0	2 (13.3)	0	2 (13.3)	4 (26.7)	2 (13.3)	1 (6.7)	3)20.0)	0
Form	70	16 (59.3)	5 (18.5)	2 (7.4)	2 (7.4)	1 (3.7)	0	1 (3.7)	0	0	0
Needle Retention	71	1 (3.8)	7 (26.9)	5 (19.2)	4 (15.4)	2 (7.7)	2 (7.7)	2 (7.7)	3 (11.5)	0	0
Good Colour	77	0	4 (20.0)	3 (15.0)	6 (30.0)	3 (15.0)	4 (20.0)	0	0	0	0
Good Height Range	79	0	1 (5.6)	6 (33.3)	5 (27.8)	2 (11.1)	0	1 (5.6)	3 (16.7)	0	0
Good Price	74	4 (17.4)	7 (30.4)	6 (26.1)	2 (8.7)	2 (8.7)	2 (8.7)	0	0	0	0
Good Service	82	0	1 (6.7)	0	2 (13.3)	1 (6.7)	2 (13.3)	4 (26.7)	3 (20.0)	2 (13.3)	0
Cheerful Time	84	0	0	0	0	1 (7.7)	0	2 (15.4)	1 (7.7)	7 (53.8)	2 (15.4)
Other	95	0	0	0	0	0	0	0	0	0	2 (100.0)

Table C-30

Retailer Estimates (Percentage of Respondents) of Quantity Demanded, This Year, Relative to Last Year

↑ indicates increased quantity demanded

↓ indicates decreased quantity demanded

= indicates no change in quantity demanded

↑ / ↓ indicates ratio of increase over decrease

↑ / = indicates ratio of increase over no change

Species	↑	↓	=	%	↑ / ↓	↑ / =
Blue spruce	42.9	14.3	42.9	100	3.0	1.0
Wild fir	22.6	12.9	64.5	100	1.75	.35
Wild spruce	15.4	38.5	46.2	100	.4	.3
Sheared fir	52.8	2.8	44.4	100	18.86	1.19
Scots pine	42.9	20.4	36.7	100	2.1	1.67
Balsam fir	56.3	6.3	37.5	00	8.9	1.5
BC fir	22.2	15.6	62.2	100	1.42	.36
White pine	33.3	29.6	37.0	100	1.175	.9

Table C-31

Frequencies of Retailers Who Think that the Artificial Tree is Harmful to Their Business

Response	Frequency	Percent
Yes, Harmful	19.6	28.4
No, Not Harmful	49.5	71.6
No Answer	30.9	--
TOTAL	97.0	100.0

Table C-32

Frequencies of Estimated Number of First Year Retailers in Retailer's Area

No. of 1st Year Retailers	Frequency	Valid Percent
1	5	45.5
3	2	18.2
4	1	9.1
5	1	9.1
20	1	9.1
30	1	9.1
0 or No Answer	86	--
TOTAL	97	100.0

Table C-33

Estimated Market Share of First Year Retailers (in percentages) by Retailers

% Market Share	Frequency	Percent
2	1	1.0
5	1	1.0
10	7	7.2
25	1	1.0
40	2	2.1
60	1	1.0
0 or No Answer	84	86
TOTAL	97.0	100.0

Table C-34

Frequencies of Items for Sale, in Addition to Natural Christmas Trees, By Retailers

Item	Frequency	Percent
Wreaths	13	13.4
Boughs	17	17.5
Cones	11	11.3
Tree Stands	62	63.9
Tree Ornaments	9	9.3
Christmas Lights	7	7.2
Flowers and Plants	5	5.2
Tree Bags	25	25.8
Artificial Trees	7	7.2
Other Items	13	13.4
Only Christmas Trees	21	21.6

Percentages do not sum to 100 due to multiple responses.

Table C-35

Mean Price of Artificial Trees Sold by Retailers Who Indicated that Artificial Trees Were Sold at Their Location

Mean = 150.000	Standard Deviation = 98.995

Table C-36

Frequencies of Retailers Who Offer Free Gifts

Response	Frequency	Valid Percent
Yes, Gifts Given	42	47.2
No, Gifts Not Given	47	52.8
No Answer	8	--
TOTAL	97	100.0

Table C-37

Percentages of Retailers Who Provide Information About:

Subject	Yes	No	%	Written	Oral	Both
How to Set Up Tree	71.1	28.9	100	1.0	58.8	11.3
Tree Maintenance	82.5	17.5	100	2.1	67.0	13.4
Tree Safety	57.7	42.3	100	4.1	44.3	9.3

Written + oral + both $\neq$ 100 due to some non response.

Table C-38

Frequencies of Promotional Techniques/Campaigns Used by Retailers

Promotion	Frequency	Percent
Print Media	24	24.7
Television	4	4.1
Radio	8	8.2
Posters	17	17.5
Billboards	44	45.4
Buyback/Disposal Service	1	1.0
Other Methods	8	8.2

Percentages do not sum to 100 due to multiple responses.

Table C-39

Frequencies of Sales by day in December 1990
(Days marked only if significantly more sales experienced or expected)

Date	Day	Percentage Marked as Significant
December 1	SATURDAY	6.2
December 2	SUNDAY	4.1
December 3	Monday	1.0
December 4	Tuesday	0.0
December 5	Wednesday	0.0
December 6	Thursday	6.2
December 7	Friday	16.5
December 8	SATURDAY	38.1
December 9	SUNDAY	34.0
December 10	Monday	12.4
December 11	Tuesday	13.4
December 12	Wednesday	17.5
December 13	Thursday	30.9
December 14	Friday	50.5
December 15	SATURDAY	81.4
December 16	SUNDAY	72.2
December 17	Monday	35.1
December 18	Tuesday	16.5
December 19	Wednesday	15.5
December 20	Thursday	12.4
December 21	Friday	12.4
December 22	SATURDAY	19.6
December 23	SUNDAY	13.4
December 24	Monday	0.0

Table C-40

Frequencies of Comments Made by Retailers
(Paraphrased and Grouped in Order of Frequency)

Comment	Frequency
In favour of Alberta grown Christmas trees	6
It's a tough business and thievery is a problem	5
Want a copy of this report	4
There are too many commercial retailers*	3
This survey/interview is a good idea	3
Resent larger chain stores involvement in tree business	3
Concerned about wasted trees	2
Hard to get good trees	2
Environmental concerns bad for business (need promotions)	2
Concerned about commercial retailers posing as scouts*	2
Christmas tree business needs more regulation	2
Public interest in natural Christmas trees is increasing	1
Tree sales very important for fund raising*	1
Am quitting Christmas tree business	1
Spruce trees would sell well, but hard to obtain	1
Repeat sales are very important	1
Need source of fresher trees	1
Christmas tree association is a good idea	1
TOTAL	39

* Comments by charitable organization tree lot managers.

Table C-41

Geographical Source of Christmas Trees

Species	Alta. Canada	B.C. Canada	Man. Canada	Sask. Canada	Mont. U.S.A.	Oregon U.S.A.	Wash. U.S.A.	Unknown Origin	Species */Study	Total %
B.C. Fir	10.32%	40.83%	16.12%	0.00%	0.00%	2.58%	17.73%	12.41%	15504	100.00%
Scots pine	2.98%	19.40%	13.58%	5.83%	21.34%	1.29%	9.05%	26.52%	7731	100.00%
Douglas fir	15.35%	52.82%	5.53%	3.07%	0.00%	0.00%	19.54%	3.69%	16282	100.00%
Wild spruce	0.00%	0.00%	0.00%	0.00%	55.56%	0.00%	0.00%	44.44%	90	100.00%
Blue spruce	28.74%	11.49%	0.00%	0.00%	14.37%	0.00%	0.00%	45.40%	174	100.00%
White pine	0.00%	59.03%	0.00%	10.55%	0.00%	0.00%	0.00%	30.41%	559	100.00%
Lodgepole pine	0.00%	5.45%	81.82%	1.82%	0.00%	0.00%	10.91%	0.00%	1100	100.00%
Sheared fir	0.00%	24.81%	1.38%	20.26%	0.00%	5.51%	1.38%	46.65%	3627	100.00%
Grand fir	2.26%	20.30%	3.76%	0.00%	0.00%	15.04	0.00%	58.65%	1330	100.00%
Noble fir	0.00%	0.00%	0.00%	0.00%	0.00%	20.49%	9.84%	69.67%	488	100.00%
Jack pine	73.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	26.97%	89	100.00%
Austrian fir	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	100.00%
Balsam fir	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	100.00%

*/Study indicates trees / 97 outlets surveyed.

Table C-42

Prices, Dollars 1990 Spent (per foot) (From Retailer Estimates)

Total Trees Sold	B.C. Fir	Scots pine	Douglas fir	Wild spruce	Blue spruce	White pine	Lodgepole pine
Total Number	15,504	7,731	16,282	40	224	559	1,100
Mean/Outlet	159.83505155	79.701030928	167.85567010	0.4123711340	2.3092783505	5.7628865979	11.340206186
Est. Total Prov.*	43,157.00	21,519.00	45,322.00	111.00	624.00	1,556.00	3,062.00
Est. Total Edm. & Cal.*	20,619.00	11,779.04	24,807.44	60.94	341.29	851.70	1,675.97
Est. Outlets (Prov.)	226						
Est. Outlets Edm. & Cal.	148						
Total Trees Prov.*	109,343.04						
*(Mean-Outlets)							

Wholesale Price/Foot	B.C. Fir	Scots pine	Douglas fir	Wild spruce	Blue spruce	White pine	Lodgepole pine
Mean Price (1st supplier)	1.161	2.966	1.315	2	2.85	2.72	1.02
Mean Price (2nd supplier)	1	3	0.5		3	5	
Mean Price (both suppliers)	1.0805	2.983	0.9075	1	2.925	3.86	1.02
Total Expenditures	$279,656.00	$384,760.00	$246,779.00	$666.00	$10,946.00	$36,067.00	$18,738.00

Consumer Price/Foot	B.C. Fir	Scots pine	Douglas fir	Wild spruce	Blue spruce	White pine	Lodgepole pine
Mean Price (1st supplier)	2.658	6.621	3.391	5.5	6.778	7.529	2.45
Mean Price (2nd supplier)	3.847	6.333	3		8	9	
Mean Price (both suppliers)	3.2525	6.477	3.1955	5.5	7.389	8.2645	2.45
$ Spent Prov.**	$586,900.74	$582,791.44	$605,550.22	$2,560.51	$19,263.59	$53,769.00	$31,366.23
$ Spent Edm. & Cal.**	$402,387.00	$399,552.00	$415,171.00	$1,754.00	$13,211.00	$36,864.00	$21,504.00
Mark-Up (Cons. Pr/Whsl Pr)	301.02%	217.13%	352.12%	550.00%	252.62%	214.11%	240.20%
Mean Mark-up	247.85%						
**(Assuming 6' Avg. Height)							

Continued ...

Table C-42 Continued ...

Total Trees Sold	Sheared fir	Grand fir	Noble fir	Jack pine	Austrian fir	Balsam fir	
Total Number	3,627	1,330	488	89	0	0	
Mean/Outlet	37.391752577	13.711340206	5.0309278351	0.9175257731	0	0	
Est. Total Prov.*	$10,095.00	$3,701.00	$1,358.00	$248.00	$0.00	$0.00	
Est. Total Edm. & Cal.*	5,526.14	2,026.40	743.52	135.60	0.00	0.00	
Est. Outlets (Prov.)							
Est. Outlets Edm. & Cal.							
Total Trees Prov.*							
*(Mean-Outlets)							

Wholesale Price/Foot	Sheared fir	Grand fir	Noble fir	Jack pine	Austrian fir	Balsam fir	
Mean Price (1st supplier)	2.62	3.21	5.125			3.5	
Mean Price (2nd supplier)	1	3		1.25			
Mean Price (both suppliers)	1.81	3.105	5.125	1.25		3.5	
Total Expenditures Assuming 6' Avg. Height) $836486.46	$109,635.00	$68,963.00	$41,762.00	$1,859.00	$0.00	$0.00	

Consumer Price/Foot	Sheared fir	Grand fir	Noble fir	Jack pine	Austrian fir	Balsam fir	
Mean Price (1st supplier)	5.004	8.623	9.799	3	6	8	
Mean Price (2nd supplier)	2	7.625		2.5			
Mean Price (both suppliers)	3.502	8.124	9.799	2.75	6	8	Total $ Spent
$ Spent Prov.**	$212,116.00	$180,402.00	$79,842.00	$4,092.00	$0.00	$0.00	$2,214,292.01
$ Spent Edm. & Cal.**	$101,347.00	$86,208.00	$38,150.00	$1,953.00	$0.00	$0.00	$1,449,357.64
Mark-Up (Cons. Pr/Whsl Pr)	193.48%	261.64%	191.20%	220.00%		228.57%	
Mean Mark-up							
**(Assuming 6' Avg. Height)							

APPENDIX D - PRODUCTION MODELS

Model #1

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	2	1	1	0	0	0	0	1000
2	3	1	1	2	0	0	0	0	1000
3	3	1	1	3	1	0	0	0	1000
4	4	1	1	4	1	1	0	0	1000
5	4	1	1	5	1	2	0	0	1000
6	5	1	1	6	1	3	0	0	1000
7	5	1	1	7	1	4	0	0	1000
8	10	1	1	8	1	5	1	1	1000

Model 1
Large Farm
regulated
plantation
8 year rotation
ld,l,k (@ %100)
own retailer

Interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$100.00
tr & roto ($/hr)*	(tr & roto = k)	$65.00
land ($/acre/yr)*		$25.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine wsl $17, ret $27	$27.00

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
0	0	0	0	0	0	0	$300.00	$200.00	$200.00
996	0	0	0	0	0	0	$300.00	$100.00	$200.00
996	993	0	0	0	0	0	$300.00	$100.00	$200.00
996	993	989	0	0	0	0	$400.00	$100.00	$200.00
996	993	989	985	0	0	0	$400.00	$100.00	$200.00
996	993	989	985	981	0	0	$500.00	$100.00	$200.00
996	993	989	985	981	978	0	$500.00	$100.00	$200.00
996	993	989	985	981	978	974	$1000.00	$100.00	$200.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$300.00	$0.00	$0.00	$0.00	$0.00	$780.00	$780.00
$600.00	$0.00	$0.00	$0.00	$0.00	$390.00	$1560.00
$900.00	$100.00	$0.00	$0.00	$0.00	$390.00	$2340.00
$1200.00	$100.00	$200.00	$0.00	$0.00	$390.00	$3120.00
$1500.00	$100.00	$400.00	$0.00	$0.00	$390.00	$3900.00
$1800.00	$100.00	$600.00	$0.00	$0.00	$390.00	$4680.00
$2100.00	$100.00	$800.00	$0.00	$0.00	$390.00	$5460.00
$2400.00	$100.00	$1000.00	$200.00	$1000.00	$390.00	$6240.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$570.00	$0.00	$3130.00	$0.00	($3130.00)
$0.00	$570.00	$0.00	$3720.00	$0.00	($3720.00)
$0.00	$570.00	$0.00	$4900.00	$0.00	($4900.00)
$0.00	$570.00	$30.00	$6310.00	$0.00	($6310.00)
$0.00	$570.00	$60.00	$7620.00	$0.00	($7620.00)
$0.00	$570.00	$90.00	$9030.00	$0.00	($9030.00)
$0.00	$570.00	$120.00	$10340.00	$0.00	($10340.00)
$3250.00	$570.00	$637.02	$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			$17087.02	$26299.17	$9212.15
			NPV	NPV	NPV
			$75824.23	$71998.21	($3826.02)

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #2

YEAR	PLANNING - (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	8	8	8	0	0	0	0	8000
2	1	0	O	8	0	0	0	0	0
3	1	0	O	8	8	0	0	0	0
4	1	0	O	8	0	8	0	0	0
5	1	0	O	8	0	8	0	0	0
6	1	0	O	8	0	8	0	0	0
7	1	0	O	8	0	8	0	0	0
8	6	0	O	8	0	8	8	8	0

Model 2
Large Farm
one shot
plantation
8 year rotation
ld,l,k (@ %100)
wholesaler

Interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$100.00
tr & roto ($/hr)*	(tr & roto = k)	$65.00
land ($/acre/yr)*		$25.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine	$17.00
	wsl $17, ret $27	

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
	0	0	0	0	0	0	$300.00	$800.00	$1600.00
7970	0	0	0	0	0	0	$100.00	$0.00	$0.00
0	7940	0	0	0	0	0	$100.00	$0.00	$0.00
0	0	7910	0	0	0	0	$100.00	$0.00	$0.00
0	0	0	7881	0	0	0	$100.00	$0.00	$0.00
0	0	0	0	7851	0	0	$100.00	$0.00	$0.00
0	0	0	0	0	7822	0	$100.00	$0.00	$0.00
0	0	0	0	0	0	7792	$600.00	$0.00	$0.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$2400.00	$0.00	$0.00	$0.00	$0.00	$3120.00	$6240.00
$2400.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$800.00	$0.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$0.00	$1600.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$0.00	$1600.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$0.00	$1600.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$0.00	$1600.00	$0.00	$0.00	$0.00	$6240.00
$2400.00	$0.00	$1600.00	$1600.00	$8000.00	$0.00	$6240.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$3860.00	$0.00	$18320.00	$0.00	($18320.00)
$0.00	$100.00	$0.00	$8840.00	$0.00	($8840.00)
$0.00	$100.00	$0.00	$9640.00	$0.00	($9640.00)
$0.00	$100.00	$240.00	$10680.00	$0.00	($10680.00)
$0.00	$100.00	$240.00	$10680.00	$0.00	($10680.00)
$0.00	$100.00	$240.00	$10680.00	$0.00	($10680.00)
$0.00	$100.00	$240.00	$10680.00	$0.00	($10680.00)
$26000.00	$100.00	$4136.17	$50676.17	$210393.39	$159717.22
			NPV	NPV	NPV
			$80278.95	$98150.07	$17871.12

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #3

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	2	1	1	0	0	0	0	1000
2	3	1	1	2	0	0	0	0	1000
3	3	1	1	3	1	0	0	0	1000
4	4	1	1	4	1	1	0	0	1000
5	4	1	1	5	1	2	0	0	1000
6	5	1	1	6	1	3	0	0	1000
7	5	1	1	7	1	4	0	0	1000
8	10	1	1	8	1	5	1	1	1000

Model 3
Small Farm
regulated
plantation
8 year rotation
ld,l,k (@ %75)
own retailer

interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$75.00
tr & roto ($/hr)*	(tr & roto = k)	$48.75
land ($/acre/yr)*		$18.75
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine wsl $17, ret $27	$27.00

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
0	0	0	0	0	0	0	$225.00	$150.00	$150.00
996	0	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	989	0	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	981	0	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	974	$750.00	$75.00	$150.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$225.00	$0.00	$0.00	$0.00	$0.00	$585.00	$585.00
$450.00	$0.00	$0.00	$0.00	$0.00	$292.50	$1170.00
$675.00	$75.00	$0.00	$0.00	$0.00	$292.50	$1755.00
$900.00	$75.00	$150.00	$0.00	$0.00	$292.50	$2340.00
$1125.00	$75.00	$300.00	$0.00	$0.00	$292.50	$2925.00
$1350.00	$75.00	$450.00	$0.00	$0.00	$292.50	$3510.00
$1575.00	$75.00	$600.00	$0.00	$0.00	$292.50	$4095.00
$1800.00	$75.00	$750.00	$150.00	$750.00	$292.50	$4680.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$570.00	$0.00	$2490.00	$0.00	($2490.00)
$0.00	$570.00	$0.00	$2932.50	$0.00	($2932.50)
$0.00	$570.00	$0.00	$3817.50	$0.00	($3817.50)
$0.00	$570.00	$30.00	$4882.50	$0.00	($4882.50)
$0.00	$570.00	$60.00	$5872.50	$0.00	($5872.50)
$0.00	$570.00	$90.00	$6937.50	$0.00	($6937.50)
$0.00	$570.00	$120.00	$7927.50	$0.00	($7927.50)
$2437.50	$570.00	$637.02	$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			$13117.02	$26299.17	$13182.15
			NPV	NPV	NPV
			$58430.56	$71998.21	$13567.66

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #4

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	8	8	8	0	0	0	0	8000
2	1	0	O	8	0	0	0	0	0
3	1	0	O	8	8	0	0	0	0
4	1	0	O	8	0	8	0	0	0
5	1	0	O	8	0	8	0	0	0
6	1	0	O	8	0	8	0	0	0
7	1	0	O	8	0	8	0	0	0
8	6	0	O	8	0	8	8	8	0

Model 4
Small Farm
one shot
plantation
8 year rotation
ld,l,k (@ %75)
wholesaler

interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$75.00
tr & roto ($/hr)*	(tr & roto = k)	$48.75
land ($/acre/yr)*		$18.75
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine	$17.00
	wsl $17, ret $27	

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
	0	0	0	0	0	0	$225.00	$600.00	$1200.00
7970	0	0	0	0	0	0	$75.00	$0.00	$0.00
0	7940	0	0	0	0	0	$75.00	$0.00	$0.00
0	0	7910	0	0	0	0	$75.00	$0.00	$0.00
0	0	0	7881	0	0	0	$75.00	$0.00	$0.00
0	0	0	0	7851	0	0	$75.00	$0.00	$0.00
0	0	0	0	0	7822	0	$75.00	$0.00	$0.00
0	0	0	0	0	0	7792	$450.00	$0.00	$0.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$1800.00	$0.00	$0.00	$0.00	$0.00	$2340.00	$4680.00
$1800.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$600.00	$0.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$0.00	$1200.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$0.00	$1200.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$0.00	$1200.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$0.00	$1200.00	$0.00	$0.00	$0.00	$4680.00
$1800.00	$0.00	$1200.00	$1200.00	$6000.00	$0.00	$4680.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$3860.00	$0.00	$14705.00	$0.00	($14705.00)
$0.00	$100.00	$0.00	$6655.00	$0.00	($6655.00)
$0.00	$100.00	$0.00	$7255.00	$0.00	($7255.00)
$0.00	$100.00	$240.00	$8095.00	$0.00	($8095.00)
$0.00	$100.00	$240.00	$8095.00	$0.00	($8095.00)
$0.00	$100.00	$240.00	$8095.00	$0.00	($8095.00)
$0.00	$100.00	$240.00	$8095.00	$0.00	($8095.00)
$19500.00	$100.00	$4136.17	$39066.17	$210393.39	$171327.22
			NPV	NPV	NPV
			$61822.41	$98150.07	$36327.66

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #5

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	2	1	1	0	0	0	0	1000
2	3	1	1	2	0	0	0	0	1000
3	3	1	1	3	1	0	0	0	1000
4	4	1	1	4	1	1	0	0	1000
5	4	1	1	5	1	2	0	0	1000
6	5	1	1	6	1	3	0	0	1000
7	5	1	1	7	1	4	0	0	1000
8	10	1	1	8	1	5	1	1	1000

Model 5
Windbreak
regulated
plantation
8 year rotation
I only (@ %75)
own retailer

Interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$75.00
tr & roto ($/hr)*	(tr & roto = k)	$0.00
land ($/acre/yr)*		$0.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine wsl $17, ret $27	$27.00

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
0	0	0	0	0	0	0	$225.00	$150.00	$150.00
996	0	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	989	0	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	981	0	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	974	$750.00	$75.00	$150.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$225.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$450.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$675.00	$75.00	$0.00	$0.00	$0.00	$0.00	$0.00
$900.00	$75.00	$150.00	$0.00	$0.00	$0.00	$0.00
$1125.00	$75.00	$300.00	$0.00	$0.00	$0.00	$0.00
$1350.00	$75.00	$450.00	$0.00	$0.00	$0.00	$0.00
$1575.00	$75.00	$600.00	$0.00	$0.00	$0.00	$0.00
$1800.00	$75.00	$750.00	$150.00	$750.00	$0.00	$0.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$570.00	$0.00	$1320.00	$0.00	($1320.00)
$0.00	$570.00	$0.00	$1470.00	$0.00	($1470.00)
$0.00	$570.00	$0.00	$1770.00	$0.00	($1770.00)
$0.00	$570.00	$30.00	$2250.00	$0.00	($2250.00)
$0.00	$570.00	$60.00	$2655.00	$0.00	($2655.00)
$0.00	$570.00	$90.00	$3135.00	$0.00	($3135.00)
$0.00	$570.00	$120.00	$3540.00	$0.00	($3540.00)
$0.00	$570.00	$637.02	$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			$5707.02	$26299.17	$20592.15
			NPV	NPV	NPV
			$26140.12	$71998.21	$45858.09

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #6

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	2	1	1	0	0	0	0	1000
2	3	1	1	2	0	0	0	0	1000
3	3	1	1	3	1	0	0	0	1000
4	4	1	1	4	1	1	0	0	1000
5	4	1	1	5	1	2	0	0	1000
6	5	1	1	6	1	3	0	0	1000
7	5	1	1	7	1	4	0	0	1000
8	10	1	1	8	1	5	1	1	1000

Model 6
Windbreak
regulated
plantation
8 year rotation
I only (@ %75)
wholesaler

Interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$75.00
tr & roto ($/hr)*	(tr & roto = k)	$0.00
land ($/acre/yr)*		$0.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine	$17.00
	wsl $17, ret $27	

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
0	0	0	0	0	0	0	$225.00	$150.00	$150.00
996	0	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	0	0	0	0	0	$225.00	$75.00	$150.00
996	993	989	0	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	0	0	0	$300.00	$75.00	$150.00
996	993	989	985	981	0	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	0	$375.00	$75.00	$150.00
996	993	989	985	981	978	974	$750.00	$75.00	$150.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$225.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$450.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$675.00	$75.00	$0.00	$0.00	$0.00	$0.00	$0.00
$900.00	$75.00	$150.00	$0.00	$0.00	$0.00	$0.00
$1125.00	$75.00	$300.00	$0.00	$0.00	$0.00	$0.00
$1350.00	$75.00	$450.00	$0.00	$0.00	$0.00	$0.00
$1575.00	$75.00	$600.00	$0.00	$0.00	$0.00	$0.00
$1800.00	$75.00	$750.00	$150.00	$750.00	$0.00	$0.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$570.00	$0.00	$1320.00	$0.00	($1320.00)
$0.00	$570.00	$0.00	$1470.00	$0.00	($1470.00)
$0.00	$570.00	$0.00	$1770.00	$0.00	($1770.00)
$0.00	$570.00	$30.00	$2250.00	$0.00	($2250.00)
$0.00	$570.00	$60.00	$2655.00	$0.00	($2655.00)
$0.00	$570.00	$90.00	$3135.00	$0.00	($3135.00)
$0.00	$570.00	$120.00	$3540.00	$0.00	($3540.00)
$0.00	$570.00	$637.02	$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			$5707.02	$16558.74	$10851.72
			NPV	NPV	NPV
			$26140.12	$45332.21	$19192.09

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
1	3	2	1	1	0	0	0	0	1000
2	3	1	1	2	0	0	0	0	1000
3	3	1	1	3	1	0	0	0	1000
4	4	1	1	4	1	1	0	0	1000
5	4	1	1	5	1	2	0	0	1000
6	5	1	1	6	1	3	0	0	1000
7	5	1	1	7	1	4	0	0	1000
8	10	1	1	8	1	5	1	1	1000

Model 7
Hobby Farm
regulated
plantation
8 year rotation
ld,l,k (@ $0)
own retailer

interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$0.00
tr & roto ($/hr)*	(tr & roto = k)	$0.00
land ($/acre/yr)*		$0.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine wsl $17, ret $27	$27.00

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
0	0	0	0	0	0	0	$0.00	$0.00	$0.00
996	0	0	0	0	0	0	$0.00	$0.00	$0.00
996	993	0	0	0	0	0	$0.00	$0.00	$0.00
996	993	989	0	0	0	0	$0.00	$0.00	$0.00
996	993	989	985	0	0	0	$0.00	$0.00	$0.00
996	993	989	985	981	0	0	$0.00	$0.00	$0.00
996	993	989	985	981	978	0	$0.00	$0.00	$0.00
996	993	989	985	981	978	974	$0.00	$0.00	$0.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
[illegible]	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$570.00	$0.00	$570.00	$0.00	($570.00)
$0.00	$570.00	$0.00	$570.00	$0.00	($570.00)
$0.00	$570.00	$0.00	$570.00	$0.00	($570.00)
$0.00	$570.00	$30.00	$600.00	$0.00	($600.00)
$0.00	$570.00	$60.00	$630.00	$0.00	($630.00)
$0.00	$570.00	$90.00	$660.00	$0.00	($660.00)
$0.00	$570.00	$120.00	$690.00	$0.00	($690.00)
$0.00	$570.00	$637.02	$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			$1207.02	$26299.17	$25092.15
			NPV	NPV	NPV
			$6249.54	$71998.21	$65748.68

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

Model #8

YEAR	PLANNING (MAN DAYS (MD))	SITE PREP (ACRES)	PLANTING (ACRES)	WEEDING (ACRES)	COR PRUNE (ACRES)	SHEARING (ACRES)	COLOURING (ACRES)	HARVEST (ACRES)	SEEDLINGS (#OF TREES)
	3	8	8	8	0	0	0	0	8000
1	1	0	O	8	0	0	0	0	0
2	1	0	O	8	8	0	0	0	0
3	1	0	O	8	0	8	0	0	0
4	1	0	O	8	0	8	0	0	0
5	1	0	O	8	0	8	0	0	0
6	1	0	O	8	0	8	0	0	0
7	6	0	O	8	0	8	8	8	0
8									

Model 8
Hobby Farm
one shot
plantation
8 year rotation
ld,l,k (@ $0)
own retailer

Interest rate (yr)		10.00%
survival rate	3% mort/rotation	99.63%
labour ($/day)		$0.00
tr & roto ($/hr)*	(tr & roto = k)	$0.00
land ($/acre/yr)*		$0.00
sdlngs($/1000)		$470.00
shearer($/acre)		$30.00
misc ($/yr)		$100.00
bales($/tree)		$0.50
price($/tree)	6' scots pine wsl $17, ret $27	$27.00

ld = land l = labour k = capital (shearer not incl) tr = tractor roto = rototiller

2YEAR (#OF TREES)	3YEAR (#OF TREES)	4YEAR (#OF TREES)	5YEAR (#OF TREES)	6YEAR (#OF TREES)	7YEAR (#OF TREES)	HARVEST (#OF TREES)	PLANNING (MD X WAGE)	SITE PREP (A X 1MD X WAGE)	PLANTING (A X 2MD X WAGE)
	0	0	0	0	0	0	$0.00	$0.00	$0.00
7970	0	0	0	0	0	0	$0.00	$0.00	$0.00
0	7940	0	0	0	0	0	$0.00	$0.00	$0.00
0	0	7910	0	0	0	0	$0.00	$0.00	$0.00
0	0	0	7881	0	0	0	$0.00	$0.00	$0.00
0	0	0	0	7851	0	0	$0.00	$0.00	$0.00
0	0	0	0	0	7822	0	$0.00	$0.00	$0.00
0	0	0	0	0	0	7792	$0.00	$0.00	$0.00

WEEDING (A X 3MD X WAGE)	COR PRUNE (A X 1MD X WAGE)	SHEARING (A X 2MD X WAGE)	COLOURING (A X 2MD X WAGE)	HARVEST (A X 10MD X WAGE)	SITE PREP TR (A X 6HRS X TR)	WEEDING TR (A X 12HRS X TR)
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

HARVEST TR (A X 50HRS X TR)	MINOR K($) (SEEDLINGS+MISC)	MAJOR K($) (SHEARER+BALES)	TOTAL COSTS $	TOTAL REV $	NET REV $
$0.00	$3860.00	$0.00	$3860.00	$0.00	($3860.00)
$0.00	$100.00	$0.00	$100.00	$0.00	($100.00)
$0.00	$100.00	$0.00	$100.00	$0.00	($100.00)
$0.00	$100.00	$240.00	$340.00	$0.00	($340.00)
$0.00	$100.00	$240.00	$340.00	$0.00	($340.00)
$0.00	$100.00	$240.00	$340.00	$0.00	($340.00)
$0.00	$100.00	$240.00	$340.00	$0.00	($340.00)
$0.00	$100.00	$4136.17	$4236.17	$210393.39	$206157.22
			NPV	NPV	NPV
			$6452.80	$98150.07	$91697.27

brackets indicate negative values

* Rounded figures from Alberta Ag (1991 a, 1991 b)

APPENDIX E - THE SURVEY AND INTERVIEW PROCESSES

Household Consumer Mailed Questionnaires

In order to obtain the information desired from household consumers, 5000 questionnaires were mailed to randomly selected households in Edmonton, Calgary, Red Deer and several other smaller centres. The questionnaire, a copy of which can be found in appendix F, was developed and pre-tested on a class of forestry students at the University of Alberta.

The questionnaire was more detailed than the one that was sent to commercial or institutional consumers. This attention to detail reflects the importance of household consumer demand and is an attempt to capture the attributes of both the households and the product itself that influence the demand for Christmas trees. To that end, questions about the nature of the household covered not only demographics but general Christmas celebratory habits as well as safety and environmental concerns about Christmas trees.

Following the section, in the questionnaire, on the nature of the household, were sections to be completed or not, based on the household's 1990 decision about displaying a Christmas tree. In these sections, answers were solicited to questions of past and present decisions, future plans and problems encountered in previous years. In addition some contingent valuation (or "what if") questions were included in an attempt to establish the nature of the household consumer demand and quantify the consumer surplus.

In order to carry out the contingent valuation exercise, the household sample was divided into four sub-samples, each containing different values for the contingent evaluation questions. One quarter of the households were asked if they were willing to pay or be compensated by 5% in order to alter their behavior; one quarter each received questionnaires with the values 10%, 15%, and 20% to the same questions.[1]

In order to simplify the sorting, coding and data entry, each quarter of the entire sample was printed on a different colour of paper stock. This had some unforeseen consequences; the response rate varied according to the colour, with the response rate to the dark yellow questionnaires being significantly less than that for the grey, light yellow and blue questionnaires. It is, however, impossible to determine if this was caused by the colour or if the overall sample size was not large enough to provide a perfectly random sample of the population (as the discrepancy between response rates for the various colours decreased as the number of questionnaires returned increased). This variation is not considered to be a problem, however, as its relative size is less than that of the non-response error associated with some of the more delicate areas of questioning, namely the income and education queries.

The information obtained about willingness-to-pay or be compensated was not used in this report as the results were inconclusive.

A copy of the questionnaire can be found in Appendix F.

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1 The results of these contingent evaluation questions (Appendix B, Table 17 and Appendix A, Table 23) show that there is a desire to support Alberta Christmas tree growers but do not provide conclusive evidence of the quantity of support.

Commercial Consumer Mailed Questionnaires

Based on the existing ratio of 1 institution per 10 households, 500 commercial consumer surveys were printed. A total of 488 questionnaires were mailed to randomly selected commercial entities throughout selected major centres in Alberta. The samples were selected as part of the same process used to sample the household consumers.

The commercial consumer questionnaire itself (also to be found in Appendix F) followed a similar format to that of the household consumers but was less than half the length.

Although the questionnaire was shorter, all of the required information was obtained. The questionnaire did not need to be as specific and detailed, particularly in regards to the personal or identification questions. The variability among institutional types is much greater than among households and therefore the questionnaire for commercial consumers had to be less specific in order to be manageable.

Geographical and spatial location as well as general institutional type, therefore, was the only identification oriented data sought and it was obtained through the use of less than half of a page; compared to the two pages that were necessary to obtain all of the household consumer demographic information, from the household consumers.

The Mail Sampling Process

Both the household and commercial consumer sampling took place at the same time using the same process which is described below.

The necessary number of entries in the appropriate telephone directories' white pages were estimated for every selected community and the samples were broken down, geographically, accordingly. The actual sampling was done by cutting cardboard rulers to measure the appropriate distance between addresses so as to draw an appropriately sized sample from each community. Random numbers were generated within the "Microsoft Works" software package in order to determine the starting row number in the starting column on the starting page (one of the first 10 pages). Researchers then simply measured down subsequent columns with the appropriate, pre-measured, ruler until the end of the ruler indicated the next individual sample. This name and address was noted and marked. If it was complete, it was written on a self-adhesive envelope label and put in a pile destined for household consumer envelopes (if it was a household address) or in a pile destined for commercial consumer envelopes (if it was a commercial or institutional listing). If the address and name in the phone book was incomplete, the next complete listing was transcribed to an appropriate label but the next sample measurement would begin at the original, marked, listing.

Response Rates for Mailed Questionnaires

The overall response for household consumers was 1,324 replies to 4,974 questionnaires delivered for a response rate of 27%. A response rate of 20% is considered

acceptable if there is no follow up as was the case for this survey because of both pecuniary and time constraints. A complete breakdown of the surveys sent and the response rates by geographical center is available in Appendix A, Tables 1 and 2.

The overall response for commercial consumers was 183 replies to 488 questionnaires delivered for a response rate of 37.5% (Appendix B, Tables 1 and 2).

The Retailer Personal Interview Process

Although the intended focus of this part of the study was on the two major cities, Edmonton and Calgary, a complete sampling procedure was not possible unless the outlying districts or bedroom communities were included. The number of outlets established in smaller centers could be easily obtained through phone calls to the civic authorities.

The retailers in Red Deer were included as they were easily sampled during the author's return from organizing the interviewers in Calgary and the results provided an intermediately sized sample. As it was determined that the rest of the Province supported close to an equal number of retailers as did Edmonton and Calgary, the decision to broaden the scope of the rest of the survey was definitely justified. To stay within the budget of the study, the species, prices and volumes of the trees sold by retailers in the smaller centres would be determined solely on the basis of consumer questionnaire results, not verified by personal interviews of retailers. Retail interviews were only conducted in Edmonton, Calgary, Red Deer and the outlying areas adjoining Calgary and Edmonton.

In those larger centres, students from the Universities of Alberta and Calgary were briefed and provided with interview forms and letters of authority. Each was given a geographic zone to cover and told to interview someone, preferably the owner or manager, at each outlet that they found in their zone. The interview form can be found in appendix F. The data collected during these interviews are summarized in Appendix C, Tables 1 through 42. At least 50% of the outlets in Edmonton, Calgary, Red Deer and the outlying areas were sampled.

The results of the interviews varied in completeness, subject to: the nature of the interviewer (some displayed more aptitude than others); the position of the person interviewed (it was not always possible to speak with someone who knew all of the details of the operation) and; the nature of the retail outlet (those run by charitable organizations and service clubs were generally more cooperative than were the commercial outlets and retail store owners). Table 8 in Appendix C provides a summary of interviewee types. Over 70% of those interviewed were owners, managers or supervisors.

The Wholesaler Study

Eleven known wholesalers were solicited, by mail, for a 1990/91 price list in order to obtain wholesale prices for various species of Christmas trees. Five replies were received, of which four provided the requested information. In addition, some of the wholesalers provided information about lines of credit and add on profit opportunities.

APPENDIX F - SURVEY AND INTERVIEW FORMS

Letter of Introduction

University of Alberta
Edmonton
Canada T6G 2H1

Department of Rural Economy
Faculty of Agriculture and Forestry
515 General Services Building, Telephone (403) 492-4225

January 15, 1991

Dear Participant:

We, at the Department of Rural Economy, University of Alberta, on behalf of Alberta Forestry, Lands and Wildlife; Forestry, Industry and Development, are trying to ascertain the market potential for natural Christmas trees to determine if Alberta has the potential to develop such an industry. A well organized Christmas tree industry would help diversify Alberta's economy and keep our dollars circulating throughout Alberta's business community.

You have been randomly selected to participate in a survey to determine the market demand for Christmas trees here in Alberta. We need your cooperation in completing the enclosed questionnaire because the economy of Alberta depends on Albertans such as yourself.

Please take 10-15 minutes to fill out the questionnaire and give us your comments about Christmas trees. Your response will be held in strictest confidence and will be combined with those of other respondents. Please do not identify yourself.

In addition to the questionnaire and the prepaid, self-addressed envelope for its return, we have also enclosed a brief history of the Christmas tree as a token of our appreciation.

Your anticipated cooperation and assistance are greatly appreciated.

Sincerely,

William E. Phillips
Professor and Chairman

WEP/ww

Encl.

Consumer Questionnaire

Please complete the following:

In which town or city do you live?_____

In what type of housing do you reside?

☐	low rise apartment	☐	mobile home	☐	row house
☐	high rise apartment	☐	double house	☐	detatched house

What is your highest year of schooling completed? Please circle one.

Grade/High School 0 1 2 3 4 5 6 7 8 9 10 11 12 13

Post Secondary Education:University/College/Technical or Trade School

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

(NOTE, A "HOUSEHOLD," FOR THE PURPOSES OF THIS SURVEY, INCLUDES YOURSELF AND THOSE PERSONS WITH WHOM YOU SHARE ACCOMODATIONS ON A PERMANENT BASIS)

Including yourself, please list the ages (or your best estimations of the ages) of the members of your household:

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

To the best of your knowledge, what was the total amount of money earned (before taxes) by all of the members of your household in 1990? Please estimate and check the appropriate category.

☐	4,999 or less	☐	30,000 - 39,999
☐	5,000 - 9,999	☐	40,000 - 49,999
☐	10,000 - 14,999	☐	50,000 - 69,999
☐	15,000 - 19,999	☐	70,000 - 99,999
☐	20,000 - 24,999	☐	100,000 - 199,999
☐	25,000 - 29,999	☐	200,000 and over

Did your household celebrate the Holidays in any of the following ways?

- ☐ having a Christmas tree or trees
- ☐ having flowers & plants instead of a tree
- ☐ hanging Christmas stockings
- ☐ having a special meal or baking
- ☐ sending cards
- ☐ giving gifts
- ☐ vacationing abroad in the sun
- ☐ skiing / toboganning/skating
- ☐ caroling
- ☐ none of the above ways
- ☐ other_____

Compared to an artificial Christmas tree, a natural Christmas tree is:

- ☐ safer
- ☐ equally safe
- ☐ less safe
- ☐ more environmentaly friendly
- ☐ less environmentaly friendly

Please comment:_____

Does your household display a Christmas wreath (or wreaths)?

- ☐ no
- ☐ yes

If yes, is it (or were they) artificial?

- ☐ yes
- ☐ no
- ☐ some were artificial

and how much did the wreath(s) cost? (Please estimate to the nearest dollar)
$_____each

- ☐ don't know

IF YOU DID NOT DISPLAY A CHRISTMAS TREE THIS HOLIDAY SEASON, PLEASE CONTINUE BY ANSWERING THE NEXT QUESTIONS THAT ARE MARKED "A" ONLY.

IF YOU DID DISPLAY A CHRISTMAS TREE THIS YEAR, PLEASE CONTINUE TO PAGE 5

IF YOU DID NOT DISPLAY A CHRISTMAS TREE THIS HOLIDAY SEASON, PLEASE CONTINUE FROM HERE BY ANSWERING THE QUESTIONS MARKED "A" ONLY.

A.1 Why did you not display a Christmas tree this year? (Please check as many boxes as you need to)

- ☐ too much trouble
- ☐ too expensive
- ☐ illness, age, death in family
- ☐ household too small
- ☐ tenent restrictions
- ☐ no children in the household
- ☐ religious reasons
- ☐ don't celebrate Christmas
- ☐ away for the holidays
- ☐ no easy to use Christmas tree stands were available
- ☐ it was too far to travel in order to purchase a tree
- ☐ did not have adequate transportation
- ☐ the Christmas tree supplier's hours of operation were not convenient
- ☐ safety considerations
- ☐ a live potted Christmas tree was not available
- ☐ environmental reasons
- ☐ other_____

A.2 How long since your household has had a Christmas tree?

- ☐ this is our first Christmas together as a household
- ☐ 1 year
- ☐ 2 years
- ☐ 3 or more years
- ☐ never have had a Christmas tree

A.3 Is your household planning to have a Christmas tree in the future?

- ☐ no
- ☐ yes

A.4 If so, would it be;

- ☐ natural
- ☐ artificial

If you answered "**natural**" to Question **A.4** ,would you give preference to a good quality Alberta grown Christmas tree?

- ☐ yes
- ☐ no
- ☐ don't know

If you answered "**natural**" to Question **A.4** ,would you give preference to a good quality Alberta grown **live potted** Christmas tree?

- ☐ yes
- ☐ no
- ☐ don't know

A.5 If a 5% reduction in price was offered, would you purchase a natural tree?

- ☐ yes
- ☐ no

IF YOU DID NOT DISPLAY A CHRISTMAS TREE THIS HOLIDAY SEASON,YOUR QUESTIONAIRE IS NOW COMPLETE.

THANK YOU FOR YOUR TIME AND EFFORT. PLEASE RETURN THIS QUESTIONAIRE IN THE PRE-PAID, SELF-ADDRESSED RETURN ENVELOPE PROVIDED (before Feb 1, 1991 please)

BEST WISHES FOR 1991!

IF YOU **DID** DISPLAY A CHRISTMAS TREE THIS YEAR, PLEASE COMPLETE THE APPROPRIATE QUESTIONS ON THIS AND THE FOLLOWING PAGES.

Was the tree (or were the trees):

- ☐ natural?
- ☐ artificial?
- ☐ both natural and artificial?

IF YOU ANSWERED "ARTIFICIAL," PLEASE COMPLETE THE QUESTIONS MARKED "B" ONLY.

IF YOU ANSWERED "NATURAL" OR "BOTH NATURAL AND ARTIFICIAL," PLEASE PROCEED TO THE QUESTIONS MARKED "C" THAT BEGIN ON PAGE 7.

B.1 Please give reason (or reasons) why you prefer an artificial tree.

- ☐ personal preference
- ☐ no mess
- ☐ safety considerations
- ☐ easy to set up
- ☐ cost
- ☐ no need to shop every year
- ☐ it is the correct height of_____feet
- ☐ no disposal problem
- ☐ environmental reasons
- ☐ away for the holidays
- ☐ no easy to use Christmas tree stands were available
- ☐ it was too far to travel in order to purchase a natural tree
- ☐ did not have adequate transportation in order to purchase a natural tree
- ☐ the natural Christmas tree supplier's hours of operation were not convenient
- ☐ a live potted Christmas tree was not available
- ☐ other_____

B.2 How long have you had an artificial tree (or trees)?
_____year(s)

B.3 How long have you had the same artificial tree (or trees)?
_____year(s)

B.4 Did your household switch its preference from natural trees to artificial?

- ☐ no
- ☐ yes

B.5 If you answered yes to B.4, please give reason (or reasons) why.

- ☐ personal preference
- ☐ no mess
- ☐ safety considerations
- ☐ easy to set up
- ☐ cost
- ☐ no need to shop every year
- ☐ correct size _____feet or meters?
- ☐ no disposal problem
- ☐ environmental reasons
- ☐ away for the holidays
- ☐ no easy-to-use Christmas tree stands for natural trees were available
- ☐ it was too far to travel in order to purchase a natural tree
- ☐ did not have adequate transportation in order to purchase a natural tree
- ☐ the natural Christmas tree supplier's hours of operation were not convenient
- ☐ a live potted Christmas tree was not available
- ☐ other_____

B.6 If you have ever had a safety problem with your artificial tree, was it:

- ☐ fire/smoke?
- ☐ injury?
- ☐ other?_____

IF YOU ANSWERED "ARTIFICIAL" TO THE QUESTION ON THE TOP OF THE PREVIOUS PAGE, YOUR QUESTIONAIRE IS NOW COMPLETE.

THANK YOU FOR YOUR TIME AND EFFORT. PLEASE RETURN THIS QUESTIONAIRE IN THE PRE-PAID, SELF-ADDRESSED RETURN ENVELOPE PROVIDED

BEST WISHES FOR 1991!

IF YOU ANSWERED "NATURAL" OR "BOTH NATURAL AND ARTIFICIAL" TO THE QUESTION ON THE TOP OF THE PREVIOUS PAGE, PLEASE COMPLETE THE FOLLOWING QUESTIONS ON THE NEXT PAGE (BEGINNING WITH C.1).

IF YOU ANSWERED "NATURAL" OR "BOTH NATURAL AND ARTIFICIAL" TO THE QUESTION ON THE TOP OF PAGE , PLEASE COMPLETE THE FOLLOWING QUESTIONS (BEGINNING WITH C.1).

C.1 Who obtained the natural Christmas tree (or trees)?

- ☐ self (circle male or female)
- ☐ spouse (circle male or female)
- ☐ parent
- ☐ family as a whole
- ☐ other relative_____
- ☐ friend

C.2 Does this person obtain the Chrimas tree every year, or does it change?

- ☐ every year
- ☐ changes
- ☐ don't know

C.3 Where was the tree (or were the trees) purchased? (Check as many boxes as are necessary)

- ☐ commercial seasonal lot
- ☐ charitable organization's seasonal lot
  - ☐ service club
  - ☐ church
  - ☐ school
  - ☐ other_____
- ☐ garden/nursery
  Name of outlet (if known)_____
- ☐ chosen & cut in woodlot
  Name of outlet (if known)_____
  How far did the purchaser travel to make the purchase? Please estimate distance(one way only).
  _____(circle kilometers or miles)
- ☐ retail store
  Name of outlet (if known)_____
- ☐ cut in woods
  ☐ on public land or ☐ on private land
  How far did the cutter of the tree (or trees) travel? Please estimate distance (one way only).
  _____(circle kilometers or miles)
- ☐ recieved tree (or trees) as a gift
- ☐ pre - ordered (before Dec 1/90)

C.4 Please give the reason (or reasons) why a natural tree (or trees) was (or were) chosen:

- ☐ tradition
- ☐ want a real tree (or trees)
- ☐ fragrance
- ☐ biodegradable
- ☐ wish to keep a live potted tree (or trees) year round
- ☐ dislike artificial trees
- ☐ other_____

C.5 If you purchased the tree(s), were you satisfied with the service you received from the Christmas tree outlet(s)?

- ☐ yes
- ☐ no (please comment)_____

C.6 How many places did the purchaser shop or go in order to get the tree (or trees)?

- ☐ one
- ☐ two or three
- ☐ four or more

C.7 Please list the HEIGHT (in feet), PRICE (estimated) and SPECIES (if known) of the trees that your household displayed this year. If it was obtained at no cash expense, please mark 0 as the price.

	HEIGHT (feet)	PRICE (to the nearest dollar)	SPECIES (if known)
first tree	_____	_____	_____
second tree	_____	_____	_____
third tree	_____	_____	_____
fourth tree	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

C.8 When was the tree (or were the trees) obtained?

Dec _____ / 1990 Dec _____ / 1990

C.9 Please rank or order the characteristics looked for when obtaining a tree:
(1 = most important, 2 = less important, . . . , 10 = least important)

_____height
_____shape
_____fullness
_____freshness
_____straight trunk
_____species
_____price
_____color
_____fragrance
_____other_____

C.10 Are you satisfied with the natural Christmas tree (or with all of the trees) that were displayed in your household?

☐ yes
☐ no

If not, how many trees were unsatisfactory?
_____tree(s)

Why was the tree (or were the trees) unsatisfactory? (Check as many boxes as required)

☐ price
☐ the tree(s) looked better in the yard/lot than it (they) did at home
☐ difficult to set up
☐ inadequate tree stand available
☐ needles fell off early
☐ clean up was troublesome
☐ no tree bag was provided
☐ other_____

C.11 Where did the tree(s) come from? (Please check as many as necessary)

☐ Alberta
☐ Saskatchewan
☐ B.C.
☐ U.S.A.
☐ other_____
☐ don't know

C.12 Was the tree (or were the trees) watered regularly during the holiday season?

☐ yes
☐ no

C.13 Has your tree (or have your trees) been sprayed with a fire retardant substance?

- ☐ yes
- ☐ no
- ☐ don't know!

C.14 How was the tree (or were the trees) disposed of?

- ☐ regular garbage pick-up
- ☐ special garbage pick-up
- ☐ taken to disposal/collection site
- ☐ bonfire
- ☐ used for firewood
- ☐ live tree was kept
- ☐ returned to sales outlet If so, was there a refund policy?
  - ☐ yes some refund? ☐ no refund

C.15 Would you be in favour of a Christmas tree disposal / pick-up service?

- ☐ yes
- ☐ no

C.16 How loyal is your household to the purchase of a natural Christmas tree (or trees)?

- ☐ have always had only natural trees
- ☐ tried artificial but returned to natural tree (or trees)
- ☐ have both natural and artificial trees
- ☐ have always had artificial but changed to natural tree (or trees)

C.17 Do you think that young children would enjoy having small Christmas trees of their own?

- ☐ yes
- ☐ no
- ☐ don't know

C.18 If a good quality Alberta grown Christmas tree was offered, would you purchase one or more?

- ☐ yes
- ☐ no
- ☐ already purchase Alberta Grown trees!

C.19 Would you be willing to pay 5% more for a good quality Alberta grown Christmas tree (or trees)?

- ☐ yes
- ☐ no

C.20 If a good quality Alberta grown live potted Christmas tree was offered, would you purchase one or more?

- ☐ yes
- ☐ no
- ☐ don't know

C.21 If you have ever had a safety problem with your natural tree(s), was it:

- ☐ fire/smoke?
- ☐ injury?
- ☐ other?_____

YOUR QUESTIONAIRE IS NOW COMPLETE

THANK YOU FOR YOUR TIME AND EFFORT

PLEASE RETURN THIS QUESTIONAIRE IN THE PRE-PAID, SELF-ADDRESSED RETURN ENVELOPE PROVIDED

BEST WISHES FOR 1991!

RURAL ECONOMY
FACULTY OF AGRICULTURE AND FORESTRY
UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G-9Z9

Please return by Feb 1, 1991

Commercial Establishment Questionnaire

PLEASE COMPLETE THE FOLLOWING

WHERE IS YOUR ESTABLISHMENT IS LOCATED (What city or town?)

_____

BUSINESS DATA, WHICH OF THE FOLLOWING TYPE IS YOUR ESTABLISHMENT?

INSTITUTIONAL	COMMERCIAL	LOCATION
☐ Bank	☐ Retail	☐ Mall
☐ School	☐ Industry	☐ Plaza
☐ Church	☐ Manufacturing	☐ Apartment Bldg.
☐ Hospital	☐ Services	☐ Other_____
☐ Nursing Home		
☐ Other_____		

Was a Christmas tree (or were Christmas trees) displayed at this location this holiday season?

☐ yes (if yes, please proceed directly to the next page (page 2).

☐ no

If not, can you tell us:

Why not?

☐ too much trouble
☐ fire regulations
☐ city bylaw
☐ office/building too small
☐ insurance regulation
☐ no adequate Christmas tree stand was available
☐ other_____

Has your establishment has displayed a Christmas tree (or trees) in past years?

☐ never	
☐ once	Circle (natural or artificial)
☐ sometimes	Circle (natural or artificial or both)
☐ often	Circle (natural or artificial or both)
☐ had always	Circle (natural or artificial or both)

How long has it been since your establishment has displayed a Christmas tree (or trees)?

_____years

Are you planning on displaying a Christmas tree (or trees) in the future?

☐ no
☐ yes

IF YOUR ESTABLISHMENT DID NOT DISPLAY A TREE THIS HOLIDAY SEASON, YOUR QUESTIONAIRE IS NOW COMPLETE

PLEASE RETURN IT IN THE PRE-STAMPED SELF ADDRESSED ENVELOPE PROVIDED

THANK YOU FOR YOUR TIME AND EFFORT.

IF YOUR ESTABLISHMENT DID DISPLAY A CHRISTMAS TREE PLEASE CONTINUE HERE.

WAS THE TREE (OR WERE THE TREES) DISPLAYED:

- ☐ artificial (or only artificial) **please proceed to question 1 below**
- ☐ natural (or only natural) **please proceed to question 2 (next page)**
- ☐ of each kind **please proceed to question 2 (next page)**

1. If you answered **"only artificial,"** can you tell us:

How long your establishment has used an artificial tree (or trees)?
_____years

If your establishment switched preference from natural to artificial?

- ☐ no
- ☐ yes

And if so, was it because having a natural tree was:

- ☐ too much trouble
- ☐ against fire regulations
- ☐ against a city bylaw
- ☐ too difficult to get into and set up in our office / building
- ☐ against insurance regulations
- ☐ other_____

If a good quality Alberta grown natural Christmas tree was offered, would your establishment switch to a natural Christmas tree?

- ☐ yes
- ☐ no
- ☐ don't know

IF YOUR ESTABLISHMENT DID DISPLAY AN ARTIFICIAL TREE (OR TREES), YOUR QUESTIONAIRE IS NOW COMPLETE

PLEASE RETURN IT IN THE PRE-STAMPED ENVELOPE PROVIDED

THANK YOU FOR YOUR TIME AND EFFORT.

IF YOUR ESTABLISHMENT DID DISPLAY AN NATURAL TREE (OR TREES), PLEASE CONTINUE HERE

2. If you answered "only natural" or "one of each kind" to the question on page 2, can you tell us:

Who in your establishment purchased the natural tree (or trees)?

- ☐ boss
- ☐ manager
- ☐ secretary
- ☐ clerk
- ☐ stock person
- ☐ other_____
- ☐ don't know!

Was your natural tree (or have your natural trees) been sprayed with a fire retardant substance?

- ☐ yes
- ☐ no
- ☐ don't know!

Would your establishment would be willing to pay 10% more for a good quality Alberta grown natural Christmas tree?

- ☐ yes
- ☐ no

When was the Christmas tree (or were the trees) obtained?
Nov _____/ 1990 Dec _____/ 1990

3. Please give the reason (or reasons) why a natural tree (or trees) was (or were) chosen:

- ☐ tradition
- ☐ want a real tree (or trees)
- ☐ fragrance
- ☐ biodegradable
- ☐ dislike artificial trees
- ☐ for staff moral/enjoyment
- ☐ for the customer's enjoyment
- ☐ other_____

4. Please list the HEIGHT (in feet please), PRICE (estimated) and SPECIES (if known) of the trees that your household displayed this year.
If it was obtained at no cash expense, please mark 0 as the price.

	HEIGHT (feet)	PRICE (to the nearest dollar)	SPECIES (if known)
first tree	_____	_____	_____
second tree	_____	_____	_____
third tree	_____	_____	_____
fourth tree	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

YOUR QUESTIONAIRE IS NOW COMPLETE

PLEASE RETURN IT IN THE PRE-PAID SELF ADDRESSED ENVELOPE PROVIDED (BEFORE FEB 1, 1991 PLEASE)

THANK YOU FOR YOUR TIME AND EFFORT.

RURAL ECONOMY
FACULTY OF AGRICULTURE AND FORESTRY
UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G-9Z9

Retailer Interview Form

INTERVIEWER _____
DATE: DECEMBER_____,1990
INTERVIEW #(with this retailer)_____

TO BE ANSWERED BY THE INTERVIEWER PRIOR TO INTERVIEWING THE OWNER/OPERATOR

- HOW MANY METERS OF LIGHTS ARE THERE?_____meters

- HOW ARE THE TREES DISPLAYED/ARRANGED? (please circle as many as required)

FREE STANDING	LEANING AGAINST FENCING
BOUND/BALED	LEANING AGAINST ROPES
DECORATED	LIT WITH CHRISTMAS LIGHTS

- WHAT SORT OF SHAPE ARE THEY IN? (please circle as many as requied)

FLATTENED BROKEN BRANCES GOOD

COMMENTS_____

- PLACE

☐ CITY_____
☐ TOWN_____
☐ VILLAGE_____

- WEATHER: (circle as many as required)

SUNNY CLOUDY SNOW RAIN FOG

WARM(above freezing) COLD(below freezing) VERY COLD(below -15C)

- HOW MANY PARKING SPOTS ARE PROVIDED AT THE RETAILER OUTLET?
(for the retail outlet's customer's use)

_____

- HOW MANY PARKING SPOTS ARE PROVIDED ADJACENT TO THE RETAILER?
(useable to the retail outlet's customer)_____

RETAILER'S NAME_____

CATEGORY

- ☐ regional chain/dept or grocery store_____
- ☐ independent retailer
- ☐ service organization
- ☐ sports & special interest group/club
- ☐ religious group/club
- ☐ itinerant/temporary/seasonal retailer
- ☐ other_____

IS THE INTEREVIEWED PERSON THE/AN: (NOTE: please try to interview the owner or manager)

- ☐ OWNER
- ☐ MANAGER
- ☐ SUPERVISOR
- ☐ EMPLOYEE

These next 26 questions (MARKED A) are for the owner/operator only!

A.1 IS THIS YOUR PRINCIPAL RETAIL ACTIVITY/OCCUPATION?

- ☐ YES
- ☐ NO I HAVE ANOTHER BUSINESS OR OCCUPATION/JOB

A.2 HOW LONG HAVE YOU BEEN SELLING TREES IN ALBERTA?_____

A.3 HOW MANY EMPLOYEES?
_____FULL TIME _____PART TIME

A.4 WHAT ARE YOUR HOURS OF OPERATION?
_____WEEKENDS, HOLIDAYS AND BUSY TIMES
_____OTHER WEEKDAYS

A.5 ARE THESE ALL OF THE TREES THAT WILL BE SOLD AT THIS LOCATION THIS HOLIDAY SEASON?

- ☐ yes
- ☐ no How many more trees have you (or are there still more to come)?_____
- ☐ don't know

A.6 PLEASE INDICATE HOW MANY OF YOUR TREES WERE BROUGHT TO THIS SITE BY EACH METHOD LISTED BELOW:

- ☐ shipped yourself_____%
- ☐ commercial hauler_____%
- ☐ other_____ _____%

A.7 DO YOU GROW YOUR OWN CHRISTMAS TREES?

☐ YES
☐ NO

A.8 WOULD AN ASSOCIATION OF ALBERTA CHRISTMAS TREE GROWERS AND RETAILERS BE BENEFICIAL TO CHRISTMAS TREE RETAILERS SUCH AS YOURSELF?

☐ yes
☐ no

A.9 WOULD YOU JOIN AN ALBERTA CHRISTMAS TREE GROWERS AND RETAILERS ASSOCIATION IF IT WERE FORMED?

☐ yes
☐ no

A.10 PLEASE RANK THE ATTRIBUTES THAT WOULD MAKE YOU SWITCH FROM YOUR PRESENT SUPPLIER (IF THAT SUPPLIER OR THOSE SUPPLIERS ARE FROM OUT-OF-THE-PROVINCE) TO AN ALBERTAN SOURCE OF CHRISTMAS TREES:
(1 = most important, 2 = less important, . . . , 9 = least important)

_____better purchase price
_____fresher trees
_____more fragrant trees
_____better formed trees
_____trees with better needle retention
_____better service
_____better delivery service
_____better credit terms
_____better packaging

☐ present supplier is in Alberta

A.11 DO YOU FEEL THAT AN ALBERTA STANDARDIZED GRADING SYSTEM FOR CHRISTMAS TREES WOULD BE BENEFICIAL TO <u>YOU IN YOUR BUSINESS</u>?

☐ yes
☐ no
☐ don't know

A.12 DO YOU FEEL THAT AN ALBERTA STANDARDIZED GRADING SYSTEM FOR CHRISTMAS TREES WOULD BE BENEFICIAL TO <u>YOUR CUSTOMERS</u>?

☐ yes
☐ no
☐ don't know

	NAME	MAILING ADDRESS	CITY	PROV	OR	STATE		
SUPPLIER#1								
	# SUPPLIED	WHOLESALE	CONSUMER	# SOLD	QUALITY	CULLED	GRADED ?	ESTIMATED
		PRICE	PRICE	TO DATE	VG-G-P?	# or circle(%)	YES OR NO	OWN SALES
B.C fir		$ .00/	$ .00/		VG G P	%	Y N	
Scots pine		$ .00/	$ .00/		VG G P	%	Y N	
Douglas fir		$ .00/	$ .00/		VG G P	%	Y N	
Wild spruce		$ .00/	$ .00/		VG G P	%	Y N	
Blue spruce		$ .00/	$ .00/		VG G P	%	Y N	
White pine		$ .00/	$ .00/		VG G P	%	Y N	
Lodgepole pine		$ .00/	$ .00/		VG G P	%	Y N	
Sheared D - fir		$ .00/	$ .00/		VG G P	%	Y N	
other		$ .00/	$ .00/		VG G P	%	Y N	
	NAME	MAILING ADDRESS	CITY	PROV	OR	STATE		
SUPPLIER#2								
	# SUPPLIED	WHOLESALE	CONSUMER	# SOLD	QUALITY	CULLED	GRADED ?	ESTIMATED
		PRICE	PRICE	TO DATE	VG-G-P?	# OR %	YES OR NO	OWN SALES
B.C fir		$ .00/	$ .00/		VG G P	%	Y N	
Scots pine		$ .00/	$ .00/		VG G P	%	Y N	
Douglas fir		$ .00/	$ .00/		VG G P	%	Y N	
Wild spruce		$ .00/	$ .00/		VG G P	%	Y N	
Blue spruce		$ .00/	$ .00/		VG G P	%	Y N	
White pine		$ .00/	$ .00/		VG G P	%	Y N	
Lodgepole pine		$ .00/	$ .00/		VG G P	%	Y N	
Sheared D - fir		$ .00/	$ .00/		VG G P	%	Y N	
other		$ .00/	$ .00/		VG G P	%	Y N	
COMMENTS:								
USE ANOTHER	PAGE IF	MORE THAN	2 SUPPLIERS					

A.13 DO YOU DISTRIBUTE TREES TO OTHER RETAILERS IN THE PROVINCE?

☐ no

☐ yes

IF YES, HOW MANY AND TO WHOM(please indicate first time or repeat customer):

TREE SPECIES	# OF TREES	LOCATION	REPEAT or 1st TIME
B.C FIR			
BALSAM FIR			
SCOTS PINE			
SHEARED D-FIR			
WILD SPRUCE			
WILD FIR			
BLUE SPRUCE			
WHITE PINE			
OTHER:_____			

PLEASE ESTIMATE THE PERCENTAGE OF YOUR GROSS SALES OR THE AMOUNT

A.14 THAT YOU SPEND ON ADVERTISING:_____% or $_____

A.15 WHAT DO YOU SPEND ON SITE LEASING?$_____/month

A.16 WHAT DO YOU SPEND ON UTILITIES?$_____/month

A.17 PLEASE RANK THE FOLLOWING CHRISTMAS TREE CHARACTERISTICS ACCORDING TO WHAT YOU, AS A RETAILER, LOOK FOR IN THE PURCHASE OF A GOOD QUALITY TREE:
(1 = most important, 2 = less important, . . . , 10 = least important)

_____freshness
_____fragrance
_____form
_____needle retention
_____colour
_____height
_____price
_____service
_____a family time full of cheer
_____other_____

PLEASE CIRCLE THE APPROPRIATE WORD:

A.18 Relative to last season, the demand for BLUE SPRUCE Christmas trees is:
INCREASING DECREASING or THE SAME

A.19 Relative to last season, the demand for WILD FIR Christmas trees is:
INCREASING DECREASING or THE SAME

A.20 Relative to last season, the demand for WILD SPRUCE Christmas trees is:
INCREASING DECREASING or THE SAME

A.21 Relative to last season, the demand for SHEARED D-FIR Christmas trees is:
INCREASING DECREASING or THE SAME

A.22 Relative to last season, the demand for SCOTS PINE Christmas trees is:
INCREASING DECREASING or THE SAME

A.23 Relative to last season, the demand for BALSAM FIR Christmas trees is:
INCREASING DECREASING or THE SAME

A.24 Relative to last season, the demand for B.C FIR Christmas trees is:
INCREASING DECREASING or THE SAME

A.25 Relative to last season, the demand for WHITE PINE Christmas trees is:
INCREASING DECREASING or THE SAME

A.26 IS THE ARTIFICIAL CHRISTMAS TREE HARMFUL TO YOUR BUSINESS?

- ☐ yes
- ☐ no

A.27 WHAT IS THE NUMBER OF FIRST YEAR RETAILERS IN THIS CITY/TOWN?_____

A.28 PLEASE ESTIMATE THE MARKET SHARE THAT THESE FIRST YEAR RETAILERS HAVE:_____% Don't know ☐

The remaining questions are for whomever you are interviewing (owner operator or employee)

B.1 PLEASE CHECK OFF THE ITEMS THAT ARE RETAILED HERE AT THE SAME TIME AS THE CHRISTMAS TREES.

- ☐ wreaths
- ☐ boughs
- ☐ cones
- ☐ tree stands
- ☐ tree ornaments
- ☐ Christmas lights
- ☐ flowers & plants
- ☐ tree bags
- ☐ artificial trees
- ☐ other
- ☐ Christmas trees only

B.2 IF ARTIFICIALCHRISTMAS TREES WERE SOLD AT THIS LOCATION DURING THE CHRISTMAS SEASON, PLEASE INDICATE/ESTIMATE THE NUMBERS SOLD AND THE PRICE/TREE:

# SOLD	PRICE/TREE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B.3 DO YOU OFFER FREE GIFTS TO CUSTOMERS WITH THE PURCHASE OF A NATURAL CHRISTMAS TREE? (please specify)

☐ no
☐ yes_____

B.4 DO YOU PROVIDE YOUR CUSTOMERS WITH ANY OF THE FOLLOWING *INFORMATION? (please specify, by circling, if it is written or verbal)*

☐	how to set up a Christmas tree	written	verbal
☐	Christmas tree maintenance info	written	verbal
☐	Christmas tree safety tips	written	verbal
☐	none of the above		

B.5 WHAT SORTS OF PROMOTIONAL TECHNIQUES/CAMPAIGNS ARE EMPLOYED HERE IN ORDER TO SELL CHRISTMAS TREES?

☐ printed media advertising
☐ television advertising
☐ radio advertising
☐ posters
☐ billboard
☐ buyback/disposal service
☐ don't know

B.6 WHEN DO YOU MAKE THE MOST NATURAL CHRISTMAS TREE SALES/DAY? (please circle a range of more than one day)

Dec: 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24

B.7 HAVE YOU ANY COMMENTS ABOUT THE CHRISTMAS TREE BUSINESS OR ABOUT THIS INTERVIEW?

_____
_____
_____
_____
_____
_____THANK YOU!