

**SPECIAL FOREST PRODUCTS  
MARKET ANALYSIS**

**for**

**Saskatchewan Timberlands Division  
Weyerhaeuser Canada, Ltd.**

**MATER ENGINEERING, LTD.  
December 1993**

Canadian Forest Service  
Prince Albert, Saskatchewan

This project was funded by the Canadian Forest Service under the Canada-Saskatchewan Partnership Agreement in Forestry.

Project No. 3017

The study on which this report is based was funded by Canadian Forest Service under the Canada/Saskatchewan Partnership Agreement in Forestry.

The views, conclusions and recommendations are those of the authors. The exclusion of certain manufactured products does not necessarily imply disapproval nor does the mention of other products necessarily imply endorsement by Canadian Forest Service or Saskatchewan Environment and Resource Management.

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Catalogue No. Fo29-37/3017E  
ISBN 0-662-21504-4

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## ABSTRACT

In 1993, Weyerhaeuser Canada Ltd., Saskatchewan Timberlands Division, and Saskatchewan Department of Agriculture and Food, La Ronge District, determined that there was a need for a study to determine potential market opportunities for non-timber products found in the Forest Management License Agreement area of Weyerhaeuser Canada Ltd., Saskatchewan Forest Management License Agreement area (FMLA). Mater Engineering Ltd. of Corvallis, Oregon USA was retained to undertake this project funded by the Canadian Forest Service through the Canada-Saskatchewan Partnership Agreement in Forestry.

In an effort to explore added economic development and job creation opportunities in the area, the study results will, in part, be used to help select specific special forest products to be inventoried in the FMLA on an annual basis. This increased inventory activity will be conducted by Weyerhaeuser in conjunction with their current timber inventory methodologies.

Analyses of the special forest products detailed in this study included extensive evaluation of published data regarding consumer buying trends. Additionally, direct buyer-seller interviews throughout the United States, Canada, and other parts of the world were conducted for this project. Overall, approximately 40 special forest products available from Weyerhaeuser's FMLA in Saskatchewan were analyzed for market potential in this study.

Based on the study's market research results, species have been prioritized for possible field inventory inclusion by Weyerhaeuser. Important discussion on possible opportunities for value-added product development utilizing the targeted special forest products is also detailed.

## ACKNOWLEDGEMENTS

Mater Engineering wishes to express its appreciation and gratitude to the many individuals willing to share their time, energy, and knowledge toward developing the valuable information detailed in this report. In particular, we wish to thank the following agencies, organizations, and individuals who devoted numerous hours, expertise, and knowledge toward the completion of this project:

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**SPECIAL FOREST PRODUCTS MARKETS ANALYSIS**  
for  
**Saskatchewan Timberlands Division**  
**Weyerhaeuser Canada, Ltd.**

December, 1993

**EXECUTIVE SUMMARY**

In 1993, Weyerhaeuser Canada Ltd., Saskatchewan Division, and Saskatchewan Department of Agriculture and Food, La Ronge District, identified a need for a study to determine market opportunities for non-timber products found in Weyerhaeuser Canada Ltd., Saskatchewan Forest Management License Agreement (FMLA) area of Weyerhaeuser Canada Ltd., Saskatchewan Division. Weyerhaeuser Canada Ltd. retained Mater Engineering Ltd. of Corvallis, Oregon USA to undertake the project. The funding for the market study was provided by Canadian Forest Service through the Canada-Saskatchewan Partnership Agreement in Forestry.

Known as special forest products, these non-timber resources from the forest can encompass a large range of product applications including florals and evergreens, botanicals and pharmaceuticals, natural health herbs and gourmet foods, decorative woods, and even oil extracts used in the manufacture of soaps, perfumes, insecticides, and industrial products.

The intent of the project is to modify the existing computerized forest inventory (G.I.S.) for the Weyerhaeuser FMLA to incorporate data on special forest products. Plant species to be targeted for the on-going field inventory will, in part, be based on the specific market research findings in this study. This will facilitate the transfer of information to stakeholders in the area.

An intended result of this joint effort between Weyerhaeuser and the Canadian Forest Service is to explore added economic development and job creation opportunities in the study area which may be realized from the gathering and processing of special forest products. This unique effort will be one of the first of its kind throughout North America in efforts to begin inventorying special forest products. It will be used as a model for other public-private efforts throughout Canada and the United States in fostering effective relationships between large and small commercial forest resource users. It will also serve as a foundation for increased understanding of sustaining the bio-diversity of forest ecosystems and improving forest resource management policies and practices.

The area of special forest products has only recently become a targeted study area in North America, as information on the growth of the markets for these products and related economic development opportunities has become more visible. It is clear that significant economic development opportunities do exist in the *sustaining*, *harvesting*, and *processing* of these non-timber resources from the forest.

Consumer buying trends throughout the world continue to point to the growing importance of special forest products as an industry. As examples:

- 1) With the cost of health care a significant concern in both Canada and the U.S., there has clearly been renewed interest in alternative health care methods and treatments. The natural and organic products industry in the U.S. alone grew to \$5.3 *billion* (U.S.\$) in retail sales in 1992, a 13.8% increase over 1991. This is not surprising when considering that 35 million Americans remain uninsured, and employer-paid insurance costs continue to skyrocket. Special botanicals found in Saskatchewan forests are consistently used in the manufacture of many natural health foods in consumer demand throughout North America today.
- 2) Many forest botanicals used in the manufacture of natural health foods are also employed as "drieds" or "permanents" in the floral industry worldwide. This area of the floral industry continues to show strong growth as recent surveys indicate that 83% of floral wholesalers in the U.S. alone anticipate the increased sales to continue in this specialty area. Further, market trends for drieds and permanents include increased emphasis on the natural (wildcrafted) look; increased sales of higher-end botanicals; and increased investments in the harvesting and/or cultivating of these botanicals.
- 3) Coupled with the increased consumer demand for botanicals and florals, the use of other forest resources such as twigs, branches, barks, tree tops, and even preserved foliated branches and evergreens continues to grow. Full lines of products for interior decor representing a "rustic", "lodge" look continue to grow in popularity throughout North America and in offshore markets. In fact, the look is so much in demand that the \$55 million (U.S.\$) a year, high end mail order catalog market includes many of these in-demand products such as twig and branch furniture, bark containers and accessories, and other interior decor furnishings produced from forest resources.

Northern Saskatchewan is in unique position to take advantage of these market opportunities given the abundance of many of these natural resources in the forests, and the value-added capabilities these special forest product resources offer.

Aside from the primary emphasis on special forest products resource inventorying, other objectives of the markets research and product development analysis conducted for this project include:

- 1) To identify those forest resources which are abundant in the study area and may hold immediate market potential.
- 2) To evaluate competitive considerations such as product pricing, seasonal access to resource, and value-added processing, etc. which may help to increase competitive market position and marketing strategy for those abundant resources holding immediate market potential.
- 3) To identify those resources which hold market potential but have not been verified as species which are abundant in the study area. The purpose of this objective is to provide a resource framework to encourage field identification and recording of resources. This identification and recording of resources would help to ascertain whether consistency of volumes are sufficient to warrant possible product development based on market trends; and
- 4) To identify those species in the study area which may hold aesthetic and/or botanical characteristics that suggest evaluation for new product development to service domestic and off-shore markets.

Evaluation of special forest products species in the targeted area were analyzed under the following product categories:

- Category 1:** Species which appear to be abundant in the study area and that hold immediate market potential. Category 1 species evaluated in the report are listed in the attached **Species Matrix**
- Category 2:** Species which appear to hold market potential but lack volume verification in the field. Category 2 species evaluated in the report are listed in the attached **Species Matrix**
- Category 3:** Species which hold aesthetic and/or botanical characteristics that suggest evaluation for new product development. Category 3 species evaluated in the report are listed in the attached **Species Matrix**

Analyses of the special forest products detailed in this study included extensive evaluation of published data regarding consumer buying trends. Additionally, for Category 1 and Category 3 species, direct buyer-seller interviews throughout the U.S., Canada, and other parts of the world were conducted by Mater Engineering researchers. Overall, approximately 200 interviews were conducted for this study and approximately 40 different special forest products from Weyerhaeuser's FMLA in Saskatchewan were analyzed for product development and market potential.

Results of the study's findings and conclusions can be summarized into the following discussion areas:

- **Special Forest Products Demand and Apparent Volume Requirements**
- **Product Processing and Packaging Requirements**
- **Competitive Pricing of Product**
- **Business Practice and Management Issues**
- **Product Differentiation and Value-Added Product Development Opportunities:**
- **Special Forest Products Annual Inventorying Practices**

**Regarding Special Forest Products Demand and Apparent Volume Requirements:**

**Category 1 Species:**

For Category 1 species, direct buyer-seller interviews throughout North America and abroad were conducted for this project. Over 60 interviews were conducted in order to ascertain market opportunities for moss, branch, tree top, and bark products. Further, over 30 additional interviews were conducted throughout the world in evaluating market opportunities for oils and extracts from the study area's targeted species.

A summary of the results of those interviews is as follows:

- 1) There appears to be solid interest in evaluating special forest products from the Saskatchewan study area. Based on the direct buyer interview results, Category 1 resources which appear to hold the best immediate market potential include:

## Species Matrix

### Category 1

<i>Product Area</i>	<i>Species</i>
<b>Boughs, Twigs, Tree Tops</b>	<p><b>Birch</b> (<i>Betula papyrifera</i>; <i>B. glandulosa</i>)</p> <p><b>Alder</b> (<i>Alnus rugosa</i>; <i>A. crispa</i>)</p> <p><b>Aspen</b> (<i>Populus tremuloides</i>; <i>P. balsamifera</i>)</p> <p><b>Willow</b> (<i>Salix ssp.</i>)</p>
<b>Mosses &amp; Lichens</b>	<p><b>Old Man's Beard</b> (on branches)</p> <p><b>Reindeer Moss</b> (<i>Cladonia ssp.</i>)</p> <p><b>Dogface Lichen</b> (<i>Peltigera ssp.</i>)</p> <p><b>Peat Moss</b> (<i>Sphagnum ssp.</i>)</p> <p><b>Club Moss</b> (<i>Lycopodium annotinum L.</i>)</p> <p><b>Ground Cedar</b> (<i>Lycopodium complanatum L.</i>)</p> <p><b>Ground Pine</b> (<i>Lycopodium obscurum L.</i>)</p>
<b>Barks</b>	<p><b>Birch</b> (<i>Betula papyrifera</i>; <i>B. glandulosa</i>)</p> <p style="padding-left: 40px;"><b>Flat Sheets</b></p> <p style="padding-left: 40px;"><b>Sleeves</b></p> <p style="padding-left: 40px;"><b>Value-Added Product Development</b></p>
<b>Oils/Extracts</b>	<p><b>Balsam Fir</b> (<i>Abies balsamea</i>)</p> <p><b>White Spruce</b> (<i>Picea glauca</i>)</p> <p><b>Black Spruce</b> (<i>Picea mariana</i>)</p> <p><b>Jack Pine</b> (<i>Picea banksiana</i>)</p>



**Species Matrix (Continued)**

**Category 2**

<i>Product Area</i>	<i>Species</i>
<b>Dried/Preserved Florals</b>	<p>Yarrow (<i>Achillea millefolium</i>)</p> <p>Wildrose [Rosehips] (<i>Rosa acicularis, R. woodsii</i>)</p> <p>Red Osier Dogwood (<i>Cornus stolonifera</i>)</p>
<b>Herbs, Botanicals, Natural Foods</b>	<p>Yarrow (<i>Achillea millefolium</i>)</p> <p>Bearberry; kinnickinnick (<i>Arctostaphylos uva-ursi</i>)</p> <p>Avens (<i>Guem aleppicum</i>)</p> <p>Alumroot (<i>Huechera richardsonii</i>)</p> <p>Coltsfoot (<i>Petasites ssp.</i>)</p> <p>Valerian (<i>Valerian septentrionalis</i>)</p> <p>Dandelion (<i>Taraxacum officinale</i>)</p> <p>Wild Sarsaparilla (<i>Aralia nudicaulis</i>)</p> <p>Nettle (<i>Urtica dioica</i>)</p> <p>Plantain (<i>Plantago major</i>)</p> <p>Fireweed (<i>Epilobium angustifolium</i>)</p> <p>Wild Licorice (<i>Glycyrrhiza lepidota</i>)</p> <p>Seneca Snakeroot (<i>Polygala senega</i>)</p> <p>Mint (<i>Mentha arvensis</i>)</p> <p>Calamus Root (<i>Acorus calamus</i>)</p> <p>Yellow Pond Lily (<i>Nuphar variegatum</i>)</p>

**Category 3**

<i>Product Area</i>	<i>Species</i>
<b>Dried/Preserved Florals</b>	<p>Pitcher Plant (<i>Sarracenia purpurea</i>)</p> <p>Labrador Tea (<i>Ledum groenlandicum Oeder</i>)</p> <p>Stemless Lady Slipper (<i>Cypripedium acaule</i>)</p> <p>Horsetail (<i>Equisiteum ssp.</i>)</p>
<b>Herbs, Botanicals, Natural Foods</b>	<p>Horsetail (<i>Equisiteum ssp.</i>)</p>

<b><u>Product</u></b>	<b><u>Indicated Immediate Demand</u></b>
Mosses (peat, sheet, long beard)	181,017 lb
Branches (no foliage) (birch, alder)	1,400,000 branches
Branches (w/foilage) (Preserved; aspen, alder, birch)	455,000 branches
Tree Tops (alder, birch)	41,500 tops
Lycopodium (Ground Pine)	530,000 lb
Birch Bark (flats)	2,776 cases plus 62,000 sq ft

- 2) Based on product pricing structure determined in the interview process, it appears that the estimated immediate demand for the selected special forest products equals over \$1.5 million (U.S.\$) in sales to the study area. Further, those interviewed indicated the potential for increased follow-on annual sales once reliability of the supplier and quality of resource was established.
- 3) Aside from the immediate interest in resource purchase from buyers in Canada and the U.S., export market opportunities particularly in Europe and Mexico were repeatedly referenced by those interviewed as holding especially strong market opportunity.
- 4) Many buyers interviewed for this project indicated an immediate interest for not only purchasing product from the study region, but also in helping to market the area's special forest products. Several even stated their interest in helping to establish processing facilities in the area, and in helping to train resource harvesters as to the appropriate foraging methods for ensuring the sustainability of the harvested resources.
- 5) For most products in Category 1, buyers were specific in detailing at what time of year the resource should be harvested to produce the highest quality of product. Buyers were also specific in detailing packaging and processing requirements for the products.
- 6) Oils extracts from wood biomass in the study area was also evaluated under Category 1 consideration. Specific species targeted for product development included balsam fir, white and black spruce, and jack pine. Over 500,000 m<sup>3</sup> of balsam and spruce needle biomass was estimated to be available on an annual basis for possible use in oils extract manufacturing in the study area.

Testing on the purity of oils extracted from these species in the study area are currently being conducted. Balsam fir, and white and black spruce appear to hold the best immediate market opportunities, particularly in the perfume and fragrance industries worldwide. Tamarack in the study area is also being testing for oil extract yield and quality.

Finally, in addition to oils extract, interview results illustrate an unusually strong interest and possible demand for the resin or sap from the area's balsam fir and jack pine.

- 7) Other Category 1 product options for consideration in the study area include cones and decorative woods, particularly diamond willow (*Salix bebbiana*). Because demand for cones can be highly volatile and subject to the availability and influx of offshore imports, it was not considered to be a strong product arena for Saskatchewan interest. The area of decorative woods, such as diamond willow, however, may hold unusual market opportunity, especially if value is added to the resource for high-end niche product development.

It should be noted that under Category 1 discussion, the report correlates product requirements to interviewed product buyers throughout North America and provides a detailed listing of those companies who indicated a specific interest in evaluating Saskatchewan species. All companies contacted by Mater Engineering for the research on this project (including contact names, addresses, and telephone numbers) are included as an attached exhibit in the final report.

### Category 2 Species:

Because of lack of information on actual volume availability in the study area, evaluation of market opportunities for Category 2 species was primarily based on published data research. Based on the market research conducted for this Category, the report establishes two recommended listings of species detailing priority for possible annual inventory inclusion. Priority Level 1 lists those species which appear to hold the best market opportunities for special forest products development in the study area and are recommended for immediate inventory program development. Priority Level 2 species are those resources in the study area which may hold market potential but also require additional process or market testing to ascertain level of market demand.

Results of the market research and recommendations on the priority level listing are as follows:

- 1) Species listed as Priority Level 1 include dandelion (*Taraxacum officinale*), valerian (*Valerian septentrionalis*), senega snakeroot (*Polygala senega*), stinging nettle (*Urtica dioica*), yarrow (*Achillea millefolium*), wild mint (*Mentha arvensis*), and wild licorice (*Glycyrrhiza lepidota*).
- 2) Species listed as Priority Level 2 include wildrose (*Rosa acicularis*, *R. woodsii*), bearberry (*Arctostaphylos uva-ursi*), coltsfoot (*Petasites ssp.*), and plantain (*Plantago major*).
- 3) Market demand for Category 2 resources (primarily forest herbs and botanicals) may be strong given the growing consumer preferences toward consumption of natural health foods and employment of unconventional medical therapies. Results from a study done in 1993 show the annual growth rate in the consumer use of herbal medicines to be 5% in Canada and between 13%-15% across the U.S. In North America alone, the value of the herbal medicine market in 1993 was estimated at over \$1 billion (U.S.\$). This growth rate outstrips the annual worldwide growth rate of traditional over-the-counter (OTC) sales between 1986 and 1990.
- 4) Several of the botanicals targeted for the natural health foods industry evaluated in the study also hold unique market potential in the national and international floral industry, especially as dried and preserved florals. Others are used extensively in the manufacture of aromatics and

potpourris. Still others are employed as seasonings and flavorings in cooking, and some species are even considered a vegetable delicacy in gourmet cooking.

- 5) Estimated domestic and worldwide demand for many of the Category 2 species, when available, have been detailed in this study. Examples of estimated demand volumes include:

<u>Item</u>	<u>Domestic Demand</u>	<u>Worldwide Demand</u>
Dandelion	45 tn	200 tn
Stinging Nettle	50 tn	100 tn
Yarrow	50 tn	250 tn
Wild Mint	150 tn	800 tn

Traditional major product areas that use Category 2 species include gourmet teas and coffees, iced beverages and juices, flavored waters and sparkling beverages, diet products, topical and internal medicinals (i.e. cough suppressants, bath additives, herbal tinctures and extracts, topical gels/lotions/compresses), food substitutes (sugar, coffee, etc.), salad ingredients, toothpaste and mouthwashes, and personal care products such as shampoos and hair conditioners. In addition, new clinical trials are employing Category 2 species for use as anti-inflammatories in the care of arthritis and allergic inflammations, tumor inhibitors in cancer treatment, and non-narcotic, non-addictive sleep enhancers.

- 6) While many of the Category 2 species may require cultivation in order to access and address market demand, wildcrafting or harvesting from the wild could potentially be used to supplement production capability. Further, some Category 2 species, such as senega snakeroot, hold unique market opportunity for Saskatchewan as much of the North American market for this botanical is provided from wildcrafted Canadian resources.
- 7) Several of the Category 2 species, such as dandelion and wild licorice, hold unique market potential as increasingly popular food substitutes. Wild licorice is fast becoming a popular natural sweetener substitute for sugar, replacing sweetener substitutes such as NutraSweet which has experienced growing consumer concerns over harmful side effects. Dandelion leaves are now employed as a tobacco-free herbal substitute for chewing tobacco, while the roots of the plant are milled and used as a popular coffee substitute in many gourmet brands.
- 8) Specialty teas for weight maintenance and weight reduction are a product area which employs many of the Category 2 species. Bearberry, plantain, dandelion, and stinging nettle are a few examples of Category 2 species used extensively in specialty teas for this purpose.

### **Category 3 Species:**

As with Category 1 species, market demand for species listed in Category 3 of the report was ascertained through research of published data and direct interviews with floral and pharmaceutical experts throughout North America. Over 30 interviews were conducted for this species Category. Results of the market research concludes the following:

- 1) Saskatchewan's pitcher plant (*Sarracenia purpurea*) may hold unique potential for market opportunity, particularly in the North American and Europe dried floral markets. Based on the enormous popularity of the *Sarracenia* plant (*Sarracenia leucophylla*) located in the southern states of the U.S., buyers interviewed stated the Saskatchewan species has an unusual red-veined green leaf which is attracting the interest of international floral wholesalers.

Because of the strength of the *Sarracenia* market, major international floral wholesalers are attempting to increase their product yield by 30% from this type of species and are most interested in the Saskatchewan plant. Although not recommended for harvesting from the wild, the pitcher plant can be cultivated from seeds.

- 2) Horsetail (*Equisetum ssp.*) is used both as a botanical and floral product. Market demand for the species, particularly in the fresh, preserved, and dried floral industry, appears on the rise, with the species even being employed in the manufacture of new floral containers.
- 3) Interest in evaluating Labrador tea (*Ledum groenlandicum oeder*) as a possible preserved floral item was expressed by those interviewed for this project. The floral industry in Saskatchewan should investigate possible uses of this plant.
- 4) While many buyers stated the aesthetics of the stemless lady slipper (*Cypripedium acaule*) were "highly marketable", because of endangered species concerns and propagation difficulties for this species, almost all interviewed stated the plant should be left in the wild untouched.

It should be noted that under Category 3 discussion, the report correlates product requirements to interviewed product buyers throughout North America and provides a detailed listing of those companies that indicated a specific interest in evaluating Saskatchewan species. All companies contacted by Mater Engineering for the research on this project (including contact names, addresses, and telephone numbers) are included as an attached exhibit in the final report.

#### **Regarding Product Processing and Packaging Requirements**

Based on the interviews conducted for this study, the report delineates specific product processing and packaging requirements to meet buyer demand. Details discussed in the report as process and packaging requirements include:

1. Recommended time for product harvesting to ensure quality of product sold;
2. Specific desired product characteristics including color and size(s) requirements.
3. Specific processing requirements including cleaning of the product prior to packaging.
4. Preferred materials for packaging product as required by specific buyers.
5. Precautions in processing and packaging, particularly with product that may become volatile or highly flammable.

### **Regarding Competitive Pricing of Product**

For Category 1 species, complete product pricing information throughout North America for each product area researched is detailed in the final report. Averaged prices paid for product are evaluated for both Canadian product purchasers and U.S. product purchasers.

The pricing information clearly illustrates the need for Saskatchewan product manufacturers to be diligent in their marketing efforts, as price structures vary significantly from buyer to buyer within the same product category.

As transportation costs are a significant factor for Saskatchewan product suppliers, this report includes a detailed breakout of averaged transportation costs for all Category 1 species. Freight costs detailed in the report are based on pricing information obtained through direct interviews with over 10 freight forwarding companies throughout Canada and the U.S. Costs were based on product transport from Prince Albert (origin) to 10 destination points throughout Canada and the U.S. Mater Engineering selected the destination points by referring to the buyer interest for product purchase indicated in the interview process for this project.

Truck transportation costs assuming use of dry van, refrigerated van, and flatbed are detailed, as are the costs for truck/rail transport combinations.

Finally, the report details the projected transportation costs per product area as a percentage of income from product sales based on product buyer interviews conducted for this project.

### **Regarding Business Practice and Management Issues**

Aside from consistency in product quality, buyers interviewed throughout North America for this project continually said that product supplier reliability and integrity are essential components for establishing business relations with Saskatchewan product suppliers. Based on direct buyer interviews, the specific issue of reliability and integrity focused on the following:

- 1) Consistency of product freshness and quality from purchase to purchase;
- 2) Consistency of product pricing from purchase to purchase (concerns over "unrealistic" wide swings in product pricing);
- 3) Timeliness of product delivery according to product purchase stipulations;
- 4) Accuracy of delivered product volume according to product purchase stipulations;

Several product buyers interviewed for this project encouraged more cooperative business development in the Saskatchewan area which could continue to address the issue of reliability and integrity. The final report details specific comments and offers of business development assistance from product buyers interviewed for the project.

### **Regarding Defining Product Differentiation and Value-Added Product Development Opportunities:**

Of particular importance to Saskatchewan product suppliers, the report details specific manufacturing options for value-added manufacturing of Category 1, 2, and 3 species analyzed for market potential. Specific value-added manufacturing and distribution options discussed in detail in the final report include:

- 1) Specialty processing of Category 1 and Category 3 species including air drying, preserving, micro-wave/vacuum drying, freeze drying;
- 2) Value-added product development from commodity product to finished product ready for consumer use through additional product design considerations;
- 3) Value-added product development through high-end niche product distribution channels
- 4) Specialty processing of Category 2 species through tincturing and extracting options.
- 5) Value-added product development through creative product identification labeling or "branding".

For some products, the final report details purchase price differences between commodity (bulk) and value-added product, and includes color illustrations of value-added product design options which might be incorporated by Saskatchewan product suppliers.

### **Special Forest Products Annual Inventorying Practices**

In an effort to evaluate special forest products identification and inventorying efforts currently under practice in North America, Mater Engineering surveyed all Canadian provincial governments, as well as 29 National Forest Systems and 16 State Forestry Divisions throughout the U.S.

While several provinces have just begun to recognize the importance and market potential of non-timber products from the forest, survey results suggest that, aside from the project in Saskatchewan, no on-going identification and/or inventory work has been done regarding the development of special forest products specific to Canadian forests. The report does detail some of the non-timber products which have been harvested in Canada, and describes current efforts throughout the provinces in obtaining further information regarding alternative product uses from their forests.

Within the U.S., there appears to be much more concentrated efforts in special forest products identification and development. This is particularly evident in the western U.S. states of California, Oregon, and Washington. The further east you go across the U.S., there is a marked difference in acknowledgement and understanding of the economic development opportunities for non-timber forest products. Several ranger districts within the U.S. National Forest System are currently undertaking action plans for developing special forest products identification and inventory models. Of particular interest to this study, the U.S. Department of Interior Bureau of Land Management (BLM) has just completed a final draft of a computerized **Forest Ecosystem Inventory** program which was specifically designed to conduct annual inventorying of targeted special forest products with commercial value. The computer program, including instructions for entering data from the field into a handheld data recorder, is accompanied by a **Special Forest Products Handbook** which is a comprehensive manual

detailing rules, regulations, forms, permits, harvest methods, contracts, and guidelines for managing special forest products. The final program and handbook are scheduled for public release in April 1994.

This project's final report presents an overview of the computer program and handbook contents developed by the BLM for special forest products.



### Some Useful Conversions

<u>To Convert</u>	<u>Multiply by</u>	<u>To Obtain</u>
pounds	.45	kilograms
ounces	.28	grams
quarts	.95	liters
liters	1.06	quarts (U.S. liquid)
feet	.31	centimeters
centimeters	.03	feet
centimeters	.39	inches
inches	2.54	centimeters
cubic feet	.028	cubic meters

## TABLE OF CONTENTS

<b>INTRODUCTION .....</b>	<b>1</b>
<b>CATEGORY 1 RESEARCH RESULTS .....</b>	<b>5</b>
Mosses and Lichens .....	7
Branches, Twigs, and Tree Tops .....	11
Preserved Branches and Tree Tops .....	14
Birch Bark .....	19
Oils/Extracts .....	20
Product Income and Cost Considerations .....	24
Transportation Costs as a Product Pricing Factor .....	30
Value-Added Considerations .....	30
Cones .....	39
Decorative Woods .....	42
<b>CATEGORY 2 RESEARCH RESULTS .....</b>	<b>44</b>
Native Plants as Health-Related Products .....	44
Drug Sales .....	48
International Overview .....	51
United States Overview .....	52
Specific Research Findings .....	59
Priority Level 1 Species .....	60
Priority Level 2 Species .....	73
Value-Added Processing of Forest Foods and Medicinals .....	79
Tinctures .....	79
Extracts .....	83
Tablets and Capsules .....	83
Teas .....	85
Bulk Herbs .....	86
<b>CATEGORY 3 RESEARCH RESULTS .....</b>	<b>87</b>
Pitcher Plant .....	87
Horsetail .....	91

Labrador Tea .....	92
Stemless Lady Slipper.....	92
<b>SPECIAL FOREST PRODUCTS INVENTORYING.....</b>	<b>96</b>
U.S. Survey Results .....	97
<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>99</b>
<b>Exhibit A</b> <b>List of Interviewees</b>	
<b>Exhibit B</b> <b>Forest Ecosystem Inventory</b>	

#### LIST OF TABLES

Table 1	Increased Sales Revenue, 1991-1992 .....	6
Table 2	Anticipated Sales for 1993.....	6
Table 3	Product Sales Prices Based on 1993 Interviews .....	25
Table 4	Category 1 Species Usage Demand Matrix	
Table 5	Transportation Assumptions Used in Costing Analysis.....	31
Table 6	Transportation Costs from Prince Albert, Saskatchewan .....	32
Table 7	Average Transportation Costs Based on 10 Destination Points .....	33
Table 8	Transportation Costs as a Percentage of Product Sales .....	34
Table 9	Mail Order Catalog Matrix.....	40
Table 10	Herbs, Botanicals, And Natural Foods Matrix .....	45
Table 11	Percentage of Respondents Who Saw a Doctor or a Provider of Unconventional Therapy .....	50
Table 12	Use of Unconventional Therapy for 10 Medical Conditions .....	50
Table 13	Sampling of Worldwide Clinical Trials on Saskatchewan Herbs.....	54
Table 14	Herbal Medicine Markets 1992.....	55
Table 15	Botanicals Demand-Availability Matrix.....	80

## LIST OF FIGURES

Figure 1	Bird Houses and Decor Lamps Made from Birch Bark Sleeves .....	36
Figure 2	Birch Bark Strip Picture Frames .....	38
Figure 3	Birch Log Candles .....	38
Figure 4	Quick Weight Loss Tea: Dandelion .....	61
Figure 5	Herbal Tea Designed for Sleep: Valerian.....	63
Figure 6	Pregnancy Tea .....	65
Figure 7	Gypsy Cold Care: Yarrow.....	67
Figure 8	Yarrow as a Cut Floral Product .....	68
Figure 9	Tension Tamer Tea: Wild Mint .....	69
Figure 10	Mentholated Cough Drops: Wild Mint.....	71
Figure 11	Banana and Cinnamon Tea: Wild Licorice .....	72
Figure 12	Iced Herbal Tea: Wild Rose.....	74
Figure 13	Wildrose in the Fresh-Cut and Dried Floral Industries .....	75
Figure 14	Rose Hip as a Dried Floral Pod .....	77
Figure 15	Super Dieter's Tea: Bearberry .....	78
Figure 16	Dried Pitcher Plant.....	88
Figure 17	Fresh Pitcher Plant.....	89
Figure 18	Saskatchewan's Pitcher Plant .....	90
Figure 19	Horsetail Floral Containers .....	93
Figure 20	Container and Fresh-Cut Floral .....	94

**SPECIAL FOREST PRODUCTS MARKETS ANALYSIS**  
for  
**Saskatchewan Timberlands Division**  
**Weyerhaeuser Canada, Ltd.**

December, 1993

## INTRODUCTION

In 1993, Weyerhaeuser Canada Ltd., Saskatchewan Division, and Saskatchewan Department of Agriculture and Food, La Ronge District, identified a need for a study to determine market opportunities for non-timber products found in Weyerhaeuser Canada Ltd., Saskatchewan Forest Management License Area (FMLA). Weyerhaeuser Canada Ltd. retained Mater Engineering Ltd. of Corvallis, Oregon USA to undertake the project. The funding for the market study was provided by Canadian Forestry Service through the Canada-Saskatchewan Partnership Agreement in Forestry.

Known as special forest products, these non-timber resources from the forest can encompass a large range of product applications including florals and evergreens, botanicals and pharmaceuticals, natural health herbs and gourmet foods, decorative woods, and even oil extracts used in the manufacture of soaps, perfumes, insecticides, and industrial products.

The intent of the project is to modify the existing computerized forest inventory (G.I.S.) for the Weyerhaeuser FMLA to incorporate data on special forest products. Plant species to be targeted for the on-going field inventory will, in part, be based on the specific market research findings in this study. This will facilitate the transfer of information to stakeholders in the area.

An intended result of this joint effort between Weyerhaeuser Canada and Canadian Forest Service is to explore added economic development and job creation opportunities in the study area which may be realized from the gathering and processing of special forest products. This unique partnership will be one of the first of its kind throughout North America in efforts to begin inventorying special forest products. The project will be used as a model for other public – private efforts throughout Canada and the U.S. in fostering effective relationships between large and small commercial forest resource users. The project will also serve as a foundation for increased understanding of sustaining the bio-diversity of forest ecosystems and improving forest resource management policies and practices.

The area of special forest products has only recently become a targeted study area in North America, as information on the growth of the markets for these products and related economic development opportunities has become more visible. It is clear that significant economic development opportunities do exist in the *sustaining*, *harvesting*, and *processing* of these non-timber resources from the forest.

Consumer buying trends throughout the world continue to point to the growing importance of special forest products as an industry. As examples:

- 1) With the cost of health care a significant concern in both Canada and the U.S., there has clearly been renewed interest in alternative health care methods and treatments. The natural and organic products industry in the U.S. alone grew to **\$5.3 billion** (U.S.\$) in retail sales in 1992, a 13.8% increase over 1991. This is not surprising when considering that 35 million Americans remain

uninsured and employer-paid insurance costs continue to skyrocket. Special botanicals found in Saskatchewan forests are consistently used in the manufacture of many natural health foods in consumer demand throughout North America today.

- 2) Many forest botanicals used in the manufacture of natural health foods are also employed as "drieds" or "permanents" in the floral industry worldwide. This area of the floral industry continues to show strong growth as recent surveys indicate that 83% of floral wholesalers in the U.S. alone anticipate increased sales to continue in this specialty area. Furthermore, market trends for drieds and permanents include increased emphasis on the natural (wildcrafted) look, increased sales of higher-end botanicals, and increased investments in the harvesting and/or cultivating of these botanicals.
- 3) Coupled with the increased consumer demand for botanicals and florals, the use of other forest resources such as twigs, branches, barks, tree tops, and even preserved foliated branches and evergreens continues to grow. Full lines of products for interior decor representing a rustic, "lodge" look continue to grow in popularity throughout North America and in offshore markets. In fact, the look is so much in demand that the \$55 million (U.S.\$) a year high-end mail order catalog market includes many of these in-demand products such as twig and branch furniture, bark containers and accessories, and other interior decor furnishings produced from forest resources.

Northern Saskatchewan is in a unique position to take advantage of these market opportunities, given the abundance of many of these natural resources in the forests, and the value-added capabilities these special forest product resources offer.

Aside from the primary emphasis on special forest products resource inventorying, other objectives of the market research and product development analysis conducted for this project include:

- 1) To identify those forest resources which are abundant in the study area and may hold immediate market potential.
- 2) To evaluate competitive considerations such as product pricing, seasonal access to resource, and value-added processing, etc. which may help to increase the competitive market position and marketing strategy for those abundant resources holding immediate market potential.
- 3) To identify those resources that hold market potential but have not been verified as species that are abundant in the study area. The purpose of this objective is to provide a resource framework to encourage field identification and recording of resources. This identification and recording of resources should help to ascertain whether consistency of volumes are sufficient to warrant possible product development based on market trends; and
- 4) To identify those species in the study area that may hold aesthetic and/or botanical characteristics that suggest evaluation for new product development to service domestic and off-shore markets.

Species breakouts for detailed markets and product development analyses detailed in this report include:

**Category 1 Species:**

**Species which appear to be in abundance in the study area holding immediate market potential**

**a. Boughs, Twigs, Tree Tops: (Florals, Craft, and Artificial Trees)**

Birch (*Betula papyrifera*; *B. glandulosa*)  
 Alder (*Alnus rugosa*; *A. crispa*)  
 Aspen (*Populus tremuloides*; *P. balsamifera*)  
 Willow (*Salix ssp.*)

**b. Mosses and Lichens: (Floral and Craft)**

Old Man's Beard (on branches)  
 Reindeer Moss (*Cladonia ssp.*)  
 Dogface Lichen (*Peltigera ssp.*)  
 Peat Moss (*Sphagnum ssp.*)  
 Club Moss (*Lycopodium annotinum L.*)  
 Ground Cedar (*Lycopodium complanatum L.*)  
 Ground Pine (*Lycopodium obscurum L.*)

**c. Barks: ("Natural" Niche Products; Botanicals)**

Birch (*Betula papyrifera*; *B. glandulosa*):  
 Flat Sheets  
 Sleeves  
 Value-Added Product Development

**d. Oils/Extracts:**

Balsam Fir (*Abies balsamea*)  
 White Spruce (*Picea glauca*)  
 Black Spruce (*Picea mariana*)  
 Jack Pine (*Picea banksiana*)

**Category 2 Species:**

**Species which appear to hold market potential but lack volume verification in the field**

**a. Dried and Preserved Florals:**

Yarrow (*Achillea millefolium*)  
 Wildrose [Rosehips] (*Rosa acicularis*, *R. woodsii*)  
 Red-Osier Dogwood (*Cornus stolonifera*)

**b. Herbs, Botanicals, Natural Foods:**

Yarrow (*Achillea millefolium*)  
 Bearberry; kinnickinnick (*Arctostaphylos uva-ursi*)  
 Avens (*Geum aleppicum*)  
 Alumroot (*Huechera richardsonii*)  
 Coltsfoot (*Petasites ssp.*)  
 Valerian (*Valerian septentrionalis*)  
 Dandelion (*Taraxacum officinale*)  
 Wild Sarsaparilla (*Aralia nudicaulis*)  
 Nettle (*Urtica dioica*)  
 Plantain (*Plantago major*)  
 Fireweed (*Epilobium angustifolium*)  
 Wild Licorice (*Glycyrrhiza lepidota*)  
 Senega Snakeroot (*Polygala senega*)  
 Mint (*Mentha arvensis*)  
 Calamus Root (*Acorus calamus*)  
 Yellow Pond Lily (*Nuphar variegatum*)

**Category 3 Species:**

**Species which hold aesthetic and/or botanical characteristics that suggest evaluation for new product development to service domestic and off-shore markets.**

**a. Nursery and Dried/Preserved Floral Products:**

Pitcher Plant (*Sarracenia purpurea*)  
 Labrador Tea (*Ledum groenlandicum Oeder*)  
 Lady Slipper:  
     Stemless Lady Slipper (*Cypripedium acaule*)  
 Horsetail (*Equisetum ssp.*)

**b. Botanical/Pharmaceutical Products:**

Horsetail (*Equisetum ssp.*)



## CATEGORY 1 RESEARCH RESULTS:

Mater Engineering completed over 60 interviews with harvesters, processors, and wholesalers of the targeted products throughout the U.S. and Canada for research conducted on the moss, branch, tree top, and bark products listed as Category 1 species in this report. Over 30 additional interviews were conducted throughout the world for evaluating market opportunities for oils and extracts from Saskatchewan balsam fir, white and black spruce, and jack pine. The purpose of the interviews was to ascertain:

- a) overall market demand for each product
- b) volume requirements for each product;
- c) seasonality of product demand (if any);
- d) product pricing;
- e) product processing requirements;
- f) value-added processing opportunities; and
- g) specific buyer interest in each product.

Category 1 species researched are as follows:

### a. Boughs, Twigs, Tree Tops: (Florals, Craft, and Artificial Trees)

Birch (*Betula papyrifera*; *B. glandulosa*)  
 Alder (*Alnus rugosa*; *A. crispa*)  
 Aspen (*Populus tremuloides*; *P. balsamifera*)  
 Willow (*Salix ssp.*)

### b. Mosses and Lichens: (Floral and Craft)

Old Man's Beard (on branches)  
 Reindeer Moss (*Cladonia ssp.*)  
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 Club Moss (*Lycopodium annotinum L.*)  
 Ground Cedar (*Lycopodium complanatum L.*)  
 Ground Pine (*Lycopodium obscurum L.*)

### c. Barks: ("Natural" Niche Products; Botanicals)

Birch: Flat Sheets  
 Sleeves  
 Value-Added Product Development

### d. Oils/Extracts: Balsam Fir (*Abies balsamea*) White Spruce (*Picea glauca*) Black Spruce (*Picea mariana*) Jack Pine (*Picea banksiana*)

The specific organizations and individuals contacted for this project phase, along with their product areas of interest, are listed in *Exhibit A* of this report. Interview results and general research conclusions are detailed below.

Overall, the market demand for artificial trees, preserved and dried flowers and foliage, and specialty containers (such as twig and bark containers) for the floral industry showed significant increases in U.S. sales between 1991 and 1992. This is according to a recent study completed for Epic Enterprises, Inc. of San Francisco, California regarding permanent floral industry trends in the U.S. The term "permanent" in the industry applies to many different product process categories. For the EPIC study, the term refers to the following:

- permanent foliage (branches, twigs, vines, bushes)
- permanent trees (other than Christmas trees; includes man-made materials combined with preserved previously living material; etc.)

*(Note: sales figures for mosses and lichens were included in the study but were combined with sales figures for dried and silk flowers, and were not available as a separate line item.)*

The study's findings report that over 50% of all importers, manufacturers, wholesalers, and distributors of these targeted products indicate increases in sales revenue between 1991 and 1992 (shown in Table 1, below):

**Table 1**

<b>Category</b>	<b>1992 Sales</b>	<b>Approximate % Increase Over 1991 Sales</b>
Permanent Trees	\$112.4 million (U.S.\$)	65%
Permanent Foliage	\$108.9 million (U.S.\$)	62%
Containers, Ribbon, and Accessories	\$1,619 million (U.S.\$)	66%

Anticipated 1993 sales for the same categories reflect an even higher increase in sales activity than realized in 1992:

**Table 2**

<b>Category</b>	<b>Approximate % of Companies Anticipating Sales Increases between 1992 and 1993</b>
Permanent Trees	70%
Permanent Foliage	74%
Containers, Ribbon, and Accessories	74%

As shown by this study's direct interviews conducted for Category 1 species, offshore imports continue to provide keen competition for U.S. and Canadian resource suppliers and product manufacturers. Over 45% of floral companies import craft and floral containers from offshore with China being the leading source (60% of imports), followed by Taiwan and the Philippines (both at 25% of all imports). Over 57% of floral companies import permanent foliage from offshore sources, and over 33% import artificial trees. China, again, is the lead exporter in both product categories (at 86% and 92% respectively), distantly followed by Taiwan (at 16% and 20%, respectively) and the Philippines (at 5% and 12%, respectively). Further, products that are imported tend to be finished products ready for consumer purchase. Little manufacturing and/or sub-assembly work in these targeted product areas is conducted in the U.S. Of the three targeted product areas, there are more companies in the U.S. who either manufacture or sub-assemble artificial trees than those that manufacture or sub-assemble foliage and containers.

Specific geographic locations where permanent floral products are marketed cover the U.S., Canada, and international locations. Within the U.S., the Midwest region leads product sales at 23% of the total, followed by the Southwest (17%) and the South (16%). Sales to Canada equal approximately 6% of the total, and 16% of sales goes to offshore markets.

Retail outlets (craft and variety stores, fabric centers, retail mass merchandisers, and supermarkets) have been the largest distribution channel for permanent floral products, followed by retail florists. However, within the next two years, while new and expanded retail markets are expected to lead in increased sales of these products, interior decorators and landscape architects are expected to replace retail florists as the second highest increased sales channels.

One of the significant limiting factors to increased sales of permanent florals identified in the EPIC study was the absence of any brand or name identification for these products.

### **Interview Results**

Further on, this section of the report provides a cross-section of information regarding product pricing responses received by Mater Engineering personnel during the direct interviews conducted for Category 1 products listed above. While not all interviewees were willing to provide pricing information, those that did submitted valuable data allowing for comparison of price structure to geographic locations throughout the U.S. and Canada. Further, the respondents also provided critical information regarding product quality, processing, and packaging to meet buyer requirements.

General observations and special comments obtained from interviewees for Category 1 targeted products are as follows:

#### **Mosses and Lichens:**

##### *General Observations:*

A variety of mosses were identified by interviewees. It is important to each product purchaser that samples of the potential product be viewed before any negotiations occur. For some interviewees, the specific species of moss was not as critical as the character of the moss which would need to be of similar quality and texture to the product they already have on the market. Mosses identified as most used include sheet, sphagnum, rock, reindeer, and tree moss (old man's beard moss).

Ground pine (*Lycopodium obscurum L.*) was referenced in great detail during the interviews and will be discussed under separate paragraph in this section.

Some interviewees stated the demand for mosses will continue as it is a staple of the industry. Others referenced specific mosses as experiencing a "glut" on the market. The dichotomy of product demand statements suggest fluctuations in the market according to not only customer demand, but geographic location within the U.S. and Canada.

Mosses are used for a variety of purposes, but mostly in the floral and craft trades and in nurseries for making hanging baskets.

The proper packaging of the moss depended on the specific interviewee. Common terms used were bales, cubic feet, and weight. In fact, many surveyed stated the unit size is a negotiated item. While many prefer the moss to be shipped in bulk (typically 25-lb bales), others preferred the moss shipped in boxes, plastic bags, and gunny sacks. Most interviewees purchase by the truckload.

Some mosses, particularly sheet moss type, are sold fresh, air dried, and glycerin treated. This preference, again, depends on the buyer's customer base. Fresh moss may be bagged but needs refrigeration during storage and shipment. Some buyers prefer to receive fresh moss which they then process themselves. Other interviewees accept or require the moss to be air dried by the pickers.

Each moss typically must be cleaned before being shipped to the buyer.

Most buyers referenced the need to store moss in a "dark" storage area to avoid color fading.

Checking the moisture content of bales of moss is a critical quality assurance step. This is typically done through the use of a hay thermometer. Buyers state that the moisture content needs to be less than 15%. If the moisture content is higher, the bales will rot from the center outward. This may also cause rotting in surrounding bales of moss.

Many buyers also stated that moss storage needs careful attention because moss decomposes as it ages, which generates heat much the same as hay, and consequently can become a highly flammable material.

A phytosanitary certificate is required to ship moss from Canada to the U.S. This is available from Agriculture Canada. Fumigation is also necessary when exporting mosses and lichens.

Most interviewees identified their moss resources coming from local, Oregon, Florida, or Canadian province suppliers (especially British Columbia, Ontario, and Quebec).

Several interviewees stated a strong interest in receiving moss samples from Saskatchewan, one even indicating an immediate demand for 800 bales of sphagnum moss to be delivered every six weeks.

The *Lycopodium* (also referred to as ground pine [*Lycopodium obscurum*]) seemed to spark unusual interest and demand from interviewees. As with the moss, some stated the demand for this miniature Christmas tree-looking plant was decreasing due to the substitute use of German statice and Spanish moss in the floral industry, while others emphasized the "great and increasing" demand for this species.

The ground pine is not to be confused with other *Lycopodia* such as the ground cedar (*Lycopodium complanatum L.*) as buyers state the ground pine is the best suited for dyeing and preserving.

Some buyers interviewed stated a growing interest in a "trailing" *Lycopodium*, but could not give more detail as to the specific species.

Some concern exists regarding the species status of this preferred *Lycopodium* both in the U.S. and Canada. The species, according to some interviewed, is considered endangered in the U.S. This may or may not pose concerns about harvesting the species in Saskatchewan.

In the U.S., this *Lycopodium* is available in such states as West Virginia, Michigan, Minnesota, and Wisconsin. As with other mosses, packaging of the *Lycopodium* is related to the processing required by the buyer. Most interviewed indicated a preference for purchasing fresh, which is then either air dried or stored in refrigeration until the buyer is ready to process (preserve) and dye it.

Many stated their preference for the use of burlap gunny sacks or woven plastic as packaging material to allow for proper air circulation.

Processing techniques identified included glycerin treating, sodium chloride processing, air drying, and "family secret" processing. Aside from air drying, most buyers stated the *Lycopodium* is usually dyed when being processed. Sometimes, it is first air dried and then processed.

More so than other mosses identified, *Lycopodium* was described as "volatile" once picked and bagged. It may be harvested and placed in gunny sacks, but air circulation is essential according to buyers. Plastic bags cannot be used. Similar to hay, *Lycopodium* generates heat when stored, decomposes and becomes a highly flammable material. Rotted bale centers are not uncommon but most undesirable. Buyers further state that refrigeration does not eliminate this problem.

Picking time for this species is best in spring and early summer as the material accepts the preserving and dye treatment better, according to those interviewed. Product harvested in the fall appears to not be as acceptable.

*Lycopodium* is usually purchased on a per pound basis. This appears to pose some problem for the harvester as the species can lose up to 15% of its original weight by the time it arrives at the buyer's operation.

Buyers did indicate a continued strong demand for this species in the U.S. and further suggested a strong demand for the product in Europe, particularly Italy and possibly France. Mexico was also mentioned as a continuing strong market.

Some buyers indicated attempts to sell the species into Pacific Rim markets, but without success. It was stated that the material is currently too unfamiliar to the Asian consumer.

Several buyers expressed an immediate interest in making contact with Saskatchewan suppliers of this species. One well-heeled U.S. operation offered to fly up to Saskatchewan and train harvesters on appropriate foraging techniques, and even referenced interest in setting up processing facilities in the area. Other interviewees expressed a strong interest in marketing value-added products such as wreaths manufactured from the Saskatchewan *Lycopodium*.

When conducting the research for botanicals, oils, and extracts, it was also discovered that *Lycopodium* is used in the botanical and pharmaceutical industry throughout the world.

*Special Comments:*

- 1) Several of the buyers interviewed stated they purchase their *Lycopodium* from India, whose processors cut, dye, and preserve the product at very competitive rates. The raw material from India is recognized as inferior to the material found in both the U.S. and Canada, but apparently this is not of concern to the consumers of the product. Within the U.S., buyers state that both North and South Carolina have this type of material in ample supply.
- 2) Aside from price, consistency of material supply for mosses and *Lycopodium* continue to be a driving concern for many buyers. Several buyers mentioned a willingness to pay higher but competitive prices to suppliers who could provide these products in large volume and on a continuous reliable basis. This was especially true for buyers interested in *Lycopodium* purchases.
- 3) Several buyers mentioned possible market opportunities for these products in Canada, as they have not been as widely distributed there as in the U.S.
- 4) Several buyers said they prefer purchasing value-added product from these species, especially *Lycopodium*. Aside from preserving and dyeing the material, buyers suggested wreath and decorative rope manufacturing as possible product options. One California buyer interviewed stated there is a lack of raw material suppliers for a "moss cloth" they produce. GBC-LA Floral Accessories holds the patent on the manufacturing of this moss cloth and was one of several interviewed who indicated a strong interest in establishing contacts in Saskatchewan. This same company also stated an ongoing interest in testing new or unusual lichens and mosses for new product development.
- 5) Several Canadian buyers interviewed for this product area stated they currently purchase their mosses and lichens from Florida and Oregon. It was suggested that some of the best market opportunities for Saskatchewan material might be "in their own backyard".
- 6) Buyers said that Italy now has several large preserving and dyeing facilities for *Lycopodium*. Marketing the material to Italy may provide a unique opportunity at this time.
- 7) One buyer stated that years ago *Lycopodium* was processed in the U.S. using strychnine, and that the market has never fully recovered as a result of that processing practice.
- 8) General product demand for any given species tended to be quite difficult, as buyer comments strictly reflected their own observations of product movement from their own business. As such, it was quite common for one buyer to relate that the market demand for reindeer moss was declining, while another buyer (even in the same geographic region) would request an opportunity to establish immediate contacts in Saskatchewan because of increased demand for reindeer moss.
- 9) Based on interview results for this project, buyers who stated an interest in evaluating Saskatchewan materials in this product category are (consult *Exhibit A* for business location and contacts):

**Mosses:**

- Forest Products Packaging
- Garden State Foliage
- Florist Brokerage
- GBC-LA Floral Accessories
- Kirby Floral
- Appalachian Root and Herb Co.
- Calfolia

Vickerman Imports, Inc.  
 Rolands of California  
 Hoh Grown  
 Preserve Botanicals  
 Teals

**Lycopodium:** Teals  
 Appalachian Root and Herb Co.  
 Winterwoods  
 Canadian Foliage  
 Preserve Botanicals  
 Apache County Dry Goods  
 Andersons  
 Lebermuth  
 Knud Nielsen

### Branches, Twigs, and Tree Tops:

#### *General Observations:*

Twigs and branches are most commonly thought of as being used in the manufacture of wreaths and baskets, and as added elements in floral designs. However, these products are also employed in the manufacture of other creative specialty products including bird cages, plant stands, decorative furniture, and door toppers. Following floral design trends, they are used to create attractive topiaries for the floral industry and become the base material used for innovative product development, such as special pew baskets for weddings and other events.

The increasing popularity of the artificial tree industry is one that deserves the attention of Canadian product manufacturers. Reasons given for the increased popularity in the use of artificial trees are:

- 1) A dramatic increase in the repair and remodel industry throughout North America, particularly in the U.S. Instead of purchasing newly constructed homes, many people are opting to remodel and repair existing parts of the home. Research conducted by the home center store and do-it-yourself industry in the U.S. has shown that with repair and remodel, an increase in the purchase of new furniture and interior decor products occurs. Artificial trees have gained considerably in consumer popularity and have become more affordable for purchase by the average consumer.
- 2) With design trends geared toward a "back-to-nature" theme, coupled with new technologies that have allowed the artificial tree industry to provide more realism and better product selection to the consumer, it is not surprising to see the healthy growth patterns the industry is now experiencing. Manufacturers stressed that the industry started with plastic trees and plastic foliage at prices that discouraged the average consumer from purchasing the product. Now, with new processing capability, the industry has progressed to real tree trunks and silk foliage at a price more accessible to the average consumer.

Even large traditional wood product producers have taken note of this floral phenomenon. Weyerhaeuser, as an example, holds the patent rights on preserving technology which, purportedly, preserves entire tree sections (trunks, branches, and leaves and needles). [See the "Preserved Branches and Tree Tops" section for further details.]

- 3) In-demand color schemes for home decor throughout the U.S. reflect a shift from dark interiors to light and natural looks. This look is reflected in most home decor products -- from moulding and millwork, to cabinetry, wall-floor-ceiling coverings, and the increased use of windows and skylights. This shift toward lighter, brighter interiors, in part, is due to people maximizing on smaller rooms to offset the high cost of construction and remodeling. To offset the necessity of working with smaller spaces, many are lightening up their interiors, employing more windows, skylights, interior glass bifold doors and creating design options to bring a feel of openness and nature indoors. For this reason, manufacturers believe American consumers will continue to purchase quality-made artificial trees. Many also feel that birch, with its clean, white bark, will continue to be the tree trunk of choice by the consumer.
- 4) Nooks, crannies, out-croppings, and landings are "hot" interior design features employed across the U.S. for new housing starts and repair and remodel activity. These design features are also being incorporated by panelized and modular housing manufacturers throughout the U.S. Often, in an attempt to enhance the feeling of ceiling height, these design features tend to be in hard-to-reach places which are perfect for artificials.
- 5) Changes in the age and lifestyles of the American consumer make a marked difference in what products are sold. With a substantial increase in people who are 65 years and older, an increase in single-parent families, and an increase in two-career families with no children, the emphasis on interior decor products that are of high-quality and *easy to care for* become the product of choice for many consumers. Artificial trees are a perfect product choice!
- 6) Finally, manufacturers tell us there has been a surge in the use of artificial trees in the restaurant business throughout the U.S., especially in places with low lighting. The effect is to provide a more natural, private atmosphere to those dining.

Expert floral designers throughout the U.S. stated a strong preference toward the use of catkins in floral arrangements of all seasons and a preference toward more "natural looking branches", in contrast to the typically stiff, straight product that is usually delivered. The use of catkins in floral design trends should not be surprising, especially when considering the move toward asymmetry which has become so popular with the consumer:

- Catkins, drooping spikes of flower clusters which may be seen with clustered berries or cone growths on branch extensions, are viewed as having excellent potential in current and future floral markets throughout the U.S. Although questions regarding the "fastness" of the cluster (cone, berries, etc.) will need to be addressed by suppliers, the aesthetic qualities of catkins are not to be overlooked.
- Manufacturers are requiring more "natural looking" branches for use in floral, wreath, basketry, and specialty product manufacturing. This may pose some difficulty for suppliers because branches and twigs are usually shipped in tight, straight bunches to maximize product delivery and minimize freight costs. Keeping the branches and twigs in more a natural-look configuration may require paying more for less, as shipping costs per unit of product are likely to increase.

Based on the interview results for this project, several buyers indicated they were purchasing their branch, twigs, and tree top poles (birch) from local or regional sources who could provide the resource at a very competitive rate, and thus felt Saskatchewan materials simply would not be economically viable for them. Others, however, stated an immediate interest in establishing contact with material suppliers in Saskatchewan. As an example, The Naturals located in Colorado indicated strong interest in obtaining prices for receiving birch branches from



Saskatchewan (see *Exhibit A* for company details). The branches should be 6-8 ft long and 1/2 in to 1-1/2 in diameter at the base. The branches should be packaged in bundles (50-60 sticks per bundle) and must be shipped within two weeks of being harvested. Year-round demand was stated at two semiloads per week, 50 weeks per year. (1 semiloading = 238 bundles). The branches would be accepted with or without leaves. The buyer stated that winter branches have a "lustrous, waxy bark", preferred by the company. The product would have to be price competitive, but quality and ability to meet consistent quantity demand is critical. Representatives of this company also indicated an interest in setting up a brokering operation in Canada for these products.

Along the same vein, Calfolia of Quebec also indicated immediate demand for "trailer loads" of birch tree tops for two customers in Mexico where the birch species is considered an "exotic". (Note: other buyers interviewed for this project also noted Mexico as a strong market for birch branches and bark). The company markets branches and poles both as raw material and manufactured finished products. Their products are sold throughout Canada, in the U.S. (they have a warehouse in New York), and in Europe (an area where Canadian products are felt to hold excellent market potential). Materials are purchased worldwide. (Calfolia also plays a highlighted role in the discussion of demand for preserved branches and tree tops in this report.)

Less than six months ago, Mater Engineering personnel, when interviewing branch, twig, and tree top buyers across the U.S., discovered that the market demand for twigs and branches was increasing by 10%-15% annually. Recent interviews conducted for this project do not contradict those findings. In fact, one buyer from New Jersey indicated the demand for birch branches is so strong, they have six-to-eight week back orders for the material.

Birch continues to be the preferred species over willow and red osier, but buyers are quick to tell us the bark coloring of red osier is a popular additive to many manufactured branch and twig products. Aspen, alder, and poplar are also purchased.

Many buyers interviewed for this project expressed their growing concern over the birch beetle infestation hitting the birch species throughout the U.S. Midwest. This concern may open up unusual opportunities for Canadian suppliers of birch materials and products.

Although China is a leading exporter of finished products produced from birch branches and twigs and artificial birch trees, interviewees cautioned us about the "inferior" quality of the birch species from China. Nonetheless, the majority of buyers of specialty baskets made from birch branches, twigs, and bark indicated their product purchases were either imported from China or the Philippines. Figures are not available regarding the current volume of standing birch timber that China has because documentation of resource is not standard forestry practice in that country.

Several Canadian buyers stated they were currently purchasing their raw materials from Florida suppliers. Ironically, several buyers in Florida indicated an interest in receiving material samples from Saskatchewan suppliers. One such buyer (Preserve Botanicals) indicated he could purchase approximately three to five truckloads of birch and alder branches with foliage during the first year doing business with a supplier ("conservative estimate"), then increase the volume thereafter. Each truck carries approximately 35,000 to 40,000 lb (44,000 lb maximum). Branches need to be 3 ft to 4 ft in length and bundled. They should be harvested at the heaviest leaf-load. Harvesting would occur late June and July and foragers would have approximately 45 days to harvest material. Branches would need to be shipped by refrigerated truck.

Species competing with birch in artificial tree top trunks include dragonwood and wax myrtle from Florida, manzanita purchased from Vancouver, B.C. suppliers, and mountain laurel and mountain mahogany from California.

Competing branch species includes beech from Pennsylvania. Grapevine was not referenced as a desired species.

*Special Comments:*

- 1) Because transportation costs are such a critical factor for Saskatchewan suppliers, one New Jersey buyer suggested it would be less expensive to rent a 48 ft trailer and driver than transport the product using commercial freight lines. Garden State Foliage indicated they would be interested in seeing material samples from Saskatchewan and would consider the alternative product transport suggestion if they liked the material and price.
- 2) Canadian Foliage out of Ontario, Canada stated they also buy birch trees for toothpick production. The wood, they state, doesn't warp, and the grain is excellent. Further, there is an increase in demand for this product.
- 3) Based on interview results for this project, buyers who stated an interest in evaluating Saskatchewan non-preserved branches, twigs, and tree top trunks are (consult *Exhibit A* for business location and contacts):

Garden State Foliage  
 Canadian Foliage  
 Apache County Dry Goods  
 Vickerman Imports, Inc.  
 The Naturals  
 Preserve Botanicals  
 Calfolia  
 Silkcraft of Oregon

**Preserved Branches and Tree Tops:**

*General Observations:*

Two of the newest product areas of interest to buyers throughout the U.S. and Canada are preserved tree tops (with limbs and leaves), and preserved foliage (leafy branch). Without question, this area of newly preserved plants sparked direct interest from interviewed buyers, many claiming they felt that new preserved product was the future of the floral and evergreen industry.

Separate from the process of naturally drying florals and greenery, the area of new processing techniques for preserving all kinds of special forest products shows excellent promise in adding value to a raw product. As is true in the solid wood industry, the special forest products industry also must look for new ways to increase the value (and profit) on sales of products offered.

While processing techniques continue to be tested, the following overview provides some discussion on systems and technologies which are currently employed, and highlights some new technologies which may hold real promise for the future:

- a) **Systemic and/or full immersion preserving:** usually done in a glycerin-based solution. Depending on the cellular structure of the plant, the processor immerses either the stem or the full plant. Most processors are quite secretive in regards to their preserving "sauce"

formulas and many continue testing to find the right formulas for the right plants. Colors or dyes are often added to this solution, resulting in the colored plants often seen in many of the floral markets.

Of particular interest are those processors who are devising new formulas that are environmentally sound. One such processor located in Oregon has actually received approval from the state's Department of Environmental Quality to preserve in the field. With this approval, the processor is often able to place the plant in solution less than an hour after the product is harvested (instead of the 24 to 36 hours usually experienced). Immediate preserving has allowed this processor to reduce his product waste factor by at least 20%. Product waste factor is a term describing the amount of harvested product which does not "take" to the preserving because of the long lead time from field to solution. A 25% waste factor is typical for foraging operations that do not preserve in the field. The product this processor preserves (in this case salal) sells for about a 300% higher profit margin over the sale of the same amount of non-preserved salal. (Note: the 300% profit difference *includes* the added product cost of preserving the salal.) Another way to look at it is that the processor only needs to harvest 50% of the volume from the field when preserving the product in order to attain the same profit level that he would attain from the sale of fresh product.

- b) **Freeze-drying:** This technique for processing floral, botanicals, vegetables, and fruits has been employed for several years, although the technical aspects of the process continue to improve. In fact many florals and greenery sold in the market are freeze-dried. However, the process is often too costly for many florals (up-front capital for the equipment, time, and energy costs, etc.) Also, many plants and shrubs become too brittle and lose their natural color when subjected to this form of preserving. Even so, several plants are successfully preserved to meet market requirements through this method.
  
- c) **Microwave Vacuum Dehydration Technology (MIVAC):** This new technology is just being opened up to the market. Since 1978, California State University at Fresno has been involved in the development of this new technology. In 1988, they obtained private sector funds to establish a pilot plant facility on campus to demonstrate this new technology. The pilot plant was completed in 1992. MIVAC essentially couples microwave energy input with vacuum to produce innovative and unique dried product. The principles employed in this technology include microwave power which supplies the energy to uniformly heat the product, and vacuum which permits water to vaporize at significantly lower temperatures than typically required at atmospheric pressure. This process allows the product to maintain its fresh color, flavor, shape, and nutritional value with the added benefit of no chemical treatments for preservation. This new technology was initially created for application in food processing but recently has been tested for application in florals, boughs and evergreen preserving. It should be noted that a small MIVAC test unit is available in the POS plant located at the University of Saskatchewan.

There are a variety of reasons for the increase and continual demand for various dried and preserved plant materials. The design styles, greater use of the materials all year long, emphasis on the natural look, and improved methods of preservation all help to explain the increase. Additionally, the domestic products on the market have increased in quantity and quality in recent years.

The impression of dried and preserved materials has changed. Colors and lifelike freshness are much improved over the heavier colors of years past. The dried and preserved materials evoke

memories of times past in flowered fields, the tranquil moments of the woodland walks, and the essence of the out-of-doors.

Today, plant materials are entering an industry where change is continual. Designers are constantly looking for something new - which means some items experience a decline in use. The preserved flowers and foliages are often a stark contrast to the heavier pods used before.

Several issues need to be considered when choosing a preserving technique. Cost, time, product quality, and finished product demand are all critical factors.

Freeze-dried products have made an impact on the industry. Although the process is not cost-effective for all floral materials, it is a process that is here to stay and is growing as more flowers are being tested and perfected.

Air driers continue in popularity. Wild flowers often dry best this way.

Glycerin-based preservation techniques have improved in recent years, and the product line has expanded. Most companies guard their process closely.

Currently, the most common of preserved foliage products are the leafy oak branch and preserved evergreens such as ferns, bushes, and boughs. Usually these products are a glycerin-preserved product with the preserving process either accomplished by systemic or full submersion process. Of all those interviewed for this project, two product buyers exhibited especially strong interest for preserved Saskatchewan species. The first, Preserve Botanicals out of Florida, already has a preserving operation in their state. They currently purchase foliage branches from many parts of the U.S. including Minnesota, Wisconsin, Michigan, Oregon, Washington, North and South Carolina, and Florida.

Criteria for supplying Preserve Botanicals include price, quality and cleanliness of product; proper harvesting of product at the proper time for desired quality; proper packaging of product; truckload shipments only of product; and ability to service the quantity requirements within their time requirements.

At present they only preserve oak foliage, but new product testing is currently occurring in other states. This company stated a direct interest in receiving samples of Saskatchewan birch, alder, and aspen branches for testing.

Calfolia from Quebec, Canada, expressed not only strong interest in buying preserved product from Saskatchewan, but has indicated to Mater Engineering personnel strong interest in helping Saskatchewan set up a preserving plant in the province. Mr. Nelson Calfat of Calfolia expressed direct interest in establishing a plant preserving operation utilizing Weyerhaeuser-patented process (but improved).

Several years ago, Weyerhaeuser in Tacoma, Washington started a business making specially preserved plants. These included plants from the forest as well as cultivated species. These plants were subjected to a new plant processing technology which was originally developed in Sweden. Preserved plants created from this new technology were called "inscape" specimens. Weyerhaeuser used the trademark *Interiorized* on their new products.

Weyerhaeuser operated the facility for about five years and then discontinued it. One Weyerhaeuser researcher contacted for this project disclosed that the facility was closed because the technology proved too expensive for consumer product application. Other Weyerhaeuser contacts, however, suggest the closure was more due to management's decision to discontinue

nursery-related business. The engineer in charge of the process reported that the operation was on the verge of profitability when it was shut down.

When Weyerhaeuser began, the technology was not completely developed, but reportedly at the time of closure, the company had improved the process to the point of producing consistent quality. The process, however, did cost more than traditional plant drying processes.

The equipment was originally sold to someone who set up operations in Australia. Mater Engineering has been informed that the business did close, was divested, and then liquidated.

When interviewed, several Weyerhaeuser executives stated they believed that the only plant in the world still using the preserved plant technology is a small company making preserved palm trees in Valencia, Spain. A Dutch company, Shemex, is said to be repackaging and distributing those products. Although Weyerhaeuser still owns the patent on the original technology, indications are that there is no corporate interest in diversifying from their current business activities.

Calfolia's interest in Weyerhaeuser's preserving technology is not new because the company actually purchased four trailer loads of the original preserved product produced from the Weyerhaeuser technology seven years ago and stated it was of high quality. The preserved florals did have a larva problem but the preserved trees were consistently excellent.

Calfolia stated they have the ability to ship twenty loads of preserved aspen trees right now if the product were available. They also state they have three other projects which could use preserved trees immediately, and have just recently shipped preserved palm trees to Rome, Italy. According to Mr. Calfat, preserving whole trees is the next logical product. Further, the demand for preserved foliage could match the demand for preserved trees.

In later conversations with Mr. Calfat during the course of this project, the following has been learned:

- 1) Calfolia is aware of more advanced, simplified technology which has been applied to the original Weyerhaeuser preserving technology. At least two other companies are successfully employing this more simplified preserving technology;
- 2) Mr. Calfat states there is "definite interest" in pursuing this operation. He says that other contacts he has made since initial discussions with Mater Engineering personnel also indicate high interest;
- 3) Calfolia has apparently tracked down the current location of the original preserving equipment and has indicated the equipment is available for purchase. The company reportedly also has access to the formulas for preserving;
- 4) Calfolia is interested in assisting Saskatchewan in establishing a plant preserving operation. Their primary interest is to ultimately serve as the marketing agent for the preserved products which would be produced. As such, they have indicated a willingness to act as an agent between Saskatchewan and those who currently own the equipment and preserving formulas.
- 5) Mr. Calfat asks the following questions for consideration:
  - a. Is there any interest in Saskatchewan to undertake such a project? If so, what is the level of interest and who might be involved?

- b. Are there people "on the sidelines ready to go?" Is there a structure (building) in place which could house a processing plant, or would one have to be built?
  - c. What species would Saskatchewan want to concentrate on? Would all the preserving formulas be required (including floral preserving formulas, etc.) or just some targeted tree species?
  - d. What funds might be available to undertake such a project?
- 6) Many buyers indicating an interest in preserved product stated that the actual cost of preserving product will vary, in some cases, dramatically according to the many factors including:
- a) species being preserved;
  - b) type of preserving process employed;
  - c) if dyes are added to the preserving process, lead times for product preserving will vary;
  - d) length of time between the harvesting of the species and the preserving application.

As such, estimating costs to preserve can not be generalized. However, as an example, experience by some buyers interviewed during this project reveals the following costs applied to preserving salal from the Pacific Northwest:

- The cost of the "sauce" used in preserving the salal equals approximately \$.75 per pound (U.S.\$) of material processed;
- The cost of labor required to preserve the material equals approximately \$.30 per pound (U.S.\$) of product processed;
- On a per gallon bases, the materials and labor cost for preserving the salal equals approximately \$3.90 per gallon (U.S.\$) (excluding the cost paid to the forager of the product).

*Special Comments:*

Other companies interviewed for this project which expressed interest in expanding preserved foliage product lines include:

W.J. Cowee, Inc.  
 Winterwoods  
 Knud Nielsen  
 Kirby Floral  
 Northwest Botanicals

## Birch Bark:

### *General Observations:*

Birch bark has been available for several years. Many buyers interviewed for this project did state the demand for birch bark products is still "high" or "stable". This is in large part due to the continuing popularity of the country-western/lodge look now prevalent in interior design throughout the U.S., Europe, and Japan. Some buyers did caution that demand for birch bark would decline in coming years because of the current high visibility of the products manufactured from the bark.

Several basket and container buyers interviewed for this project stated they currently purchase birch bark products from the Orient, primarily mainland China. Most stated that the containers and baskets are made from birch that is grown in Manchuria. These containers from China continue to be popular with the American consumer and are extremely cost competitive because of lower worker pay.

Although the conventional wisdom is that the raw material comes from China, at least one buyer mentioned a depletion of birch resource from China, and several said they are purchasing product from Hong Kong. This should be of particular interest to Saskatchewan material suppliers as Mater Engineering has learned of orders placed by Hong Kong buyers a few months ago with Minnesota birch bark suppliers for over 60,000 ft<sup>2</sup> of birch bark flats to be delivered to Hong Kong. This may be an avenue worth pursuing, especially since there appears to be ample concerns regarding the beetle infestation in birch coming from Midwest states such as Minnesota. A collaborative effort between Minnesota providers of birch bark to Hong Kong buyers may be quite feasible. Further, it may be reasonable to continue making contact with other manufacturers of birch bark finished product in Minnesota such as Lady Slipper Designs. Saskatchewan material suppliers have already been in touch with this company. Lady Slipper Designs requires that the birch bark be delivered in flat sheets of various thicknesses and that it needs proper storage facilities. Because this company produces quality finished product they would need to create new designs for the material if it's supplied to them, and would have to find people willing to manufacture the newly designed product(s). This suggests that the opportunity may exist for Saskatchewan material suppliers to produce quality finished bark product for either selling direct to Lady Slipper Designs, or having Lady Slipper Designs act as the marketing agent for Saskatchewan products. Lady Slipper Designs has been in the business for some time and has a product catalog and complete marketing network already established.

From discussions with Lady Slipper Designs during this project, there appeared to be some interest for Saskatchewan birch bark sleeves. However, company representatives stated that their Saskatchewan contacts appeared to be "unclear as to the price they would require for the bark sleeves". Lady Slipper Designs also references their concern over the birch bark beetle infestation in their own birch supply, and stated they would need to look at options in the near future.

Finally, Lady Slipper Designs emphasizes the requirement for consistent material quality over several years as a primary decision factor in purchasing birch bark from outside sources.

Several buyers said that it's important to provide new product designs to potential buyers, even when supplying only raw materials. One buyer from Ontario, Canada (Floridus) suggests Saskatchewan material suppliers look at producing birch bark strips that can be used to cover containers as accent pieces as a possible value-added product.

Several buyers suggested that Saskatchewan material suppliers should look at producing value-added product from their raw materials and should target their value-added product quality to a high-end niche market.

Birch bark sleeves and flats are the most common forms of material supply, but some suppliers are employing different methods of processing for birch bark product development. One such company is W. J. Cowee, Inc. This company produces birch bark containers from their own birch timber holdings. Instead of peeling the bark from the birch logs, the company cuts the outside slabs of the log (called jackets). The slabs with the bark are then kiln dried so they don't crack or warp, and then manufactured into floral containers. These containers have been on the market approximately two years and continue to be good sellers, again because of the popularity of the lodge look with product buyers.

*Special Comments:*

- 1) One product buyer in California stated that while birch bark containers continue to be quite popular, they have had some problem with the birch bark sleeves when they dry. They state that the inner bark "curls" towards the outside white bark.
2. Buyers interviewed for this project who indicated an interest in evaluating birch bark material and products from Saskatchewan include:

GBC-LA Floral Accessories  
Lady Slipper Designs  
The Naturals

**Oils/Extracts:**

*General Observations:*

Research and interview work conducted during this project regarding the use of needles, wood, sap, and bark from Canadian balsam fir, white and black spruce, and jack pine disclosed strong interest in oils extracted from these species for use in the manufacture of cosmetics, fragrances, flavorings, floor polishes, and disinfectants.

The soap and detergent industry, which is a consumer of wood oils, had sales of \$14 billion (U.S.\$) in 1991, an increase of 3.2% over the previous year. Exports have been increasing, totalling \$487 million (U.S.\$) in 1991, while imports have been decreasing. Increased automation over the years has given the industry a competitive edge in global markets. The soap and detergent industry is highly competitive, but also relatively stable. Significant potential for market growth exists in both industrialized and developing countries.

Environmental concerns have forced changes in the industry. One of the changes has been a surge of concentrated, more powerful detergents that require less packaging material. Of significance in the role of oils is the trend to natural soap, away from dependence on petrochemicals.

The toilet preparations industry consists of five sections: shaving preparations, fragrances, hair preparations, dentifrices, and cosmetics. The industry also includes establishments engaged in compounding perfumes – both synthetic and essential oils. The value of industry shipments in 1991 was estimated at \$16.8 billion (U.S.\$). The industry is highly competitive with more than 500 companies marketing in excess of 20,000 brands. Of significance to potential wood oil sales



is the increased tendency, prompted by environmental concerns, to switch from using animal by-products and chemicals to more plant materials. Vegetable dyes and proteins are being utilized to promote mildness and reduce toxicity.

The "color market" – lipstick, blush, eye shadow – is projected to increase about 10% per year. Hair coloring shipments will also increase as hair coloring is increasingly used. In shampoos, as with other preparations, there is a trend toward using natural raw materials and conditioners.

It is expected that product claims will require more backing by clinical and other trials. There is increasing demand for products such as skin preparations containing sun screens, hair coloring, and plaque-reducing dental products.

The fragrance preparations industry has joined other American industries in restructuring through mergers and acquisitions. Although there was an increase in the number of companies operating in the toilet preparations industry from 596 in 1982 to 649 in 1987, currently the total number is decreasing. Companies in the beauty business have found that acquiring an established brand is most often less expensive than developing a new one. Consequently, significant changes in retail market shares have occurred in the fragrance industry. Mergers have positioned the industry for a global marketplace, including markets in Latin America, Eastern Europe, and the Pacific Rim. Sixty-two percent of the \$2.6-billion American retail market is controlled by the top five fragrance makers, in contrast with 46% market share in 1981.

The "prestige" cosmetic and fragrance manufacturers share the worldwide annual \$8 billion (U.S.\$) prestige market. One-third of worldwide cosmetic sales and more than half of perfume sales are in the prestige category.

Although the worldwide prestige market for fragrances has been growing at 10% a year, new emerging markets promise additional growth of the fragrance industry, which in turn, reflect added growth for the oils industries. These new markets include:

1. Men's fragrances: U.S. growth in these fragrances has been 5%, but European growth is reported about twice that amount.
2. The ethnic cosmetic market: Increased interest in ethnicity has been reflected in this market. The domestic Asian population is growing by 65% a year with the highest per capita incomes of any ethnic group in America. Many cosmetics formulated for white skin are not appropriate for other skin tones.
3. The teen market: Young girls are wearing jewelry and styles, formerly reserved for more mature women and they are interested in the cosmetics that go with them.
4. Home fragrances: Sales of home fragrances have increased faster than any other fragrance uses, including potpourri aerosols and plug-in gel forms of potpourri.
5. Increased interest in aromatherapy: Based on recent research findings that people concentrate better if they receive regular puffs of perfume, some companies have already introduced aromatherapy lines. Aveda produces aromatherapy hair, skin, and bath products, and Estee Lauder markets Origins Natural Resources. Evidence that aroma is gaining recognition as an aid to a sense of well-being is the new focus on sensory therapy.

It is believed that a major opportunity may arise from fragrances released into factories and banks where workers do repetitive jobs. Perfume spraying may benefit patients in nursing homes and hospitals. Subway and prison stress may also be relieved by controlled fragrances. The Shimizu Corporation, the fifth largest Japanese construction company,

recently was awarded a patent for a computer system to deliver fragrances to large buildings through their ventilation systems. Shimizu cooperated with the Japanese fragrance house, Takasago, in exposing key punch operators to a lemon scent and a lavender scent. The error rate among key punch operators fell nearly 50% after exposure to a lemon scent and to a remarkable close to 80% after exposure to lavender.

Over 30 oils buying companies worldwide have been contacted thus far for interviews for this product area. While Mater Engineering continues to receive information from several of these companies (including international inquiries from France and Switzerland), the information obtained to date has been most revealing.

**Balsam Fir (*Abies balsamea*):** Interest in the use of Canadian balsam fir needles (especially from Northern Canadian climes) for oils extraction appears quite good. The oils extracted from the needles of this species is currently being used in the manufacture of cosmetics, fragrances, and flavorings. The balsam aroma is an international fragrance, according to interviewed buyers. The needles can produce what is called an absolute (extremely high grade) oil or extract. The tree itself is tapped for its sap or resin. Both oil and sap are sold in 25 lb drum quantities. From the oils processor, the oils are then sold for approximately \$20/lb (U.S.\$) (depending on quality and product application).

Several of the oils and raw material buyers interviewed for this project repeatedly emphasized quality consistence of the oil as a top priority in raw material selection. Weather conditions, growing elevations, and soils conditions are just a few items that can dramatically affect material quality, even among like species. For that reason, buyers tell us there are fundamental differences between balsam grown in southern Saskatchewan and balsam grown in northern Saskatchewan. The buyers tell us the balsam grown in the northern climes are preferred because they produce a purer grade of oil. Oil quality and purity are essential for application in the fragrance and cosmetics industries.

Competitors to Canadian balsam fir currently on the market include balsam firs from Oregon, Peru, and Siberia.

Buyers stipulate that harvesting of the balsam fir needles must be done during the winter months between October through April, when the tree is dormant. This is when the oil concentration is the highest in the needles, and the quality is at its best.

Regal Research Laboratories plans to open an oils extraction plant in Prince Albert, Saskatchewan, and provided the following information regarding processing.

Balsam fir boughs having twigs and needles and a stem diameter up to 1/2 in are removed from trees. The boughs are then processed into chips. The bigger stem pieces and debris are left on the ground, the chipped twigs and needles are delivered to the oils processing plant. The oils processing plant in Prince Albert is expected to utilize one ton of chipped product at a time. It takes a couple of days to process the oil.

Because the conifer boughs are harvested during the winter months, the boughs or chips can be stockpiled up to six weeks before they need to be processed into oil.

Regal Research Laboratories states that they have shipped samples of balsam fir needle oil to their clients and are awaiting sample approval before they begin full production. Once approval is received they will be able to determine overall quantities of raw material required and corresponding material prices. The company has already been in contact with Weyerhaeuser officials to gain access to balsam fir needles and twigs for oils production.

Regal Research Laboratories stated that testing is currently being conducted on balsam wood and bark to ascertain opportunities for oils extraction, quality characteristics, and ultimate product application. As of the writing of this report, so far, test results on oils extracted from balsam fir needles in the study area have not been conclusive. New testing has been required due to variations in oil grades derived from the first test. The company is also conducting additional research on oil extracts from balsam fir needles from southern locale.

Cedaroma of Quebec, Canada is another company manufacturing oils from Canadian balsam fir needles and cedar leaves. The cedar leaf material comes from British Columbia, and the balsam fir needles are collected from an eastern township of Quebec. This company is interested in receiving needle samples from Saskatchewan for testing. The company receives a shipment of needles every week and requires 1 to 2 tn of material to fill their oils processing container. The company states they sold 53,000 lb of balsam oil this year (1993). Much of the oil is sold to the U.S.

Botanicals International located in New Jersey stated they would be interested in receiving samples of Saskatchewan balsam fir sap. The sap is tapped from live trees, much the same as syrup processing. Only a small amount of sap flows from each tree. The sap is strained before it is placed in containers. Like the needles, the sap is only tapped during certain times of the year. Typically, the sap is bought in 25 lb containers. Approximately 220 lb of sap are purchased yearly from northwestern Canada by this company.

Bell Flavors & Fragrances in New York states they purchase approximately 150 to 200 lb of Canadian balsam fir needle extract annually. They currently purchase this oil from Polarome Manufacturing Company based out of New Jersey. They indicated an interest in evaluating balsam fir needle oil produced from Saskatchewan materials.

Liberty Natural Products in Oregon purchases their balsam fir needle oil from Peru.

Responding to an inquiry from Mater Engineering personnel, the Robertet - Grasse - France company in France has requested additional information on Canadian balsam fir needles. They have indicated an interest in purchasing the raw material and state that their use of balsam fir needle oil is "several hundreds of kilograms" per year.

**White and Black Spruce** (*Picea glauca* and *Picea mariana*): Regal Research Laboratories was the only company interviewed for this project working with oil extracts from white and black spruce. The company states there is demand for this oil, although it has not been used extensively in the past. The lab is interested in moving this oil into a higher price and quality market. According to Mr. Jeff Johns of Regal Research Laboratories, black and white spruce from northern Saskatchewan is unadulterated and more pure than spruces found in southern locations. The oils from these species have already been analyzed, and samples have been sent to the largest fragrance house in Europe. Johns suggests that the spruce in the Cyprus Hills area of Saskatchewan needs to be analyzed to see if it can be produced into a different oil which may also be marketable.

**Jack Pine** (*Picea banksiana* Lamb.): In the past, the Russians have extracted the resin or sap from jack pine and lodgepole pine for use in the fragrance and perfume industry.

Regal Research Laboratories indicates they are currently being "inundated with requests for this product." The resin is used as an intermediary in perfumes and is also used in high-price hand soaps and shampoos. The oil extracted from the needles of this species is used in disinfectants and

floor polishes. Mr. Johns states that the new processing plant in Prince Albert will also be processing these needles for oils production.

**Tamarack (*Larix laricina*):** Regal Research Laboratories indicates that next year they plan to research northern tamarack for its yield and quality in oils production.

For this study, Weyerhaeuser Canada Ltd. has provided preliminary information detailing an approximate balsam and spruce needle biomass of 500,000 m<sup>3</sup> annually for possible use in oil extraction. Assuming a specific gravity of .35 (similar to the specific gravity of southern pine species), under specified environmental conditions 1 cu ft of Weyerhaeuser biomass might equal 21.8 lb. Therefore, one m<sup>3</sup> would equal approximately 770 lb. At 500,000 m<sup>3</sup>, the potential annual biomass weight available for oil production could be 385 million lb or 32 million lb/month. With an assumed oil yield of 1% of biomass weight, a very preliminary estimate of potential oil production per month is approximately 320,000 lb or 12,800 drums of oil.

### Product Income and Cost Considerations

The attached *Product Sales Prices* (see Table 3) provides an overview of the price ranges paid by purchasers of Category 1 products. Price ranges detailed in the Table are based on the interviews conducted for this project throughout the U.S. and Canada. Regarding the sales prices listed, the following should be noted:

- 1) Prices listed may vary according to actual quality of product that can be provided from the Saskatchewan project area. Other factors affecting pricing will include the capability of the supplier to provide **quantity** of material on demand, and reliability of product **quality** and delivery. Confidence in the reliability and professionalism of the material supplier will also play a leading role in purchase price consideration.
- 2) Many purchasers indicated price structures for a first year trial. That is, with a new product supplier, the purchaser will want to be assured of consistency in product quality and ascertain the overall professionalism of the supplier. Almost all product purchasers predicted an increase in volume requirements for in later years once a "comfort zone" with the supplier has been established.
- 3) For some interviewees, there may always be a reluctance to relate the *actual* price they may be willing to pay for product. For example, an interviewee who is willing to discuss average prices paid for product might be inclined to tell you *what they are hoping to pay* for the product, not necessarily *what they are willing to pay* assuming product quality, volume, and supplier reliability are good. Conversely, it could be safely assumed that an interviewee would not be inclined to indicate a top price they may be willing to pay for product. Therefore, prices detailed in Table 3 may be negotiable.

Based on interviews conducted for this study, the attached *Usage/Demand Matrix* (see Table 4) provides an overview of the estimated annual product usage and immediate additional annual demand indicated by those product purchasers wishing to evaluate Saskatchewan product. It should be noted that the volumes listed in this *Matrix* represent actual values stated by those interviewed who were willing to provide this information. In several cases, product purchasers were reluctant to discuss annual volume of product they purchase, and even more reluctant to discuss possible purchase prices for Saskatchewan product without first seeing the product. Even so, it is interesting to note that over \$1,500,000 (U.S.\$) in income opportunity appears to exist in the study area, according to interviewees who were willing to share volume and purchase price information.

**Table 3**  
**Product Sales Prices Based on 1993 Interviews**  
**(delivered costs)**

(Cdn\$) = Canadian currency  
 (p) = price paid to harvester/first-line processor  
 (s) = wholesale price

<i>Item</i>	<i>Location</i>	<i>U.S.\$/Unit</i> <i>(unless otherwise noted)</i>	<i>Comments</i>
<b>LYCOPODIUM</b> (Ground Pine)	East Coast, USA	\$2.00-\$2.50/k (p) (\$1/lb)	Buys from India preserved; dyed; cut to 1 in to 2 in pieces
	West Coast, USA	\$1.50/lb (s)	Preserved/dyed
	East Coast, USA	\$1.00/lb (p)	Preserved; receives approximately 2,000 lb/year; shipment every 3 months - 25 lb bales
	Southeast Coast, USA	50¢-80¢/lb (p)	6 in to 10 in length dry or fresh; sell thousands of lbs/year
	Eastern USA	35¢/lb (p)	Fresh - then treated at the plant; dry product goes to Europe
	Eastern Canada	38¢/lb (Cdn\$) (p)	Past years price has been 42¢-43¢/lb (C\$)
	East Coast, USA	25¢/lb (p)	Fresh; sells \$2-3 million worth/year

**Table 3 (Continued)**

**Product Sales Prices Based on 1993 Interviews**

(delivered costs)

<i>Item</i>	<i>Location</i>	<i>U.S.\$/Unit (unless otherwise noted)</i>	<i>Comments</i>	
<b>MOSSES</b>	Eastern USA	\$12-\$16/cubic ft (s) (92¢/lb)		
	West Coast, Canada	\$6-\$10/bag (C\$) (p) (40¢/lb C\$)	Dry; 1 bag = 2-3 cu ft; not sold by weight	
	West Coast, Canada	\$4/every 2 cu ft (Cdn\$) (p) (26¢/lb Cdn\$)	Dry; moves approximately \$10,000 of moss/month throughout the year (5,000 cu ft/month)	
	West Coast, USA	\$13-\$25/bale (\$1/lb sphagnum) (p) \$2/lb (longbeard) (p)	25 lb bales; dry; 800 bales every 6 weeks; 16 in x 16 in x 20 in = bale	
	Southeast Coast	\$1.00/lb (dry) 50¢-80¢/lb (fresh) (p)	Fresh - needs preserving	
	Eastern USA		\$1-\$2/lb (sheet moss) (p)	Dry; clean
			\$1/cu ft (reindeer moss) (p)	Glut on the market

Table 3 (Continued)

Product Sales Prices Based on 1993 Interviews

(delivered costs)

<i>Item</i>	<i>Location</i>	<i>U.S.\$/Unit (unless otherwise noted)</i>	<i>Comments</i>
<b>BRANCHES (non-foliage)</b>	East Coast, USA	\$50/1000 branches (5¢/branch)	Birch and alder; 3 ft to 4 ft length; 25 branches per bunch; leaves must be removed
	Southeast Coast	20¢/lb (p) (8¢/branch)	3 ft to 4 ft length; alder and birch; 3 to 5 truckloads first year; increase thereafter
	Southern USA	\$2.50/bunch (p) (10¢/branch)	Purchased from West Coast; 18 in to 36 in lengths
	Midwestern USA	\$2 to \$4/bunch (p) (8¢ to 16¢/branch)	Birch - either 36 in length or 12 in to 18 in length
<b>BRANCHES (with foliage preserved)</b>	West Coast, USA	\$4.55/5 branches (p) 91¢/branch	Preserved
<b>TREE TOPS</b>	West Coast, USA	\$1.25/each (p)	Mountain laurel; mountain mahogany; 6 ft to 8 ft or 10 ft to 12 ft lengths; with branches
	West Coast, USA	64¢ to 80¢/each (p)	Alder; 8 ft length; 2 in diameter; bundles of 10; buys semiloads; 10,000-13,000 tops/semiload
		\$1.50/each (p)	Birch; 10 ft to 12 ft length; 2 in to 3 in diameter
	Eastern Canada	\$5.00/each (p)	Buys from Florida (wax myrtle); 6 ft to 8 ft length; 2 in diameter; purchases 50 tops at a time

**Table 3 (Continued)**  
**Product Sales Prices Based on 1993 Interviews**  
**(delivered costs)**

<i>Item</i>	<i>Location</i>	<i>U.S.\$/Unit</i>	<i>Comments</i>
<b>TREE TOPS</b>	Midwestern USA	80¢/each	Birch; 10 tops/bundle
<b>HORSETAIL</b>	Eastern Canada	\$6.50/bunch (Cdn\$)	25 stems/bunch; 10 in to 12 in long; 24 bunches/case
	Midwestern USA	70¢/lb (botanical use) (p)	Purchased from Hungary



Table 4

## Category 1 Species

## Usage/Demand Matrix

(Based on Interview Results Where Actual Volumes Were Given)

<i>Product</i>	<i>Annual Usage</i>	<i>Immediate Additional Annual Demand</i>	<i>Estimated Income Based on Additional Demand (U.S.\$)</i>
Mosses (peat, sheet, long beard)	330,242 lb	181,017 lb	\$222,651 (\$1.23/lb)
Branches (no foliage)	2,400,000 branches	1,400,000 branches	\$224,000 (16¢/branch)
Branches (preserved foliage)	617,424 branches	455,000 branches	\$413,636 (91¢/branch)
Tree Tops (poles only)	280,080 tops	41,600 tops	\$52,000 \$1.25/top
Lycopodium (Ground Pine)	4,641,495 lb	530,000 lb	\$662,500 (\$1.25/lb preserved)
Birch Bark Flats	unknown	2,776 cases plus 62,000 sq ft of bark	unknown

## Transportation Costs as a Product Pricing Factor

The crucial issues in evaluating the feasibility of implementing special forest products economic development in Saskatchewan are seasonal access to the resource, and the availability and cost of transporting the product from point of origin to its final destination. Over 10 freight forwarding companies throughout Canada and the U.S. were surveyed regarding transport of Category 1 special forest products from Prince Albert, Saskatchewan to 10 destination points throughout Canada and the U.S. (see **Exhibit A** for listing of freight forwarding companies interviewed). Destination points were selected based primarily on the locations of product buyers interviewed for this project who indicated an immediate interest in evaluating Saskatchewan products. Obtaining a good geographic distribution of destination points throughout Canada and the U.S. was also a decision factor in destination point selection.

Assumptions used for obtaining costing information from each of these companies and in deriving calculated product transport costing data are detailed in **Table 5**. Logistics and costing data received from the interviewed freight forwarders, and analysis of that data concludes the following:

- 1) Depending on location of product destinations, using trucks and truck/rail combinations is necessary in order to gain maximum cost benefit. For the 10 destinations evaluated in this report, the trucking/rail combinations proved more cost effective for product transport to New Jersey, Florida, and Texas. All other destinations had cost-effective truck transport opportunities (see **Table 6** for transportation cost breakdown per destination.)
- 2) Prices were requested for product transport by dry van, refrigerated van, and flatbed, as Category 1 products required all three modes. Costing breakouts per mode of transport per end destination are detailed in **Table 6**.
- 3) Transportation costs per product unit have been calculated and are represented in **Table 7**. Per unit costs were based on an averaging of transport costs for dry van, refrigerated van, and flatbed. In other words, the costs will be slightly high per unit if the actual product transported only requires a flat van. Conversely, if the product requires a refrigerated unit, the stated costs per unit will be slightly low.
- 4) The direct correlation of transportation costs to product purchase prices are detailed in **Table 8**. The importance of evaluating transportation costs for Saskatchewan special forest products is clearly evidenced in this Table.

As a point of interest, it may be worth noting that Geo. S. Bush & Co., Inc. based out of Portland, Oregon, and Arnold Brothers based out of Winnipeg, Manitoba, Canada consistently proved to be the most competitive in product transport from Prince Albert to all 10 destination points employed in this study's evaluation.

## Value-Added Considerations

What becomes clear in evaluating the cost of product transport alone is the necessity for Saskatchewan interests to seriously consider the benefits of adding value to available special forest products resources. Important benefits of adding value to the resource include:

- 1) Becoming less reliant on "commodity" product price structures which often can produce tight profit margins. As an example, **Table 3** details the cost differential between non-foliaged branches selling for significantly less than foliaged branches which have value added to them through preserving.

Table 5

<b>Transportation Assumptions Used in Costing Analysis</b>
--

- 1) Average semi truck size = 48 ft long; 8 ft-10 in high; 98 in wide
- 2) Volumes per semi based on results of direct interviews for this project in accordance with proper packaging requirements for stated product (bale size for mosses; bundle amounts for branches, etc.).
- 3) Above rates are based on one way movements and trucks as available at origin.
- 4) In the event protection from weather is necessary for flatbed loads, add an additional fee of \$45.00 (U.S.\$) per truck for tarps.
- 5) Maximum cargo weights per truck are as follows:

<u>Dry Van</u>	<u>Refrig</u>	<u>Flatbeds</u>
46,000 lb	44,000 lb	48,000 lb

*Note: Above weights will fluctuate depending on the actual truck tare weight at the time of loading. Above weights are offered as a general and minimum guide.*
- 6) Transit times would be best possible based on driving conditions and subject to maximum driving hours allowed daily by federal and provincial law. A general method of calculating transit times is an average of 500 miles per day.
- 7) Rail/truck rates apply to dry cargo loads only (non-refrigerated). Load and unloading time allowed is two hours at origin and destination. Load weight limits would remain at approximately 44,000 lbs.
- 8) U.S. duties for the commodities offered are nonexistent provided the intended use of product is "suitable for ornamental purposes". "Other" uses would result in an 11% duty if other than Canadian origin, and a 5.5% duty for Canadian origins.
- 9) U.S. Customs Clearance Fee                      \$110.00 (U.S.\$) per truck load
- 10) USDA Clearance Fee                                \$25.00 (U.S.\$) per truck load
- 11) First Time Set Up Fee                              \$50.00 (U.S.\$)
- 12) Annual Importers Bond                            \$450.00 annually (U.S.\$)  
*Note: A single entry bond can be provided on a per shipment basis at a cost of \$3.00 (U.S.\$) per 1000 of value plus duty.*
- 13) Cargo insurance can be provided on an "as needed basis"; carriers usually provide a standard coverage that may or may not be sufficient.
- 14) In the event U.S. Customs demands to inspect shipment, costs incurred are for the account of the importer. Past experience has shown that inspections can result in costs that can range between \$70 to \$700 (U.S.\$) per load, depending on the extent of the inspection. Customs inspections occur in the case of new importers, or if questions occur at the time of declaration to U.S. Customs. This cost is usually not repetitive unless problems are detected.

**Table 6**  
**Transportation Costs (U.S.\$) from Prince Albert, Saskatchewan**  
**(November, 1993 values)**

**Truck: (48 ft Containers)**

<i>Destination</i>	<i>Miles</i>	<i>Dry Van (U.S.\$)</i>	<i>Refrigerated Van (U.S.\$)</i>	<i>Flatbed (U.S.\$)</i>
Antigo, WI	1,118	\$1,295	\$1,325	\$1,325
Jackson, NJ	2,127	\$2,765	\$2,800	\$2,775
Casselberry, FL	2,455	\$2,950	\$3,250	\$2,875
Goldthwaite, TX	1,807	\$2,200	\$2,450	\$2,200
Denver, CO	1,070	\$1,550	\$2,075	\$1,550
Encinitas, CA	1,921	\$2,275	\$2,625	\$2,250
Salem, OR	1,266	\$1,600	\$1,775	\$1,600
Owen Sound, ON	1,857	\$1,900	\$2,050	\$1,900
St. Laurent, PQ	2,114	\$2,175	\$2,475	\$2,220
Burnaby, BC	950	\$1,500	\$1,550	\$1,525

**Truck/Rail: (45 ft Containers)**

<i>Destination</i>	<i>U.S.\$</i>
Antigo, WI	\$1,600
Jackson, NJ	\$2,068
Casselberry, FL	\$2,512
Goldthwaite, TX	\$1,988
Denver, CO	\$2,007
Encinitas, CA	\$2,840
Salem, OR	\$1,968

Table 7

Averaged Transportation Costs (U.S.\$) Per Unit of Product

Based on 10 Destination Points in the U.S. and Canada (Origin: Prince Albert, Saskatchewan)

Truck

Destination	Tree Tops (per top)	Branches(non-foliage) (per branch)	Branches (w/foliage) (per branch)	Mosses	Lycopodium
				16" x 16" x 22" bale (per lb)	14" x 30" x 10" box (per lb)
Antigo, WI	13¢	9¢	11¢	7¢	5¢
Denver, CO	17¢	12¢	14¢	9¢	7¢
Encinitas, CA	24¢	17¢	20¢	12¢	9¢
Salem, OR	16.5¢	12¢	13.5¢	8¢	6¢
Owen Sound, Ontario, CAN	19.5¢	14¢	16¢	10¢	7¢
St. Laurent, PQ, CAN	23¢	17¢	19¢	11¢	9¢
Burnaby, B.C., CAN	15¢	11¢	13¢	8¢	6¢

33

Truck/Rail

Casselberry, FL	25¢	18¢	21¢	13¢	10¢
Goldthwaite, TX	20¢	14¢	17¢	10¢	8¢
Jackson, NJ	21¢	15¢	17¢	10¢	8¢

**Table 8**  
**Transportation Costs as a Percent of Product Sales**

<i>Product</i>	<i>Transport Costs Per Unit</i>	<i>Product Sales Price</i>	<i>Transport Costs as a Percent of Product Sales</i>
Branches: non-foliage	(U.S.\$) 9¢ - 18¢/branch	(U.S.\$) 5¢ - 16¢/branch	Best case = 56%
Branches: w/foliage & preserved	(U.S.\$) 11¢ - 21¢/branch	(U.S.\$) 91¢/branch	Approximately 18%
Tree tops	(U.S.\$) 13¢ - 25¢/each	(U.S.\$) \$1.25 each	Approximately 20%
Moss (Dry) [sphagnum; sheet; long beard]	(U.S.\$) 7¢ - 13¢/lb	(Cndn\$): 26¢ - 40¢/lb (U.S.\$): \$1.23/lb	(Cndn\$)=approximately 33% (U.S.\$)=Approximately 11%
Lycopodium (Ground Pine)	(U.S.\$) 5¢ - 10¢/lb	Fresh: (Cndn\$) 38¢/lb (U.S.\$) 47¢/lb Preserved: (U.S.\$) \$1.25/lb	Fresh: (Cndn\$)= Approximately 18% (U.S.\$)= Approximately 15% Preserved: (U.S.\$)= Approximately 11%

Even with the added cost of preserving, the profit margins are significantly better for preserved product, according to those interviewed for this study.

- 2) The potential for niche product development. As an example, the use of birch bark flats and/or sleeves in floral baskets is fairly common (see Figure 1). For those looking to decrease product competition and tap creative niche market demand, new designs and product options are called for.

Converting birch bark sleeves into unique bird houses or interior decor lamps with wildlife accents is an example of value-added product development servicing niche markets (see Figure 1). Employing birch bark strips for picture frames (see Figure 2) and creating unique birch log candles (see Figure 3) are all examples of value-added birch products commanding excellent prices in the high-end niche market arena today. Detailing cultural history and distinctiveness in product development can also command excellent niche market prices. It can also create added opportunities in product marketing by private non-profit organizations dedicated to providing financial and economic development assistance to Native Indian pursuits. One example might be the development of Saskatchewan birch products which incorporate the beautiful birch bark "bitings" of the Plains Cree.

- 3) Opportunities to conduct direct product marketing to prospective retailers, especially those in the high-end niche catalog market. Many niche product producers are discovering that one of the fastest growing product distribution channels today is high-end mail order catalogs. Within the U.S. alone, there are over 10,000 product catalogs serving over 100 million Americans annually who prefer to shop by catalog. In 1992, the total product sales in the U.S. achieved through mail order catalogs was estimated at over \$55 million (U.S.\$).

There are several steps that a manufacturer or potential vendor must take in order to get a product sold through a direct mail order catalog. First, the manufacturer must submit product information in writing, including a photo, pricing information, sales history data (if available), and a detailed letter describing the product. The manufacturer must send the product to the appropriate buyer. A manufacturer can call the office headquarters of the catalog and find out who the appropriate buyer would be.

If, after reviewing the literature, the buyer is interested in purchasing the product, he/she will order a sample. If the product is not selected for the catalog, the sample will be returned to the manufacturer.

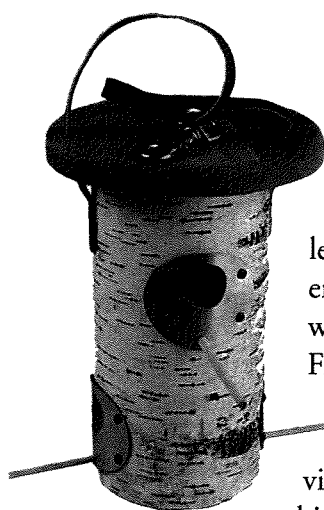
If, after reviewing the sample, the buyer wants to purchase the product, he/she will contact the manufacturer or representative to negotiate pricing.

Manufacturers can deal directly with buyers or they can choose to have their product sold through a representative. A representative is an independent salesman who often sells several "lines" (different products) to several direct mail order catalogs within his region. A representative would sell the product in a certain geographical area with which he is very familiar. It is not uncommon for one manufacturer to have several representatives selling the product in different regions. In most cases, the representative has sold to catalogs in his area before and has contacts within the industry, which makes selling the product easier. A representative will charge a fee for his services usually totalling 10-15% of the final sale.

There are several ways to find a representative to sell your product, including:

- a. Call a buyer of the catalog to which you want to sell your product. Buyers deal with representatives on a regular basis for numerous products and can refer you to the appropriate representative for your region and product.

Figure 1



### **Birch for Birds**

Handmade by Amish craftsmen, our thistle-seed feeder is superbly constructed of natural birch, copper, leather, and hardwoods, ensuring that it can withstand any weather. Finches and other thistle-seed lovers will become regular visitors when you hang this attractive feeder. And it

simply looks good in any balcony or back yard. Measures approximately 7" diameter and 11" high.

**Birch Thistle-Seed Bird Feeder #1663... \$39.95**



### **A Light in the Woods**

Don't doubt it for a moment — our lamp is made from real birch, with a tiny, perching bird crafted to add a natural, deep-in-the-woods feeling. Measures approximately 14-1/2" high; comes with burlap shade.

**Birch Lamp #1660... \$69.95**



# ONE-OF-A-KIND SOUVENIR

Extend wedding sales with a  
dried flower garden photo frame.

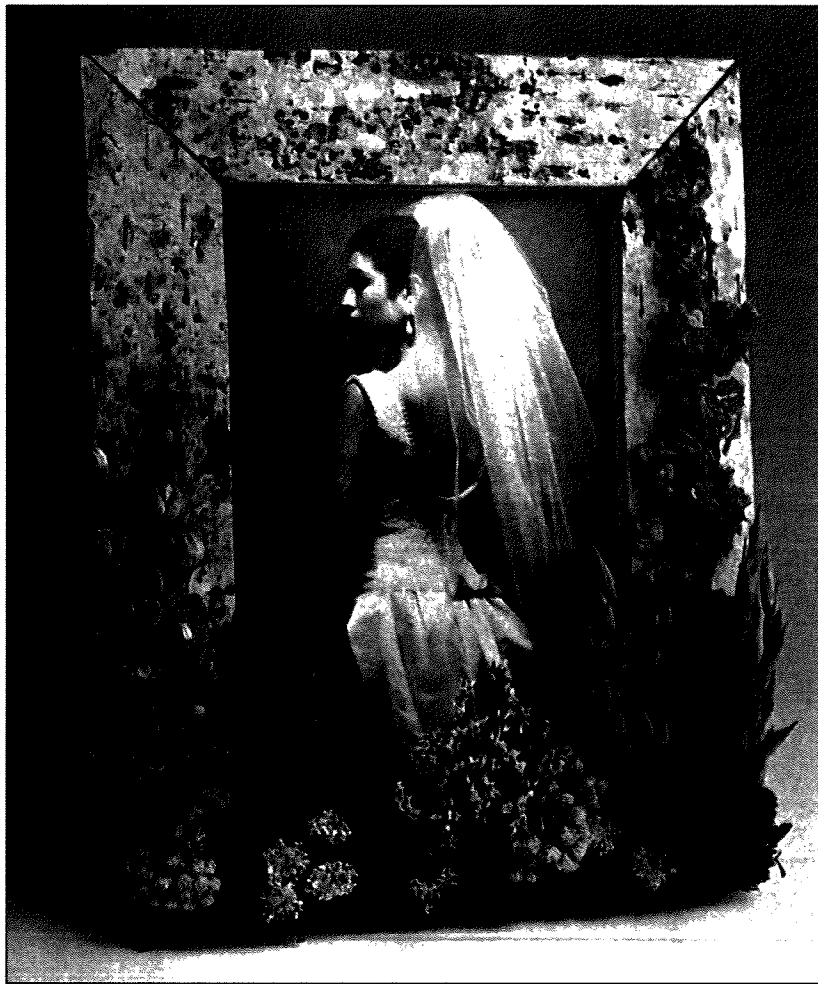
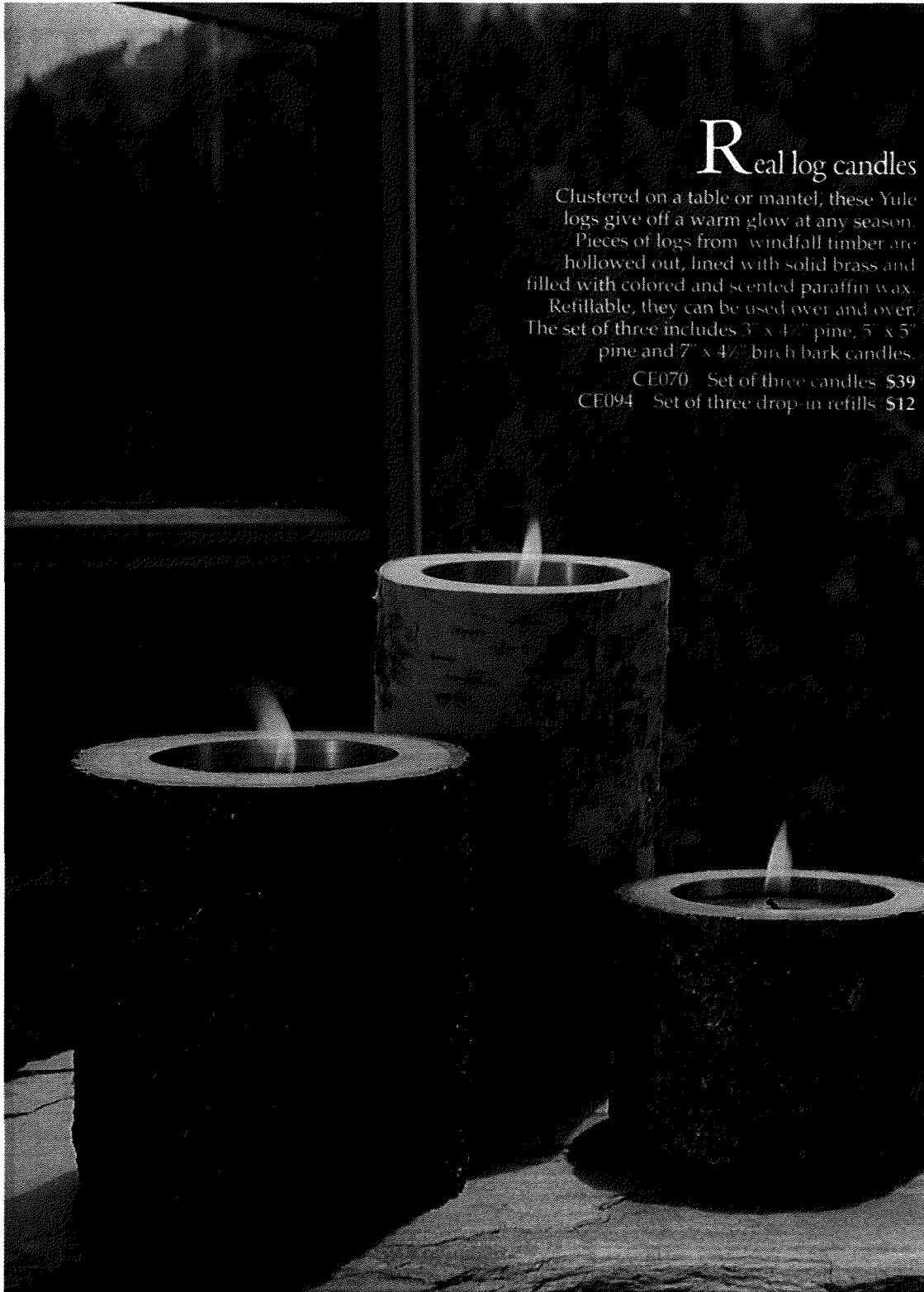


Figure 3



- b. Exhibit your product at an industry show such as The Housewares Show or the New York Gift Show. Representatives as well as buyers attend these shows looking for new products to sell. There is usually a bulletin board at the show where an ad or brochure can be placed requesting a representative for your product.
- c. Advertise your need for a representative in the classified ads of a trade magazine such as the *HFD Trade Magazine*.

Whether the product is sold directly from manufacturer to buyer or through a representative depends entirely on the manufacturer. Buyers prefer to negotiate with the party that is going to give them the best price and the best service. Since your product is being sold through a direct mail order catalog and will be receiving nationwide exposure, the buyers expect to purchase the product at the lowest possible price through volume discounts, negotiable minimum purchases, dating, or ad allowances (usually 5-10%).

Selected mail order catalogs and their product offerings which may be of interest to Saskatchewan special forest product manufacturers are shown in Table 9.

4. Creating possible incentives for ancillary product development and resource/marketing cooperatives. Combining the creative product development talents in Saskatchewan with the special forest products resources can produce unique opportunities to develop full product lines for consumer purchase. For example, a full line of natural interior decor products, so popular with the "country" and "lodge" look found in furniture design consumer preferences throughout North America and in Japan, could sport a brand name of *Saskatchewan Interiors*. A cooperative could be established for manufacturers of *Saskatchewan Interiors* products for coordinating resource buying activities, conducting market research, and selling and distributing products.

#### Other Product Options for Consideration

Although not selected for extensive market research concentration in this report, during the direct interview process, two other possible product areas have been referenced for Saskatchewan consideration. Those areas are:

- Cones
- Decorative Woods: primarily diamond willow (*salix bebbiana*)

Specific details regarding each of these product options follows:

#### Cones

In general, larger cones are used in the wreathing industry, while selected smaller cones are used whole in the potpourri industry or in the production of smaller wreaths. Based on early 1993 research conducted by Mater Engineering throughout the U.S. in this product area wreath manufacturers from throughout the U.S. stated that sugar pine, ponderosa pine, slash pine, and loblolly pine cones clearly dominate the Christmas wreath-manufacturing industry; a trend which is not seen as changing in the future.

**Table 9**  
**Mail Order Catalog Matrix**

<i>Name</i>	<i>Address</i>	<i>Contact</i>	<i>Products</i>
<b>Crate and Barrel</b>	725 Landweha Road North Brook, IL 60062 (708) 272-2888	Nicole Maile	All types of interior decor products featuring: <ul style="list-style-type: none"> <li>• Light colored woods</li> <li>• Contemporary styling</li> <li>• Attractive woods</li> <li>• Woods that hold up to wear &amp; tear</li> </ul>
<b>The Nature Company</b>	750 Hearst Avenue Berkeley, CA 94710 (510) 644-1337	Susan Manrique	Products that are: <ul style="list-style-type: none"> <li>• Nature-oriented</li> <li>• Environmentally sound</li> <li>• Wood items made to look like wild endangered animals</li> </ul>
<b>Plow and Hearth</b>	301 Madison Road Orange, VA 22960-0492 (703) 672-1712	Cal Saulneir	Products that are: <ul style="list-style-type: none"> <li>• Anything for animals</li> </ul>
<b>Bloomingdale's</b>	130 E. 59th Street New York, NY 10022 (212) 418-7195	Andrew Hannen	Products that are: <ul style="list-style-type: none"> <li>• Of nature</li> <li>• Plain looking products</li> <li>• Native American</li> <li>• Western or lodge look</li> </ul>
<b>Sugar Hill</b>	1037 Front Avenue Columbus, GA 31902 (706) 571-6055	Becky Carrier  Jan Dee	Products that are: <ul style="list-style-type: none"> <li>• Unique</li> <li>• Wood products (twig furniture)</li> <li>• Rustic or country look</li> </ul>

The 1993 research results also showed that the overall demand for targeted large and small cones exceeds the annual supply. Manufacturers anticipated that annual increases for ponderosa, slash, and loblolly pine cones will be approximately 20% for the wreath industry alone.

Preference of cone type for products, aside from aesthetic value, tends to be based on three criteria:

1. Volume of cone type consistently available;
2. Cost of shipping as a bulk product; and
3. The weight of the cone as related to the overall final product weight.

Many cone types are still being imported for sales in the U.S. One of the businesses interviewed stated a preference for imported cones because of the price differential. For the same cone type, he states he is able to purchase imported at \$.005 per cone compared to a U.S. price of \$.03 per cone. However, it should also be noted that offshore interest in investing and purchasing cones and other special forest products is becoming more visible, particularly in the west with regards to direct investment from substantial Japanese concerns.

Interviews during the 1993 research indicated that the species of cones most referenced as being used include:

- White pine:** Although referenced as a used cone by many, it was noted that white pine was often used when describing pine cones in a generic sense. Many simply stated they buy pine cones in bulk with package identification of large, medium or small pine cones. Several were, however, specific in their referencing of white pine as separate from Norway pine, jack pine, and scotch pine. There appears to be more than an ample supply of this species.
- Loblolly:** Interviewees purchased mostly from Florida and southern states. Estimates of 20% increase in demand annually.
- Austrica:** Imported primarily from Europe. Sold primarily to the potpourri and wreath companies. Estimates of 6-7 million cones sold per year with anticipated annual increases.
- Ponderosa:** Millions of cones purchased each year with estimates of a 20% increase in demand annually.
- Slash pine:** Millions of cones purchased each year with estimates of a 20% increase in demand annually.
- White spruce:** Millions of cones purchased each year with estimates of a 20% increase in demand annually.
- Norway pine:** Growing in demand. One large product manufacturer located in Wisconsin states this cone is in constant demand.
- Douglas fir:** Growing in demand. Purchased from the Pacific Northwest.
- Lodgepole pine:** Growing in demand. Purchased from the Pacific Northwest.

Other cones referenced in the interviews included alder ("birch" cones), Norway spruce, black spruce, scotch pine, cedar (incense), western hemlock, tamarack, and grand and noble fir scales.

"Birch" cones from India and Thailand were also referenced by one major herb company, that purchases several tons of these cones per year.

During the interviews conducted for this project, two companies indicated an immediate demand for cone supply (consult *Exhibit A* for addresses and contacts). Canadian Foliage of Ontario, Canada, stated they were in the market for pine cones. Currently the company purchases approximately 200,000 cones per year. Types requested included Ponderosa pine and cones the size and same configuration as Austrica. The company requests cone sizes requested were from 2 - 6 in in width and from 1 - 1.5 in in length. JPM Imports from New York also indicated a need for cones. The cones need to be under 2 in long and either alder, birch, or scotch pine. JPM Imports indicated they were interested in immediately evaluating samples from Saskatchewan.

One note of caution: unless value is added to a resource such as cones, the cone supplier may find fierce competition from seasonal domestic and continual offshore markets. For example, in 1993, China inundated the U.S. markets with their cones at extremely competitive rates, virtually shutting down many U.S. suppliers of the resource. Adding value to this resource can come in the form of finished products manufactured from cones such as candle holders, attractive containers, Christmas tree ornaments, or any number of unique specialty gift items that can be sold in niche markets. Following the discussion of value-added for birch bark products (see "Value-Added" section in Category 1 products of this report), part of a *Saskatchewan Interiors* product could be potpourri made from the special forest products from the region, including birch, alder, and aspen cones. The potpourri could be called *Saskatchewan Scents* and could be packaged in an attractive birch bark container with birch bark "biting" inlay.

#### **Decorative Woods: Diamond Willow (*Salix bebbiana*)**

This species of willow appears to be one of the most common in the study region and bears noting as a decorative wood. During early 1993, Mater Engineering conducted research for niche U.S. Midwest clients regarding the market potential for product development from this species. The results of that earlier research should interest potential Saskatchewan suppliers. Based on over 30 interviews conducted with decorative wood buyers and sellers throughout the U.S., the following information was obtained:

- 1) Canadian diamond wood was referenced by some as a strong competitor to the American midwest species. Producers indicated the Canadian species had more "diamonds" and larger diameter branches (up to 2 in).
- 2) The species is often referred to as the "older gents" species, because many of the younger crafters and artisans do not either know of the species or have chosen not to work with the species.
- 3) One limitation to the sales of diamond willow items may be related to the custom work required to create an item made from the species. The need to customwork each branch suggests that mechanical or mass production is not likely. This is perceived to be a hindrance to some and an opportunity for the creation of an original art item to others. One manufacturer stated his surprise at being able to sell one-of-a kind diamond willow walking sticks to German customers last year for approximately \$50 (U.S.\$) each.
- 4) Some interviewed suggested that diamond willow may have unique qualities for potential use as a design material in the floral industry.

- 5) Because of the preferred country and rustic look being so popular in home furnishings, several manufacturers have noted increased product manufacturing opportunities, particularly in furniture legs, arm spindles, etc.
- 6) Crafters from surrounding states stated that although they had demand for diamond willow, they had trouble in locating *dependable* sources with adequate volumes.

## CATEGORY 2 RESEARCH RESULTS

Category 2 species have been defined for this project as plants which are currently used in product development, appear to have market demand, but lack actual volume verification in the targeted project area. Species selected for Category 2 evaluation include:

### a. Dried and Preserved Florals:

Red-Osier Dogwood (*Cornus stolonifera*)  
Wildrose [Rosehips] (*Rosa acicularis*, *R. woodsii*)  
Yarrow (*Achillea millefolium*)

### b. Herbs, Botanicals, Natural Foods:

Alumroot (*Huechera richardsonii*)  
Avens (*Gum aleppicum*)  
Bearberry; kinnickinnick (*Arctostaphylos uva-ursi*)  
Calamus Root (*Acorus calamus*)  
Coltsfoot (*Petasites ssp.*)  
Dandelion (*Taraxacum officinale*)  
Fireweed (*Epilobium angustifolium*)  
Mint (*Mentha arvensis*)  
Nettle (*Urtica dioica*)  
Plantain (*Plantago major*)  
Senega Snakeroot (*Polygala senega*)  
Valerian (*Valerian septentrionalis*)  
Wild Licorice (*Glycyrrhiza lepidota*)  
Wild Sarsaparilla (*Aralia nudicaulis*)  
Yarrow (*Achillea millefolium*)  
Yellow Pond Lily (*Nuphar variegatum*)

The following *Category 2 Herbs, Botanicals, and Natural Foods Matrix* (Table 10) provides an illustration of the common products produced from these species, and the more typical homeopathic and naturopathic applications of these species.

As noted above, the majority of species listed in Category 2 are classified as forest herbs and medicinals. Before detailing the specific research findings and field inventory recommendations for Category 2 species, it is important to gain an insight into the significant trends involving the natural health foods industry, and to understand the general product development opportunities for natural herbs and medicinals.

### Native Plants as Health-Related Products

The greatest immediate opportunities for the development of native plant materials for herbal markets come in the medicinal herb area. Dozens of native plants are already used in a wide variety of products in both domestic and foreign markets, especially in Europe, and with expanding opportunities currently developing in Japan. The medicinal herb industry -- in terms of products sold through health and natural food markets -- as opposed to pharmaceutical markets, is extremely difficult to define statistically. Statistics regarding the size of this marketplace are not available.



Table 10

## Category 2 Herbs, Botanicals, Natural Foods Matrix

<i>Botanical</i>	<i>Traditional Uses</i>	<i>Common Products</i>
<b>Alumroot</b> ( <i>Huechera richardsonii</i> )	Styptic, astringent; leaf tea used for diarrhea, dysentery, gargled for sore throats; root poulticed on wounds, sores, abrasions.	Leaf tea Hot compress of roots Gargle for sore throat
<b>Bearberry *</b> ( <i>Arctostaphylos uva-ursi</i> )	Astringent, diuretic, tonic; used as urinary tract antiseptic, treating kidney and gallstones.	Leaf tea Tincture
<b>Calamus root</b> ( <i>Acorus calamus</i> )	Antispasmodic, sedative, carminative; used for indigestion, stomach ailments; bath additive for insomnia and stress. Some strains said to contain carcinogen beta-asarone; oils free from this chemical show spasmolytic properties comparable to standard antihistamines.	Tea Tincture Oil Cough syrup Bath additive (boiled in water & strained)
<b>Coltsfoot *</b> ( <i>Petasites ssp.</i> )	Coughs, colds, asthma, bronchitis; contains mucilage which soothes mucus membranes. External application for insect bites, swelling, inflammations.	Leaf/flower tea Leaves boiled and strained for external application
<b>Common Plantain</b> ( <i>Plantago major</i> )	Leaves contain tannin astringent, pulls tissue together, confirmed antimicrobial, promotes healing. Diuretic, astringent, expectorant; used for coughs, bronchitis, ulcers, bladder problems. Seeds contain high mucilage similar to psyllium.	Tea Juice Hot compress of leaves Vegetable Seeds for bowel regularity
<b>Dandelion</b> ( <i>Taraxacum officinale</i> )	Diuretic, tonic, stimulant; used for liver, gallbladder, rheumatism; roots dried to make coffee substitute; leaves are eaten raw or cooked, and are rich in Vitamins A & C.	Leaf tea Root tea Coffee substitute Juice Vegetable Salad ingredient

\* Potentially toxic in large doses

Table 10

## Category 2 Herbs, Botanicals, Natural Foods Matrix (Continued)

<i>Botanical</i>	<i>Traditional Uses</i>	<i>Common Products</i>
<b>Fireweed</b> ( <i>Epilobium angustifolium</i> )	Used in mouthwash for sore gums; shoots and leaves are cooked; leaves & young flower shoots used as salad.	Mouthwash Vegetable Salad ingredient
<b>Senega Snakeroot</b> * ( <i>Polygala senega</i> )	Stimulant expectorant for colds & bronchitis, emetic, cathartic, similar to ipecac; used for pulmonary conditions.	Root tea
<b>Stinging Nettle</b> ( <i>Urtica dioica</i> )	Stimulant, astringent, tonic, blood purifier, relief of coughs and colds. Extract containing volatile oil is used as a hair rinse in Europe; leaves are used in industrial preparation of chlorophyll for coloring soaps, etc.	Leaf tea Tincture Vegetable Salad ingredient
<b>Valerian</b> ( <i>Valerian septentrionalis</i> )	OCT tranquilizer in Europe, allowed to be sold in Canada as a sleeping aid; CNS depressant, antispasmodic, nerve tonic, liver-protective, stimulant in fatigue, antibacterial, antidiuretic.	Leaf tea Tincture
<b>Wild Licorice</b> * ( <i>Glycyrrhiza lepidota</i> )	Sugar substitute 50 times sweeter than sugar, safe for diabetics; contains mucilage; as effective as codeine as a cough remedy; contains cortisone-like substances which help skin ailments; used for inflammation, ulcers, immune system.	Root tea Powdered root Compress for external use
<b>Wild Mint</b> ( <i>Mentha arvensis</i> )	Same uses as spearmint or peppermint; tea, flavoring, extracts; oil stops smooth muscle spasms; contains menthol; leaf tea used for indigestion, stomach aches, carminative.	Leaf tea Tincture Oil Extract Herb Salad ingredient
<b>Wild Sarsaparilla</b> ( <i>Aralia nudicaulis</i> )	Diuretic, stimulant; used for kidney & bladder ailments, coughs, skin ailments.	Root tea Compress for external use

\* Potentially toxic in large doses

**Table 10**  
**Category 2 Herbs, Botanicals, Natural Foods Matrix (Continued)**

<i>Botanical</i>	<i>Traditional Uses</i>	<i>Common Products</i>
<b>Yarrow *</b> <i>(Achillea millefolium)</i>	Expectorant, analgesic; tea made from flowering plant used to cure fever, colds, bruises, stomach problems; anti-inflammatory; fresh herb stops bleeding.	Flower tea Tincture Extract Gargle for sore gums Compress for external use
<b>Yellow Avens</b> <i>(Geum aleppicum)</i>	Used instead of quinine, tonic, digestive, cleansing	Root tea
<b>Yellow Pond Lily *</b> <i>(Nuphar variegatum)</i>	Closely related to European <i>nuphar luteum</i> ; contains tannin & mucilage, astringent used to treat diarrhea, stomach inflammations, sore throats, wounds, swelling, boils.	Root tea Compress for external use

\* *Potentially toxic in large doses*

Many opportunities in the herb industry lie in the production -- be it farming or manufacturing -- of fresh, dried, or processed plant materials of all descriptions. The medicinal plant market includes the production of native botanicals for manufacturing purposes, and a host of other direct market support systems.

Other countries are also taking strong interest in the area of herbs and medicinals. The Japanese have developed 40% of the world's new medicines since 1986, and have obtained more than half of the world's natural patents.

Worldwide imports of medicinal plants into the U.S. increased from \$355 million (U.S.\$) in 1976 to 551 million (U.S.\$) in 1980. Looking at this upward trend, industry experts estimate the current figure to reach well over a billion dollars.

Before the anti-cancer properties of the mayapple were discovered, about a hundred tons of the plants were being used annually in the U.S. Etoposide, the drug derived from the mayapple, already had annual sales of \$15 million (U.S.\$) in 1988, even though it was only introduced in 1984.

The market for anti-cancer drugs has been growing at a more rapid rate than the pharmaceutical market as a whole. This submarket has grown 25% annually during the last decade; prices increased 24% compared to 11% for the pharmaceutical industry.

According to industry experts, there is a "green wave" (back to nature) of lay interest in herbs and natural plant medicines which is unparalleled in modern history. American "health-food" stores sold an amazing \$360 million (U.S.\$) worth of herbs in 1981, and books and pamphlets describing the use of these products amounted to another \$145 million (U.S.\$) in sales. According to industry expert James Duke, in 1986 sales in the natural food industry were at \$3.1 billion (U.S.\$), with \$500 million (U.S.\$) going to herbs and \$750 million (U.S.\$) going to vitamins. In 1987, the overall market for skin care products was \$2.7 billion (U.S.\$). Body and face lotions and creams accounted for about one half of this.

### Drug Sales

Prescription drugs comprised a total world wide market in 1984 in excess of \$87 billion (U.S.\$) (in manufacturers' prices), an increase of about 75% over 1983 sales figures. Adjusted to reflect retail prices, the 1985 world sales figure increased to 150 billion (U.S.\$).

Based on survey data for the period 1959-1973, drugs that contain one or more plant-derived active ingredients represented just over 25% of all prescriptions dispensed from community pharmacies.

For 1973, there were 1.5 billion total prescriptions dispensed in the U.S.. The average cost to the consumer in 1973 was \$4.13 (U.S.\$). Thus the total value of prescriptions filled by community pharmacies was about \$6.3 billion (U.S.\$) at the consumer level. As plant-derived drugs represented 25% of the market in 1973, the value of these prescriptions was about \$1.6 billion (U.S.\$). Applying a factor of 2 to compensate for other dispensing facilities, an estimated total value of plant-based prescriptions in 1973 in the U.S. was \$3.2 billion (U.S.\$).

In 1980, the total number of prescriptions dispensed was approximately 2 billion. The average prescription price was about \$8.00 (U.S.\$). Using the same formula as in the 1973 calculation, the estimated total value of plant-based prescriptions in 1980 in the U.S. was valued at \$8 billion (U.S.\$).

Estimated world wide annual sales (in 1984 dollars) through the year 2000 of current plant-based pharmaceuticals is in the range of \$400-\$600 billion (U.S.\$).

In 1986, crude botanicals imported into the U.S. totalled nearly \$750 million (U.S.\$):

a) Natural gums, resins, balsams, and lacs	= \$86 million (U.S.\$)
b) Vitamins	= \$44 million (U.S.\$)
c) Antibiotics	= \$152 million (U.S.\$)
d) Alkaloids, etc.	= \$83 million (U.S.\$)
e) Hormones - botanicals	= \$69 million (U.S.\$)

Normally, North America exports more medicine than we import, and import more crude botanicals than we export.

According to a January 1993 report in *The New England Journal of Medicine* entitled, "Unconventional Medicine in the U.S.", nontraditional medicine has an enormous presence in the American health care system. From a sample of 1,539 adults 18 years and older (response rate 67%), one in three respondents reported using at least one unconventional therapy in the past year, and a third of these went to providers for unconventional therapy (see *Table 11*). The majority used unconventional therapy for chronic, as opposed to life-threatening, medical conditions (see *Table 12*).

Extrapolation to the U.S. population suggests that in 1990 Americans made an estimated 425 million visits to providers of unconventional therapy. This exceeds the number of visits to all U.S. primary care physicians (388 million). Expenditures were equivalent in out of pocket expenses between unconventional therapy and hospitalization in the U.S.

Although there is a "green wave" of lay interest in herbs and natural plant medicines unparalleled in modern history, there has been very little research done in the field of phytochemicals in the U.S. The only notable exception to these and other unsuccessful efforts was the discovery of leurocristine and vincalucoblastine in the Madagascar periwinkle, *Catharanthus roseus*, by researchers at Eli Lilly and Company. It is interesting to note that the Lilly researchers included the plant in their tests, not because of its reputed antitumor properties, but because of its reputation as a hypoglycemic agent.

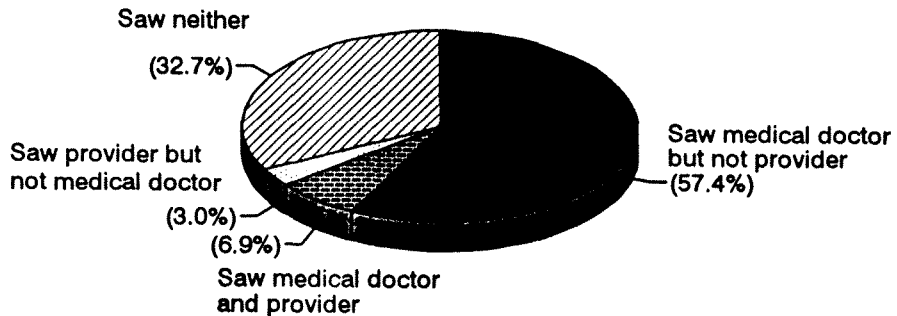
Many researchers are now evaluating new drugs that we may be attempting to find in nature or to cultivate in the 21st century. Diseases for which satisfactory cures still remain to be developed include:

1. Viral diseases, such as herpes (genitalis, simplex, and zoster), AIDS, and certain cancers;
2. Diseases of unknown etiology, including arthritis, some cancers, muscular dystrophy, and Parkinsonism;
3. Self-inflicted diseases, that is, alcoholism, drug dependency, obesity, smoking, stress, and the like;
4. Genetic diseases, ranging from cystic fibrosis and hemophilia to sickle-cell disease.

In addition, improved drugs need to be developed for the control of chronic symptoms, such as pain. A non-addictive narcotic, for example, is urgently needed. Also required are treatments for conditions not readily positioned in any one of the above categories. Examples are elevated cholesterol level,

**Table 11**

**Percentage of Respondents Reporting at Least One Principal Medical Condition Who Saw a Medical Doctor or Provider of Unconventional Therapy in 1990**

**Table 12**

**USE OF UNCONVENTIONAL THERAPY FOR THE 10 MOST FREQUENTLY REPORTED PRINCIPAL MEDICAL CONDITIONS**

CONDITION	PERCENT REPORTING CONDITION	USED UNCONVENTIONAL THERAPY IN PAST 12 MONTHS*	SAW PROVIDER IN PAST 12 MONTHS*
Back problems	20	36	19
Allergies	16	9	3
Arthritis	16	18	7
Insomnia	14	20	4
Sprains or strains	13	22	10
Headache	13	27	6
High blood pressure	11	11	3
Digestive problems	10	13	4
Anxiety	10	28	6
Depression	8	20	7

\*Percentages are of those who reported the condition.

\*"Provider" denotes a provider of unconventional therapy

hypertension, and even the general susceptibility to diseases of various kinds, both infectious and non-infectious.

Another area in which plant principles exhibit considerable promise is that of hepatoprotective drugs. Such agents are urgently needed not only to protect the liver from infections, such as viral hepatitis, but also to help prevent damage from accidentally or purposely ingested toxins ranging from anatoxins to ethyl alcohol. Silymarin, a mixture of flavono-lignhe milk thistle, (*Silybum marianum*) is currently marketed and used for just these purposes with considerable success.

Drugs introduced since 1938 had been proven safe by a procedure known as a New Drug Application (NDA). However, to update information on their effectiveness, the FDA turned for help in 1962 to the National Academy of Sciences-National Research Council (NAS-NRC). That group, in turn, organized a "Drug Efficacy Study" which was completed and submitted to the FDA in 1969. Then, in 1972, the FDA proposed an additional review of all over-the-counter (OTC) drugs, because only a small number of such products had been included in the original NAS-NRC Study.

Based on that review, the FDA declared that any drug would be considered misbranded if the manufacturer made any claims for it that were not in accord with the findings of one of several panels set up to review the efficacy of the active ingredients of all OTC drugs. In other words, a drug, even though exempt from proofs of safety and efficacy under existing laws, was barred from commerce if any claim was made as part of the labeling that it was "good" for anything, that is, "effective" for the treatment of a disease state. Currently, however, all decision-making on FDA regulations is on hold.

This led to a very curious situation in which all of the old-time herbal remedies were essentially removed from the shelves of pharmacies and from the supervision of knowledgeable pharmacists. These plant drugs, however, did not cease to be used. Instead, they found their way in large numbers to the shelves of so-called health-food stores where, under the guise of herbs, teas, or food supplements, they may be found labeled only with the name of the drug. No claim of effectiveness for any condition appears on the label of such containers. But if customers want to know what the product is used for, the health-food store's selection of books and charts will provide the sought-after information. Some of the books are called herbals; others are designated as health-food books.

### International Overview

While critics decry the lack of plant-drug development in the U.S. and express pessimism about its future, research and development in the field continues to flourish in another country quite similar to the U.S. in technological advancement. That country is Germany. There, new plant-drug preparation (so-called phytopharmaceuticals) and even new plant constituents are continually being introduced into the market by a relatively large number of manufacturers. How does one account for this difference?

First, there has always been a strong tradition of natural drug use in Germany, and that still prevails. A 1982 survey showed that nearly 76% of the women in Germany drank herbal teas for their beneficial effects, and about 52% of them turned to herbal remedies for the initial treatment of minor illnesses.

In addition, there is a much more favorable regulatory climate regarding new drug introduction in Germany. In the U.S. costs of drug development have risen so high (\$200+ million (U.S.\$) per new product), that innovation is stifled, and the activity is restricted to a few of the largest pharmaceutical manufacturers. This is not the case in Germany, where even some of the smaller companies have the resources to innovate in the plant-drug field. This serves to stimulate competition and thereby encourages new product development.

Proof of effectiveness is the area where appreciable cost savings are afforded to the pharmaceutical industry in Germany. A doctrine of "reasonable certainty" is substituted in Germany for the strict clinical trials mandated in the U.S. Heavy emphasis is placed on the reports of clinical experience supplied by general practitioners, and this is supplemented by evidence found in the literature and by data supplied by manufacturers. The result is approval of a number of plant remedies not available in the U.S..

According to recent international research, the leading market for herbal medicines is Germany, where sales were estimated at \$1.2 billion (U.S.\$) in 1990, followed by the U.S. (\$480 million), France (\$90 million U.S.\$), and the UK (U.S.\$ 70 million). In 1980-81, sales of herbal medicines rose by 15% in the U.S.; 12% in Italy, the UK, and Spain; and 10% in France and Denmark. This rate of growth outstrips the average worldwide growth of sales for OTC (over the counter) products in 1986-90.

There are 2,000 herbal medicine companies in Europe, and more than 220 in the U.S., of which 90% are privately owned. Of the eight companies specializing in prescription and OTC herbal medicines with sales of more than \$20 million (U.S.\$) per year, the majority are German, led by *Schwabe* with annual herbal sales of approximately \$180 million (U.S.\$) (81% of total sales). *Proctor and Gamble*, the leading U.S. company in the field, has estimated annual herbal sales of \$80 million (U.S.\$).

Herbal medicine companies have already begun to expand. Companies will find it difficult to remain independent as OTC divisions of pharmaceuticals enter the field. Many large pharmaceutical companies already have been expanding their herbal medicine sales.

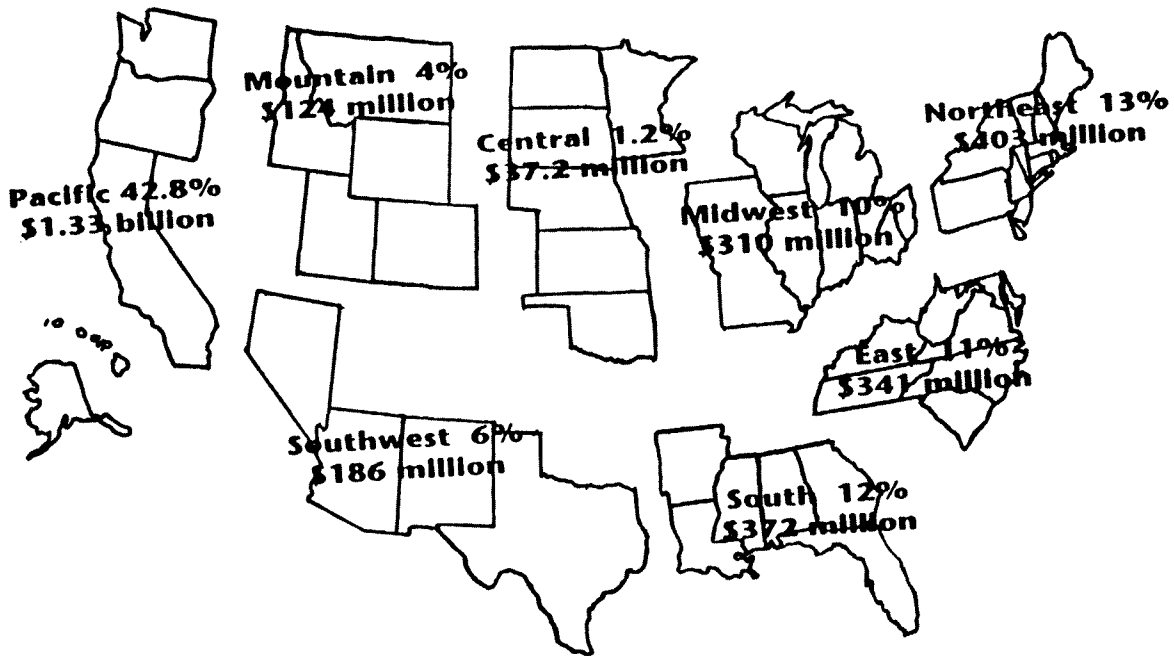
### U.S. Overview

The entire area of herbs, medicinals, and natural and organic foods and vitamins has experienced some exponential growth not only in the U.S., but in many other areas throughout the world, particularly Europe and most recently, Japan. Experts attribute this new focus in natural health care to an ever-increasing older population and the rising cost of health care in the U.S. Aging baby-boomers and other health-conscious consumers are now concentrating efforts on the benefits of naturopathic and homeopathic health care. Even many physicians and other health care professionals are turning to more natural and organic health care products to balance with the traditional increased use of controlled substance prescriptions.

The 11% average growth rate of health food product sales across the U.S. during 1991 was clear evidence of the consumer shift toward natural foods and health care. According to a 1992 market overview survey conducted by the *Natural Foods Merchandiser*, of the types of stores selling natural foods and health care products across the U.S. last year, independent stores lead the way with 68% of total natural products sales or \$3.15 billion (U.S.), compared to mass market outlets at 20% of total sales or \$922 million (U.S.), and large food chains at 12% of total sales or \$571 million (U.S.). The survey also showed that average customers per day increased from 53 to 72 between 1990 and 1991 for small to medium sized health food stores, and from 77 to 148 for large/mini-chain health food stores. Finally, the survey showed that the Pacific states -- California, Oregon, Washington, Alaska, and Hawaii clearly accounted for the highest percentage of independent health food sales (almost 50%) of any place in the U.S. at \$1.33 billion (U.S.) in 1991. The Northeast was a distant second at 13% of total sales or \$403 million (U.S.).



### Independent Store Sales By Region



Source: *Natural Foods Merchandiser 1992 Market Survey*

### National Health Foods Industry Overview

Natural is becoming more of a lifestyle than just a description of ingredients. As consumers become more environmentally aware, they are looking for products in all areas that are convenient, environmentally friendly, and provide health benefits. And not just for humans! In Westport, Connecticut, the first animal products superstore, Earth Animal, was launched. The store sells all-natural pet foods, vitamins, and supplements and features a bakery that turns out a variety of canine and feline treats made with all natural ingredients.

Eastern European countries are buying more Western-made flavors and fragrances. Since these products have become increasingly available, Hungary and Poland are adopting western standards in taste, furnishings, etc. . Fragrance and flavor manufacturers are targeting this market as a future growth area.

The trend toward light, natural, lower fat, less sugar, and fewer calories is gaining popularity all over Europe. The demand for these products is approaching U.S. levels, which are the highest in the world, according to a consumer study.

The desire for healthier foods is more than just a fad. Evidence has been mounting that some plant foods contain much more than vitamins and minerals. Scientists are now looking at the biologically active compounds that occur in fruits, vegetables, grains, and herbs to see what benefits they might have in disease prevention. These compounds are called phytochemicals, and research efforts are increasing rapidly. Epidemiological evidence shows that licorice root is a prostaglandin inhibitor and may protect against breast cancer and ulcers.

The National Cancer Institute (NCI) has just funded a \$20-million (U.S.\$), five-year research project to design foods that contain higher levels of phytochemicals found in natural plant material. These

"designer foods" are currently very popular in Japan, according to Herbert F. Pierson, Jr., former head of NCI's research program. The focus of the study is on anticarcinogenic properties of components in several plant foods. Pierson, now with Preventive Nutrition Consultants in Woodinville, Washington, is helping food and drug companies incorporate promising phytochemicals in their products. He reports that Campbell Soup, Kellogg, Proctor & Gamble, and others are already secretly working on such products.

Because of the expense involved in testing phytochemicals, the body of scientific research is small but promising. A sampling of clinical trials that have been done worldwide on some of Saskatchewan's herbs is shown in *Table 13*.

Plants provide at least 25% of the world's pharmaceuticals, worth \$63 billion (U.S.\$). The increase in herbal medicine markets for 1992 is shown in *Table 14*. While it is difficult to enter into the pharmaceuticals market because of the many problems involved in testing and marketing, using botanicals in food and beverage preparations that promote better health is a unique marketing opportunity that is gaining in popularity both in North America and abroad.

The most lucrative marketing opportunity appears to be in all areas of exotic beverages including hot and cold beverages in food service, bottled ready-to-drink beverages, specialty coffees, and dried tea. According to a September 1991 report in *Beverage World*, flavor houses are working hard to develop a wide array of flavors and colors for the flavored waters, all-natural sodas, and sparkling juices that have proliferated in recent years. Customers are demanding healthful and natural ingredients.

**Table 13**

<i>Herb</i>	<i>Clinical Trial</i>
<b>Bearberry</b> <i>(Arctostaphylos uva-ursi)</i>	Japanese studies on animals show that extract from leaves increases the anti-inflammatory effects of indomethacin in arthritis, and dexamethazone ointment on allergic inflammations.
<b>Fireweed</b> <i>(Epilobium angustifolium)</i>	A flavonid from leaves of fireweed had more than 10 times the anti-inflammatory effect than indomethacin in rats.
<b>Wild Licorice</b> <i>(Glycyrrhiza lepidota)</i>	A feed additive containing dried bile (from cattle & pigs) and licorice or licorice extract is disease resistant; suitable for cattle & pigs.
<b>Wild Mint</b> <i>(Mentha arvensis)</i>	Healthy tomato plants were injected with extract of mint in the presence of fruit rot. Compared with untreated fruit, there was some protection.
<b>Plantain</b> <i>(Plantago major)</i>	Trials show that it inhibits cancer tumors in infected animals.
<b>Stinging Nettle</b> <i>(Urtica dioica)</i>	Freeze dried plant in double blind study for treatment of 98 people with allergic rhinitis. Nettle rated higher than placebo in global assessments.
<b>Valerian Root</b> <i>(Valerian septentrionalis)</i>	A double blind study showed that a valerian preparation had good results in treating poor sleep. When compared with placebo, 44% reported perfect sleep; 89% reported improved sleep.

**Table 14**  
**HERBAL MEDICINE MARKETS 1992**

<i>Country</i>	<i>Value of Market (U.S.\$)</i>	<i>Growth Rate</i>
<b>Canada</b>	<b>\$84 million</b>	<b>+5%</b>
<b>France</b>	<b>\$144 million</b>	<b>+10%</b>
<b>Germany</b>	<b>\$1.8 billion</b>	<b>+4%</b>
<b>Great Britain</b>	<b>\$120 million</b>	<b>+6%</b>
<b>U.S.</b>	<b>\$970 million</b>	<b>+13-15%</b>

*Source: Herb Market Review 1993*

Tea and coffee are naturally low in calories and can be combined with many other flavoring ingredients to appeal to upscale tastes. Beverages made from herbs may be combined with other ingredients, such as fruit juice or flavoring to provide a wide variety of tastes that are being marketed as alternatives to sodas and other beverages.

The major criterion for choosing which herbs to use in these product areas is good taste. For a successful commercial product, any health benefits (real or implied) are secondary to flavor.

For example, Crystal Star of Sonora, California markets many different combinations of herb teas for different purposes, such as *High Energy Tea*. A mixture called *Female Harmony* contained the following herbs:

red raspberry leaf	spearmint
licorice root	lemon grass
nettles	burdock root
sarsaparilla	strawberry leaf
rosehips	

While no claims are made on the package label for specific herbs, the mixtures combine good taste with an herbal medicine tradition. *Female Harmony*, for example, contains herbs that are high in Vitamin C (the leaves and rosehips) with naturally sweet licorice (protects against breast cancer). Mint and lemon grass are also flavorful and traditionally used to soothe digestion.

There are endless combinations that could be put together using this strategy. The teas could be marketed as loose tea, tea bags, or bottled as low-calorie, all-natural, ready-to-drink beverages which could also contribute to good health.

Herbal tea and fruit juice mixtures are being sold in bars as non-alcoholic variations of a wine cooler. Many restaurants throughout the U.S. serve a variety of these ice tea and fruit juice drinks. In 1992, Seagram introduced Seagram's Light, a lower calorie version of its wine cooler line geared to upscale taste and the demand for less sugar.

***Herb Market Review 1993*** reports that many natural products stores are adding "tonic bars" to their establishments. Tonic bars are herbal variations on juice bars, and are capitalizing on consumer concerns about the unhealthy effects of alcohol. The tonics sell for \$2, \$5, (U.S.) or more for a shot of herbal tonic combined with carbonated water. The tonics contain highly concentrated extracts of Chinese herbs, such as ginseng and ma huang, mixed with honey. These extracts are not drugs and are virtually alcohol free. Using this concept, companies could combine any tasty herbal extract or tea with fruit juices or other flavorings to provide a myriad of healthful beverages to a thirsty public.

***Ready-to-drink teas:***

Iced tea combinations, the fastest growing category of beverages in the U.S., jumped 34% by early 1991 and boasted sales of \$400 million (U.S.\$) that year. Industry giants like Lipton, Nestea, and Snapple command the lion's share of the market, but some independent "kitchen" operations are having an impact.

Perrier and Celestial Seasonings Herb Tea have joined together to produce six flavors of ready-to-drink herbal teas using spring water from Perrier's U.S. properties. Celestial Seasonings commands a 49.8% market share in herbal teas. That equals \$53.4 million (U.S.\$) in sales; an 11.8% increase for the year ending July 1992.

Canada now supplies 69% of U.S. sweetened water imports (mainly Clearly Canadian), and 24% of U.S. unsweetened water imports. Like the Perrier-Celestial Seasonings merger, a cooperative effort between Saskatchewan Food and Agriculture and a company that is already selling bottled water might lead to many new beverage flavors and a good share of the market.

Of the Saskatchewan botanicals, any combination of wild licorice, coltsfoot, dandelion, nettle, valerian, wild mint, or yarrow would be tasty. These could be mixed with sparkling water, spring water, fruit juice, natural flavorings, or black or green tea to provide a wide variety of combinations with or without caffeine. They can be bottled or provided in food service settings (juice bars, coffee carts, bars, restaurants, etc.)

***Gourmet coffees or coffee substitutes:***

Roasted dandelion root and wild licorice (for sweetening) are often used for coffee substitutes. These could be combined with water, milk, sweeteners, and other natural flavors to provide ready-to-drink iced coffees similar to those that have become so popular recently. These would be low calorie, low sugar, and would also provide health benefits.

Dandelion root, for example, is said to be a powerful blood cleanser, high in potassium and used for inflammation of the liver and gall bladder. It is currently roasted and sold in natural food stores as a coffee substitute. Licorice root has 50 times the sweetening power of sugar, is safe for diabetics, and according to the NCI, has some anticarcinogen properties.

***Other hot and cold beverages:***

Combinations of herbs and spices could be marketed as a soup mix or bouillon. Some of the less tasty but healthful herbs could be seasoned in this way and sold for specific health purposes. For example, herbs high in mucilage (coltsfoot and plantain) soothe mucous membranes and are good for sore throats. Anti-inflammatory herbs (bearberry) could be marketed for aches and pains. Senega snakeroot and yarrow are purported to be good for colds and fevers. Dandelion and bearberry are used as blood

purifiers and are particularly helpful in treating liver and gall bladder problems. Young stinging nettles are said to make an excellent broth high in Vitamins A and C.

***Gourmet herbs for seasoning:***

According to a 1992 International Trade Commission study, import demand in Europe for gourmet herbs is expected to rise due to a growing interest in international cuisine, and the increasing use of herbs in industrial food manufacturing as natural preservatives and anti-oxidants.

Saskatchewan herb species with marketing potential in this arena include mint, dandelion leaves, and dandelion flowers. As fresh herbs have a limited shelf life, other options for marketing and value-added processing should be considered. As an example, LJ Minor has developed herb concentrates for use in shelf-stable, frozen or fresh/refrigerator foods that eliminate the microbiological problems of fresh herbs. The concentrates are made from sauteed fresh herbs and natural flavor intensifiers, and retain the volatiles and essential oils.

***Ingredients for diet products:***

Plantain has a high mucilage content which is soothing and bulking. When taken before meals, the mucilage decreases the absorption of LDL (bad) cholesterol and tryglycerides; HDL (good) cholesterol levels are left untouched. Research shows that there is increased risk of heart disease in obese people with low HDL levels.

Traditional Medicinals, based in Sebastopol, California markets several varieties of herbal teas manufactured in Canada. They have five varieties of caffeine-free Weightless Herb Tea with a high concentration of uva-ursi (bearberry).

Celestial Seasonings Diet Ice Box Iced Tea is a ready-to-drink blend of black and herbal tea with natural herb extracts, with lemon flavor and caffeine, but no artificial sweeteners or juice added. It is a low calorie, 100% natural tea.

***Botanicals and herbs for gourmet foods:***

Gourmet salad mixtures containing botanicals, exotic greens, and edible flowers are selling in the U.S. for as much as \$12/lb.

In 1992, SupHerb Farms was jointly formed by Amanino Farms of California and Daregal (Milly-la-Foret, France) to grow culinary herbs and specialty vegetables. The company was planning on opening a processing plant early in 1993, which would allow for packaging, shipping, and export of their products.

Dandelion leaves and flowers, and the leaves and young flower shoots of fireweed can be marketed as an upscale salad mixture.

Dandelion greens, fireweed leaves and shoots, and young stinging nettles can be steamed or boiled as potherbs. Further investigation is required to determine whether these vegetables could be dried and sold with directions for rehydrating in water, thus extending their shelf-life. Recipes for using these gourmet foods could be included.

## Key Consumer Buying Trends

In addition to understanding key product trends in the natural foods industry, it is also important to understand which customers are purchasing these products and why.

Natural products consumers have very specific characteristics which underscore and even predetermine their buying patterns. As an example, a 1992 *Delicious!* magazine survey of approximately 2,500 natural products consumers across the U.S. revealed the following:

- 1) The natural products consumer is relatively young (39 years old);
- 2) They are likely to be married (52%);
- 3) They are predominantly female (80% of all consumers);
- 4) They tend to be college educated (86%);
- 5) They have a median household income of \$31,000

Natural products consistently purchased by these consumers are:

Vitamin Supplements	-	79%
Organic Foods	-	78%
Personal Care Products	-	73%
Herbs	-	70%

From these fundamental characteristics of the natural products consumer, we learn that products that might be targeted for evaluation in forest herbs and medicinals usage should cater to women in either the herb/vitamin arena as well as personal care products, such as lotions, soaps, shampoos, conditioners, and cosmetics, etc.

Market research conducted in 1993 by industry experts in natural products manufacturing and sales also suggest key attention be given to the following consumer types and activities:

### Cultural Populations:

This is of particular importance in the U.S. where the Asian and Hispanic populations have increased significantly over the last few years. These diverse and growing populations have unique buying characteristics that favorably target natural products. As an example, Hispanics in the U.S. spend more money on food products than non-Hispanics. They spend more for fresh fruits and vegetables and are especially interested in processed foods. Their collective current buying-power is over \$172 billion in the U.S. alone. Equally important, Hispanic cultures have traditionally used natural products not just in their diets, but for healing as well. In New York City, there are at least 1,000 botanical stores that sell roots and herbs. At least 99.5% of their customers are Hispanic.

California has the largest population of Hispanics of any state (7.5 million), followed by Texas, New York, and Florida.

Dispelling traditional myths about cultural populations, Donnelley Marketing Information Services in Connecticut reports that almost 30% of Hispanic Americans have annual incomes over \$35,000, and 13.5% have annual incomes over \$50,000.

### Women's Issues:

Products dealing with key women's issues such as pregnancy and weight maintenance or weight reduction all show strong market potential for natural herbs and medicinals applications.

According to industry experts, there's no question that childbirth represents a strong and growing market for naturals retailers. Retailers interviewed by Natural Foods Merchandiser in 1993 said that new mothers are clearly turning to natural products -- some for the first time -- for help in dealing with concerns ranging from infertility to labor and nursing. Illnesses such as colds and flus during pregnancy also rank high in offering keen market opportunities for naturals products. Herbs and botanicals such as peppermint, valerian, yarrow, and stinging nettles hold especially good market advantage in these arenas.

For weight maintenance or reduction, plantain and dandelion roots and leaves hold unique opportunity.

### The Maturing Population:

Nearly one in every four Americans is age 50 or older. That's 64.2 million people, representing a lucrative market for natural products. Today's mature population is active, financially secure, and keenly interested in health and nutrition.

The 50-plus group already makes up 35% of the American population and controls 43% of the nation's disposable income - some \$139 billion, according to industry experts.

A 1987 study conducted by *Modern Maturity* magazine showed that 60% of the 50-plus population ranked fitness and activity as a number one priority, closely followed by diet and nutrition.

### Specific Research Findings

Based on the market demand and consumer buying trends research conducted for this project, 12 of the original 17 species from Category 2 have been prioritized into two levels for possible field inventorying by Weyerhaeuser-Canada. [Note: the following species were determined to not be of Level 1 or Level 2 importance for special forest products development application in this study: Fireweed (*Epilobium angustifolium*), Calamus Root (*Acorus calamus*), Avens (*Gum aleppicum*), Alumroot (*Huechera richardsonii*), Wild Sarsaparilla (*Aralia nudicaulis*), Yellow Pond Lily (*Nuphar variegatum*).]

Priority Level 1 lists those species which appear to hold the best opportunity for special forest products development in the study area and are recommended for immediate inventory program development. Priority level 2 species are those resources which may hold market potential but also require additional process or market testing to ascertain level of market demand.

Criteria used to differentiate priority levels of species in Category 2 include:

- 1) Is the species traditionally used in high priority product development based on researched market demands and consumer buying trends detailed at the beginning of this section?
- 2) Is the species a multi-function species? In other words, is the species in demand for multiple product application based on researched market demands and consumer buying trends (florals, botanicals, edibles, homeopathy, etc.)?

- 3) Based on current published data, are there apparent acceptable substitutes for the species as it is currently used? For example, some botanicals initially in high demand for pharmaceutical use may quickly lose competitive edge as similar offshore species or synthetic substitutes move into the market. To illustrate:
  - a. The bark of the cascara tree is traditionally used in the manufacture of laxatives, but two years ago was supplanted by an acceptable substitute coming from Russia. Before that, the U.S. was supplying over 600 tn of the bark annually, but quickly dropped to less than 100 tn annually as a result of the offshore competition.
  - b. The explosion of interest in the bark of the yew tree for ovarian cancer treatment has been dramatically altered by the announcement from Bristol Meyers of an effective synthetic substitute. While the needles and bark of the yew are still used and being sold, the annual volume required from foragers appears to have significantly decreased.
- 4) Based on market research, is the demand for a species used in traditional product development currently being met by Canadian suppliers? In other words, does Canada already have a market edge in the supply of a resource for product development?

As extensive direct interviews by Mater Engineering concentrated on Category 1 resources for this project, it should be noted that species selection for Level 1 and Level 2 prioritization under this section was based more on product trends and consumer buying patterns research. Further, as volume demands for many of these species tend to be significant for product development, individuals choosing to become resource suppliers of these species must clearly evaluate their capabilities to meet *year-round* volume requirements. In most cases (although not all), this mandate means specific *cultivation* of the species. And while the wildcrafted resources (foraged from the wild) are often used to supplement supplies, baseline volumes of many of these resources may come from domestic and/or offshore cultivated plots. In any case, in order to ensure that the resource will be accepted for product manufacturing, the key to business development is direct buyer-seller contacts.

**Priority Level 1 species include:**

**Dandelion (*Taraxacum officinale*):**

Considered a traditional botanical for weight reduction because of its liver-cleansing abilities, the root of this plant is often found in herbal teas taken for weight-reduction (see **Figure 4**). The botanical is commonly used in treating the liver, the largest internal organ of the body and a central player in the metabolism of nutrients such as fat, carbohydrates, and protein. Purportedly, dandelion helps revive the liver by promoting production and secretion of bile, a liquid necessary for the proper digestion of fats. Detoxification from excessive consumption of fatty foods is considered a specialty of this species. The plant also soothes congestion and inflammation of the liver and the gallbladder.

Female hormones such as estrogen, which affect fatty deposits on the female body, are more active when the liver is not cleansed. Thus, the female consumer both in the U.S. and abroad find this botanical to be quite popular.

A staple sold in natural food stores throughout the U.S. and Europe, this botanical is often sold in capsule form. The plant has been a favorite European remedy for centuries and is still found in the national pharmacopoeias of Switzerland, Hungary, and Poland.

The entire dandelion plant is purported to possess medicinal qualities. Its leaves and roots are tossed in salads. Larger leaves are often served as vegetables. The roots are often dried, milled,



**NATURADE.**   
Since 1926 

**ALL-NATURAL HERBAL FORMULA**

This product contains no artificial colorings, flavorings, caffeine or preservatives.

**QUICK  
WEIGHT  
LOSS TEA**

WITH DIET PLAN

**INGREDIENTS:**

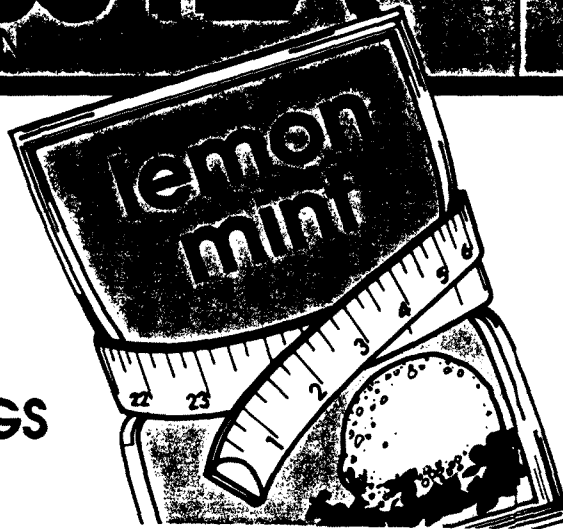
Arcrostaphylos Uva Ursi	Arctium Lappa
Cassia Angustifolia	Lemon Grass
Foeniculum Vulgare	Mentha Piperita
Taraxacum Officinale	Ma Huang
Urtica Dioica	Dong Quai
Juniperus Communis	Natural Flavor
Trifolium Pratense	



- 100% Natural HERBAL BLEND
- No Caffeine

**48 TEA BAGS**

NET WT. 3.20 OZ./90 G.



Distributed by  
NATURADE PRODUCTS, INC.  
Paramount, CA 90723  
Made in U.S.A.—Item No. 2632

and then used as a popular coffee substitute. The plant is even used in the manufacture of alcoholic beverages such as dandelion wines which grace European dinner tables as liver tonics.

Known to be a mild laxative, an appetite stimulant, and a diuretic, the leaves also contain high levels of potassium. In addition, there appears to be an increasing demand for dandelion leaves in the manufacture of herbal chewing tobacco. In contrast to organic tobacco, as found in American Spirit tobacco products manufactured by Santa Fe Natural Tobacco Company, herbal chew is completely tobacco-free. Herbal chew is now sold in many grocery stores and supermarkets throughout the U.S. today.

It is estimated that the annual demand for this botanical is approximately 45 tn domestically and approximately 200 tn worldwide.

Regulatory status:	U.S.:	Generally recognized as safe
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	France:	Traditional medicine
	Germany:	Approved as an over-the-counter drug

**Valerian (*Valerian septentrionalis*):**

A popular and reliable muscle relaxant and sleep aid, valerian is continuing to gain in popularity as an effective non-narcotic, non-addictive substitute for prescribed medications such as Valium. The botanical can be purchased in a variety of different forms including capsules and liquid form, but is most often used as an ingredient in herbal teas designed for sleep (see Figure 5). The plant continues to be one of the most popular and widely used medicinal herbs.

Valerian was listed in most official British and American drug books until about 40 years ago when the pharmaceutical industry set the standard for sedative ingredients, such as Valium and Xanax. With the increased cost of medical care in the U.S. and a transition back to non habit-forming herbal medicines, the use of this species has escalated.

Experts suggest that valerian's sedative effect is brought on by combining depression of some nervous system centers with the relaxation of smooth muscles in the uterus, colon, and bronchial tubes. This apparent effect makes valerian useful in relieving cramps, colic, and some mild forms of asthma.

In controlled tests, the herb has been shown to lessen the time needed to fall asleep, and it also produces a deep, satisfying sleep, similar to that of many sleeping aids currently on the market. Although traditional medicine still does not often recommend the use of valerian, herbalists use it extensively for its sedative and antispasmodic action against emotional stress, muscle pain, intestinal cramps, lingering coughs, tension headaches, insomnia, and general restlessness.

It is estimated that the annual demand for this botanical is approximately 150 tn domestically and approximately 1,000 tn worldwide.

Regulatory status:	U.S.:	Generally recognized as safe
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	Germany:	Approved as an over-the-counter drug
	Japan	Listed in <i>Japanese Pharmacopoeia</i>

**DR MALCOLM STUART PHD**

A man of enormous creative energy, Dr Stuart has been described as "the Father of Modern Herbalism". Having gained a scientific doctorate at the age of 23, he spent several years in Africa as a Commonwealth University lecturer. His direct observation of native healers and ethno-botony had a major influence on his subsequent work and research.

Now based in Cambridge, Dr Stuart has advised both governments and international companies. His *Encyclopaedia of Herbs and Herbalism* is regarded worldwide as a standard reference work.

This range of Herbal Teas embraces, for the first time, the wealth of Dr. Stuart's knowledge.

**No. IV VESPERS**

This blend has been created as a relaxing even-tide beverage. Make with boiling water and brew for 5 minutes.

**DOSEAGE GUIDANCE.** Adults: One sachet one hour before retiring. Not recommended for children.

**WARNING.** Can cause drowsiness. If affected, do not drive or operate machinery. Avoid alcoholic drinks.

**INGREDIENTS.** Lime flowers, Valerian root, Hops, Passion flowers, Fennel.

**PRODUCT OF VARIOUS COUNTRIES.**  
PACKED IN GERMANY.

**DR. STUART'S  
BOTANICAL TEA**

20 SACHETS

**No. IV**

**VESPERS**

A HERBAL TEA  
FOR THE EVENING

NATURALLY  
CAFFEINE FREE

1.2oz *Malcolm Stuart* 35g e  
NET WT DR MALCOLM STUART PHD OF CAMBRIDGE

*For best before and  
for side panel.*

BEST BEFORE END:

08.1994

Figure 5

### Senega Snakeroot (*Polygala senega*)

This botanical, similar to ipecac, is used as a stimulant expectorant for colds and bronchitis.

The root was introduced into European medicine in 1735 as an effective counter to rattlesnake bites (thus the name snakeroot). Physicians during that time period observed that some symptoms of rattlesnake bite were similar to those of pleurisy and certain types of pneumonia, and suggested an infusion of senega to treat these conditions. Later, senega root was recognized as an official drug in European and American compendia. It remained popular as an ingredient of expectorant cough preparations until the mid-20th century, when its use declined and it was deleted from the National Formulary in 1960.

The plant continues to be incorporated in some proprietary herbal preparations. The Japanese use considerable quantities of it each year, the majority of it grown as a horticultural crop in the country.

European and American customers prefer material harvested from the wild, alleging the product has superior therapeutic qualities to that derived from cultivated sources.

Although not a high volume botanical, senega snakeroot is selected for Priority 1 listing in this report because Manitoba and Saskatchewan have become the major sources of supply for the entire North American market. All of the senega snakeroot being supplied to North America from Canada is harvested from the wild. In addition, research indicates that a large tonnage of the botanical is being shipped to Europe from Canada.

Demand for this botanical is estimated to increase at an approximate 5% annual growth rate.

### "Stinging" Nettle (*Urtica dioica*):

Dried nettle has long been used by herbalists, mainly as a diuretic. The herb has also been used as an important botanical ingredient during pregnancy as a stimulant for increasing the supply of mother's milk. In this capacity, it is often manufactured into herbal teas for this purpose (see Figure 6).

Nettles have astringent properties, and when applied to the skin they have been known to relieve eczema and numerous other skin problems. More controversial is their use for treating arthritic conditions. According to some users, when nettle leaves are allowed to sting the skin over sore joints, arthritic pain is eased instantly. Apparently, nettles act as counter-irritants, relieving pain in the afflicted area. Although this usage has not been scientifically validated, it is quite popular in Europe. Additionally, a recent study on freeze-dried nettles (in capsule form) indicated potential benefits for hay fever sufferers.

In addition to its herbal qualities, stinging nettle is also said to be a very tasty cooked vegetable. The young shoots and tender, pale green top leaves are excellent when simmered for 10-15 minutes and served with butter and lemon juice (the stinging qualities disappear upon cooking). As such, it is said to be an excellent addition to soups and stews.

Industry experts indicate that more than 40 tn of stinging nettle herb is used each year by Clairol as a conditioner ingredient. Yugoslavia used to be the primary supplier of the herb.

Estimated annual demand for this botanical exceeds 50 tn domestically and 100 tn worldwide.

# TRADITIONAL MEDICINALS<sup>®</sup>

AMERICA'S MEDICINAL HERB COMPANY

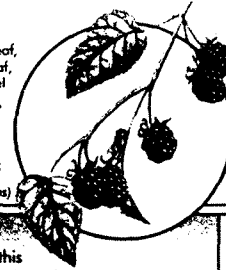
**S**ince the beginning of time, herbs have played an important role in the development of medicine. Long before their use as beverage teas, herbs were used for the treatment of illness. In fact, up until the turn of the century, herbs still provided the basic ingredients for most medicines. With the development of drug chemistry, many of the simple ways of traditional medicine were left behind.

## PREGNANCY TEA<sup>®</sup>

### Contents:

Spearmint leaf, raspberry leaf,  
lemon grass leaf,  
strawberry leaf, fennel  
seed, nettle leaf,  
rosehips, alfalfa,  
lemon verbena.

**Raspberry leaf**  
(*Rubus idaeus*)



For Expectant Mothers  
Yesterday's Way  
for Early Motherhood

**A**n old Latin saying tells of this herb: "Let it be awarded to the fairest of these womankind." Not only is it a favorite of the ladies, young and old alike enjoy its succulent red berries. Both the leaves and the fruits are harvested for their virtues. As a tea, the leaves are a valuable astringent.

Caffeine  
Free!

**HERB TEA**  
16 BAGS NET WT. .71 OZ/20G

Herbal Formulas  
You Can Trust!

Figure 6

Regulatory status:	U.S.:	None
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	France:	Traditional medicine
	Germany:	Approved as an over-the-counter drug

#### Yarrow (*Achillea millefolium*):

Before the turn of the century, yarrow was listed in the *U.S. Pharmacopoeia* as a tonic and stimulant. Traditional European healing uses included relieving spasms, aiding digestion, and fighting disease microbes when used as an astringent poultice.

When crushed, yarrow's leaves and flowers are purported to release active compounds (more than 120, according to test results) which are said to give the plant healing powers against viral hepatitis and cancerous tumors.

Azulene, a volatile blue oil captured when yarrow is distilled, is an anti-inflammatory used in cosmetics and skin creams.

Although not confirmed by modern medicine, achilleine, an alkaloid from the plant, is said to coagulate blood and stop bleeding (as is referenced in Homer's *The Iliad*).

Today, yarrow is often employed in herbal teas and is said to be an important general flu and cold fighting ingredient (see Figure 7). Native Americans have often used this herb as a local analgesic to heal wounds, fight fevers and colds, and relieve rashes and itching.

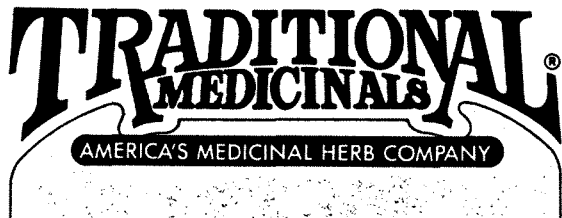
Aside from its apparent medicinal qualities, yarrow is a hot item in the international cut floral industry (see Figure 8). This species is sold as fresh-cut or dried product, and even frequently sold as a dyed product throughout the U.S. and abroad. Based on earlier 1993 research conducted by Mater Engineering on this floral, the markets for this product appear to be quite stable. Larger wholesalers and distributors interviewed earlier in 1993 indicated an increase in this floral because it is seen as an inexpensive and attractive material. In fact, yarrow is seen in over 80% of all floral designs presented in top industry magazines throughout the U.S. and Canada for the last three years. When dried, the plant is consistently seen in dried floral arrangements and wreaths. As evidence, Saskatchewan's own dried flower specialist, Jennette Verhelst (author of *Everlasting Flowers for Pleasure and Profit*, 1991) details yarrow as a preferred dried floral in her book.

Estimated annual demand for yarrow flowers is approximately 50 tn domestically and 250 tn worldwide.

Regulatory status:	U.S.:	None
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	France:	Traditional medicine
	Germany:	Approved as an over-the-counter drug

#### Wild Mint (*Mentha arvensis*):

Known for its soothing effects on the stomach, peppermint is widely used in a variety of different products throughout the world. An anti-spasmodic and carminative, the herb is useful for relieving indigestion, nausea, and intestinal gas. It is frequently sold in capsule or tincture form



**S**ince the beginning of time, herbs have played an important role in the development of medicine. Long before their use as beverage teas, herbs were used for the treatment of illness. In fact, up until the turn of the century, herbs still provided the basic ingredients for most medicines. With the development of drug chemistry, many of the simple ways of traditional medicine were left behind.

# GYPSY COLD CARE<sup>®</sup>

### Contents:

Active Ingredient: Menthol, 5 mg. per cup from peppermint leaf. Other herbal ingredients: Rosehip, cinnamon bark, ~~yellow flower~~, ginger root, elder flower, safflower petal, clove stem, hyssop herb, and natural flavors.

**Peppermint Leaf**  
(*Mentha piperita*)



Herbal Nasal Decongestant  
Temporary Relief from  
Stuffy Nose & Sinus Passages

**T**he ancient Egyptians and Greeks knew of the medicinal virtues of peppermint, and the Romans crowned themselves with mint at their feasts.

Today peppermint is cultivated for culinary, cosmetic and medicinal purposes. Look for it in the wild, with green fuzzy leaves, a purplish stem and pink or lilac flowers in summer. Its aromatic, glowing taste is unmistakable.

Caffeine  
Free!

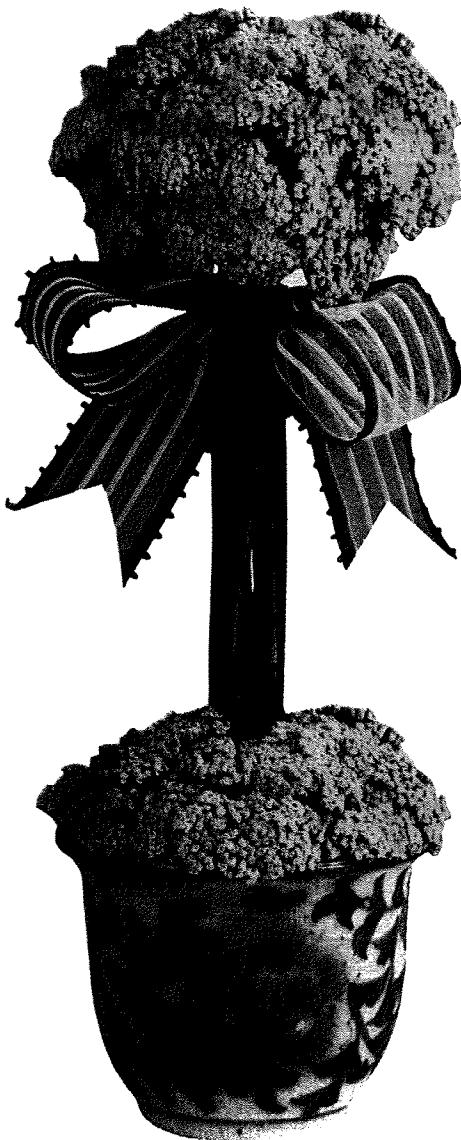
**HERB TEA**  
16 BAGS NET WT. .99 OZ/28G

Natural Medicines  
You Can Trust!<sup>®</sup>

Figure 8



These dried topiaries were awaiting shipment to Turner's newest shop in Japan



This elegant topiary (at left) is formed by bundling a grouping of yarrow and binding it directly under the blossoms to form a mounded shape. The Wedgwood blues of the cachepot and French wired ribbon create a striking contrast to the golden color of the yarrow.

Product Source Guide on page 181.

## LEGACY OF YARROW

Appropriate for the month of October, yarrow has been ascribed many magical qualities over the centuries. Also called devil's plaything, yarrow was thought to have been used by the devil to cast evil spells.

If wrapped in flannel and placed under the pillow, yarrow was supposed to cause one to dream of matters of love. To dream of cabbages under these circumstances, however, was sure to bring bad luck.

*Historical data about yarrow was taken from Garden Flower Folklore by Laura C. Martin, The Globe Pequot Press, Chester, CT, 1987.*



**CELESTIAL SEASONINGS**<sup>®</sup>

**NEW**

**Caffeine Free**

**24 HERB TEA BAGS**

NET WT. 54 g (1.9 OZ.)

**TENSION TAMER**<sup>™</sup>



**ABOUT THE TEA**

Since 1970, Celestial Seasonings has created the most unique, flavorful herb teas in the world. Handcrafted by our master blenders, each Celestial Seasonings herb tea is a uniquely delicious blend of all-natural, caffeine free herbs and spices.

**Tension Tamer™ Herb Tea** is a soothing blend of eleuthero ginseng, celebrated for centuries by the Chinese, ginger root and chamomile. We've added the mildly sweet flavors of peppermint, cinnamon and lemon to provide a relaxing moment in your busy day.



*Eleuthero ginseng*

**TENSION TAMER™**

**NUTRITION INFORMATION PER BREWED SERVING:**

Serving Size	1 Tea Bag	Carbohydrates	less than 1 g
Servings per pkg.	24	Fat	less than 1 g
Calories	6	Sodium	0 mg
Protein	less than 1 g	Potassium	25 mg

Percentage of the U.S. Recommended Daily Allowance (U.S. RDA): contains less than 2% of the U.S. RDA of protein, vitamin A, vitamin C, thiamine, riboflavin, niacin, calcium, and iron.

**100% NATURAL INGREDIENTS:**  
 Eleuthero ginseng root, peppermint leaves, cinnamon, ginger root, chamomile flowers, lemon grass, licorice root, catnip leaves, tilia flowers, natural lemon flavor, and hops. ★

©1991 Celestial Seasonings, Inc.  
 4600 Sleepytime Drive, Boulder, CO 80301-3292 USA

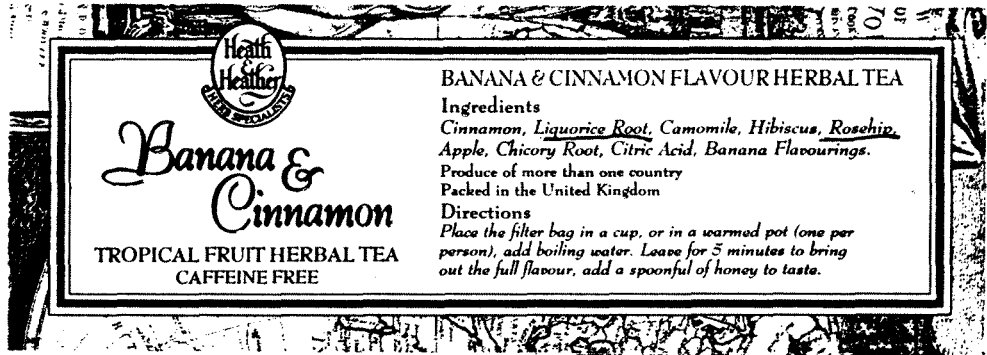
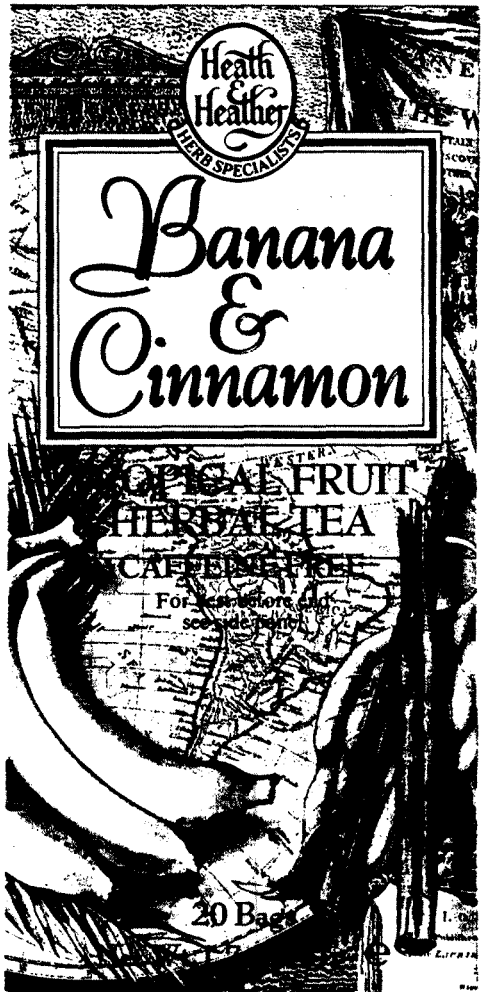


Figure 11

Regulatory status:	U.S.:	Generally recognized as safe
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	France:	Traditional medicine
	Germany:	Approved as an over-the-counter drug
	Japan:	Listed in <i>Japanese Pharmacopoeia</i>

#### Red Osier Dogwood (*Cornus stolonifera*):

Although sometimes referenced as kinnickinnick, red osier dogwood is not to be confused with bearberry whose common name is also kinnickinnick (see Priority 2 listing, below). However, red osier dogwood does have value as a special forest product in the floral and wreathing industry. The branches of this species have long been used as decorative branch accents in floral designs and were one of the most popular materials for twig/branch wreaths. Today, birch material has assumed a top position in that arena, but red osier continues to be in demand and will most likely rotate in popularity with birch and grapevine as the top three wreathing and branch/twig materials for the floral industry.

#### Priority Level 2 species include:

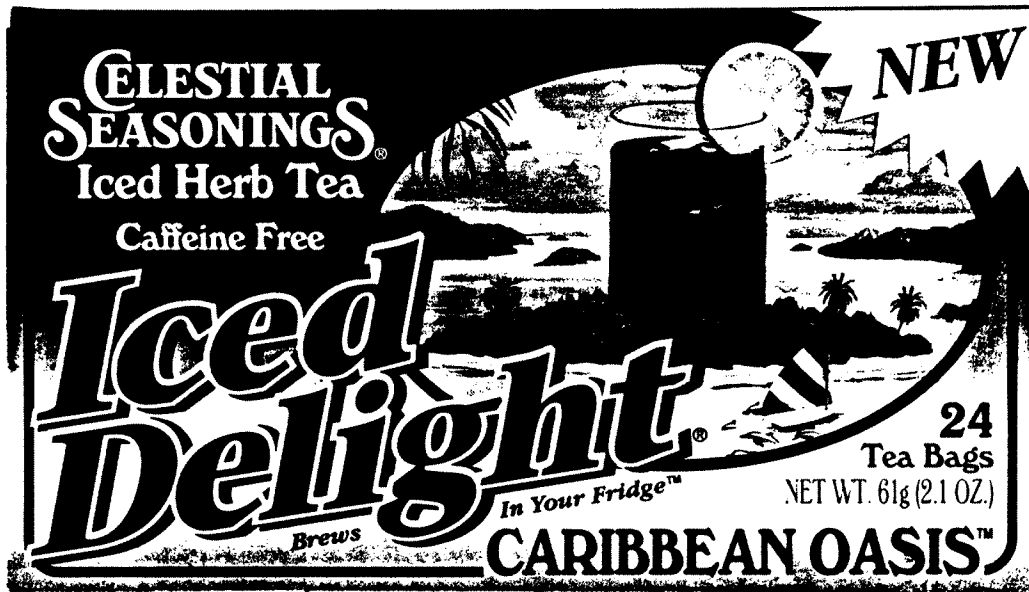
##### Wildrose (*Rosa acicularis*, *R. woodsii*):

Like the yarrow plant, the wildrose has multiple applications and uses. The fruit of the plant, known as rosehip, is quite edible and is used in multiple products such as jams, syrups, and candy, and is often used as an emergency survival food in the field. Most herbalists are familiar with the fruits application in herbal teas. Of the six natural native teas produced by Native American Herbal Tea, Inc. (referenced above under the *mentha* discussion), four of the teas contain rosehip as an ingredient. The wildrose found in Saskatchewan (*woodsii*) has an unusually pleasant fragrance and is especially popular in both hot teas and in herbal ice teas, the new craze inundating the consumer market (see Figure 12).

The fruit of this plant is also said to contain more vitamin C, calcium, phosphorus, and iron than oranges. During World War II in England, the hips were gathered for these abundant essential vitamins and minerals. The pleasant taste/flavor coupled with the high vitamin and mineral content also makes it an obvious choice as an ingredient for many herbal medicinals. Naturade, manufacturers of a full line of herbal medicinals show rosehip as a leading natural ingredient in their Children's Cough Syrup, adult cough syrup called Expec II Herbal Cough Syrup, and mucus relief products such as Expec Herbal Expectorant.

Oil extracts from the seed of the plant are used extensively in personal care products such as lotions, shampoos, and hair conditioners. The oils from this plant are considered a less expensive, yet acceptable, alternative to Evening Primrose Oil.

Aside from its herbal qualities, the wildrose is also a species favored in the fresh-cut and dried floral industry. Because the hips remain on the shrub throughout the winter and into the spring, the branches with attached fruit can be used as *catkins* in the floral markets. Catkins -- spike-shaped droopy clusters of flowers or fruit seen, for example, with clustered berries or cones -- are viewed as having excellent potential in current and future floral markets throughout the U.S. The use of catkins in floral design trends match the strong move toward asymmetric designs which are so popular with both domestic and international consumers (see Figure 13).



**100% Natural Caffeine Free**

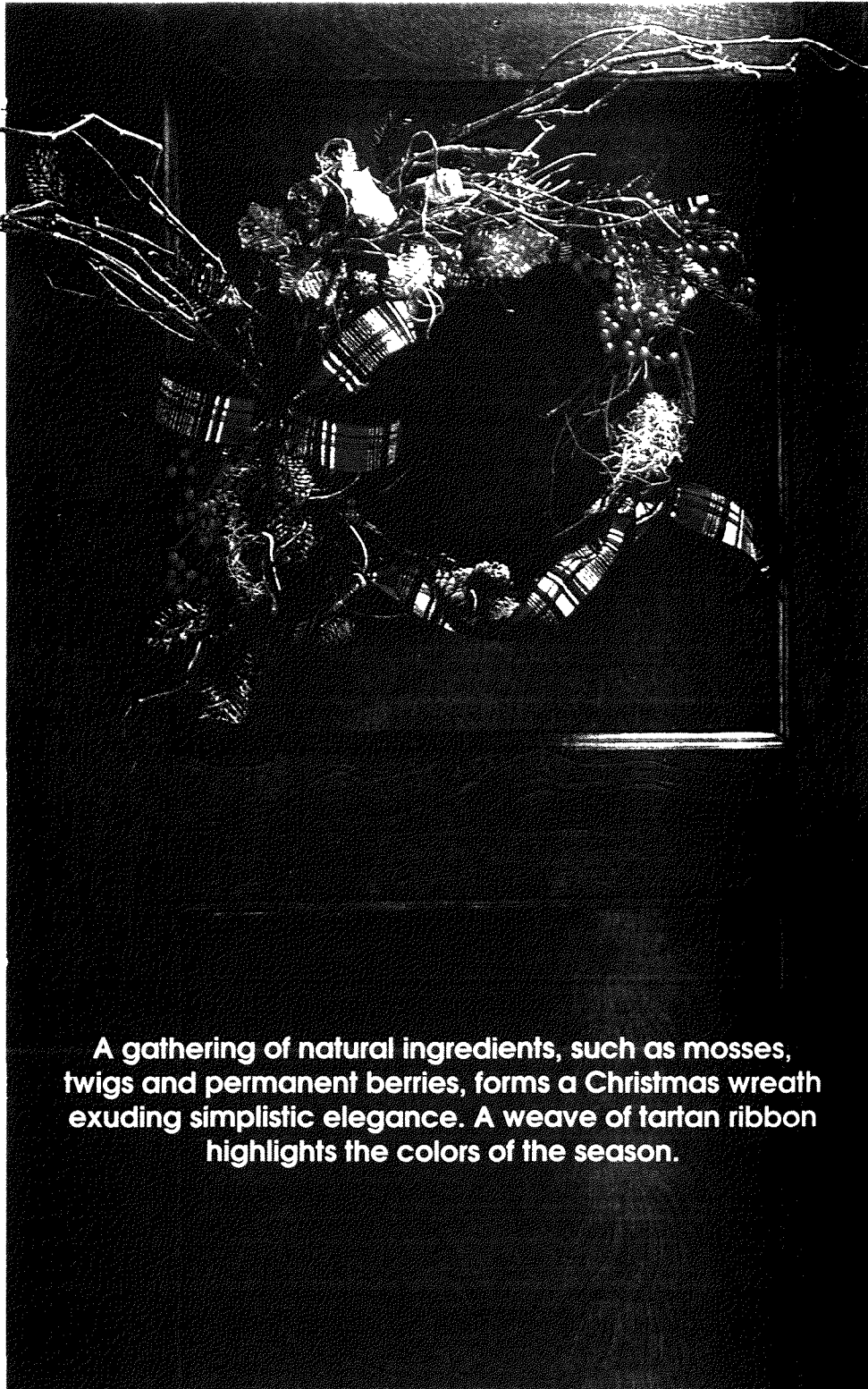
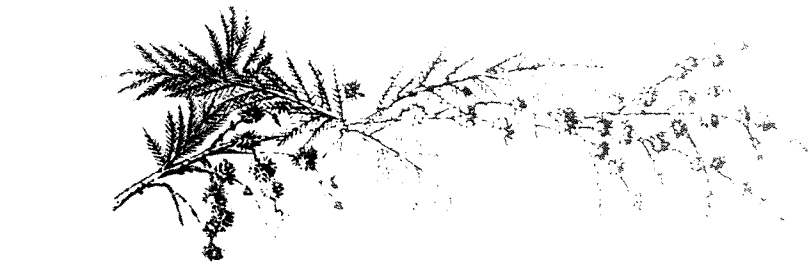
**INGREDIENTS:** Hibiscus flowers, roasted chicory root, rosehips, hawthorn berries, lemon grass, natural passionfruit and mango flavor, other natural flavors, and citric acid.

This is an all-natural product containing no artificial colorings, flavorings, or preservatives.

NUTRITION INFORMATION PER BREWED SERVING:			
Serving size	1 Tea Bag	Carbohydrates	less than 1 g
Servings per pkg.	24	Fat	less than 1 g
Calories	0	Sodium	0 mg
Protein	1 g	Potassium	40 mg

Percentage of the U.S. Recommended Daily Allowance (U.S. RDA): contains less than 2% of the U.S. RDA of protein, vitamin A, vitamin C, thiamine, riboflavin, niacin, calcium, and iron. ★

Figure 12

**Figure 13**

**A gathering of natural ingredients, such as mosses, twigs and permanent berries, forms a Christmas wreath exuding simplistic elegance. A weave of tartan ribbon highlights the colors of the season.**

viewed as having excellent potential in current and future floral markets throughout the U.S. The use of catkins in floral design trends match the strong move toward asymmetric designs which are so popular with both domestic and international consumers (see **Figure 13**).

As a dried floral, rose hip is used in many floral creations both on and off the branch (see **Figure 14**). The dried hip is also used as an ingredient in potpourris and specialty lines of aromatics.

**Bearberry (*Arctostaphylos uva-ursi*):**

Although apparently used less than dandelion, the leaf of this medicinal is best known as an astringent, diuretic and tonic. When used, its purpose is as a urinary tract antiseptic, cleansing the kidney and gall bladder. For this reason, it may be used as an ingredient in diet teas (see **Figure 15**). Uva-ursi teas, capsules, and extracts are purportedly useful for treating inflammations of the tract, as well as cystitis. The leaves also contain a fair amount of tannin and, taken over time, may irritate the stomach. Some people tolerate this medicinal more easily by adding an equal amount of peppermint leaves to the mixture.

The fruit of this plant may actually offer more immediate special forest products opportunity. During the fall, the fruit of this plant is edible and can be eaten fresh or as a dried fruit.

Regulatory status:	U.S.:	None
	United Kingdom:	Included on general sales list
	Canada:	Approved as an over-the-counter drug
	France:	Traditional medicine
	Germany:	Approved as an over-the-counter drug
	Japan	Listed in <i>Japanese Pharmacopoeia</i>

**Coltsfoot (*Petasites ssp.*):**

Coltsfoot is a plant grown throughout many regions of the U.S. and Canada. There are various types of coltsfoot, including *Tussilago farfara L.*, all of which are used for similar purposes.

Synonyms used for the herb often best describe the herbs benefits: *coughwort* and *British tobacco*.

The silky seed of the flower was once used for stuffing pillows and mattresses. The root, with wine, is still used as a folk remedy for hardening of the liver. It is also still used as one of the most popular herbal cough remedies (see **Figure 10** under discussion of *mentha*).

According to the U.S. Federal Drug Administration (FDA), the only therapeutic value the leaves of this herb possess is as a demulcent, because of its high mucilage.

Homeopaths do prescribe the tincture of the whole plant for obesity and excessive eating habits. For lung congestion or consumption, coltsfoot is often combined with elder flowers, ground ivy, horehound, and marshmallow, and then smoked. The fresh leaves, or juice, are also used for treating a bad, dry cough or wheezing, and shortness of breath.

**Plantain (*Plantago major*):**

The soothing, bulking properties of this plant's mucilage is reported used as an effective appetite suppressant. Tested on Italian women, the herb purportedly helped the women lose more weight

Figure 14



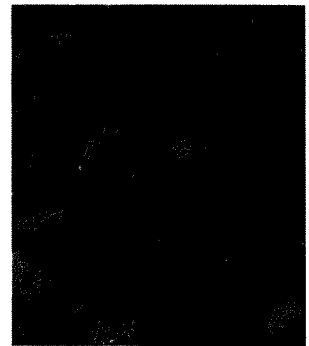
NUTMEG



ANISE



CLOVES



ROSE HIPS




A dramatic tabletop tableau of dried arrangements and candles takes center stage. Playing major roles are a candleholder fashioned from a glass cylinder holding cinnamon chips and sporting a bow; a larger cylinder filled with layers of spices and topped with a handcrafted ornament; and a third container of cloves, canella berries and rye.

THE ORIGINAL

**Laci Le Beau**®

NUTRITIOUS DIETARY PLAN ENCLOSED



**Super Dieter's Tea**

A Dieter's De-Lite at only 3 Calories

**NATURAL LEMON MINT**  
CAFFEINE FREE

30 Tea Bags Net Wt. 2.63 oz./75gm.

The Original

**Laci Le Beau**®

**RECOMMENDATIONS FOR FIRST TIME USERS**

**SUPER DIETER'S TEA** from Laci Le Beau is the result of painstaking research and experimentation with hundreds of herbs, leaves and spices. Our Master Tea Blenders combined ancient Chinese wisdom with American ingenuity to create a refreshing tea of unequalled flavor and aroma.

Since everyone is unique, it's recommended that you start with a small amount of **SUPER DIETER'S TEA** and gradually increase your intake to meet your personal taste requirements.

**DIRECTIONS:** Pour two cups (12 ounces) of boiling water over one tea bag and let steep for 2 minutes. Do not over steep. Remove tea bag. Drink one cup, hot or cold, after your evening meal. Save second cup for next day. After 3-4 days, gradually increase strength of tea by using one tea bag with one cup of boiling water and steep for 2 minutes. For optimum flavor, never over steep.

**NOTE:** Beverages consumed by a nursing mother are often transferred to the baby. As with all beverages, consult a physician before using if you are pregnant, lactating, on medication or have a medical condition.

**NUTRITIONAL INFORMATION PER BREWED SERVING**

SERVING SIZE .....	1 Tea Bag	CONTAINS LESS THAN 2% OF
SERVINGS PER PACKAGE .....	30	THE U.S. RECOMMENDED
CALORIES .....	3	DAILY ALLOWANCE (U.S.RDA)
CARBOHYDRATES .....	Less than 1 Gram	OF THESE NUTRIENTS: VITA-
PROTEIN .....	Less than 1 Gram	MIN A, VITAMIN C, THIAMINE,
FAT .....	Less than 1 Gram	RIBOFLAVIN, NIACIN, CAL-
SODIUM .....	5mg	CIUM, IRON.

**INGREDIENTS:** Cassia Angustifolia, Orange Peel, Licorice Root, Althaea officinalis, Arctostaphylos uva ursi, Ginseng, Papaya, Honeysuckle, Chrysanthemum, Spices Lemongrass Oil and Mint Oil.

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on a low-calorie, reduced-fat regimen than when they dieted without taking the plantain. Experts state the herb does more than just eliminate hunger pangs. When taken before meals, the mucilage in the plant diminished both LDL (bad) cholesterol and triglycerides by decreasing their absorption. HDL (good) cholesterol levels are left untouched. There appears to be an increased risk of heart disease when obesity accompanies low HDL cholesterol levels.

Traditionally, the leaf of the herb has been used for coughs, diarrhea, dysentery, and bloody urine. Leaves applied to blisters, sores, ulcers, swelling, insect stings, etc, are thought to reduce the heat and pain of inflammation.

In China, a related species (*plantago asiatica*) is used clinically to reduce blood pressure with a 50% success rate.

In Latin America, *plantago major* is a prominent folk cancer remedy.

According to earlier 1993 research conducted on this species by Mater Engineering, the demand for this herb appears to be growing, but it is a relatively undeveloped botanical in the U.S.

Aside from the medicinal qualities of this botanical, the young leaves of plantain apparently make tasty salad fixings, and, when cooked, are delicious as vegetables served with butter.

The attached *Botanicals Demand-Availability Matrix* (see *Table 15*) illustrates both demand and resource availability factors in North America for some of the represented species listed in Priority Levels 1 and 2.

### Value-Added Processing of Forest Foods and Medicinals

With the botanical, herbal, and natural foods markets being so strong and clearly growing, it is reasonable to look at products which hold high value in the natural health care products industry. These types of natural health care products are sold in many value-added forms. The most common value-added forms are:

1. Tinctures & Extracts
2. Tablets & Capsules
3. Teas
4. Bulk Herbs

The following data provide a basic overview of each of these value-added processes relative to manufacturing and equipment requirements and costs, and value-added (profit-added) benefits.

#### Tinctures

Herbal tinctures are a concentrated liquid form of herb(s). Tinctures are manufactured by placing 1/2 to 1 lb of powdered herb per gal of water containing 20% to 50% alcohol. The alcohol serves as a solvent which extracts the active ingredients from the herb. The herb is allowed to soak for four to

**Table 15**  
**Botanicals Demand - Availability Matrix**

<b>Availability/Demand Legend:</b>		
1	=	low
2	=	medium
3	=	high
<b>Class Legend:</b>		
c	=	cultivated
w	=	wildcrafted
i	=	imported

<i>Botanical Name</i>	<i>Demand (1992-1993)</i>	<i>Availability (in North America)</i>	<i>Class</i>	<i>U.S.\$/lb (1992-1993)</i>
Dandelion Root ( <i>Taraxacum officinale</i> )	3	3	wc	\$5.00
Horsetail ( <i>Equisetum arvense L.</i> )	3	3	wc	\$4.50
Licorice Root ( <i>Glycyrrhiza lepidota</i> )	3	3	ic	\$10.50
Nettle Herb ( <i>Urtica dioica</i> )	3	3	wc	\$7.00
Uva Ursi Leaf ( <i>Arctostaphylos uva-ursi</i> )	3	3	wc	\$4.00
Valerian Root ( <i>Valerian septentrionalis</i> )	3	3	wc	\$5.00
Plantain Herb ( <i>Plantago major</i> )	2	3	wc	\$5.00
Coltsfoot Leaf ( <i>Petasites ssp.</i> )	1	3	i	\$3.50

eight weeks. During the extraction process the solution is agitated on a regular basis to ensure that the herb makes optimum contact with the alcohol solvent. This can be accomplished by manually shaking the bottles several times a week or building an automated agitation system which can be operated consistently. All things considered, manufacturing herbal tinctures is by far the best way to add value to an herb with the least amount of investment.

Herbal tinctures are becoming more popular as customers are learning about their benefits:

1. Tinctures are a concentrated form of the herb, so less is required per dose.
2. Tinctures have a long shelf life as they are stored in an alcohol solution which serves to preserve them. They are normally bottled in amber bottles which helps to eliminate the effects of breakdown from exposure to light.
3. Tinctures are normally sold in 1- and 2-ounce bottles which are convenient to carry and store.
4. The extraction process is done at room temperature which does not destroy the delicate enzymes and other fragile components. You are left with a complete balance of the original herb.
5. Tinctures are easy to assimilate. The herb is already broken down which makes it easier for the body to utilize the nutrients.

**Equipment Requirements:** *(Note: all prices in this section are in U.S.\$)*

**Herb Processing:**

1. **Hammer Mill.** A hammer mill is required when working with whole herbs that need to be powdered for the tincturing process. This would be needed if you were going to wildcraft your herbs yourself. Most herbs are available in powdered form from suppliers. For low volume requirements it is also possible to use an industrial blender (Vita Mix) which is less expensive but more difficult to use.

Cost:	
Hammer Mill	\$2,000.00 to \$2,500.00
Vita Mix	\$320.00

2. **1-gal wide-mouth glass bottles.** A minimum of one bottle is required for each herb. They are used to contain the powdered herb and the alcohol solution during extraction.

Cost:	
1-gal wide-mouth bottle with lid	\$1.50 each

**Filtration:**

The filtration process is the final part of creating a tincture. After the extraction process is finished, it is necessary to filter the herb powder from the liquid to get a filtered tincture with no sediment. This can be accomplished in several ways. One is to use a press which will squeeze the liquid out of the powder. The more efficient method is to use a vacuum process.

**Vacuum Filtration:**

The vacuum process requires several pieces of equipment.

1. **Vacuum Pump.** The vacuum pump is used in the filtration process to create a vacuum in a flask which will receive the liquid.

Cost: \$350.00 to \$1,000.00 each

2. **Filtering Flask.** The filtering flask is a 4 l glass flask with a vacuum hose attachment.

Cost: \$90.00 each

3. **Buchner Funnel.** This is a special funnel which is set on top of the flask. A paper filter is placed in the funnel which receives the herbal solution from the 1-gal wide-mouth jars.

Cost: \$116.00 each

4. **Filter Paper 25 cm.** One filter is required for each gallon of filtered material.

Cost: \$16.00 per 100

5. **Accessories.** Valves, hoses, adapters, etc.

Cost: Approximately \$200.00

6. **Bottling Equipment.** The final product can be bottled in several ways, from the inexpensive manual method (squeeze bottle) to automated systems. Many people have a designer/builder make a custom one for their needs.

Cost: Off the shelf bottler - \$500.00 and up

7. **1-gal storage bottles.** Tinctured product which is not bottled is stored in 1-gal amber bottles.

Cost: \$1.75 each

**Value-Added Benefits**

As noted earlier, the tincture process adds the most value to an herbal product when compared to other manufacturing and packaging processes. Setting up the process is inexpensive and the benefits are many.

Listed below is a general summary of the average cost and markups of a tincture, taking into consideration the product and direct labor cost.

Cost of herb:	\$6.00	for one lb
Cost of alcohol:	\$3.00	for one gal
64 two oz bottles:	<u>\$24.00</u>	for one gal
<b>Product cost 1 gallon:</b>	<b>\$33.00</b>	
Cost per 2 oz bottle:	\$.52	each
Approx labor cost:	<u>\$1.00</u>	each
<b>Total</b>	<b>\$1.52</b>	<b>for one 2 oz bottle</b>

Profit per 2 oz
-----------------

Average Retail (2 oz):	\$12.00	\$10.48
Average Wholesale (2 oz):	\$6.00	\$4.48

As noted in this rough outline, the tincturing process is an excellent value-added process.

### Extracts

Extracts are another class of concentrated herbs. Extracts are normally more concentrated than tinctures. The extraction process starts with the same process as tincturing. After the herb has been filtered the, liquid is then evaporated to yield a thicker liquid or evaporated all the way to form a dry powder.

Standardized extracts are extracts which have been tested to verify that they have a specified amount of the active ingredient found in the herb. This testing is usually done by an independent laboratory.

There are many standardized extract powders available which you can add to a water/alcohol solution, giving you a standardized product. This is the easiest way to add extracts to your line. To manufacture them is expensive and requires a considerable expertise.

### Tablets and Capsules

Herbs in tablet and capsule form are very popular. Currently, more herbs are sold to the end consumer in this form. While this is an excellent way to add value to an herb, the initial setup cost is high. With this type of processing, the herb will have a shorter shelf life than with tincturing. Typical shelf life is 6 months to 1 year.

**Equipment Requirements**

1. **Hammer Mill.** (See description in previous section)
2. **Tabulating Press (for Tablets only).** This is a device which will take the herb powder and compress it into tablet form. It then fills the container with the tablets. Presses vary in their capacity and cost.

Cost: \$35,000.00 to \$60,000.00

While the cost is high for a press, there is good market demand for tablets. An outside service can be used to tablet for you.

3. **Capsuling Machine (for Capsules only).** This device will fill gel caps with the required amount of herb and fill the container with the capsules.

Cost: \$55,000.00 to \$120,000.00

In addition to tableting and capsuling your own product, one of these machines allows you to offer these services to other customers.

**Other related cost.**

Bottles: \$.35 to \$.75 depending on the type of bottle.

**Value-Added Benefits**

The profitability is good for tableting and encapsulating herbs, even though the retail prices can vary widely depending on the herb. However, the labor cost is low, and production is high because most of it is done by machine.

Listed below is the average cost and markup for tablets and capsules based on a bottle of 100 units at 2 oz each.

Cost of herb:	\$ .50	for 2 oz
Bottle:	\$ .50	each
Misc.:	<u>\$ .10</u>	gel cap, shrink wrap, cotton, etc.
<b>Total</b>	<b>\$1.10</b>	

Profit
--------

Average Retail:	\$12.00	\$10.90
Average Wholesale:	\$8.00	\$6.90

While the profit is also good on tablets and capsules, the setup cost is considerably more than that for tinctures.

## Teas

Teas are another popular value-added herbal product and packaging method. Experts tell us the demand for herbal tea is growing between 10% and 20% annually. Teas are usually sold in a cut and sifted form. They are packaged in loose form and in tea bags.

### Equipment Requirements:

1. **Hammer Mill.** (See previous description)
2. **Tea Bag Filler.** This is a machine which fills tea bags. They are expensive new and hard to find used.

Cost:	\$50,000.00 used
	\$375,000.00 new

There are outside services which will fill tea bags for around \$6.00 for 1,000 tea bags.

Tea is also sold loose in small bags and other types of containers which do not require a tea bag filler.

### Manufacturing Options and Costs

#### **Brown Paper Bag Packaging:**

Most herb teas are purchased for more than \$3.00/lb. All bulk herb teas are sold as 1/4-lb units. Therefore, the cost of herb ingredients per bag (or box) is \$0.75.

The bag used should have a glassine liner, similar to those used for coffee. These cost less than \$0.02 each in quantities of 2,000.

An over/under bagging machine can be made or purchased for less than \$2,000.00. This can reduce your labor requirements by more than 300%. Only two persons are needed to meet fairly high production requirements.

The cost for producing a brown bag herb tea is given as:

Bag	\$0.02
Label/Printing	\$0.02
Ingredients	\$0.75
Labor	\$0.05
Advertising	\$0.05
Overhead	<u>\$0.05</u>
 Total cost:	 \$0.94

#### **Tea Bag Packaging:**

Machine and paper costs average \$8.00/1,000 bags. There is also a \$600 one-time plate charge.

Preferred packing for a box of tea bags consists of 16 tea bags for a net weight of 1.5 oz (average for most blends). Each tea bag holds 35-40 grains of herbs. There are 12 boxes per case.

There are 170 tea bags/lb of herb tea. Most herb teas can be purchased for \$3.00/lb. Therefore, the cost of herb ingredients per tea bag is \$0.0132. The cost for ingredients in one box of tea (16 bags) is \$0.22.

The cost per box for bagging this tea is about \$0.13. From these figures, it can be inferred that the total costs are approximately given as:

Container/box	\$0.08
Packing carton	\$0.10
Tea bagging	\$0.13
Ingredients	\$0.22
Advertising	\$0.05
Overhead	<u>\$0.05</u>
<b>Total cost:</b>	<b>\$0.63</b>

### **Bulk Herbs**

Bulk herbs are sold primarily to other herb processors who use them in their own value-added products. There is a good demand for quality bulk herbs, especially wildcrafted. Both the wildcrafted and cultivated bulk herb businesses are high-volume, low-profit ventures. There is considerable competition from around the world for this market. It is labor intensive and involves many processes from growing and gathering, to drying, processing, and packaging.

Once the herb has been harvested or gathered, the following equipment is required to process the herb after it has been prepared for use:

1. **Drying.** Drying can be accomplished in several ways. The herb can be sun dried in a greenhouse or forced-air dried with fans and a dehumidifier. A large sealed space is necessary.
2. **Powdering/Grinding.** (See the section on hammer mills). A hammer mill can be set to achieve varying types of cuts, from a fine powder to a loose chip for a cut-and-sifted product.
3. **Packaging.** Bulk herbs are sold in 1 lb packages or in packages up to hundreds of pounds. They are packaged in everything from bags to barrels.



### CATEGORY 3 RESEARCH RESULTS

Category 3 defines the special group of forest plants holding aesthetic and/or botanical characteristics that suggest possible market potential and warrant analysis under this project. Because these plants would currently be either non-existent on the market or marketed by a small number of individuals, direct interviews were required.

Mater Engineering personnel completed over 30 direct interviews across the U.S. and Canada in evaluating the following Category 3 species for floral and pharmaceutical market opportunities:

Pitcher Plant (*Sarracenia Purpurea*)  
 Horsetail (*Equisitum ssp.*)  
 Labrador Tea (*Ledum groenlandicum oeder*)  
 Stemless Lady Slipper (*Cypripedium acaule*)

As with Category 2 species, actual field inventories for these plants have not been conducted, so no data exists regarding actual volume availability. Further, on visual review of the forests in the targeted area, only Labrador tea could be said to be consistently abundant.

Interview results were as follows:

#### Pitcher Plant (*Sarracenia purpurea*):

Of the four plants evaluated under this category, the pitcher plant appears to hold immediate market opportunity for Saskatchewan. It resembles the *sarracenia*, a plant located in the southern states of the U.S. (*Sarracenia leucophylla*) which has become a popular floral product, both fresh and dried, throughout the U.S. and Europe (see Figures 16 and 17). Buyers state that the *purpurea* offers unique market opportunity because of its unusual color difference.

While the typical southern *sarracenia* has more of a black-veined white leaf, other types of plants have a red-green coloration desired in the floral industry (see Figure 18). Saskatchewan's pitcher plant (*Sarracenia purpurea*) has an unusual red-veined green leaf which is attracting the interest of international floral wholesalers such as Knud Nielsen. Buyers from Knud Nielsen state they have identified the *sarracenia* species as a potential new floral offering for their international markets.

The *purpurea* variety apparently prefers boggy soils in order to propagate which, therefore, restricts the geographic locations of where this species can come from. Further complicating access to this species are varying state laws for endangered species. For example, Knud Nielsen currently purchases the *leucophylla* variety from wildcrafters in Alabama but not Florida where the species also grows because Florida has designated the variety as an endangered plant.

Market demand for this species is strong enough that Knud Nielsen is currently attempting to cultivate the southern variety of *sarracenia* in order to increase their product yield by 25-30%. They are not aware of any others who are currently cultivating the species.

Knud Nielsen buyers stated they are very interested in the Saskatchewan variety and would like to receive samples. If they like the quality and price, the buyers state they could order approximately 500,000 stems the first year, with increases up to 1 million stems in the following years.



## NEW COUNTRY

Wafting in on the sweet, late-summer air comes the cleaner, crisper, less complicated New Country look, shown here in stonewashed pinks, whites and greens. The drieds design features regal sarracenia lilies, Queen Anne's lace and grass green rye. The neutral, naturally washed look of birch bark appears in the candleholder, tray and updated heart motif hatbox.

Product Source Guide on page 117.

Figure 17



## ALPINE WREATHS

The cool colors and fine textures of alpine flora predominate in this dried wreath. White larkspur, California lace moss, salal and melaleuca leaves, saracenia lillies, brunia, sage, and pinecones are woven on a base of huckleberry vine. Two sizes are available: approximately 18" in diameter (shown) or a larger circle that measures about 30" across.

*Medium Wreath #1683 \$69*

*Large Wreath #1368 \$149*

Figure 18



One Florida buyer mentioned a price of approximately \$.10 (U.S.\$) per fresh stem to the forager (wildcrafter) when talking about purchasing southern *sarracenia* from U.S. material providers. It was also noted that the southern variety was also imported into the U.S. from Malaysia, Venezuela, Singapore, and Taiwan, but no prices were given. No other prices were shared by other buyers interviewed during the research on this species.

It was noted by buyers in the south that traditional logging practices "destroy" the natural growing *sarracenia* in the south, which means fewer plants will be available in the future.

Several botanical experts consulted during the research conducted on this species stated that cultivation of the northern and southern species is not difficult. If market demand is as strong as thought to be by some in the industry, establishing greenhouses for *sarracenia* cultivation may prove worthwhile.

One note of caution: several buyers said that *some* varieties of *sarracenia* are listed in an international endangered species agreement called CITES. This agreement has been signed by many countries including the U.S., Japan, Canada, and many of the remaining industrialized countries throughout the world. The agreement stipulates that the signing countries will not export or import endangered species of plants or animals. Currently, it is unclear whether the *purpurea sarracenia* is listed in the CITES.

It should be noted that Lebermuth of Indiana also offers pitcher plant as one of their botanical product offerings.

#### Horsetail (*Equisetum ssp.*)

Horsetail is used in the botanicals industry. Alcohol extracts are produced from the species which are then used to manufacture homeopathic products and shampoos. Botanicals buyers state that while the demand for the product in the U.S. remains small, a much greater demand exists in the European markets.

Botanicals International of New Jersey states there is demand for the species. Company buyers said that the product must be air dried, cleaned of dirt and debris, then bagged in plastic or burlap bags of 25 stems. They state they are interested in receiving Saskatchewan samples in order to evaluate for ash content. The plant is apparently high in silica and used extensively in the nutritional foods industry.

Lebermuth of Indiana currently imports their horsetail from Hungary. The species is harvested in September for delivery in November. Their purchase price is currently \$.70/lb for the product.

Brown & Sons of Indiana (related to Lebermuth) states they purchase large volumes of the plant. Currently they import tens of thousands of pounds annually, some which come from wildcrafters out of Oregon. The buyers state they would be interested in receiving samples of Saskatchewan product. They also suggest that the plant must be harvested at the height of botanicals season (September).

Horsetail has been used as an important remedy in folk medicine. A poultice of crushed sterile stems can be applied to wounds to stop bleeding. A liquid extract made by boiling the stems can be used as a mouthwash for oral infections, and there is some evidence which suggests that horsetail has some antibiotic properties.

However, the plant is designated a Priority 2 level not only because of its botanical/medicinal benefits, but also for its potential as a material for the fresh and dried floral markets. The use of

horsetail in a variety of product lines seems to have just recently come into its own. As examples, Washington state-based Hoh Grown has come out with a new line of floral containers made from dried horsetail, mosses, and branches (see inset on Figure 19). *Equisetum* also appears to be a popular fresh-cut floral (see Figure 19). Some have even decided the plant is warranted for use simultaneously as a container and fresh cut floral (see Figure 20). The potential for both resource development and value-added product development from this species should not be overlooked.

Buyers interviewed for this project stated they are involved in testing horsetail with new drying, dyeing, and preserving processes. Calfolia of Canada feels there may be excellent demand for this species and are currently researching the dyeing and color retention of this plant from their first cultivation this year.

As shown above, Hoh Grown of Washington is the first to actually develop a new line of floral containers made from horsetail. Hoh Grown states that if the new containers become a popular item, they will require significantly more volume than is currently available in their surrounding areas. Hoh Grown buyers stated they would be interested in seeing the horsetail from Saskatchewan to evaluate the quality of the species as a dried product in order to consider purchase. The species must be air dried, not hot or forced dried, so the product stays pliable and retains as much green color as possible. Hot-drying and forced-air drying have been tested but apparently result in a product that crumbles. Some Canadian buyers such as Canadian Foliage have indicated that the species does not dye properly, but other preserving processes have been used successfully.

Highland Evergreen Supply Company in Ontario, Canada states that the product is currently purchased fresh and sold fresh. They also find air drying a satisfactory method of preserving the species, but feel that if the plant could be preserved differently, through glycerin treatment for example, the demand could grow significantly.

It was noted by several buyers that if market demand increases for this product, this could make a good year-round product choice as the species does not winter kill.

#### **Labrador Tea (*Ledum groenlandicum oeder*)**

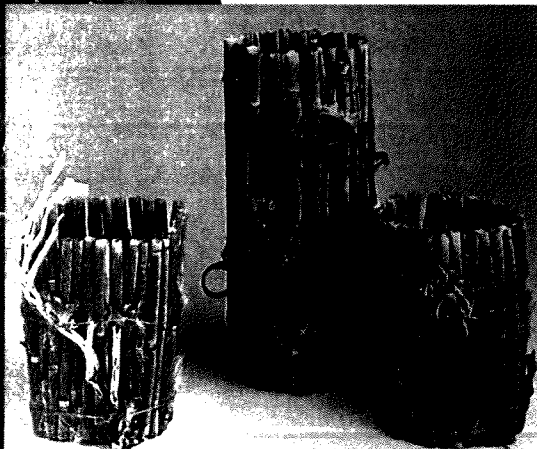
Although this plant can be used in producing herbal teas and homeopathic remedies, Mater Engineering was interested in also evaluating the potential for this plant in the floral industry.

As might be expected, very few floral buyers even knew what the plant looks like, but several indicated an interest in testing the species because the described color and texture of the plant had appeal. Buyers recommend that conducting tests on multiple processing of the plant (preserving, drying, dyeing, etc.) would be needed in order to further evaluate actual market potential in the international floral industry.

#### **Stemless Lady Slipper (*Cypripedium acaule*)**

Almost all of the individuals interviewed for market research on this species strongly recommended that the plant be left in the wild.

Figure 19



▲ HOH GROWN  
EQUISETUM CONTAINERS  
FORKS, WA  
206-374-9267  
CIRCLE #117

# WATER GARDEN

A serene oasis provides a soothing presence for home or office.

**M**inimal materials are necessary to create this design, yet its serene beauty will provide a soothing presence for home or office interior.

Snips of equisetum, or horsetail, are glued to the sides of a clear plastic tray from which vertical placements of equisetum spires and a lush bush of freesias emerge.

The small white rocks reflect the purity of the three freesias, just as all the elements are reflected in the cool pool of water.





Difficulty with propagation, dormancy (between 12 and 15 years experienced by many), and specialized growing conditions were all reasons cited as to why there has been limited success of this species in the market. The dormancy issue, as an example, was highlighted as one of the key reasons why plants transplanted from the wild are said to have "died".

According to those interviewed, dormancy is often an issue of poor growing conditions. The Saskatchewan variety needs more specialized growing conditions.

While many buyers stated that the aesthetics of the plant were "highly marketable", propagation difficulties would prove an overwhelming barrier (aside from endangered species concerns).

Based on the results of the interviews conducted for this project for Category 3 species, it is recommended that field inventorying to be conducted by Weyerhaeuser-Canada include the Pitcher Plant (*Sarracenia purpurea*). The goal of the field inventory on this species is not for purposes of harvesting the species, but rather collecting plant seeds for cultivation.

## **SPECIAL FOREST PRODUCTS INVENTORYING**

Because creating an annual inventorying process for selected special forest products in the study area is a basic goal of this project, Mater Engineering conducted surveys throughout the U.S. and Canada to ascertain what, if any, special forest products identification and inventorying programs existed for either public or private timberlands. For this research, all the provincial governments throughout Canada were surveyed, as were 29 National Forest Systems and 16 State Forestry Divisions in the U.S. Exhibit A contains a listing of the contacts made by Mater Engineering personnel for this research.

In each survey, three basic questions were asked:

- 1) Has any program been established, either by government or private interest, which conducts annual inventories of non-timber (understory) products? If so, what is the methodology and technology employed in the inventorying process?
- 2) If no annual inventory process exists for non-timber products, what is the current level of activity for identifying and tracking special forest products harvesting in the jurisdiction?
- 2) Is there any system in effect (or currently being planned) for the coordination of timber harvesting and the foraging of non-timber products from identified timber harvest site?

### **Canadian Survey Results**

Results of the surveys relative to Canadian forests were fairly consistent across all regions. Most interviewees stated that special forest products inventories either did not exist or that they were not aware of the existence of such inventories. Several did indicate that the issue of inventorying special forest products was just currently being seriously considered. Officials in New Brunswick, for example, detailed that many regions and provinces are just beginning to think about or have just realized the need for information and regulations pertaining to the alternative product uses from the forests. They stated there is a move away from traditional forest products and a growing need to develop programs for the smaller privately-owned woodlands. The Forest Extension Service in New Brunswick is currently developing a model which will make the landowner aware of these potential product needs. The program to be developed around the model will also help the landowner identify the potential for non-timber species and advise the landowner on the potential management of these special forest products.

Almost all Canadian officials stated a lack of market research on special forest products specific to Canada and indicated a strong interest in gaining a better understanding of Saskatchewan's activities in this area.

Reference was made to the New Forestry Act - Environmental Access Act in Canada which, according to some interviewed, may contain a statement which could prohibit the removal of anything from the forest which may cause nutrient degradation of the site. Apparently, the statement is "not very clear" and may be subject to interpretation.

Based on the interviews in Canada, types of non-timber products which have been harvested from various provinces include:

Burls from trees  
 Lichens (shipped to Scandinavia)  
 Maple syrup (mainly on private timberland)  
 White birch  
 Christmas trees  
 Evergreens for wreaths  
 Pine mushrooms (shipped to Japan)  
 Berries  
 Salal (for the floral industry)

Regulations concerning the foraging of these products in Canada were noted either as "minimal" or "nonexistent". It should also be noted, however, that there appears to be an immediate concern for defining better regulations on the harvesting of non-timber products because of growing market demand for the products, and the apparent "poor" foraging techniques employed by some which illustrate a disregard for sustainable product management and the health of surrounding ecosystems.

A number of computer modeling programs for resource analysis are currently employed in Canada (i.e. BIP, EDIS, TREEWHERE, SEEDWHERE, GRASS). However, according to survey results, no inventory program currently exists which is being applied to special forest products (although some programs such as the Bio-Environmental Indices Project [BIP] in the Ontario Region appear to have the basic elements for such a program).

Regarding the question of timber harvest coordination with special forest products foraging, all interviewed in Canada stated they were unaware of any coordination efforts in this area.

## U.S. Survey Results

Depending on geographic location in the U.S., the term *special forest products* may be well-known or not known at all. In general, the western states of the U.S. appear much more actively involved in identifying, inventorying, and conducting detailed market research on the non-timber products from their forests. For example, five National Forests (all located in Oregon) have recently established baseline identification systems for non-timber products in their forest. Additionally, other National Forest systems and several State Forestry systems have permit structures in place for the harvesting of special forest products.

Those who expressed a need for a special forest products inventory system were National Forests located primarily in California, Oregon, and Washington. They cited a lack of funding and a lack of historical data as the major detriments toward developing a forest management inventory that included special forest products.

Much of the information about the amount of special forest products is gleaned by the Ranger District rather than Forest Management personnel. The most active Ranger Districts include those areas of California and Oregon where matsutake mushrooms are growing. Some of the National Forests or Ranger Districts within these areas have appointed a Special Forest Products Coordinator to track harvests, permits, species availability, etc.

The first step in establishing an inventory of special forest products in these areas consists of compiling a list of commercially-acceptable quantities of special forest products available in each Ranger District. Field surveys are currently in progress to obtain this data in several National Forests. The data also includes details of the optimum harvest methods for commercially-viable species, recommended harvest rotations, and the identification of best seasons for collecting. The data will be used to establish a forest-wide policy of managing these special forest products.

The Chemult Ranger District in the Winema National Forest, Klamath Falls, Oregon has completed a *Botanical Collection Guideline* which is meant to be used as a proactive tool for the District Office. It also includes species specific codes for commercial botanicals; the codes are then tied into a working mapping system which will facilitate inventory and long-term management of special forest products. A few other districts are moving in this same direction of data collection to establish a baseline for a computerized inventory system.

Rogue River National Forest in Oregon has applied for funds to conduct a botanical survey, and has established a Special Forest Products Program, including an Action Plan. The stated goal is to promote the responsible utilization of special forest products to aid the growth and diversification of the local economy while maintaining the sustainability of all of the resources and the integrity of the ecosystem.

In May, 1993 the U.S. Forest Service in Washington, D.C. appointed a Supervisory Forester, Mr. Jerry Jeansonne, to coordinate and establish special forest products management policy for public and private forest lands. When interviewed for this study, Mr. Jeansonne detailed his current efforts in collecting reports from individual ranger districts throughout the U.S. that identify special forest products and describe the market opportunities of each species. Mr. Jeansonne also emphasized the need for data to substantiate the business sustainability of each resource, as well as the sustainability of surrounding ecosystems.

According to Mater Engineering survey results, the U.S. Department of the Interior Bureau of Land Management (BLM) has clearly made the most progress in the direct inventorying of special forest products in forest management. The BLM recently established a Special Forest Products Task Force and has appointed Special Forest Products Managers in Oregon and Washington. A *Special Forest Products (SFP) Handbook* which will be a supplement to the BLM Manual is in progress and will be completed by April 1994. A computerized *Forest Ecosystem Inventory* program that includes special forest products has been developed. Exhibit B of this report contains the draft version of the special forest products inventorying section to be included (with possible revisions) in the April release.

In conducting the inventory, data is collected in the field with a handheld data recorder and then transferred to the Timber Sales Information System (TSIS), a data base that generates a variety of reports on the examination and classification of special forest products. Details regarding species identification, average height, cover percent per plot inventoried, physiographic class (used to describe the topographic features that most affect the management of the area the sample plot is on), and even the quality of the species are all data input in the computerized inventory system.

The *SFP Handbook* is a comprehensive manual detailing the rules, regulations, forms, permits, minimum prices (to be updated annually), reasonable amounts for personal use, harvest methods, procedures, contracts, and guidelines for managing special forest products. The introduction to the manual states that special forest product management is an important component of forest ecosystem-based resource management. The *SFP Handbook* is intended to provide uniform standards and guidelines for the management of SFP in Oregon and Washington.

Regarding the issue of timber harvest coordination with special forest products foraging interests, there appears some level of coordination in several National and State forests where a "window" is set up with the forager so that the product can be removed before the timber is harvested. How successful these coordination efforts are remain to be seen.

## CONCLUSIONS AND RECOMMENDATIONS

Based on market trends research and direct product buyer interviews conducted throughout North America for this study, market opportunity clearly exists for special forest products found within Weyerhaeuser Canada Ltd., Saskatchewan Forest Management License Area (FMLA). Market opportunities not only exist for resources employed in floral and craft products, such as bark, branches, and mosses, but new product development opportunities appear to have significant potential, particularly in the dried and preserved floral industries.

In addition, the study area has a large volume of spruce and balsam fir needle biomass which may be effectively employed in the manufacture of oils used in the perfume and fragrance industries throughout the world. Purity of oil from this available biomass is currently being tested.

Other special forest products found in the project area are currently used in the natural health foods industry throughout North America and Europe. These botanicals are gaining in popularity as main ingredients in alternative medicinal products. The availability and volume of these botanicals in the study area need to be documented as part of an annual inventory evaluation to determine whether adequate volumes exist to capture potential market demand.

Immediate and projected demand for many of the special forest products targeted in this study, coupled with the interest in evaluating Saskatchewan resources suggests strong justification for supporting efforts toward special forest product economic development in the project area.

With transportation costs a significant factor in product competitiveness, concentrating on value-added processing is critical for special forest product development in Saskatchewan.

Finally, new emphasis on the importance of special forest products within North America has focussed on the need for program development in identifying and annually inventorying non-timber forest products of commercial value.

**Exhibit A**

**List of Interviewees**

## Exhibit A

## Targeted Products Interviewees

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Active Organics, Inc.</b> 7715 Densmore Avenue Van Nuys, CA 91406 214-348-2015 214-348-1557 (fax)	Linda DeFratus	Oils
<b>James Akerson</b> (Current Pres., Society of Cosmetic Chemists) 6 Carriage Drive Bethel CT 06801 203-792-0204	James Akerson	Oils
<b>American Association for the Dried &amp; Preserved Floral Industry, Ltd.</b> 968 Lexington Avenue New York, NY 10021 212-628-6014 212-628-7983	Madi S. Heller	Lady Slipper Sarracenia
<b>Anderson's</b> PO Box 2032 Jamestown, NY 14702-2032 716-665-5197 716-665-3959	Curt Anderson	Lycopodium
<b>Apache County Dry Goods</b> 1106 2nd Street, #195 Encinitas, CA 92024 619-943-9369	Craig Arnold	Birch tops Alder tops Birch bark sleeves Lycopodium
<b>Appalachian Root &amp; Herb Co.</b> 37 Center Street Rainelle, WV 25962 304-438-5211 304-438-5211 (fax)	A.T. Thomas	Lycopodium Moss
<b>Autograph Foliages</b> 1501 Euclid Avenue, Suite 435 Cleveland, Ohio 44145 216-696-6151 216-861-3624 (fax)	Donna	Birch tops
<b>Basket Galleria</b> 2692A Middlefield Road Redwood City, CA 415-367-6314 415-367-6316 (fax)	Edward Santos	Baskets

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Chemical Specialties Manufacturer's Assoc., Inc</b> 1913 Eye ST NW Washington D.C. 20006 202-872-8110 202-872-8114 (fax)	Dr. Hill	Oils
<b>Colony Import &amp; Export Corp.</b> 226 7th Street Garden City, NY 15330 516-746-2560 516-294-4575 (fax)	John Muhlsteff	Extracts
<b>Commodity Services International, Ltd.</b> 114B N West Street Easton, MD 21601 301-820-8888 301-820-8890 (fax)	George Clark	Oils
<b>Colorado Evergreen</b> 1067 Des Moines Loveland, CO 80537 303-667-3770 303-663-2276 (fax)	Jan Earle	Branches Birch bark Moss
<b>Cosmetic Industries Buyers &amp; Suppliers</b> 75 Varick Street New York, NY 10013 212-941-0702 212-941-0708 (fax)	Steve Burman	Oils
<b>Cosmetic Toiletries &amp; Fragrances Assoc.</b> 1101 17th Street NW Suite 300 Washington, D.C. 20036 202-331-1770 202-331-1969 (fax)	Susan Warren	Oils
<b>Cosmetochem USA, Inc</b> Industrial West Clifton, NJ 07012 201-471-8301 201-471-3783 (fax)	Mildred McKinney	Oils



## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Côté Decor Action, Inc.</b> 3450 des Entreprises Terrebonne, Quebec J6X 4J8 514-477-4183 514-477-4185 (fax)	Luke Côté	Branches Moss Tree tops
<b>Custom Pharmaceuticals</b> 333 Jarvis Street Fort Erie, Ontario LZA 5M9 416-639-4629 416-639-4945 (fax)	Ellen	Synthetics/ inorganics Oils
<b>David O. Jones</b> 3737 Marine Way Burnaby, BC V5J 5A7 604-451-7200 604-451-7296 (fax)	Ron Andrew	Wholesale florist
<b>Dragoco Inc.</b> <b>Fragrance Division</b> 10 Gordon Drive Totowa, NJ 07152 201-256-3850 201-256-6420 (fax)	Susan Casanovas	Oils
<b>Elbin International</b> 2140 E. 51st Street Vernon, CA 90058 213-588-6767 213-588-3079 (fax)	Eli Bina	Baskets
<b>Epic Enterprises</b> 8989 Rio San Diego Drive Suite 160 San Diego, CA 92108-1647 619-294-2999, ext 136 619-294-6699 (fax)	Gideon Goren	Baskets
<b>Floral Express International Ltd.</b> R.R. 3 Box 22A Caribou, Maine 04736 800-392-7417	Carla Jackson	Sarracenia Lady Slipper
<b>Floridus</b> 7245 Pacific Circle Mississauga, Ontario L5T 1V1 905-670-7281 905-670-7281 (fax)	Carl Insley	Tree tops Lycopodium Horsetail Moss

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Florist Brokerage Company</b> 107 N. Maple Lemoni, Iowa 50140 515-784-7885	Rich DeLong	Moss
<b>Flowers Canada</b> 400 Silvercreek Pkwy N. Guelph, Ontario N1H 1E8 519-823-2670	Marjorie	Baskets
<b>Forest Products Packaging</b> 5180 Center Street NE Salem, OR 503-378-1333 503-378-7357 (fax)	Richard Reinhard	Moss
<b>Garden State Foliage</b> 340 Bismark Road Jackson, NJ 08527 908-928-9390	Louis Landwehr Tom Nagengast	Tree tops Branches Pine cones
<b>GBC-LA Floral Accessories</b> 7351 Heil Avenue, #1 Huntington Beach, CA 92647 714-842-6106	Larry Gallup	Moss Birch bark
<b>Greenleaf Wholesale Florist</b> 2801 Tchoupitoulas Street New Orleans, LA 70115 504-897-5100	Waldo	Sarracenia
<b>Growers Direct</b> 4220 98th Street, Suite 3301 Edmonton, Alberta T6E 6A1 403-436-7774 403-436-3336 (fax)	Doug Monroe	Fresh cut florals
<b>Haarmann &amp; Reimer</b> 70 Diamond Road Springfield, NJ 07081 201-467-5600 201-467-9370 (fax)	Chris Baude	Oils
<b>Highland Evergreen Supply Co.</b> 7125 Pacific Circle Units 4 & 5 Mississauga, Ontario L5T 2A5 905-670-7125 905-670-5562 (fax)	Fred Henderson	Branches Moss

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Hill Imports</b> PO Box 594 Allentown, PA 18105 215-776-1488 215-956-9855 (fax)	Faith Mariano	Baskets
<b>HOH Grown</b> PO Box 2135 Forks, WA 206-374-9267 206-374-5838 (fax)	Janet Hayes	Moss Branches Lycopodium
<b>Indiana Botanical Gardens, Inc.</b> 3140 E Ridge Road Hobart, IN 46424 219-947-4040 219-947-4148 (fax)	Kim	Extracts
<b>International Flavors &amp; Fragrances</b> Creative Center 650 Highway 36 Hazlet, NJ 07730 908-329-5531	Bipin Kahara	Oils
<b>International Sourcing, Inc.</b> 121 Pleasant Avenue Upper Saddle River, NJ 07458 201-934-8900 201-934-8291 (fax)	Larry Smith	Oils
<b>International Specialty Products (ISP)</b> 1361 Alps Road Wayne, NJ 07470 201-628-4000 201-628-4117 (fax)	Bob Ianniello	Inert chemicals Oils
<b>J.T. Forest Products</b> 577 Highway 61 Carlton, MN 55718 218-384-3296	John Tisdell	Birch tops Poplar tops Alder tops
<b>JPM Imports</b> 10-43 47th Avenue Long Island City, NY 11101 718-784-6430 718-784-6435 (fax)	Laura Moutet	Lycopodium Cones

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Kirby Floral</b> Unit 1 8560 Roseberry Avenue Burnaby, B.C. V3J 3N3 604-438-3535	Kenny Crompton	Moss Leafy branches Horsetail
<b>Knud Nielsen Company, Inc.</b> 217 Park Street Evergreen, AL 36401 205-578-2900 205-578-1887 (fax)	Jim Rigsby  Barbara Register	Branches Moss Sarracenia
<b>Lady Slipper Designs</b> R3 Box 556 Bemidji, MN 55601 218-751-0763	Lisa Bruns	Birch bark
<b>Landscape Alternatives, Inc.</b> 1465 N Pascal Street St. Paul, MN 55108 612-488-3142	Dean Hansen	Lady Slipper
<b>Lebermuth</b> PO Box 4103 South Bend, IN 46634 219-259-7000 219-259-7450 (fax)	Allan Brown	All species, medicinal & decorative Oils/extracts
<b>Mains Import</b> 231 Uran Street Hillsdale, MI 517-437-4407 517-437-2868 (fax)	Brook Shurmur	Baskets
<b>Marie's Orchids &amp; Carnivorous Plants</b> 6400 Cedarbrook Pinellas Park, FL 34666 813-546-7882	Clarence Baumgartel	Sarracenia
<b>Marvin Enterprises</b> PO Box 611 Dickson, TN 37055 615-441-1015	Charlene	Baskets
<b>Liberty Natural Products</b> 8120 SE Stark Street Portland, OR 97215 800-289-8427 503-256-1182 (fax)	James Dotten	Balsam fir oil extract

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Mayhews Wholesale</b> 5 3979 Marine Way Burnaby, B.C. V5J5E3 604-432-9809 604-430-9800 (fax)	Katherine	Tree tops
<b>McCann Brothers</b> 261 River St. Bridgeport, CT 06604 800-621-5678 203-366-2653 (fax)	Tim Vincent	Baskets
<b>Merck &amp; Co., Kelco Division</b> 8355 Aero Drive San Diego, CA 92123-1718 619-292-4900 619-467-6520 (fax)	Della Brenson	Extracts
<b>National Wildflower Research Center</b> 2600 F.M. 973N Austin, TX 78725 512-929-3600 512-929-0513 (fax)	Angela Barton	Sarracenia Lady Slipper
<b>Natural Heritage Program, DNR</b> 500 Lafayette Box 7 St. Paul, MN 55155 612-296-3344	Welby Smith	Sarracenia Lady Slipper
<b>The Naturals</b> 910 16th Street, # 614 Denver, CO 303-571-5320	Paul Bowersox	Branches Birch bark
<b>The Nature Conservancy</b> Oregon Field Office 1205 NW 25th Avenue Portland, OR 97210 503-228-9561	Susan	Sarracenia Lady Slipper
<b>Northwest Botanicals, Inc.</b> 1305 Vista Drive Grants Pass, OR 97577 503-476-5588	Richard Miller	Moss Preserved branches

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Oregon State University</b> Dept. of Botany & Plant Pathology 2082 Cordley Hall Corvallis, OR 97331 503-737-0123	Chiska Derr	Tree moss Oils research
<b>Orgel's Orchids</b> 18950 SW 136th Street Miami, FL 33199-1942 305-233-7168	Clyde Branblett	Sarracenia
<b>Peter Paul's Nursery</b> Canandigua, NY 14424 716-394-7397	Peter Paul	Sarracenia
<b>Plant Biotechnology Institute</b> National Research Council 110 Gymnasium Road Saskatoon, Saskatchewan S7N 0W9	Dr. Martin Lapp	Oil extracts
<b>Polarome Mfg. Company</b> 200 Theodore Conrad Drive Jersey City, NJ 07305 201-309-4500 201-433-0638 (fax)		Oils
<b>Preserve Botanicals</b> 3115 Commercial Street Casselberry, FL 32707 407-831-5590 407-331-5489 (fax)	Jeff Dokkestul	Leafy branches Lycopodium Moss
<b>Rainbow Hill Gardens</b> 6600 Woodlawn Maple Plain, MN 55359 612-479-3242	Barb Allwin	Lady Slipper
<b>Regal Research Laboratories, Inc</b> #107 19871 57A Avenue Langley, B.C. V3A 7J4 604-533-0602	Jeff Johns	Balsam fir oil
<b>Research Institute for Fragrance</b> <b>Materials</b> 2 University Plaza Hackensack, NJ 07481	Dr. Richard Ford	Oils

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Robertet-Grasse-France</b> BP 100 Avenue SIDI BRAHIM 06333 Grasse CEDEX France 93-40-33-66 (phone) 93-70-68-09 (fax)	D. Bertaud	Balsam fir oil Tree moss
<b>Robertet, Inc.</b> 125 Bauer Drive Oakland, NJ 07436 201-337-7100 201-337-0070 (fax)	Nadine Scaglione	Oils
<b>Roland's of California</b> 8768 9th Street Rancho Cucamonga, CA 91730 714-982-2601 714-982-8791 (fax)	Marjorie Prescott	Tree tops Branches Birch bark Moss Lycopodium
<b>Royal Green</b> 7320 Pacific Circle Mississauga, Ontario L5T 1V1 905-795-0250 905-795-0239 (fax)	Margaret	Branches
<b>Satsuki's Florist</b> 33253 1st Avenue Mission, B.C. V2V 1G6 604-826-1110	Hitomi Gilliam	Moss Branches Horsetail Lycopodium
<b>Shan &amp; Birdie International</b> 2635 Pointe Coupee Chino Hills, CA 91709 909-393-7745 909-393-7745 (fax)	Shan Weng	Birch products Imports only
<b>Silk Plus</b> 7315 Pacific Circle Mississauga, Ontario L5T 2A5 905-795-0250 905-795-0239 (fax)	Jamie Young	Tree tops
<b>Silkcraft of Oregon</b> 11120 SW Industrial Way Tualatin, OR 97062 503-692-8286	Debbie O'Rourke	Tree tops
<b>Society of Cosmetic Chemists</b> 1955 Broadway, Suite 1701 New York, NY 10023 212-874-0600	James Akerson	Oils

## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Strand Nursery</b> 2894 240th Street Cushing, WI 54006 715-488-2676	Bonita Hutton	Lady Slipper
<b>Sunbay, Inc.</b> 50 Harrington Road Watsonville, CA 99076 408-724-7577	Sandra	Sarracenia
<b>Teals</b> N726 Evergreen Road Antigo, WI 54409 715-627-7911	Art Teal	Moss Lycopodium
<b>Twig/Luzon Imports, Inc.</b> 531 Albany Street Boston, MA 02118 617-482-5012 617-482-1107 (fax)	Michael Volpe	Baskets Branches
<b>Twig/Luzon Imports, Inc.</b> 531 Albany Street Boston, MA 02118 617-482-5012 617-482-1107 (fax)	Jerry Gold	Branches
<b>United Flower Growers</b> 405 Marine Way Burnaby, B.C. V5J 5E2 604-430-2211 604-430-9800 (fax)	Henk Grasmeyer	Moss
<b>U.S. Testing Company</b> 1415 Park Avenue Hoboken, NJ 07030 201-792-2400 201-656-0636 (fax)	Arthur Tracton	Oils
<b>University of B.C., Vancouver</b> Department of Botany Vancouver, B.C, 604-822-2211	Neil Towers	Oils
<b>University of Guelph</b> Department of Botany Guelph, Ontario 519-824-4120, ext 6006	Melanie Howarth	Oils



## Targeted Products Interviewees (Continued)

<i>Company</i>	<i>Contact</i>	<i>Products</i>
<b>Vickerman Imports, Inc.</b> 1353 Larc Industrial Blvd. Burnsville, MN 55337 612-882-8893 612-882-8895 (fax)	Dick Weber	Birch branches Birch bark Moss
<b>Dr. E. Von Rudloff</b> 1375 Newport Avenue, #503 Victoria, B.C. V8S 5E8 604-592-8777	Dr. Von Rudloff	Oil extracts
<b>W.J. Cowee, Inc.</b> PO Box 248 Berlin, NY 12022 518-658-2233 518-658-2244 (fax)	Craig Gutermuth	Leafy branches Birch bark containers
<b>Walter's Gardens</b> PO Box 137 Zeeland, MI 49464 616-772-4697	Evan	Sarracenia Lady Slipper
<b>Weyerhaeuser Corporate Office</b> WTC 1-H-39 Tacoma, WA 206-924-6150	Gunther Hoffman	Preserving process technology
<b>Winterwoods</b> 701 Winterwoods Drive Glidden, WI 54577 715-264-4892 715-264-4893 (fax)	Ed Schmocker	Moss Lycopodium Birch branches

**U.S. Department of Agriculture Forest Service Interviewees**

<i>Forest</i>	<i>Contact</i>
<b>Arahapo/Roosevelt National Forest</b> 240 W. Prospect Fort Collins, CO 80526 303-498-1198	Austin Condor
<b>Bighorn National Forest</b> 1969 S. Sheridan Avenue Sheridan, WY 82801 307-672-0751	Bernie
<b>Bitterroot National Forest</b> 316 N. 3rd Street Hamilton, MT 59840 406-363-3131	Karen Wandler
<b>Black Hills National Forest</b> Rural Route 2, Box 200 Custer, SD 57730-9504 605-673-2251	Dick Kessler
<b>Chatahoochee National Forest</b> 508 Oak Street NW Gainesville, GA 30501	Virginia Land
<b>Chemult Ranger District</b> P.O. Box 150 Chemult, Oregon 97731 503-365-2229 503-883-6703 (fax)	Jerry Smith
<b>Chippewa National Forest</b> Cass lake, MN 56633 218-335-8600	Lynn Jackson
<b>Coconino National Forest</b> 2323 E. Greenlaw Lane Flagstaff, AZ 86004 602-556-7400	Lloyd
<b>Eldorado National Forest</b> 100 Forni Road Placerville, CA 95667 916-621-5226	Laurie Tippen, SFP Coordinator
<b>Flathead National Forest</b> 1935 3rd Avenue E. Kalispell, MT 59901 406-755-5401	Jim Vandenburg

**U.S. Department of Agriculture Forest Service Interviewees (Continued)**

<i>Forest</i>	<i>Contact</i>
<b>Fremont National Forest</b> 524 North G Street Lakeview, OR 503-947-2151	<b>Bob Carlson</b>
<b>George Washington National Forest</b> P.O. Box 233, Harrison Plaza Harrisonburg, VA 22801 703-433-2491	<b>Jerry (Lands)</b>
<b>Gifford Pinchot National Forest</b> 6926 E. 4th Plain Blvd. Vancouver, WA 98661-7299 206-750-5000	<b>Monte Wilcox</b>
<b>Hiawatha National Forest</b> 2727 N. Lincoln Road Escanaba, MI 49829 906-786-4062	<b>Barbara Caswell</b>
<b>Lassen National Forest</b> 55 S. Sacramento St. Susanville, CA 96130 916-257-2151	<b>Tom Simonson</b>
<b>Modoc National Forest</b> 441 N. Main Street Altruas, CA 96101 916-233-5811	<b>Jane Moore</b>
<b>Mt. Hood National Forest</b> 2955 NW Davison Street Gresham, OR 97030 503-666-0700 503-666-0641 (fax)	<b>Sue Richards, SFP Coordinator</b>
<b>Ochoco National Forest</b> Box 490 Prineville, OR 97754 503-447-6247	<b>Denise (Resources)</b>
<b>Plumas National Forest</b> Box 11500 Quincy, CA 95971-6025 916-283-2050	<b>Sue Wickman</b>

**U.S. Department of Agriculture Forest Service Interviewees (Continued)**

<i>Forest</i>	<i>Contact</i>
<b>Rogue River National Forest</b> 333 W. 8th Street Medford, OR 97501 503-776-3600 503-776-3622 (fax)	Glenn Brady
<b>Sawtooth National Forest</b> 2647 Kimberly Road East Twin Falls, ID	John
<b>Stanislaus National Forest</b> 19777 Greenley Road Sonora, CA 95370 209-532-3671	Rex Payton
<b>Tahoe National Forest</b> Highway 49 Nevada City, CA 95959 916-265-4531	Art Umland
<b>U.S. Forest Service</b> P.O. Box 96090 Washington, DC 20090-6090 202-205-1177	Jerry Jeansonne, Supervisory Forester, SFP
<b>U.S. Forest Service Regional Office</b> San Francisco, CA 415-705-2850	Dean Huber
<b>Umpqua National Forest</b> Box 1008 Roseburg, OR 97470 503-672-6601 503-673-4017 (fax)	Brenda Woodard, SFP Coordinator
<b>Wallowa-Whitman National Forest</b> Box 907 Baker, OR 97814 503-523-6391	Carla Tipton
<b>Wayne Hoosier National Forest</b> 811 Constitution Avenue Bedford, Indiana 47421 812-275-5987	Ken Day
<b>Winema National Forest</b> 2819 Dahlia Klamath Falls, OR 503-883-6714	Jack Sheehan

## State Forest Interviewees

<i>Forest</i>	<i>Contact</i>
<b>Arizona Department of Forestry</b> Flagstaff, AZ 602-774-1425	John Krasky
<b>California Department of Forestry</b> Sacramento, CA 916-653-7772	Gary Brittner
<b>Colorado State Forest Service</b> Fort Collins, Colorado 303-491-6303	Mike Schoumaker
<b>Georgia Forest Management Department</b> Macon, GA 910-744-3237	Larry Thompson
<b>Idaho State Forestry Office</b> Boise, Idaho 208-334-3488	George Bacon
<b>Indiana Division of Forestry</b> Indianapolis, Indiana 317-825-6769	Bob Mayer
<b>Kentucky Division of Forestry</b> Frankfort, KY 502-564-4496	Cary Perkins
<b>Montana Department of State Lands</b> Missoula, Montana 406-542-4274	Pat Flowers
<b>New Hampshire Division of Forests &amp; Lands</b> Concord, NH 603-271-2214	Jim Cotter
<b>Ohio Department of Forestry</b> Columbus, OH 614-265-6706	Mike Long
<b>Oregon Department of Forestry</b> Salem, OR 503-945-7365	George Schapfer
<b>Oregon State Land Unit Forester</b> Veneta, OR 503-935-2283	Rick Rogers

State Forest Interviewees (Continued)

<i>Forest</i>	<i>Contact</i>
Virginia State Department of Forestry Charlottesville, VA 804-977-6555	Elvin Frane
Washington Department of Natural Resources Olympia, WA 206-753-3410	Howard Thronson
West Virginia Division of Forestry Charleston, WV 304-558-2788	Ed Merner
Wisconsin Department of Natural Resources Madison, WI 608-266-0842	Bob Mather
Wyoming Department of Forestry Cheyenne, WY 307-777-7586	Herb Kotchell

U.S. Department of the Interior Bureau of Land Management Interviewee

<i>Office</i>	<i>Contact</i>
Eugene District Office 1255 Pearl Eugene, OR 503-683-6961	Jim Weir, SFP Manager

Canadian Forest Service Interviewees

<i>Forest</i>	<i>Contact</i>
<p><b>Canadian Forest Service Northwest Region Northern Forestry Center 5320 122nd Street Edmonton, Alberta T6H 3S5</b></p>	<p><b>Peter Boxall 403-435-7272</b></p> <p><b>Dave Cheyne 403-435-7210</b></p>
<p><b>Canadian Forest Service Forest Economics P.O. Box 490 1219 Queen Street E. Sault Ste. Marie, Ontario P6A 5M7 705-949-9461</b></p>	<p><b>Dan McKenney</b></p>
<p><b>Canadian Forest Service Maritime Region P.O. Box 4000 Regent Street Fredericton, New Brunswick E3B 5P7 506-452-3500</b></p>	<p><b>Ken Runyon</b></p>
<p><b>Canadian Forest Service Newfoundland &amp; Labrador Region P.O. Box 6028, Bldg. 304 Pleasantville, St. Johns, Newfoundland A1C 5X8 709-772-6028</b></p>	<p><b>Hildegarde Dumphy Bill Alexander Jill O'Neill Bruce Roberts</b></p>
<p><b>Canadian Forest Service Pacific Forestry Center 506 W. Burnside Road Victoria, B.C. V8Z 1M5 604-666-8350</b></p>	<p><b>Elaine Tesk Dave Gilber Jill Peterson</b></p>
<p><b>Canadian Forest Service Quebec Region Library 1055 P.E.P.S. Street Ste - Foy, Quebec GIV 4C7 418-648-3770</b></p>	<p><b>Meridel Mercier</b></p>

Other Canadian Interviewees

<i>Affiliation</i>	<i>Contact</i>
<b>Alberta Pacific Forest Industry</b> Box 8000 Boyle, Alberta T0A 0M0 403-525-8000	Mr. Lefebvre
<b>Forest Extension Service</b> P.O. Box 6000 Fredericton, New Brunswick E3B 5H1 506-453-3711	Joakim Hermelin
<b>Ministere des Forêts, Direction de la Recher</b> 2700 Einstein, Complexe Scientifique Ste - Foy, Quebec G1P 3W8 418-643-7994 418-643-2165 (fax)	Normand Dionard Leon Carrier
<b>Ministere des Forêts, Services Techniques et Interventions</b> 930 Chemin Ste - Foy, 5c étage Quebec, Quebec G1S 4X5 418-646-1144 418-646-9267 (fax)	Jean-Pierre Tetreault



**Transportation Interviewees**

<i>Company</i>	<i>Contact</i>
<b>Arnold Brothers</b> 739 Lagimodiere Boulevard Winnipeg, Manitoba R2J 0T8 204-257-6666	Kurt Roesler
<b>Geo. S. Bush &amp; Company, Inc.</b> P.O. Box 8829 Portland, OR 97208 503-228-6501	Sarah Clark Gibson Darwin Rutland
<b>Kleysen Transport</b> 2100 McGillvray Boulevard Winnipeg, Manitoba R3T 3N5 204-488-5315	Bill Hilash
<b>McDonalds Consolidated Freight Lines</b> 1000 King Edward Winnipeg, Manitoba R3C 2Y8 306-780-9810	Mr. Sauer
<b>Porter Truck Lining</b> Box 157 Station T Calgary T2H 2G8 403-279-2751	Doug Caufield
<b>Ren Express</b> P.O. Box 2633 Prince Albert, SK S6V 7J1 306-764-3248	Pete Hrenyk
<b>TNT Reddaway</b> P.O. Box 1035 Clackamas, OR 97105 800-395-1360	Dave Eoland
<b>Triline Freight Systems</b> 2950 Miners Avenue Saskatoon, Saskatchewan S7K 4Z7 306-934-3037	Eldon Hrischuk

**U.S. DEPARTMENT OF THE INTERIOR**  
**Bureau of Land Management**

**BLM FOREST ECOSYSTEM INVENTORY**

**October 1993**



Percent	Code
0-10	1
11-20	2
21-30	3
31-40	4
41-50	5
51-60	6
61-70	7
71-80	8
81+	9

Example:

	Salal	Hazel
Quad 1	10%	10%
Quad 2	50%	40%
Quad 3	70%	20%
Quad 4	60%	10%
Total + 4	47% (round to 50)	20%
	code 5	code 2

The procedure for determining percent cover is as follows:

1. Start at center.
2. Visually divide the plot into 4 quadrants.
3. Each quadrant represents 25%. Visually estimate the percent of the quadrant that is covered by a given competing species. Cover is the crown width projected vertically to the ground. If the species enters the plot cylinder by overhanging, it is also counted.
4. Complete this procedure for each quadrant.
5. Add the 4 quadrants to determine total cover by species and divide by 4.
6. Round to the nearest 10% and enter the corresponding 1-digit code.

**ITEM NO. 43**  
**Special Forest Products**  
**Quality**

The following species are commonly sold as special forest products:

Common Special Forest Products
Sword fern
Salal
Oregon grape
Evergreen huckleberry
Beargrass
Princess pine
Moss
Cascara (bark)
Mushrooms:
Morel
King botetus
Chanterelle

Quality is a subjective measure of the value of a product on the open market. Products that are small, shriveled, discolored, or lack sufficient numbers may not be as desirable and, therefore, would bring the seller a lesser price.

For the above species, record quality as a 1-digit code:

- Code**
- 1 Excellent
  - 2 Good
  - 3 Poor

**ITEM NO. 44**  
**Physiographic Class**

Physiographic class is used to describe the topographic features that most affect the management of the area the plot is on. Record as a 3-digit code on all plots. The first digit is for aspect, second for slope, and the third digit for topographic position, as follows:

**Physiographic Class Codes**

Code	Aspect	Code	Percent	Code	Topographic Position
0	Level	1	1-10	0	Headwall
1	N	2	11-20	1	Flat or rounded ridge
2	NE	3	21-30		ridgetop or mountain peak (2 or more chains wide)
3	E	4	31-40	2	Narrow ridgetop or peak (less than 2 chains wide)
4	SE	5	41-50	3	Sidehill-upper one-third
5	S	6	51-60	4	Sidehill-middle one-third
6	SW	7	61-70	5	Sidehill-lower one-third
7	W	8	71-80	6	Canyon bottom (less than 10 chains wide)
8	NW	9	81-90	7	Bench or terrace
		9	91+	8	Riparian zone
				9	Swamp or wet flat