

Research Findings

CONES:

Although cones are used rather extensively for specialty product development such as scented cone fire starters, cone baskets, cone candle holders, cone Christmas tree ornaments, etc. (see Exhibit A), the predominant use of cones is in the wreathing and potpourri industries. Overviews of the wreathing (seasonal and non-seasonal) industry and the potpourri industry, which should be reviewed when considering if the cones market is a reasonable product area for the DNR's increased focus, are included at the end of this "Cones" Section.

Three critical comments continue to rise to the top of interview discussions across the U.S. for this product area:

1. **Some of the larger native cones in Minnesota, such as balsam fir, do not meet consumer demand, especially in the wreathing industry, due to their look;**
2. **Several smaller native cones hold strong potential for increased market growth for both the wreath industry and the growing potpourri industry; and**
3. **Lack of harvested supply of the smaller native cones showing market promise continues to thwart industry visibility of Minnesota's resource potential.**

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. Some of the larger cone species found in Minnesota are not what the seasonal (Christmas; evergreen) wreath consumer desires, especially when compared to sugar pine, Ponderosa pine, slash pine, and loblolly pine cones typically supplied from the Pacific Northwest and the South. Based on the interviews, wreath manufacturers from throughout the U.S. stated that these four cone species clearly dominate the seasonal wreath-manufacturing industry; a trend which is not seen as changing in the future. Wreath manufacturers in the State of Minnesota and the mid-west stated that consumers were not willing to pay for many of the large cones easily found locally.

Based on direct interviews, the overall demand for large and small cones exceeds the annual supply. Manufacturers anticipated annual increases for ponderosa, slash, and loblolly pine cones to be approximately 20% for the wreath industry alone.

Based on the interviews, at least three native Minnesota cones appear to hold strong market potential. Those species and market uses are:

Tamarack	- used whole in the potpourri industry
White spruce	- used whole in the potpourri industry
Scotch pine	- used in the wreathing industry

Several cone buyers across the U.S. referenced the immediate need for these three cone species, all claiming the demand far outstripped the supply. As an example, one of the largest botanical buyers in the Pacific Northwest stated he had immediate demand for these cones:

- a. **White Spruce:** The buyer states he cannot get enough. He sells the cone to potpourri manufacturers throughout the U.S., *several in the State of Minnesota*. He states that *immediate demand* (not annual demand) for the cone exceeds 440,000 pounds. He pays an average of \$.65/lb. for this cone. The buyer is currently purchasing the white spruce cones from Canada (primary source) and selling them in bulk to the potpourri industry in the State of Minnesota and the mid-west.
- b. **Tamarack:** The buyer states that this cone is a becoming a "premier" cone for the potpourri industry. The potpourri industry likes the cone because of its size (small) and attractive shape. It is also known to be a "strong", less fragile cone that holds its shape. This buyer pays an average price of \$.90 to \$1.10/lb. and has an immediate demand of 10,000 pounds with strong potential for more if he can access a dependable supply.
- c. **Scotch Pine:** The wreath industry is looking at this cone quite strongly as a new cone product. This buyer states the cone has "excellent potential" but needs added visibility in the right places. He has an immediate need for 60,000 lbs. of these cones, for which he pays approximately \$.65/lb.

Several substantial herb and preservative companies located in the Midwest indicated strong interest in Minnesota cone species, particularly Tamarack and white spruce, but stated they simply had not been approached by suppliers yet.

Almost all stated a growing annual demand for cones. Although pods were discussed as a potential substitute for cones in products, it was felt that cones have a long-standing tradition in relation to seasonal products which is not likely to change appreciably.

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. One west coast product broker interviewed for this report specifically stated his interest in working with Minnesota suppliers **immediately** to help fill product requirements for Japanese buyers currently entering into the potpourri (and wreathing) industry.

Many businesses stated their source of cones was seed extracting operations.

Of the 30 plus interviews conducted for this cones research, 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 the 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, say, separate from Norway pine, jack pine, and scotch pine. West coast brokers, as separate Midwest and east coast interviewees appeared to have an over supply white pine and were having trouble "giving them away."

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 20% increase in demand annually.

Slash pine: Millions of cones purchased each year with estimates of 20% increase in demand annually.

White spruce: Millions of cones purchased each year with estimates of 20% increase in demand annually.

Norway pine: Growing in demand. One substantial product manufacturer located in Wisconsin states this cone is in constant demand. Mostly purchased in states surrounding Minnesota and from the Pacific Northwest.

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, who purchases several tons of these cones per year. It was not known whether these "birch" cones are domestically available.

Potpourri Industry Overview:

Key factors regarding the potpourri industry as reported at the 1991 International Herb Growers and Marketers Association annual meeting include:

- 1) During the last fifteen years, the potpourri industry has evolved into a staple product category at the retail market level. Experts such as Alan Brown, Vice President of the internationally-renown The Lebermuth Company, Inc. believes the potpourri industry has reached the \$500 million dollar per year level, excluding consideration of products which claim "potpourri" attributes such as carpet fresheners, light bulb rings, fragrances, water-based liquids, simmering fragrances, fragranced waxes, salt crystals, etc. Including these industry elements, the potpourri industry is believed to exceed 1 billion dollars a year.
- 2) The potpourri industry has experienced its fastest growth within the last five years. By 1990, the industry had gained at least 400 new business, all which had goals of manufacturing and marketing potpourri and/or potpourri-related products
- 3) By 1991, a shift in consumer demand to higher quality potpourri was experienced. Lower-priced lower quality potpourri typically contains larger percentages of dyed wood chips and wood shavings. Higher quality potpourri contains larger concentrations of dried flowers and evergreens, botanicals, cones (whole and scales), mushrooms, moss, etc.

- 4) More and more herbal and scent companies are being formed to capture a *regional "essence"* such as producing potpourris that capture the scents of the Northwest. One such company located in the Pacific Northwest successfully produces potpourris that include a special rain forest scent and an Oregon desert blends scent. Their potpourris include dried florals, evergreens, and botanicals, along with berries and whole cones which "add aroma plus the look of nature to the forest-scented mixtures".

Wreath Industry Overview:

Based on stated demand by wreath manufacturers, the evergreen wreath industry could easily double if the harvesting efforts were more stable and reliable, and if the resource was in a more concentrated geographic area. Cones will always be an important component to this seasonal wreath industry. But the growth of wreath manufacturing has expanded well beyond the evergreen stage. In fact, it may be safe to say that cone, dried herb - floral - fruit - vegetable - evergreen, and permanents (silk) wreaths are one of the hottest product concepts to hit the specialty gift industry in the U.S. (see the **Dried Florals** section of this report for industry details). These individual products are not mutually exclusive in specialty wreath manufacturing. Many wreath manufacturers are successfully combining these products in wreaths that are capturing the hearts (and pocketbooks!) of the American consumer. As a product that evokes the smells and memories of home, and the emphasis on "back-to-nature", many experts in the industry predict that cones will continue to play a central role in wreath manufacturing for year-round purchase.

DECORATIVE GREENERY:

This section was divided into the following product components for in-depth interview and market analysis:

Evergreens: Primarily boughs for use in the fresh Christmas wreath, swag, and garland industry. May also include some preserved/dried for seasonal (wreath) and non-seasonal (wreath, potpourri) product manufacturing.

Tree Tops: Used in the manufacture of artificial or "permanent" trees for the home and office.

Branches: Used in wreath and specialty product manufacturing
Twigs

Bark: Used in the manufacturer of specialty products.

Over 50 companies/individuals in the decorative greenery industry throughout the U.S. were interviewed for this research report. The research findings for each product category area are as follows:

Evergreens

Those interviewed under this product category were generally very optimistic about the growth and direction of this industry, particularly as it relates to seasonal (Christmas) wreath, swag, and garland manufacturing. Because of the general increase in population, the potential for increased customer demand for evergreen products is felt to be good by many in the industry. Minnesota manufacturers state they are not, in fact, keeping up with demand for their product and note that their product geographic distribution area is restricted by their inability to make more product. This primarily is due to not having enough harvester to forage the boughs for the product when needed. On the other hand, industry experts also note the following trend data:

- 1) The artificial wreath, tree, etc. industry has taken a large share of the fresh business;
- 2) The purchase of fresh items is a yearly expense for the consumer, compared with a one-time purchase for artificial products which can be stored year after year.
- 3) Many of the larger cities such as Los Angeles and Chicago have fire ordinances which prohibit the use of fresh wreaths, trees, etc.

Even so, many fresh wreath producers indicate volumes of production have doubled during the last few years, with demand far exceeding supply. Many of those manufacturers now plan on between 5% to 20% production increases annually, assuming they can obtain the necessary volume of boughs from harvesters.

For Minnesota wreath manufacturers, the primary species used for product manufacture is balsam fir. Some white pine, Norway pine, scotch pine, and cedar product is used in the fresh evergreens, but in significantly smaller quantities. *Dried and preserved* evergreen species include cedar, juniper, noble, and spruce (see Knud Nielsen Company product advertisement attached as Exhibit B). Balsam has been tested as a dried product but has been found to become brittle and loses its needles. Even as a preserved product, balsam lasts only about three weeks in preservative solution, compared to silver fir and noble fir which last a full month. "Lasting" capabilities of other preserved seasonal product species include:

Douglas fir:	Three weeks in preservative solution
Incense cedar:	10 days in preservative solution
Juniper:	42 days in preservative solution
White pine:	40 plus days in preservative solution
Red pine:	40 plus days in preservative solution
Scotch Pine:	Two plus weeks in preservative solution
Norway spruce:	20 days in preservative solution

Based on industry interviews, experts believe Minnesota wreath industry sales are about \$10 million per year, with over 4,000 tons of balsam branches being harvested annually. The average prices paid for 18"-24" boughs is \$175/tons, and \$200/ton for 15"-18" boughs. Prices can vary between \$150/ton to \$400/ton.

Several manufacturers commented that they felt that there would be an adequate volume of balsam in the state to service the industry for another five to seven years, but that pulp and chip board operations were clearly having an effect on their supply.

Wreath manufacturers from surrounding mid-western states that use balsam typically do not purchase from out-of-state. As an example, one large wreath manufacturer in Wisconsin states he uses about 600,000 pounds of fresh balsam annually for wreath manufacturing, with 99% being harvested in Wisconsin.

It may be interesting to note that while the index species (balsam) for fresh evergreen wreath manufacturing is typically harvested and purchased in-state, species purchased by Minnesota manufacturers for dried and/or preserved evergreens such as white pine, jack pine, and cedar are harvested and purchased from surrounding states and the Northwest. These preserved or dried species are also used in wreath, swag, and garland manufacturing, and are also used in the potpourri industry.

Other species being tested for fresh wreath manufacturing include alder and red dogwood. And lycopodium, a type of long-fingered moss found throughout the forests of Minnesota, is also being used in fresh and dried wreath manufacturing. The lycopodium is being harvested in Minnesota, Wisconsin, and Michigan, and being processed in Wisconsin (see the **Dried Florals** section of this report for more information on this Minnesota wildcrafted species).

Overall, the market trending for fresh evergreen wreaths certainly looks optimistic, based on interview results. Problems perceived by the Minnesota wreathing industry which are believed to diminish production capability lie in four key areas:

- 1) **Availability of Resource:** Use of balsam fir from pulp and chip board operations appear to have fresh wreath manufacturers taking a hard look at future supplies and wondering if enough balsam fir will be available for harvest in five to seven years from now. Manufacturers also state their concern over their perception of forest reseeding practices which they believe favor other species over balsam fir. (Although Minnesota DNR data reflects a different picture of what is happening with the pulp and paper industry and forest reseeding practices, the misperceptions and apparent lack of communication between public and private concerns are worth noting).
- 2) **Access to Resource:** Access problems due to severe weather conditions and the current balsam fir resource being spread out throughout the state also pose concern for manufacturers. One Minnesota wreath producer suggests the development of a 500 acre plot for growing balsam fir to be specifically harvested, on a sound rotational pattern, for the states wreath industry.
- 3) **Consistent Labor Force for Harvesting Boughs:** Directly related to the resource access concern, many manufacturers interviewed stated their continuing concern over not having a consistent labor force they can count on from year to year. Some even shared experiences where they were unable to produce contracted volumes because of labor problems. This problem is endemic within the special forest products industry throughout the U.S. and has no ready solutions.
- 4) **Rising Fee Structure for Harvesting Permits:** Although not noted in the same degree of concern as the first three listed above, manufacturers are taking note of increased fees for harvesting permits and looking at consistency of fee structure applied throughout the state between private (if any), state, and federal lands.

Tree Tops

According to those suppliers and manufacturers surveyed for this report, the artificial tree top business is going strong and getting stronger. All of the manufacturers interviewed across the U.S. stated they either expected annual sales to remain strong or to increase on the average between 15% to 25% annually. Those manufacturers who have been in the business a while tell us the business is the best it's been in the last 15 years. Many manufacturers simply cannot meet their existing demand.

Reasons given for the increased popularity in the use of artificial trees are:

- 1) A dramatic increase in the repair and remodel industry throughout the U.S. Instead of being able to purchase newly constructed homes, 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.
- 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, to wall-floor-ceiling coverings, to the increased use of windows and skylights. This shift toward lighter, brighter interiors, in part, is due to people maximizing on smaller rooms due to 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; 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 which 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 low-light places. The effect is to provide a more natural private atmosphere to those dining.

Although birch is a sought-after species by many artificial tree manufacturers, other wood species were also popular for this product:

Dragonwood: Primarily harvested in Florida and shipped to artificial tree manufacturers throughout the U.S. Not considered a tree by many but, as an underbrush which is dragged through the forest (therefore the name "draggin'" wood we are told). Manufacturers find the tree to have interesting branching. The tree trunk is known to be durable yet soft enough to allow for easy drilling of the holes required to insert the artificial limbs. Many of the manufacturers surveyed did emphasize that there is a dwindling supply of this species and that they are "actively looking" for a substitute.

Myrtlewood: Also known as crape myrtle, wax myrtle, and wetlands myrtlewood. Harvested primarily in Florida and Georgia. The species is described as an "underbrush" harvested periodically from the forests. It is popular among manufacturers because of its color and quality and, like dragonwood, is durable but easy to drill for limb insert.

River birch: Harvested in Alabama, this species appears to be competitive with Minnesota birch. Manufacturers tell us that when the bark on this tree dries, it peels back to reveal a coloring similar to the white birch.

Although on a much smaller scale, other species referenced by producers as being used in artificial tree manufacturing include **maple**, **ironwood**, and **scrub oak**. These species are predominantly provided by suppliers in Utah, Minnesota, and Wisconsin. Manufacturers also told us that the customer preferring a more unusual look may prefer **manzanita** or **yucca**. **Aspen**,

although tried by several manufacturers, appears not to be as desired a species because the bark tends to "wither" when it dries and is "not durable enough".

It was interesting to note that manufacturers of birch tree tops located in the Mid-west typically indicated that the markets were stable, with anticipated product demand increases averaging between 10%-15% next year. Buyers of birch tree tops in the west, however, indicated there was an immediate, significant demand not being met. One buyer in California that buys birch tree tops from a Minnesota supplier stated he buys approximately 72,000 birch pieces every three weeks. 90% of the product is sold in the California markets. He states he simply can't get enough and could be selling *three times* the volume if his Minnesota supplier could provide the volume. He relates that his supplier tells him the work force is too limited in Minnesota to supply the volumes required. This same buyer estimates that his market demand for the birch product will be increasing by 20% annually, assuming he can get the volume of product required.

Another major artificial plant distributor in the west states they could increase their artificial tree sales "**ten-fold right now, and not meet the demand**". The company anticipates a growth of 30%-60% per year for the next few years. The main reason for this substantial increase in consumer demand for the products in the west is mass merchandizing. Discount operations stores such as CostCo are currently buying 60,000 units per month and selling them in their stores.

Problems surrounding the use of birch for artificial tree top manufacturing include:

- 1) A perception that the tree tops are obtained at the expense of "killing" the rest of the tree. Manufacturers do not understand that the tops of the trees are obtained only after the tree has been downed during logging operations for other species with the birch being typically left to rot in the forest. One major manufacturer out of Texas stated they believe there is a shortage of birch and dislikes the fact that the tree is destroyed. As a result, the company purchases Dragonwood "brush" and a species called Banela from Mexico. The Banela branches are pruned from the tree, rather than destroying the tree. This manufacturer stated he would be interested in buying birch tree tops if the product did not come from trees that were killed for that purpose.
- 2) Several manufacturers stated their concerns over the use of birch due to the problem with the birch borer and other insect problems. One major manufacturer stated that, although they do purchase birch tops untreated, they are beginning to prefer that the product be fumigated before they purchase.
- 3) Minnesota suppliers appear to be sending a message to interested tree top buyers throughout the U.S. that they are unable to supply the volumes required. In discussing this issue with several Minnesota suppliers, the problem from their standpoint is quite real and needs to be

given direct attention in order for them to become real players in the artificial tree business.

From the interviews conducted for this report, it is clear that the artificial tree industry is thriving. It is also clear that Minnesota suppliers need some assistance in overcoming some of the real barriers and misperceptions surrounding Minnesota's resource capability for this industry.

Branches, Twigs

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 (see photos attached as Exhibit C). 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. One buyer from California indicated she was looking for 2" diameter birch branches for use in picture frame manufacturing. Minnesota birch is a favored species for these products because of its' appearance. Species providing competition to birch are grapevine purchased from suppliers in Texas and River birch supplied from Colorado, Canada, Montana, and Utah. Manufacturers stated they preferred the use of grapevine and River birch over white birch because of the added moisture content and increased twig pliability, and fewer insect problems. Willows and red osier used to be popular for the wreath and floral industry but birch has clearly assumed the position as species of choice for these industries.

Those interviewed told us that the demand for twigs and branches was increasing annually; some suggesting annual volume increases between 10%-15%. One artificial tree manufacturer in Colorado stated they have lots of calls for birch wreaths, but are not set up to manufacture them at this time.

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

- **Catkins**, spike-shaped droopy flower clusters such as might be seen with clustered berries or cone growths on branch extensions (see attached photos in Exhibit D) 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.

- Manufacturer are requiring more "natural looking branches for use in floral, wreath, basketry, and specialty product manufacturing. This may pose some difficulty for suppliers as the shipping of branches and twigs are usually done 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.

Finally, political events happening around the world should be watched carefully in order to ascertain new market opportunities. As an example, the October, 1992 issue of *Florist's Review* reports that baskets supplied from China may be costing the consumer substantially more in the near future. The future of the floral trade is directly linked to a heated foreign policy debate over whether to allow China to maintain its Most Favored Nation (MFN) status. The MFN status is intended to encourage product flow and the strengthening of economic development in the U.S. by offering selected nations financial incentives on reduced duty charges for imported products. China MFN status has affected the cost of many products used in the floral industry including twig and branch baskets. The dispute between the government of China and some U.S. Congressional leaders revolves around the issue of human rights policy employed in China. The Chinese government's crackdown on the pro-democracy movement in Beijing's Tiananmen Square and the subsequent human rights violation and press restrictions have fired the controversy.

Should the MFN status for China be revoked, the change in duty charges for imported products would be significant (see **Table 1** attached). If this occurs, it is conceivable that new market opportunities for the use of branches and twigs in basket manufacturing for U.S. markets could be opened.

Bark Products

Manufacturers and suppliers of decorative greenery interviewed for this research project were generally not aware of bark products that are on the market as novelty products. Most stated that the bark has not been made available to them, nor the products which may be manufactured from it. Manufacturers and distributors of herbal products, of course, had full knowledge of the use of barks in medicinals, herbal products, and teas (see **Medicinals and Herbals** section of this report for more details).

One wholesale distributor of over 150 different dried and preserved floral products based out of Wisconsin did state that although they had not used birch bark products to date, they were currently considering such a product line.

Table 1

Import		MFN Duty	Non-MFN Duty
	Artificial Flowers, other than plastic	9.0%	71.5%
	Bamboo, Palm Leaf and Wicker Baskets.....	10%	50%
	Willow Baskets	5.0%	50%
	Glass Christmas ornaments.....	6.6%	60%
	Ceramic Figurines	3.1%	20%
	Toys, various categories	6.8%	70%

Source: Department of Commerce
Reprinted with permission of SAF Business News for the Floral Industry

Another major wholesale florist in Minnesota stated that products made from birch bark would be considered a "common" product in the state, but may hold more appeal and greater demand throughout other portions of the country.

Within the State of Minnesota, the Ojibwe Indians manufacture traditional items from birch bark. These special bark baskets, in fact, have been featured in a "Container Trend" article in the October, 1992 issue of *Florist's Review* (see Exhibit E). Other bark basket manufacturers presented in the issues' **Container Guide** section include Colorado Evergreen, Palecek (woven barks) from California, and Mainly Baskets from Georgia.

The specifications of the bark products manufactured by the Ojibwe Indians through Lady Slipper Designs are established by the Indians. Once manufactured, the products are marketed and distributed throughout urban areas such as the Twin Cities area, on both the east and west coasts, and major cities throughout the mid-west. According to manufacturing representatives interviewed, the specialty products have increased in demand consistently over the last five years. Typical birch bark products manufactured are baskets, vases and planters, birch bark jewelry, lighting switchplate fixtures, birdhouses, canoes, birch bark lamp shades, and picture frames (see attached photos in Exhibit E).

One design trend which may provide a new twist to the traditional birch bark products manufactured is to vertically integrate the bark product with other products manufactured from Minnesota resources. This may work particularly well for high-end domestic and foreign niche markets. As examples, combining popcorn kernels manufactured from Minnesota corn packaged in birch bark baskets; combining "bundled" native dried florals with elegant birch bark planters that could be sold in quality specialty gift catalogs, such as *Smith and Hawken* and *John Deere*. These special gifts catalogs reach American consumers from coast to coast and are known to focus on environmentally-sound natural handmade products obtained from "good stewards of the land." (See the **Dried Florals** section in this report for further example and details of these floral trends). Creative products like these are also often sold through international airlines gift magazines such as United Airlines' *High Street Emporium* (see **Dried Florals** section).

Or try selling the product through different distribution systems to consumers who appreciate a green product - i.e. organic (void of chemical exposure for three years or more) birch bark baskets filled with potpourri from native products which may create regional scents (and memories) from the Land of 10,000 Lakes (see discussion of this concept under the **Cones** section of this report).

From the interviews conducted for this product category, it is apparent that potential interest for creative birch bark products is there, provided the initiative of Minnesota product manufacturers is also there to look at how products need to be designed, packaged, and distributed to service the high-end niche markets.

DRIED FLORALS & ORNAMENTALS:

Our research and interview efforts under this product category concentrated on the market potential for **wildcrafted** (grown in the wild versus cultivated) florals either native or currently growing in abundance in Minnesota. Further, those wildcrafted florals which either grow in or on the perimeters of forested areas were given priority in market evaluation. Specific florals and ornamentals evaluated for this product category include:

Artemisia, White Yarrow, Pearly Everlasting, Liatris, Tansy, Baby's breath, Penny cress, berried branches (Ilex, Wahoo, Bittersweet), Sumac, Willow, Curly dock, cattail, Lycopodium, and Ferns (see attached photos in Exhibit G).

Before detailing the results of the interviews, it is important to review the current floral trends in the U.S. for consumption of fresh florals and drieds/preserveds, and current popular floral design trends:

Overview: U.S. Consumption - Fresh Cut Florals

U.S. Department of Agriculture facts at a glance as reported in 1991:

- 1) In 1990, U.S. per capita expenditures on cut flowers was 12th highest in the world at \$23.61 per person. Italy was number one at \$70.84 per person. Experts predict the U.S. could be number one by the year 2000 (see **Table 2**).
- 2) A \$7.2 billion increase in U.S. retail sales of cut flowers and plant-related products between 1982 and 1990 translates into an 11% average annual increase.
- 3) The U.S. imported \$3.4 billion stems of cut flowers and other fresh cut ornamentals in 1990, 21% more than in 1989.
- 4) Leading import increases of major crops during the 1989-1990 period include:

Roses - Up 36%
Carnations - Up 39%
Pompom Chrysanthemums - Up 23%

Leading import countries, in order of import volume to the U.S., include Colombia, Mexico, and The Netherlands.

Table 2

Expenditures for Cut Flowers & Potted Plants
The U.S. Leads the World in Total Expenditures for Cut Flowers and Potted Plants

Country	— Total expenditures —			— Per capita expenditures —		
	Flowers	Plants	Total	Flowers	Plants	Total
U.S.	5,913	4,813	10,727	23.61	19.22	42.84
Japan	5,839	NA	NA	47.23	NA	NA
Italy	4,085	1,647	5,732	70.84	28.58	99.40
Germany	2,902	2,629	5,531	46.68	42.29	88.97
France	1,548	1,300	2,848	27.46	23.07	50.52
United Kingdom	1,201	411	1,612	20.87	7.14	28.01
Netherlands	607	369	976	40.64	24.71	65.35
Sweden	379	572	951	44.48	57.00	111.48
Switzerland	400	455	855	59.31	67.55	128.86
Spain	431	345	776	10.98	8.79	19.77
Belgium	345	305	650	33.50	29.66	63.16
Norway	266	313	579	62.61	73.59	136.20
Denmark	176	356	532	34.05	68.65	102.70
Austria	260	264	526	34.05	34.60	68.65
Greece	181	181	363	18.12	18.12	36.25

Source: Economic Research Service, USDA

5) Domestic growers cash receipts for cut flowers in 1990 totaled \$565 million, up 4% from 1989. However, specific product declines included:

Standard Chrysanthemums - Down 4%
Pompom Chrysanthemums - Down 4%
Gladiolus - Down 1%

Much of the drop in grower receipts was due to imports.

6) The largest gains in domestic grower receipts were in specialty cut flowers.

7) Domestic grower's cash receipts for cut greens in 1990 increased to \$124 million, a 12% increase over the previous year.

8) The opportunity for U.S. growers to expand sales, both domestically and abroad, are excellent. Domestic production and profits will rise for those who employ new technologies, produce a wider variety of crops and develop aggressive marketing efforts.

9) Receipts from leatherleaf ferns were up 11%, while receipts from all other cut floral greens were up 14%. Imports of leatherleaf ferns were up modestly, but imports of miscellaneous ferns were sharply higher in 1990.

Overview: U.S. Consumption - Dried & Preserved Florals

In 1992, *Florist's Review* conducted an industry survey to obtain a "feel" for how dried and preserved (both referred to as "permanents") plants and flowers have been integrated throughout the existing markets, and future market trends for these products. One hundred wholesalers were asked to evaluate:

- a) Sales now with sales three years ago;
- b) Characterize the outlook of future buying for these products;
- c) Breakdown their product inventory by percentages; and
- d) Identify what type of consumer buys the most permanents.

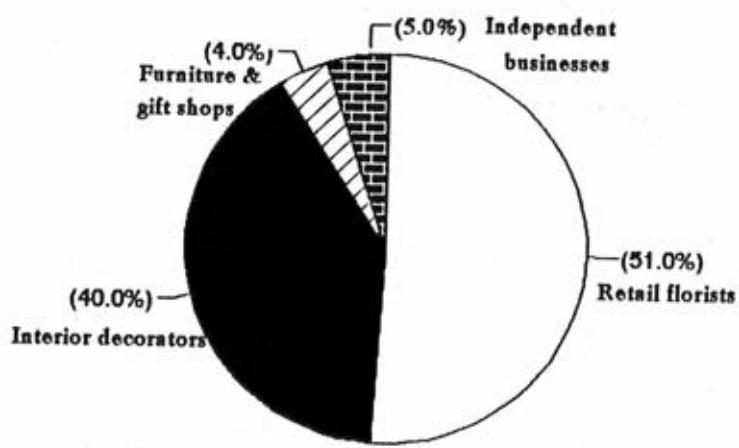
The results are as follows:

- 1) Retail florists are still the top purchasers of permanent botanicals in wholesale houses (51%), interior decorators are a strong second (40%) (see Table 3).

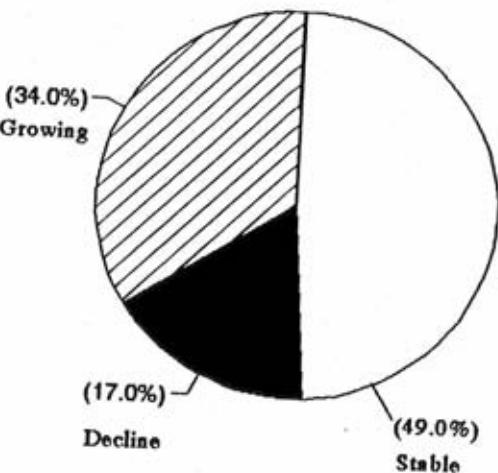
Table 3

DEMAND FOR DRIEDS AND PRESERVEDS (PERMANENTS)

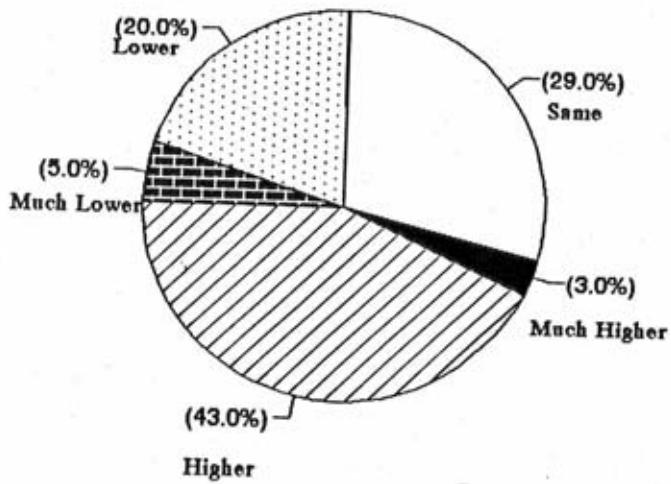
Who's Buying???



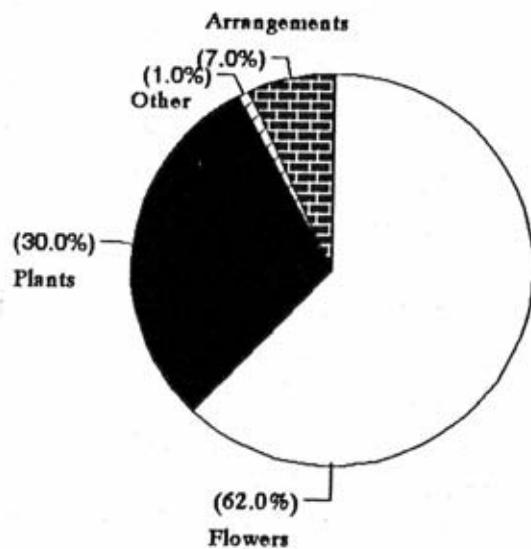
Future Buying...



Sales



Breakdown Of Wholesalers' Inventories



Source: 1992, Florist's Review Survey.

- 2) 83% of the wholesalers surveyed indicated they expected the purchase levels to either remain the same or grow in the future (see **Table 3**).

With a majority of respondents reporting stability for future buying trends, it appears the permanents industry will maintain a good buying climate in the near future.

- 3) 75% of respondents indicated their total sales of drieds and permanents had either stayed the same (29%) or had increased (43%) over the last year (see **Table 3**).
- 4) Market trends for permanents include:

- a) increased emphasis on the natural (wildcrafted) look;
- b) increased sales of higher-end botanical flowers;
- c) increased investments in the harvesting and/or cultivating of botanicals;
- d) increased product focus on perma-dried botanicals;
- e) increased use of natural colors such as yellows, oranges, and shades of beige; and
- f) increased sales in products for the bridal industry.

- 5) A breakdown of inventories of permanents of those wholesalers queried for the survey conducted by *Florist's Review* revealed that 62% of their average product volume is represented in dried and preserved flowers, with another 30% represented in dried and preserved plants (see **Table 3**).

Overview: U.S. Floral Design Trends:

Based on the research conducted for this report, including direct interviews with over 30 harvesters, processors, floral wholesalers throughout the U.S., floral design trends in drieds and permanents capturing the consumer's eye and pocketbook include:

Bundling:

Touted as one of the most important methods of presenting dried herbs and florals, bundling is simply *grouping* like materials together in an attractive gift packaging format. Often seen as stalk-like presentations, bundling can result in products emerging from a variety of different planters, pots and low-profile vases. Bundled product can be presented as a stand-alone item (wheat and

hop stalks are often seen this way), or can even be presented in an agricultural "pint" format. (See attached photos in Exhibit H). Specialty catalogs such as *Smith and Hawken* are selling bundled product in their 1992 Holiday edition as is *John Deere* in its Fall, 1992 Catalog. Even the Knud Nielsen Company, one of the most respected names in the floral industry, has bundling in it's product offers. And, as illustrated in *Florist's Review*, the silk industry has recognized the attractiveness of bundled products for their product sales.

Topiaries:

Topiaries are making a large comeback as a favored floral presentation form for all seasons, not just the traditional Christmas season. The "sculpted" floral format lends itself to many different species including Minnesota naturals such as yarrow (see attached photos in Exhibit H). Topiaries can be made from most any type of plant including herbs, florals, berries, evergreens, and mosses. One reason for the popular resurgence of this presentation form includes the floral trends in "bundling" (see above) which present the same visual characteristics of simplistic design and compact presentation.

The topiary designs are also proving attractive to European and Pacific Rim floral consumers (particularly in England and Japan).

Dried and Silk Mixtures:

Many of the floral wholesalers we interviewed across the U.S. emphasized that the dried floral look is so popular that silk floral manufacturers are modifying their plant designs to resemble drieds and preserves. The artificial plant manufacturers interviewed also supported this observation. Today, silks and dried materials are common partners in many floral and wreath arrangements sold throughout the U.S.

Wreathing:

Perhaps ahead of the bundling floral trends, wreathing has clearly captured top attention of the herb and floral industries and the American consumer. Because of the strong "back-to-nature" emphasis in the U.S., wreaths made of dried florals, herbs, mosses, berries, cones, and natural grasses can be found for sale in practically any floral shop and many specialty product catalogs in the U.S. Books, newsletters, and videos on naturals wreath designs are readily available to the consumer interested in the subject. Examples of this exposure (attached in Exhibit H) include:

- 1) The *Norm Thompson* 1992 Holiday Gift Catalog;
- 2) United Airlines 1992 Holiday Gift Catalog;
- 3) *Smith and Hawken* 1992 Holiday Gift Catalog; and
- 4) The Complete Book of Everlastings by Mark and Terry Silber.

Each of these examples include wreath designs using dried florals wildcrafted in Minnesota: Artemisia, Goldenrod, Pearly Everlasting, Yarrow, Bittersweet, Baby's breath.

Suppliers and wholesalers interviewed for this research project expect the popularity of natural wreaths to continue to increase in the future.

The Wildcrafted (Natural) vs. a "Cultivated" Look:

Industry experts emphasize that wildcrafted florals for more traditional arrangements are often a preferred look over the "more stiff" cultivated look of some florals. As an example, while *Liatris Spicata* conveys a very straight, tightly-designed feel in floral arrangements (especially effective in bundling arrangements), experts tell us that wild *liatris* is oftentimes preferred in the more traditionally floral arrangements, accomplishing an asymmetric, "airy" presentation (see attached photos in Exhibit H). Perhaps for the same reason many are looking at increasing the use of catkins in floral arrangements (see the **Branch and Twig** section of this report for details), wildcrafted products are increasing in demand.

Dried Decorative Greenery:

As noted in the **Decorative Greenery** section, major floral wholesalers such as Knud Nielsen are offering *dried* boughs and ferns for swag, garland, and wreath arrangements. As the markets seem to be growing for dried/preserved greenery, many in the industry would like to see more research conducted on better preservative processes for a wider range of tree species to help resolve some of the problems related to needle drop and discoloring.

FLOBS (Floral Objects):

Although not yet engrained within the floral industry, the use of floral objects as art has some intriguing potential. As reported in the April 1992 issue of *Florists' Review*, the difference between floral arrangements and FLOBS is as follows:

"Floral arrangements are concerned with function (i.e. Is it a centerpiece? Is it vertical or horizontal?). FLOBS, through the use of flowers, flower products and natural products, allow the form or shape to be the focus."

In effect, FLOBS are intended to be art objects (see attached photos in Exhibit H) which can be displayed as permanent floral pieces in offices, art galleries, and museums as opposed to worrying about fresh flowers in water which may only last five to six days.

Although we cannot classify FLOBS as a real floral *trend*, we do see it as an attractive concept that could really take hold, potentially creating a whole new niche market for Minnesota dried florals and ornamentals.

Dried Florals and Ornamentals Interview Results:

According to those interviewed, a variety of reasons were stated 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, 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 drying technique. Cost, time, product quality, and finished product demand are all critical factors.

Freeze dry 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 growing as more flowers are being tested and perfected.

Air drieds 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.

There are so many new products and ideas for using dried and preserved materials, it's easy to see why the demand is on the increase. Interior decorators are able to have artificial plants custom-designed. The pre-made arrangement industry has become more sophisticated in this product line and has expanded its market over the last two years.

According to industry experts, America is still discovering the many plants within its boundaries which can be used to decorate homes. We are rediscovering what we loved before - the out-of-doors and all it has to offer, and we're bringing into our homes and businesses to enjoy.

General product supply issues which should be of interest to the Minnesota DNR in policy evaluation include:

- 1) Several major processors of florals and botanicals interviewed stated they were looking at options for cultivating some of the traditional wildcrafted florals and botanicals in *native* forest soils. As an example, recognizing that better quality control of traditional wildcrafted products is a desired next step, one major manufacturer of preserved foliages out of Florida is currently investigating the possibility of purchasing property in Minnesota in order to grow products to meet their specifications rather than continuing to harvest from the wild. The manufacturer feels they would be able to control the insect and disease damage better this way. They stated they would be looking at cultivating florals, ferns, and trees. Other manufacturers interviewed stated they would be looking at the same cultivating processes in other states as well.
- 2) Organic materials (florals, botanicals, trees, evergreens) are becoming more in demand by the large manufacturers and product distributors. Not only are more U.S. consumers requiring the organic labelling, but manufacturers looking to sell product internationally are recognizing the importance of organic labelling to product pricing.
- 3) Many product distributors interviewed stated they are in the market for new products and larger volumes of traditional dried and preserved floral products. Distributors of products in states surrounding Minnesota, who are, as an example, currently purchasing Artemisia from California and Ohio suppliers, "welcome the opportunity to do business with Minnesota suppliers" because of lower shipping costs. Other manufacturers tell us they simply cannot keep up with the demand and are looking for new suppliers to help address their backorders.
- 4) Wholesalers and distributors who have been in the dried and preserved plants industry for years purchase 75% of their product from domestic suppliers, while fifteen years ago 90% of their product was imported.

Regarding the market potential for specific Minnesota species based on the researched market trends and the interviews conducted for this report, the conclusions are as follows:

Artemisia:

An noted before, it is available from many suppliers located in Minnesota and elsewhere, most notably California and Ohio. It is used as both fresh floral product and is also air dried. It is a material that has had stable demand but may be on the decline. Artemisia has a variety of uses as a line material, in wreaths, and is sold to bulk craft makers. While it can be harvested in the wild, many are selecting to cultivate the plant for easier harvesting.

White Yarrow:

This is sold as fresh cut, air dried, and frequently sold as a dyed product. Based on the interviews, the markets for this product were essentially stable. While some indicated that there appeared to be no increased demand for this floral, it should be noted that several of the larger wholesalers and distributors indicated an increased use of yarrow because it is an inexpensive and attractive floral item. It should also be noted that yarrow can be seen in almost 80% of all the floral arrangements presented in *Florists Review* for 1991 and 1992, and is an item used consistently in the dried herbs and florals wreathing industry for specialty markets.

Pearly Everlasting:

Although harvested from the wild, several wholesalers interviewed stated they also cultivate enough of this plant for their own use. This floral is an item which is similar to a Dutch imported dried called *Immortelles* which has been on the market in a variety of colors for almost 20 years. The wholesalers and distributors tell us that there may be an increased market for pearly everlasting if it can be dyed and can compete with the price of Immortells. Others interviewed tell us that this type of floral is being replaced by other florals less common and, therefore, in more demand.

Liatris:

This is a floral which has been very popular for over ten years as a cut flower. Based on the interviews and trends information presented in the floral trade literature, the market demand is most likely to remain quite stable as a fresh floral. As a dried product, liatris has not had much success because of its brittleness when dried, and discoloration (turns to black) when preserved. Several referenced the need to identify better methods for preserving this floral, which could have immediate demand if brittleness and discoloration were not a problem. And, as noted before, movement toward incorporating more of the curvy, non-linear products match well with wild liatris (vs. cultivated). However, experts do tell us that the supply of wild liatris is often difficult to predict from year to year. Additionally, the floral market trends in bundling would also suggest a strong need for better evaluating preservative methods for cultivated liatris.

Tansy:

This floral is used as both a fresh flower and a dried floral. In general, the comments from those interviewed suggest a decline in market demand for this plant. It has been a product used in natural color air dry form for several years. A few surveyed mentioned its use as a dyed product as well. Tansy has become a cultivated crop in the past few years and people who are using the product seem to be harvesting their own rather than relying on wildcrafted product.

Baby's breath:

Although not native to Minnesota, this floral is abundant in various parts of the State. And while one major floral wholesaler did indicate an increase in use of baby's breath, many others indicated a decline in demand for this product. The difference in attitude may be a result of the first wholesaler exporting baby's breath. This major wholesaler purchases the product he exports from suppliers in Minnesota and South Dakota. This product has been in the floral trade for more than twenty years as fresh, dried, preserved, colored, and glittered. However, other species such as acacia seem to be healthy competitors to this product as a floral "filler".

Penny cress:

Of those surveyed for this report, few stated they are currently using penny cress. In general, there is not much demand.

Berried branches:

Berry branches are very popular and in demand, especially during the fall and winter months. The increased popularity of the use of fruits and vegetables and asymmetric designs employed in popular floral arrangements invite the use of berry branches. Although desired from a visual perspective, the issue of "fastness" of the berries once the branch is dry is still of concern. Many interviewed for this survey indicated that the berried branches easily fit both the fresh floral and dried floral popular designs. The three berried branch types most often referenced were:

1. **Bittersweet:** A large percentage of the wholesalers interviewed (several located in Minnesota) stated they had an immediate unmet demand for this product. The product has been a staple in fall decor and arrangements for many years, but seems to be experiencing a healthy boost in popularity. In particular, it appears to be a difficult volume product for wholesalers to find. This may be a floral product area that Minnesota needs to devote more attention to.

2. **Ilex:** This product is a native, no leaf "holly". Although found wild in Minnesota, the plant does not have a consistent berry yield every year. There seems to be a growing interest in better learning how to cultivate this plant for commercial use.
3. **Wahoo:** A plant with an orange berry, this plant has appeal to the floral industry because of its fruit color. Several of those interviewed stated they thought this product might be an acceptable substitute for bittersweet, which is difficult to find.

Sumac:

Although many surveyed had used or knew of celosia in the past, few knew of or had seen sumac. A few familiar with the plant had expressed some concern for insects and suggested that fumigation might be required in order for the plant to be used in the floral industry. For those who were familiar with celosia and sumac, several indicated preference toward celosia because of the more unusual "flowerhead" design. Even so, several stated there might be good market demand for this product.

Willow:

Pussywillow was the name given most often when asking if willows were used. Curly willow (not native to Minnesota) was also listed. Pussywillows are used traditionally as a seasonal item, most often after Christmas and throughout Easter. It is defined as a staple identified with spring. When interviewees considered branches for floral design, the clear preferences stated were for birch or curly willows.

Curly dock:

Considered a very popular floral product ten or fifteen years ago, this plant grows abundantly throughout Minnesota. Several wholesalers interviewed said they were currently using this product in their floral lines and liked it. Years ago, the product was used as a line material, much like artemisia is used today. Several suggested that this product may be due for a revival.

Cattail:

This product is considered a seasonal staple in the floral industry. It is a typical design material for Fall and Thanksgiving. the pencil-thin variety is the most common used and requested. Several wholesalers stated they purchase from local growers, while others indicated they purchased from out-of-state suppliers. This product is also imported from other countries such as India, who provide the product at \$.03 per piece.

Lycopodium:

Many wholesalers and manufacturers referenced the increased popularity of this product in floral and wreath design, and as a dried product used in the potpourri industry. This product is currently being harvested in Wisconsin, Michigan, and Deer River, Minnesota. It is harvested from the same locations on a 2-3 year rotation. Harvesters find ample supply of the product, as long as the harvesting sites haven't been logged off. Lycopodium is not harvested in new growth stage or when it is seeding because it does not dye well, with the tips showing white while the remainder of the plant is dyed.

Ferns:

Several wholesalers and distributors referenced that ferns were being "overlooked" as a potential cash crop for Minnesota, both as fresh and dried. Many felt the ferns growing throughout the state need to be more carefully evaluated for use in domestic and international floral markets.

HERBS AND MEDICINALS:

The greatest immediate opportunities for the development of native plant materials for herbal markets come in the medicinal herb area. Already dozens of native plants are 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. Figures regarding the size of this marketplace are not available.

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 obtained more than half of the world's natural patents.

Following the same format as other special forest products detailed in this report, this section will delineate, based on direct interviews with approximately 50 herb and medicinal suppliers and manufacturers throughout the U.S., some past, present, and future market trends for the following 17 botanicals:

burdock root	yellow dock root	wild ginseng root
elder flowers	blue cohosh	wild cherry bark
motherwort herb	blood root	white oak bark
mullein herb	golden seal root	white poplar bark
plantain leaf	may apple root	white willow bark
violet leaf	wild ginger root	

These selections represent those botanicals currently being harvested from or near Minnesota's forest base.

In looking at the market value of medicinal plants and the drugs derived from them, it becomes clear that the best that can be done is a patchwork of various types of data. There is no set of complete data for any one plant or drug, and the pieces that are available are often not exactly comparable. Nevertheless, the data provides a feeling for the magnitude of the market.

Natural Products:

World wide imports into the U.S. of medicinal plants increased from \$355 million in 1976 to \$551 million 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 may apple were discovered, about a hundred tons of the plants were being used annually in the U.S. Etoposide, the drug derived from the may apple, already had annual sales of \$15 million in 1988, even though it was only introduced in 1984.

The anti-cancer drug market 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% as compared with 11% for the pharmaceutical industry.

Drug Sales:

Prescription drugs comprised a total world wide market in 1984 in excess of \$87 billion (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.

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 United States. The average prescription cost to the consumer in 1973 was \$4.13. Thus the total value of prescriptions filled by community pharmacies was about \$6.3 billion at the consumer level. Since plant-derived drugs represented 25% of the market in 1973, the value of these prescriptions was about \$1.6 billion. Applying a factor of 2 to compensate for other dispensing facilities, an estimated total value of plant-based prescriptions in 1973 in the United States was \$3.2 billion.

In 1980, the total number of prescriptions dispensed was approximately 2 billion. The average prescription price was about \$8.00. 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.

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.

Survey Results:

Based on the survey results of the 50 companies interviewed for this product area, the following current usages per botanical was indicated:

HERB	LBS. DOMESTIC USAGE	LBS. INTERNATIONAL USAGE
Burdock Root	112,000	20,000
Elder Flowers	10,000	
Motherwort Herb	5,750	20,000
Mullein Herb	74,800	20,000
Plantain Leaf	46,800	20,000
Violet Leaf	38,600	20,000
Yellow Dock Root	56,000	
Blue Cohosh	48,000	20,000
Blood Root	6,000	
Golden seal Root	212,000	100,000
May Apple Root	200,000	
Wild Ginger Root	2,000	
Wild Ginseng Root	10,000	190,000
Wild Cherry Bark	52,000	
White Oak Bark	26,400	
White Poplar Bark	7,200	
White Willow Bark	8,400	200,000

Specific details regarding past, present, and projected use of each targeted botanical, as referenced by those interviewed for this study, are included in the following text.

Burdock

Features

Naturalized in North America, from Asia and Europe. This plant grows from 2-5 feet and can be found along roadsides and in all vacant lots. Hunters will remember burdock burrs adhering to their clothes and being troublesome to their game dogs. The root, which should be dug in the Autumn or early Spring, is thick, brownish-grey externally, with white pith-like tissue inside. The roots and seeds have a sweetish, slimy taste, the leaves and stems being bitter. Common burdock is planted in Japan, where it has been improved by cultivation for its enlarged parsnip-like roots which are eaten as a boiled vegetable.

Medicinal Part:

Root, seed, leaves, stems, the whole herb.

Solvents:

Diluted alcohol, boiling water.

Purported Bodily Influence (not necessarily supported by scientific evidence):

Diaphoretic, diuretic, alterative.

Indicated Uses:

Herbalists all over the world use burdock. The root and seed is claimed to be a soothing demulcent, tonic alternative; slowly but steadily cleanses skin, soothes the kidneys, and relieves the lymphatics. It is said to eliminate boils, carbuncles, etc. It is soothing to the mucous membranes throughout the entire system.

Cultivation:

The roots grow best in a light, well drained soil. The seeds germinate readily and may be sown directly in the field, either in Autumn or early Spring. It takes about 6 to 8 lbs. of seed per acre, which will yield approximately 2000 lbs. of dried root.

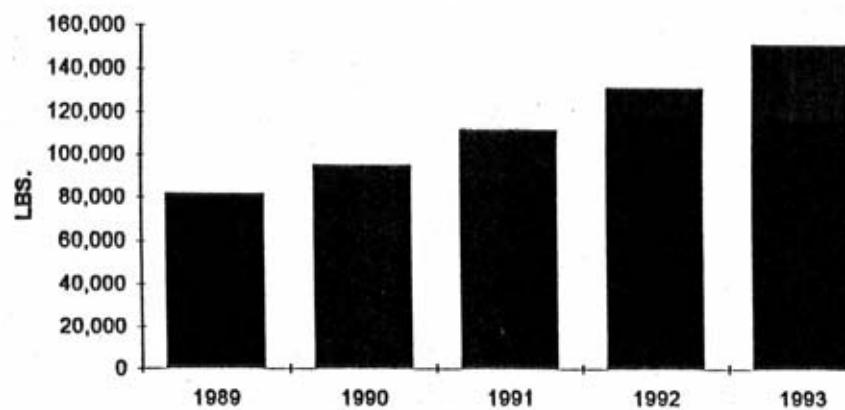
Market Trend:

Burdock was used by over 80% of the companies surveyed. It is used by processors, in tea blends, and as a fresh vegetable. Over the past three years there has been a 15% increase with the same trend projected into the future. Two popular anti-cancer plant-based formulas being marketed share burdock as one of their ingredients. Burdock root can be purchased in bulk in many health food stores nationwide.

Price Variables Per Pound:

Wildcrafter	\$3.00-\$8.00
Retail	\$6.00-\$16.00

Historical, Current, & Projected Burdock Usage of Those Surveyed



Elder Flowers

Features

An indigenous shrub growing in all parts of the United States, and Canada, in low, damp ground, thickets and waste places. Elders are frequently cultivated for their ornamental foliage. They grow from 5 to 25 feet high, blooming in June and July, with purple black berries containing 3 or 4 round seeds, maturing in September and October.

Medicinal Parts:

The roots, inner bark, leaves, berries, and flowers are all used.

Solvent:

Water.

Purported Bodily Influence (not necessarily supported by scientific evidence):

Emetic, hydrogogue, cathartic, diaphoretic, diuretic, alterative.

Indicated Uses:

The flowers, berries, leaves, inner bark, and roots have been used for many people in conditions of headache due to colds, rheumatism, jaundice. Note: Only the flowers of the blue elder should be used for medicinal purposes.

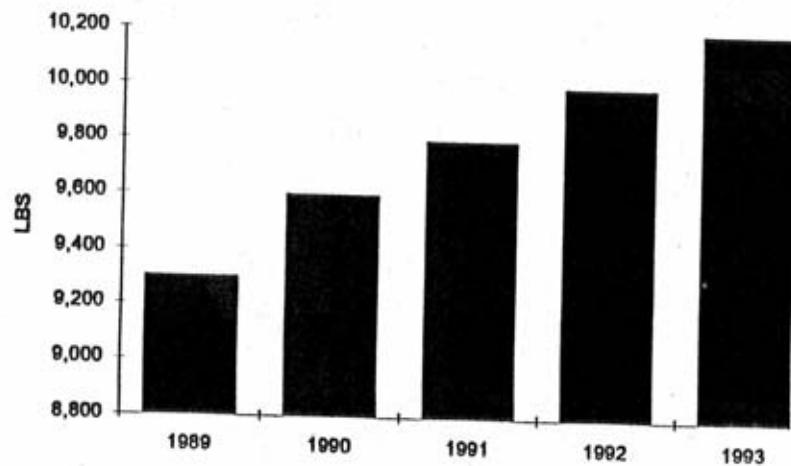
Market Trend:

Approximately 50% of the businesses surveyed either use or sell this botanical. Over the past three years demand for elder flowers has slightly increased. The market for elder flowers is being supplied by Eastern European sources. The demand for domestic supply is small, but has potential for development. Competition with foreign suppliers would likely be fierce because of lower labor costs and organized development of cultivation and harvesting. However, factors like the pollution from Chernobyl and the break up of the Communist block could make market development profitable.

Price Variables Per Pound:

Wildcrafter	\$4.00-\$16.00
Retail	\$8.00-\$32.00

**Historical, Current, & Projected
Elder Flower Usage of Those Surveyed**



Motherwort Herb

Features

There are about ten Eurasian species of this plant, three of them introduced into North America. The genus is of the mint family. Motherwort is an exotic perennial plant found growing in pastures and fields. The rigid stem grows up to 5 feet, bearing some resemblance to horehound, but it bears much longer and darker leaves.

Medicinal Parts:

The tops and leaves.

Solvents:

Water and alcohol.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Motherwort has been employed as a domestic remedy in infusion preparations. It is believed to be especially strengthening to the heart when it palpitates and a valuable bitter tonic for almost all conditions of the stomach. Being a true nervine, it is believed to be excellent for many female ailments.

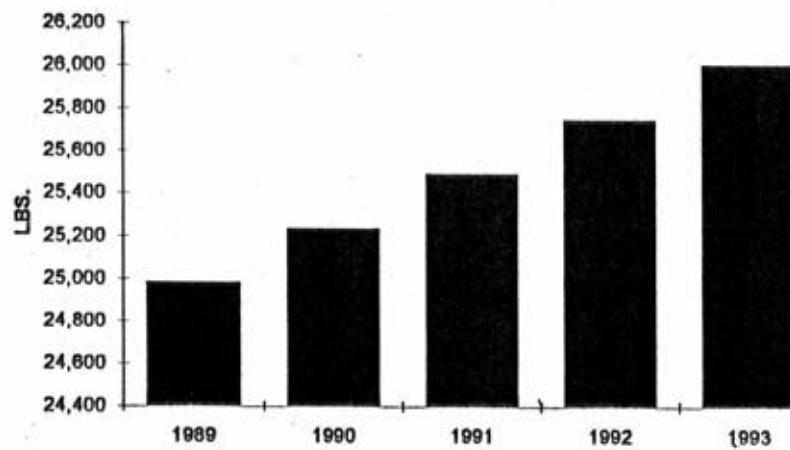
Market Trend:

Approximately 40% of the businesses surveyed used motherwort. Motherwort is far more popular in Europe where one company surveyed used approximately 10 tons for the extract market. Demand for motherwort is steady but scarcely developing in the United States. It is used by European health practitioners for female disorders as a nervine and in syrup form for cardiovascular strengthening.

Price Variables Per Pound:

Wildcrafter	\$4.00-\$12.00
Retail	\$10.00-\$24.00

**Historical, Current, & Projected
Motherwort Usage of Those Surveyed**



Mullein

Features

The genus comprises some 300 species native to Europe, North Africa, Western, and Central Asia. Some species have escaped and are common in the United States, growing on hillsides and waste areas. The best known species in America is the common *V. thapsus*, marked by a stout, erect, unbranched, woolly stem 2-3 feet tall.

Medicinal Parts:

The leaves and flowers.

Solvent:

Boiling water.

Purported Bodily Influence (not necessarily supported by scientific evidence):

Demulcent, diuretic, antispasmodic, pulmonary.

Indicated Uses:

The dried leaves were smoked to relieve lung congestion by the Indians, this being one of the many uses for mullein. Today's herbalist knows of its remedies for coughs, colds and pulmonary complaints, including hemorrhages from the lungs, and shortness of breath.

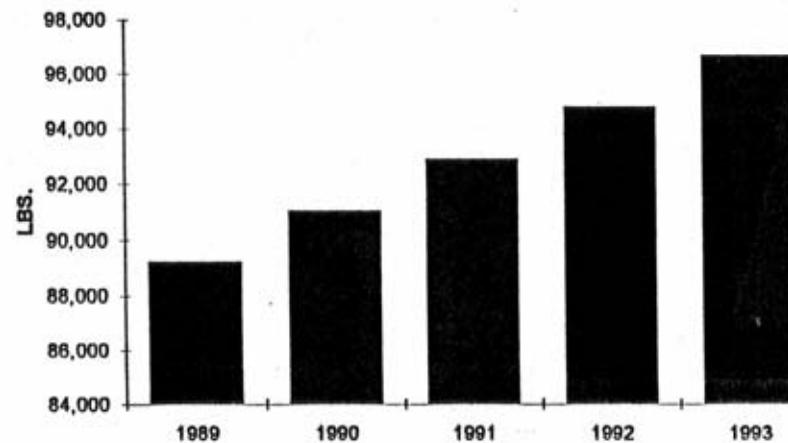
Market Trend:

Approximately 2/3 of the companies surveyed use mullein on a yearly basis. Over the past three years demand for mullein has slightly increased. The market is steady and will probably increase as the benefits of mullein become more widely known. Product development for mullein as an herbal smoking blend and ear oil has great potential.

Price Variables Per Pound:

Wildcrafter	\$2.00-\$7.00
Retail	\$8.00-\$16.00

**Historical, Current, & Projected
Mullein Usage of Those Surveyed**



Plantain

Features

Most of the two hundred or more widely distributed species of plantain are weedy herbs or subshrubs of the family Plantaginaceae. *Plantago major* is the best known backyard plantain, abundant in most North America. It is native to Europe but was spread so rapidly by human explorers in America that the Indians called it "White man's foot".

The leaves all radiate from the base but in some species are broader than in others. They are dark green in color and strongly ribbed lengthwise. The flower stem is stiff and smooth and attains heights of 6 to 18 inches. The head is short and studded with tiny four-parted dull white flowers with long slender stamens.

Medicinal Part:

The whole herb.

Solvent:

Water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Plantain is used by herbalists for ulcers, female disorders, kidney and bladder trouble, and inflammation of the intestines.

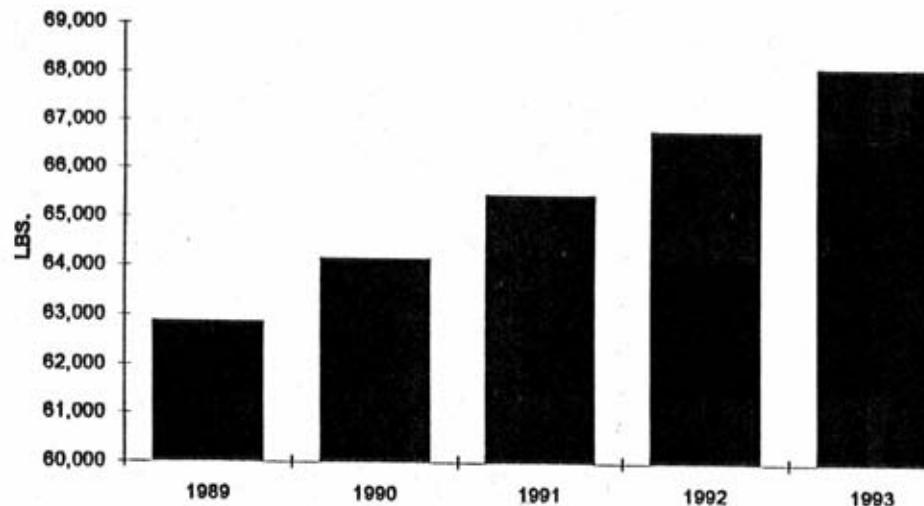
Market Trend:

Approximately 60% of the businesses surveyed used plantain leaf on a yearly basis. There is no significant increase in the use of plantain over the past three years. The plantain market is steady but undeveloped in the U.S.

Price Variables Per Pound:

Wildcrafter	\$4.00-\$12.00
Retail	\$8.00-\$20.00

**Historical, Current, & Projected
Plantain Usage of Those Surveyed**



Violet Leaf

Features

The violets have a large family tree of some 400 species, predominantly perennial herbs with few annuals. Violets are found in damp woods and other shady places and are among the best known wild plants. Violet leaves contain certain glucosidal principles of distant antiseptic properties and the flowers are expectorant and have been used for generations in syrup form for coughs, colds, etc.

Medicinal Parts:

Leaves and flowers.

Solvent:

Boiling water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Violet is used by herbalists to relieve pain in cancerous growths, some even say to cure cancer. It is also used for fever, headaches, ear disturbances, sore throat, and inflammation of the lungs.

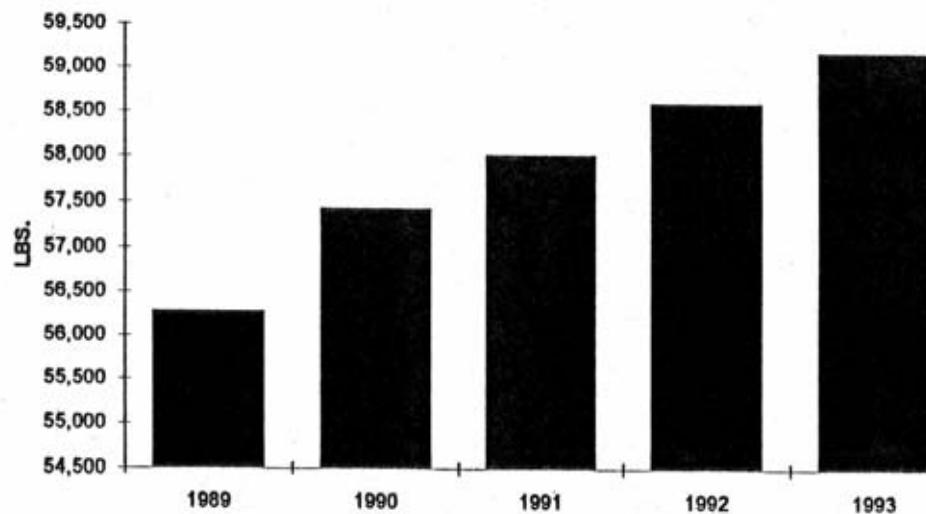
Market Trend:

Approximately 40% of the businesses surveyed used violet leaf on a yearly basis. From the information received a slight increase in demand was observed. The market trend is steady but underdeveloped in the United States. Violet leaf has potential as a cultivated domestic product. Presently, the market is being supplied by foreign sources.

Price Variables Per Pound:

Wildcrafter	\$4.00-\$16.00
Retail	\$10.00-\$32.00

Historical, Current, & Projected
Violet Leaf Usage of Those Surveyed



Yellow Dock

Features

The docks are members of the buckwheat family, native to Europe, except the blunt leafed variety which is indigenous. However, they have all been introduced to the United States. There are four varieties which may be used in medicine; *Rumex aquaticus*, *Rumex britannica*, *Rumex abutusifolius*, and *Rumex cripus*. They all possess similar qualities, but the yellow dock is the only one entitled to extensive consideration. It grows 2-3 feet high with slender, crisped edged leaves, which are lanceolate, acute and of a light green color; the leaves and stalk taste sour.

Medicinal Part:

The root.

Solvents:

Water, alcohol.

Purported Bodily Influence (not necessarily supported by scientific evidence):

Alterative, astringent, laxative, antiscorbutic, tonic.

Indicated Uses:

A favorite herb of the ancient Indians, old time doctors, early settlers and herbal practitioners. The rich and easily digested plant iron is one of the main contents of yellow dock. This common herb is believed to have valuable ingredients for conditions of the blood and glandular system and is indicated in scrofula, eruptive diseases especially when discharges are experienced, as in running of the ears, and skin conditions. Many herbalists use the mineral rich plant for cancer, leprosy, bleeding of the lungs and bowels, and for rheumatic conditions.

Cultivation:

Yellow dock is so abundant in waste places that, at present, cultivation is not necessary.

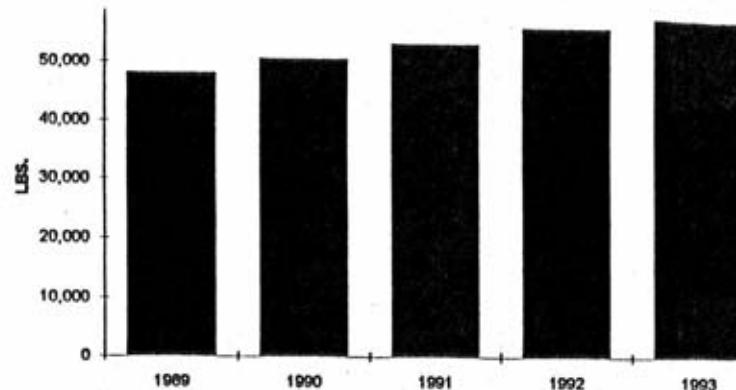
Market Trend:

82% of the businesses surveyed use yellow dock root on a yearly basis. There has been a steady 10% yearly increase in demand over the past 3 years. Yellow dock has potential in the dye , floral markets. One company interviewed sold freeze dried yellow dock root in capsules, they found this product to be very effective as a laxative.

Price Variables Per Pound:

Wildcrafter	\$1.00-\$6.00
Retail	\$4.00-\$12.00

Historical, Current, & Projected Yellow Dock Usage of Those Surveyed



Blue Cohosh

Features

This perennial grows in all parts of the U.S. near running streams and in low moist, rich grounds. The plant reaches 1-3 feet high. Its active principle is Caulophyllin.

Medicinal Parts:

The root, and the rhizome.

Solvent:

Water, alcohol.

Purported Indicated Uses (not necessarily supported by scientific evidence):

The old established uses were for feminine problems. Herbalists claim it is especially valuable, and it has been found in many cases to almost entirely relieve the patient of pain in childbirth and promote prompt delivery. Blue cohosh contains the following vital minerals potassium, magnesium, calcium, iron, silicon, and phosphorus which helps to alkalize the blood and urine.

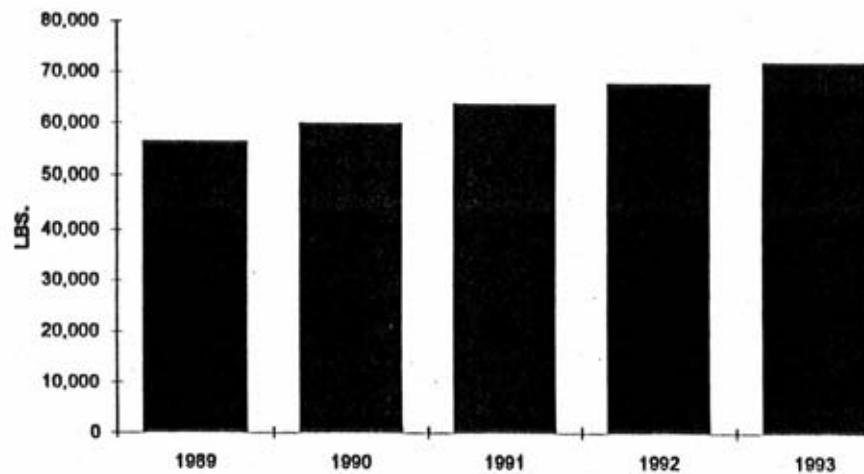
Market Trend:

Blue cohosh is a popular native American medicinal plant. Approximately 70% of the businesses surveyed use blue cohosh on a yearly basis. Market demand has increased 10% yearly. It is used in various products in tea blends, extracts, and a number of formulas to assist women in labor. Many midwives are known to use a formula with blue cohosh while dispensing their services. This botanical deserves more research and market development.

Price Variables Per Pound:

Wildcrafter	\$3.00-\$7.00
Retail	\$10.00-\$24.00

**Historical, Current, & Projected
Blue Cohosh Usage of Those Surveyed**



Blood Root

Features

Indigenous to Eastern North America, this small herb is often difficult to find in its woodland home, where the sheltered places and the leaf mold is ideal for its survival.

The whole plant is very brittle and succulent and when broken, especially at its thick, fleshy root, an acrid red juice bleeds from the divided sections.

Medicinal Part:

The root.

Solvent:

Alcohol, and water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Blood root was used for all blood conditions and as a dye for decoration. Blood root extract is used in the toothpaste industry in an anti-plaque formula. The properties are useful in chronic bronchitis, laryngitis, croup, and complaints of the respiratory organ.

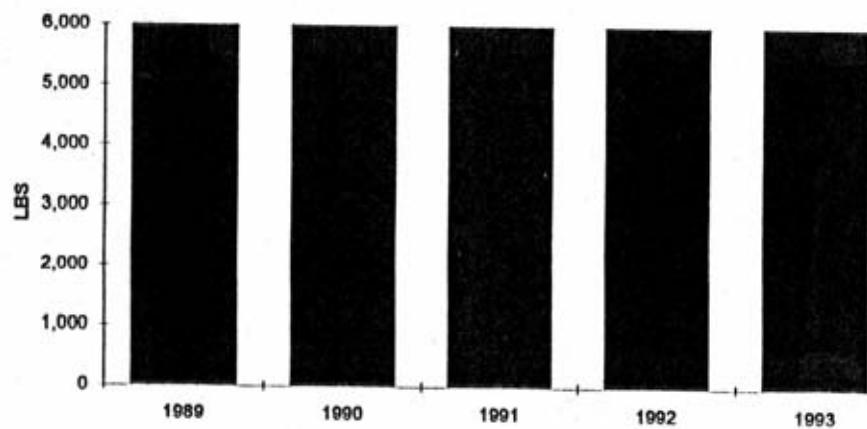
Market Trend:

Approximately 1/3 of the businesses surveyed used blood root. Most of the harvest is collected by one company that produces the extract used for the anti-plaque toothpaste. This one company is the largest user of blood root, and, as such, controls the amount harvested and the price paid to the wildcrafter. Pending F.D.A. regulations place the future commercial use of blood root in question. Research is presently being conducted on Macleaya cordata (plume poppy) which also contains sanguinarene, the active ingredient in blood root.

Price Variables Per Pound:

Wildcrafter	\$3.00-\$12.00
Retail	\$9.00-\$24.00

**Historical, Current, & Projected
Blood Root Usage of Those Surveyed**



Golden Seal

Features:

A perennial herb native to the moist woods and damp meadows of eastern North America. The rough, wrinkled yellow root contains several alkaloids; odor is distinct, with bitter taste. When fresh it is juicy and is used by the Indians to color their clothing, etc. The plant sends up a simple hairy stem 8 to 20 inches tall with 3 to 5 lobed, dark green leaves that in the summer may become 4 to 10 inches broad. The May and June flower is a solitary one, small, white or rose-colored, appearing in early spring proceeded by a crimson head or small berries resembling raspberry, and consist of many 2-seeded drupes. The plant is scarce today and is being cultivated for medicinal purposes.

Medicinal Part:

The root.

Solvent:

Alcohol, diluted alcohol, boiling water.

Purported Bodily Influence (not necessarily supported by scientific evidence):

Tonic, alterative, laxative.

Indicated Uses:

The Cherokee Indians introduced golden seal as an agent for treating ulcers and arrow wounds. Since then it has gained a title of being one of the most powerful agents in the entire herb kingdom.

Golden seal purportedly has been used in a wide range of illnesses from the common cold to complicated advancements. Also for smallpox, cancer, and asthma.

Cultivation:

The best conditions for the cultivation of golden seal is said to be a well-drained soil, rich in humus, with 60% to 70% shaded area. Seedlings are transplanted in beds where they acclimate for one year. The second year the plants are transplanted to beds until they are harvested in three years. Thirty-two sturdy plants set to each square yard, in three years' growth will yield two pounds of dry weight.

Market Trend:

Golden seal is by far the most popular of our native American herbs. Over 90% of the businesses contacted for this study use golden seal. The market trend for golden seal has increased 20% yearly from 1989 to 1992.

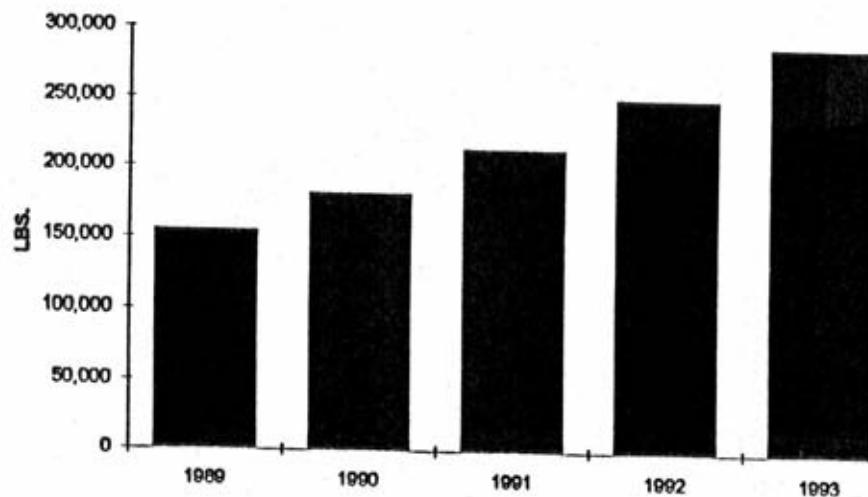
From November of 1991 to September of 1992, the price to the wildcrafter increased almost 1/3. One pharmaceutical company interviewed indicated it was buying a large quantity and selling to Germany for processing.

Harvest yields can fluctuate yearly due to climatic conditions and the loss of native habitat. There is a great deal of interest in creating successful cultivation techniques for this botanical. The market price varies from \$32.00 to \$80.00 per pound.

Price Variables Per Pound:

Wildcrafter	\$22.00-\$32.00
Retail	\$66.00-\$88.00

**Historical, Current, & Projected
Golden Seal Usage of Those Surveyed**



May Apple

Features

American mandrake is native to Eastern North America and can be found growing throughout the states in moist, open woods and pastures. The proper time for collecting the root is the latter part of October or early part of November, soon after the fruit has ripened. Its active principle is podophyllin which acts upon the liver in the same manner as mercury, but is far superior.

Medicinal Part:

Rhizome, and the resin extracted from it.

Solvents:

Alcohol, boiling water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Its usefulness is believed to cover a wide range, brought to our attention by the Indians. Herbalists claim it seldom fails in cases of urine incontinence or diseases associated with it. The influence is exercised on every part of the system, stimulating glands to a healthy action, and releasing obstructions such as bilious and typhoid febrile diseases.

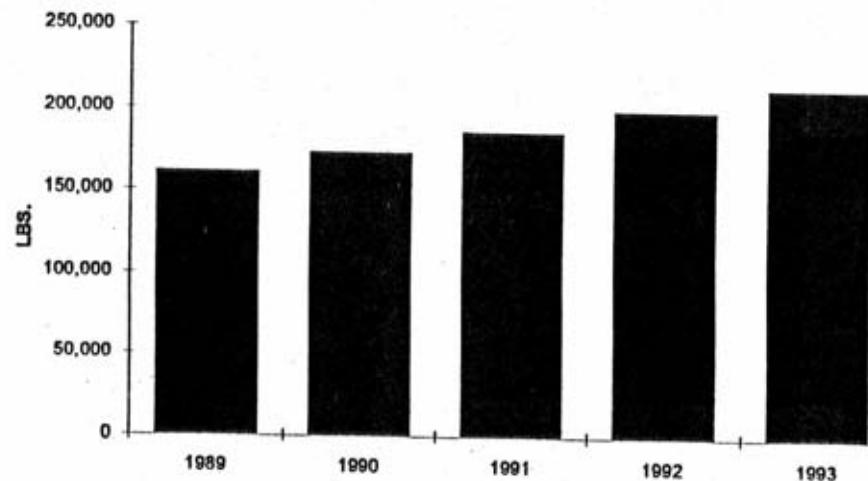
Market Trend:

Approximately 1/3 of the businesses surveyed use may apple root. According to reports in Economic and Medicinal Plant Research, over 200,000 pounds are used domestically. Etoposide, the drug derived from the may apple, used for its anti-cancer properties in 1988 had annual sales of about \$15 million, even though it was only introduced in 1984. Research is currently underway on a similar species native to India with a higher content of podophyllin. If the content of the active ingredient in our native species can be increased, this botanical would have a great market potential.

Price Variables Per Pound:

Wildcrafter	\$2.00-\$8.00
Retail	\$6.00-\$24.00

**Historical, Current, & Projected
May Apple Usage of Those Surveyed**



Wild Ginger

Features

Ginger, represented by many species, differs in appearance according to habitat. Native ginger is found growing in rich woods.

Medicinal Part:

The root.

Solvent:

Boiling water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

As a carminative, herbalists use it for painful spasms of the bowel and stomach, to promote perspiration, in all cases of colds, female obstructions, whooping cough, and fevers.

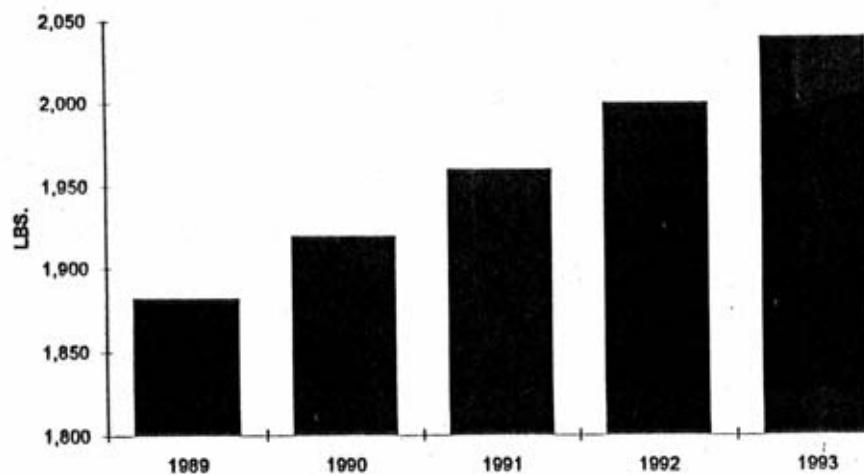
Market Trend:

Approximately 30% of the businesses surveyed use ginger root. Wild gingers' niche in the marketplace today is small but steady, its current use is as a medicinal. However, it is also used as a culinary product and as an ornamental. As these potential markets are developed, demand is sure to increase.

Price Variables Per Pound:

Wildcrafter	\$2.00-\$16.00
Retail	\$6.00-\$32.00

**Historical, Current, & Projected
Wild Ginger Usage of Those Surveyed**



Wild Ginseng

Features

Indigenous to China, North America, and East Asia. American ginseng grows naturally on the slopes of ravines and other shady but well drained places in hardwood forests, in varying abundance, from Eastern Canada to Maine and Minnesota and southwards into the mountain regions of Georgia and Carolina. The root is thick, spindle shaped 2-4 inches long, and 1/2-1 inch or more in thickness. It usually takes at least 6 years for the root to reach marketable size.

Medicinal Part:

The dried root.

Solvent:

Water, alcohol.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Ginseng has been known and respected for centuries. For many people, ginseng has had beneficial results in the home for general strengthening and appetite. A modern Chinese herbalist avows that it is the most energy giving, and is distinguished by the slowness and the gentleness of its actions. Ginseng is believed to increase vitality by carefully improving the condition. The activating process improves the mental, physical and spiritual efficiencies of the brain, so inducing better feeling, sleep, appetite, and well being.

Cultivation:

It is difficult to cultivate out of its native grounds. A rich compost is necessary. Propagation by cuttings of the roots is the most successful method, the cuttings being placed in sand. Cultivation has been attempted in various areas of the U.S. with little financial success.

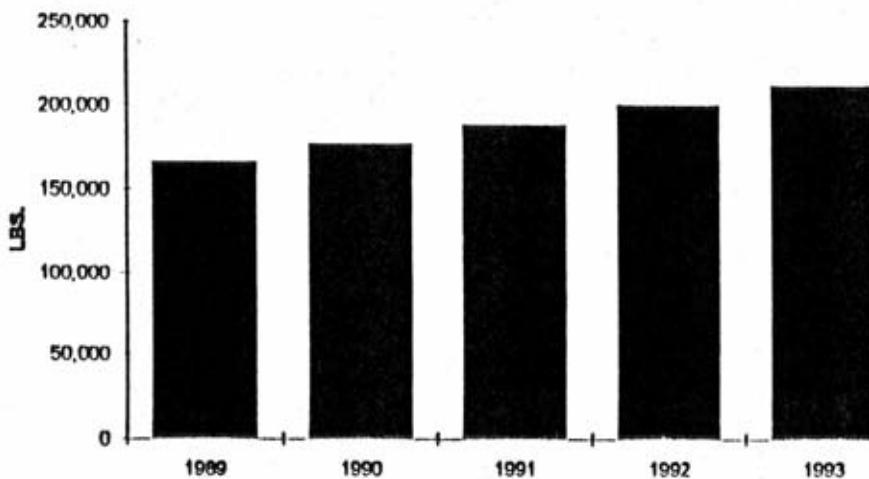
Market Trend:

Approximately 40% of the businesses surveyed deal with ginseng. Experts believe that most of the wild and cultivated harvest in North America is exported to Asia. In China only a handful of wild ginseng roots are dug each year. The oriental ginseng has been valued as a medicinal for over 2000 years. It has been virtually exterminated from the wild. One wild root of oriental ginseng can sell for as much as \$20,000 on the Hong Kong market. Wild ginseng has enjoyed high demand for centuries. However, the availability, due to over harvest and destruction of habitat, is very low. The cost of wild ginseng on the market today continues to rise. This year's harvest from the wild was low and cost \$320 a pound. Cultivation has taken place for many years. Domestically, however, the six year rotation cost of growing this plant keeps profits low compared to other botanicals. Most cultivated ginseng is sold to Asian markets. Some 90% of domestic crop is shipped to China, Korea, and Japan every year.

Price Variables Per Pound:

Wildcrafter	\$200.00-\$240.00
Retail	undetermined

Historical, Current, & Projected Wild Ginseng Usage of Those Surveyed



Wild Cherry Bark

Features

This large fruit tree is native to North America and is found from Canada to Florida and from Minnesota to Texas. The bark has a distinct aromatic odor, resembling bitter almond when macerated in water. Stem bark is collected in the Autumn and carefully dried.

Solvent:

Hot or cold water.

Medicinal Part:

The young, thin bark.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Wild cherry bark is extensively used in cough medicines as a vehicle base. It is also used for bronchitis, scrofula, and heart palpitations.

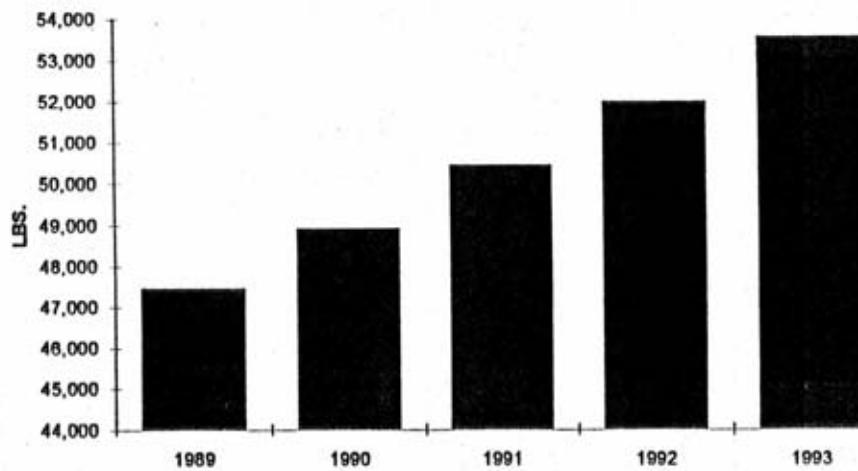
Market Trend:

Approximately 50% of the businesses surveyed use this botanical. Wild cherry has had a long history of use as a cough remedy and as a flavoring agent. The demand is steady and can increase with marketing.

Price Variables Per Pound:

Wildcrafter	\$1.00-\$8.00
Retail	\$4.00-\$16.00

**Historical, Current, & Projected
Wild Cherry Bark Usage of Those Surveyed**



White Oak Bark

Features

White oak bark is chiefly used in medicine. Approximately 80 species of the beech family are native to the U.S., 58 of which are trees. These trees vary in size, according to the climate and the soil.

Medicinal Part:

The bark, acorn.

Solvents:

Alcohol, water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

The bark is believed to be an agent in chronic diarrhea, chronic mucous discharges, passive hemorrhages, and wherever an internal astringent is required. The oak bark tea acts like a resin in a strengthening way on the outer vessels. Herbalists claim that dangerous fistules on the rectum are dissolved and healed by this method, occasionally using the dilute tea as a colonic. Excellent as a gargle for sore or relaxed throat.

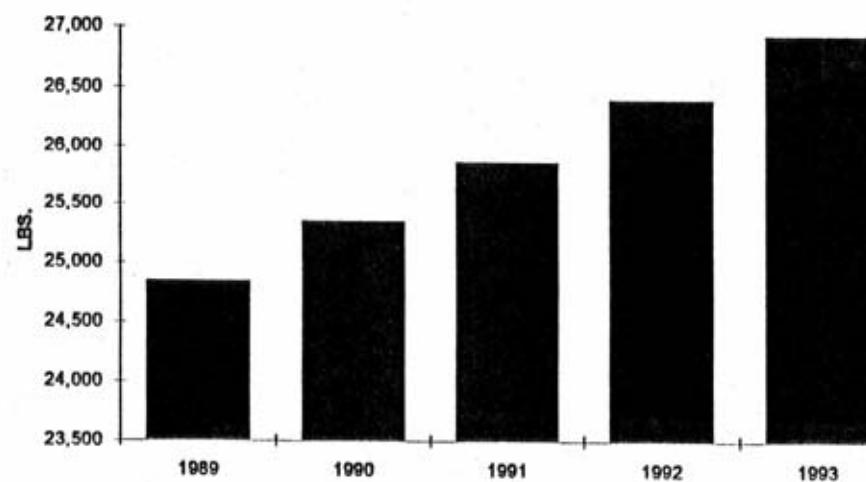
Market Trend:

Approximately 50% of the businesses surveyed use this botanical. There is a small but steady demand for white oak bark. Product market research and development is needed to develop increased demand for this botanical.

Price Variables Per Pound:

Wildcrafter	\$1.00-\$6.00
Retail	\$4.00-\$16.00

**Historical, Current, & Projected
White Oak Bark Usage of Those Surveyed**



White Poplar

Features

The poplar grows throughout the United States and Canada, from subtropical to subarctic regions and from sea level to timberline. The bud of this species and *Populus canadensis* are commonly called Balm of Gilead.

Medicinal Part:

Leaves, bark, and buds.

Solvent:

Boiling water.

Purported Indicated Uses (not necessarily supported by scientific evidence):

Preferred agent to Peruvian bark, and quinine, with the same results but fewer after-effects. A well established bitter tonic to restore digestive disturbances caused by disease or old age. The relaxing effect to the system relieves headache due to liver or stomach conditions of flatulence and acidity. If the skin is bathed once a week with a solution of poplar, it has excellent cosmetic benefits, acting as a tonic and conditioner.

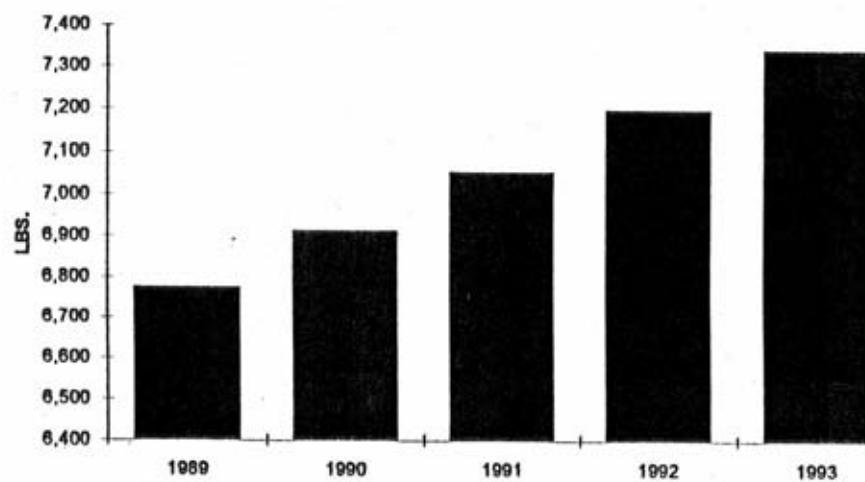
Market Trend:

Approximately 1/3 of the businesses surveyed use this botanical. A number of natural product pharmaceuticals use poplar bark for its pain killing properties. Bees produce propolis from the buds of this tree. The buds have potential as antifungal, antibacterial, for periodontal diseases. More research in these areas is needed.

Price Variables Per Pound:

Wildcrafter	\$2.00-\$20.00
Retail	\$8.00-\$32.00

**Historical, Current, & Projected
White Poplar Usage of Those Surveyed**



Willow Bark

Features

The genus Salix comprises many trees and shrubs.

Medicinal Part:

The bark.

Solvent:

Water

Purported Indicated Uses (not necessarily supported by scientific evidence):

Willow is very similar in action to quinine, the active principle is salicin and is believed to be far more valuable for ague and low grades of fever. These salicylic acids are found in a number of herbal remedies used throughout the world. When the American Indians were in need of a fever reducing agent, willow bark tea was given. The drug derived from willow salicylic acid is known today as common aspirin.

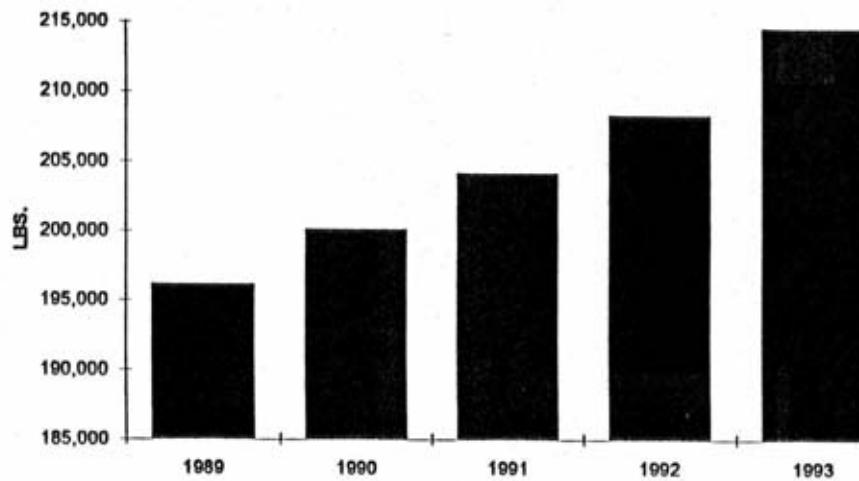
Market Trend:

Approximately 75% of the businesses surveyed use willow bark. One Swiss pharmaceutical company used 200,000 lbs. in its extraction process. The market has been steady with a slight increase in product use. Its use as a pharmaceutical (aspirin) and a natural pain killer has a long history in the industry and it is likely to continue in the future.

Price Variables Per Pound:

Wildcrafter	\$1.00-\$8.00
Retail	\$4.00-\$32.00

**Historical, Current, & Projected
Willow Bark Usage of Those Surveyed**



DECORATIVE WOODS:

Over thirty interviews of craftsmen, businesses, artisans, material suppliers, retailers, etc. of decorative wood and wood products representing multiple states throughout the U.S. were interviewed. Species evaluated under this category included:

paper birch, yellow birch, aspen, cottonwood, basswood, poplar, oak, walnut, maple, ash, cherry, plum, apple, cedar (multiple species), spruce, elm, butternut, diamond willow, sumac, and Russian olive.

Those involved in the purchase and sales of decorative woods conservatively estimate that annual sales of decorative wood from U.S. species is as follows:

Worldwide Sales	=	800 ton annually	=	\$960,000.
Domestic Sales	=	250 ton annually	=	\$300,000.

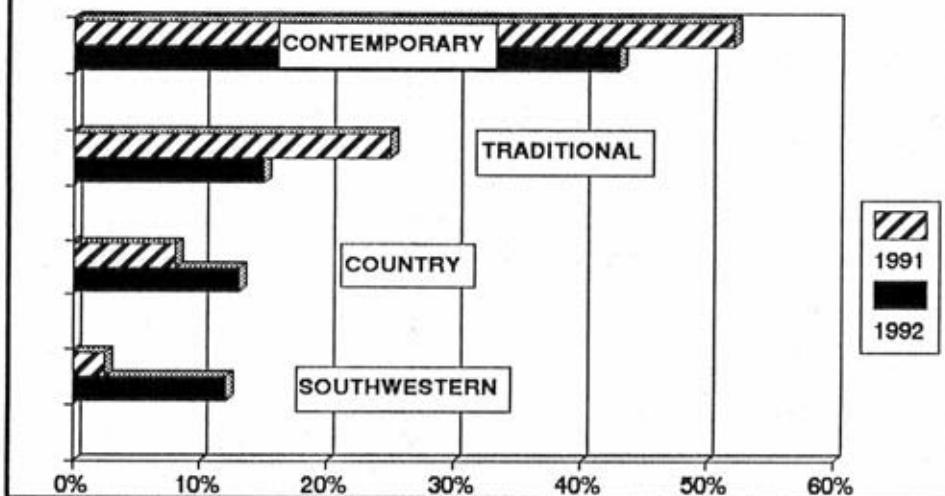
(Average \$/# = \$.60/#)

There are many people in the Minnesota and Wisconsin area which use a variety of forest species for furniture, carvings, musical instruments, bowls, walking sticks, and many other finished products. The North County Artisans Directory lists many craftsmen and business which were contacted by Mater Engineering for this research. Some wood species, such as ash, black walnut, cherry, hickory, oak, birch, myrtlewood, madrone, butternut, aspen, cottonwood, basswood, and poplar, appear to be preferred base materials for wood crafters. Only a small number of crafters indicated their use of diamond willow as a species choice.

Almost all crafters interviewed stated they had stable, steady markets for the products they manufacture, with some indicating substantial increases in sales over the last few years. The main reason given for increases in sales stems from the growing popularity of the rustic or "lodge-look" in furniture design and home furnishings. This rustic, "western" look appears to be anything but a localized fad, as is illustrated by the following 1992 research findings of U.S. furniture style purchases conducted by Furniture Today:

Contemporary leads; Southwestern growing

PERCENTAGE OF RETAILERS
NAMING STYLE AS SHOWING
FASTEAST SALES GROWTH



Source: Furniture Today, 1992

The research findings show that although *contemporary* and *traditional* furniture styles still lead the nation in furniture sales, *country* and *southwestern* styles showed marked increases in popularity during 1992. This, in contrast to drops in sales for both *contemporary* and *traditional* furniture styles between 1991 and 1992. Attached as Exhibit I are pictures of *country* (or "lodge") style furniture, *southwestern* (or "mission") style furniture, and even examples of "*rustic*" style furniture commanding prices worth noting through specialty product catalogs such as Sugar Hill (early Spring, 1993).

With the furniture styles in demand clearly reflecting a "back to nature" emphasis, it comes as no surprise that home furnishings and accessories reflecting that natural, rustic style are also in demand. Examples range from fireplace, kitchen and dining accessories, to specialty items such as walking sticks and wooden journals (see examples from John Deere: 1992 Holiday Catalog; Horchow Home Collection: January 1993; The Nature Company Catalog: Holiday 1992 in Exhibit I).

Based on the interviews, the most common species-into-product correlations are as follows:

SPECIES	TYPICAL USES
birch (yellow and paper)	cabinets, carvings, furniture, doors
oak	furniture, walking sticks
walnut	furniture, lamp bases, other specialty items
maple, ash	walking sticks, furniture
cherry, plum, apple, sumac, Russian olive, lilac	bowls, etc.
cedar	outdoor items
spruce	musical instruments
elm, ash	bowls, boxes
bentwood willow	used in rustic furniture manufacturing
butternut	bowls, clock faces

General observations based on research in the decorative wood category for this project include:

1. Most crafters/decorative wood businesses indicated their sales were stable, steady from year to year. None indicated an awareness for increased market growth opportunities for their products.
2. Most businesses rely on word-of-mouth for product sales. Little, if any, actual advertising is done. Localized art and craft fairs are typically the main opportunities for product exposure.
3. A few decorative wood crafters have sold product outside the Minnesota area. Some have even sold internationally. Some crafters have, through word-of-mouth, sold products outside the immediate area. They claim there is opportunity for increased markets and profit potential, but that they lack the knowledge of how to reach those markets.
4. High-quality specialty gift stores located in the Pacific Northwest were interviewed to determine if Minnesota decorative wood products were sold in their stores. The most referenced products purchased from Minnesota producers were birch boxes made from bark and moss. (Although stores were unwilling to confirm,

Minnesota-based companies like **Lady Slipper Designs** are a logical guess of where some of these products are manufactured and marketed through).

5. Many acknowledge the lack of formalized marketing organizations that could help to market decorative wood products to outside and off-shore markets. One furniture cooperative called **Complements** located in Minneapolis, allows for woodcrafters to come together in a shared manufacturing and sales environment. The cooperative rents bench space and major tools are shared among members. Each member participates in the sales of crafted products at the Complements store. However, no advertising is done. All products are sold by word-of-mouth and previous customers.
6. Specialty gift stores interviewed for this project who are located in Minnesota and sell wooden products made from burls and decorative woods stated they do **not** purchase these specialty products from Minnesota producers but from outside sources (California, Illinois, Vermont, and Wisconsin frequently referenced). The store owners stated they are unaware of Minnesota producers and typically sell products offered to them through marketing/buying networks. This suggests that market opportunity does exist for Minnesota decorative wood product producers within their own backyard provided more organized marketing strategies are employed that offer higher visibility of local products being produced.
7. Several businesses interviewed offered that butternut **canker** is becoming a popular decorative wood, although the butternut resource is diminishing. Canker is the diseased tissue in the tree as a result of fungus. After the tree starts to die, worms enter into the tree randomly, resulting in the desired distinctive look sought after in the decorative wood market. The wormy wood is sliced and used for clock faces and attache-type display cases, etc.
8. Cedar was also a species referenced by some manufacturers. Although falling into more of a "specialty product" category than decorative wood category, both northern white cedar and even eastern red cedar (a.k.a. "aromatic" cedar) is used by Minnesota producers. One manufacturer, Mealey's Gift and Sauna Shop located in Ely has done well with manufacturing special sauna and jacuzzi products made from local northern white cedar (see attached pictures of products offered in Exhibit J).
9. Black willow for furniture manufacturing was referenced by several interviewed.

Specific market research findings for use of diamond willow and burls in specialty product manufacturing are as follows:

Diamond (Bebb) Willow:

This willow species is found in the shrub swamps of Northern Minnesota. It may grow to be 20 feet tall at maturity and have a trunk approximately 4"-5" in diameter. Branches as small as 1" in diameter are used for various crafted items. Diamond willow has been used historically by Minnesotans as a craft wood for making walking sticks, lampstands, crosses, letter openers, utensil handles, etc.

Interview results for this project reveal the following:

- 1) Canadian diamond wood was referenced by some as a strong competitor to the Minnesota species. Producers indicated the Canadian species had more "diamonds" and larger diameter branches (up to 2").
- 2) The species is often referred to as the "older gents" species, referring to the fact that many of the younger crafters and artisans do not either know of the species or have chosen not to work with the species.
- 3) Many crafters interviewed referenced that the species was "too common" in Minnesota, and needed broader visibility outside the Minnesota market in order for products to be marketable at a reasonable profit. This is especially important due to higher labor cost involved in preparing the wood for product manufacturing (i.e. bark removal, diamonds cut out, wood dried & cured, etc.).
- 4) Another 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 custom-work 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 their surprise at being able to sell one-of-a kind diamond willow walking sticks to German customers this last year for approximately \$50 each.
- 5) Some interviewed suggested that diamond willow may have unique qualities for potential use as a design material in the floral industry.
- 6) 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.

7) Several decorative wood product manufacturers from surrounding states (Wisconsin, most notably) stated they thought diamond willow might make attractive furniture items, but also thought the Canadian diamond willow might prove a better quality resource than what Minnesota could offer. Other crafters from surrounding states stated that although they had demand for diamond willow, they had trouble in locating *dependable* sources with adequate volumes.

Burls:

Companies who specialize in the use of burls for veneers are located outside the Minnesota. One such manufacturer located in Indiana interviewed for this project related the following:

- 1) The company was not aware of any burls coming from Minnesota. They stated they were aware of birdseye maple burls being available in the state and being used in box manufacturing.
- 2) The most popular burl species used are walnut, maple, myrtle, madrone, and redwood.
- 3) Veneer from burls is a very specialized market. It is stable but doesn't appear to have lots of growth potential. Products manufactured from peeled or sliced burls include furniture and paneling. Some burls are sliced to make slabs used as table tops, etc.
- 4) This Indiana manufacturing operation buys between 10 and 20 truckloads of burl per year. This equates to 800,000 pounds of burl annually (high end). They pay up to \$1.00 per pound, with the average burl weighing between 1,000 - 2,000 pounds. They state they know of at least five other operations that use about the same volume of burl product per year.
- 5) In addition to manufacturing, this company serves as an exporter and wholesaler of burls. They state they see good potential for increased export opportunities for burls.

Aside from the Indiana manufacturer, other contacts interviewed on the market for burls revealed the following:

- 1) Burls are used to make many specialty gift items such as bowls, boxes, bookends, or veneered products, etc. Species often referenced include cherry, ash, hickory, oak, elm. Some interviewed stated that the most commonly used burls are actually imported carpathian elm or maple.

- 2) Many crafters have tried to use Minnesota burls but state they are too erratic and not consistent. Minnesota burls of birch and other local species are too soft and lack the preferred qualities evidenced in hardwood species. Minnesota is on the northern fringes of hardwoods and has difficulty competing against other states with higher volumes of preferred hardwoods to work with. The fact that there has been no concerted effort or visibility in Minnesota to save burls to make veneer or other products does not help, according to those interviewed.
- 3) According to those interviewed, there appears to be a limited use of Minnesota burls for several reasons:
 - a) **Availability:** Loggers typically leave burls in the woods or do not see the economic value in the burls;
 - b) **Demand:** Products currently being manufactured from burls are typically sold as specialty furniture or unique products sold in specialty one-of-a-kind shops. Visibility of product is therefore limited and purchased by a limited number of consumers.
 - c) **Quantity:** Because Minnesota lacks in a high volume of hardwoods, the perception is that the state cannot compete against the more southern states such as Indiana in the burl market.
 - d) **Quality:** The quality of burls produced from Minnesota species is not consistent, according to manufacturers interviewed. Burls are caused by damage or interruption of the tree's growth. These damaged areas are often decaying and too soft for use as veneer or woodturning. Drying of the burl pieces may not be consistent and cracks may become evident - years later.

FLAVORWOODS/SMOKEWOODS:

Over twenty interviews with manufacturers and users (smokehouses, restaurants, etc.) of smokewoods/flavorwoods in 13 different states throughout the U.S. were conducted for this research. Key species evaluated included:

Hickory, maple, mesquite, alder, fruitwoods (cherry, apple, pear, peach, plum, citrus, fig, nectarine), oak, birch, ash, sassafras, nutwoods (hazel, almond, pecan, chestnut, blackwalnut, butternut).

Those involved in the purchase and sales of flavorwoods conservatively estimate that annual sales of these smokewoods from U.S. species is as follows:

Worldwide Sales	=	6,500 ton annually	=	\$3,250,000.
Domestic Sales	=	5,000 ton annually	=	\$2,500,000.

(Average \$/# = \$.25/#)

Woods more traditionally used in the smoking and flavoring of foods include:

Mesquite:

- most commonly found in the southwest from Texas to California;
- is reportedly in short supply and is losing popularity as a flavorwood;
- burns a very hot fire;
- lightly woody flavor;
- best on beef and poultry.

Hickory:

- non-resinous;
- intense smokey aroma
- best on barbecued ribs, poultry, and beef;
- produces very flavorful smoke;
- used also in sawdust and liquid smoke form;
- appears to be one of the most popular cooking woods.

Alder:

- good for salmon
- throws out fewer sparks
- has priced itself out of the firewood market due to its popularity in the manufacture of furniture and paper products.

Cherry/Apple:

- fruity smoke;
- best on chicken, turkey, pork, ham, and sausages

Oak:

- similar to hickory;
- less pungent;
- sweeter aroma;
- produces very flavorful smoke

By 1985, information on the health risks of preparing foods through use of charcoal, gas, and wood as fuels for grilling, smoking, charring, and burning received a high level of public exposure. Articles written by consumer research groups presenting research conducted by such credible groups as the Institute of Medicine/National Academy of Sciences detailed the following:

- 1) **Charcoal Broiling:** produces carcinogens that are located on the meat. As the meat fat drips on the heated charcoal, the resulting smoke rises and coats the meat. The smoke contains polycyclic aromatic hydrocarbons (PAHs), including a compound related to the tar found in cigarette-smoke condensate. The quantity of PAHs consumed by eating one well-cooked, charcoal-broiled steak, it was estimated, was equivalent to that inhaled by smoking 600 cigarettes!! Further, the research concluded that, aside from the PAHs coating the meat from the smoke, additional carcinogenic compounds were being produced from the breakdown of amino acids in the meat.
- 2) **Smoked Foods:** Although the level of PAHs in smoked foods was determined to be far lower than that evidenced in charcoal-grilled foods, research concluded that PAHs are absorbed in the food during smoking process, and increase during storage. Over 24 different PAHs have been identified in wood smoke.

These findings apparently did not go unnoticed by the public. Although the U.S. Barbecue Industry Association (BIA) details the annual sales of barbecue grill units as remaining fairly constant during the last decade (between 12 - 13 million grills being sold annually), what may be more interesting to note is the *type* of grill being bought by the consumer:

Table 4

**Grill Statistical Data
(Estimated Unit Sales)**

Year	Charcoal	Gas	Electric	Total
1984	10,548,000	2,684,000	84,000	13,316,000
1985	9,513,400	3,173,000	78,000	12,764,400
1991	8,074,623	4,261,181	142,734	12,478,538

Source: Barbecue Industry Association

Noting the significant drop in charcoal grill sales between 1984 and 1991 (-30%), contrasted with the increased sales in electric grills (+69%) and gas grills (+58%) during that same period of time, it may be reasonable to conclude that consumers have taken note of the health risk warnings.

The sharp decrease in the number of U.S. and Canadian grill manufacturing companies between 1985 and 1991, as seen in the table below, may also be an indicator of the impact the health risk warnings are having on the buying patterns of consumers.

Table 5

**Grill Manufacturing Companies
(Number of operating U.S. and Canadian
grill manufacturers existing within
reporting dates)**

	1985	1991	% change Increase/(decrease)
Charcoal	45	20	(-55%)
Gas	30	20	(-33%)
Electric	12	8	(-33%)

Source: Barbecue Industry Association

Even so, BIA sales figures of charcoal briquets, flavorwood chips, and flavorwood chunks between 1987 and 1991 indicate an interesting growth pattern which may indicate increased market opportunities for both flavorwood chips and chunks over briquets:

Table 6
Grill Cooking Fuel Sales
(Pounds Shipped)

	1987	1991	% change Increase/(decrease)
Charcoal Briquets	1500mm	1500mm	0%
Wood Chips*	6,173,802	6,965,403	+13%
Wood Chunks*	3,628,668	4,852,650	+33%

Source: Barbecue Industry Association

* Figure includes sales for Hickory, Mesquite, and Alder only

Equally interesting, while hickory lead the sales figures for flavorwood *chips* over mesquite between 1987 and 1991 (60% to 38% in total pounds sold, respectively), mesquite lead the sales figures for flavorwood *chunks* over hickory during that same time period (55% to 43% in total pounds sold, respectively).

Adding fuel to the flavorwoods/smokewoods fire may be the recent statewide crackdowns on the use of gas grills in condominium and apartment buildings. The State of New Jersey in March of 1992 imposed a new state law which does just that. The regulation, enacted by the State Department of Community Affairs as part of the state fire code, was initiated over legislative concerns that gas grill owners were "storing a 500-pound bomb in a 20-pound cylinder". Articles from other states regarding fires started by propane barbecues foster continuation of the heated debate in this arena. (See Exhibit K).

Direct interviews conducted by Mater Engineering personnel for this project revealed the following trends on the use of smokewoods and flavorwoods:

- 1) While over 22 wood species were identified in product usage during the interviews, the species and species combinations most preferred by buyers and manufacturers were hickory, mesquite, alder, maple, cherry, apple, oak, and the combinations hickory/oak and hickory/pecan. Some smoke foods manufacturers have developed some exotic flavors from unusual sources (such as avocado pits), while others have tried less-used species such as birch. Birch, however, has too strong and pungent a flavor and is not a preferred choice for that reason. Several interviews did indicate a growing demand by culinary experts for pinon, to replace mesquite as a flavorwood.
- 2) Most businesses use local sources of wood. All pay by the cord with indicated prices ranging from \$60/cord for hickory to \$275/cord for oak. None of those interviewed indicated shortages of resources nor appeared to have supply concerns for the future.
- 3) All interviewed indicated either a "steady" or "increasing" demand for their smokewood or flavorwood products, with average annual increases in sales ranging from 5% to 15%. One exception was a company based on the east coast that has established a large mail order business to high-end restaurants for their smoked products. According to this source, the company (not new to the culinary foods industry), indicated they had been experiencing a 700%-800% increase annually in the sales of their products. This may suggest that those in the smokewood/flavorwood industry take a much more critical look at how and where their products are marketed. It may be a worthwhile endeavor to concentrate marketing efforts on specialty niche markets rather than targeting mass merchandisers for product distribution.
- 4) Most indicated that consumers and users of smokewoods and flavorwoods clearly did not prefer the use of liquid smoke. Liquid smoke results from the extracting of the woods oils into liquid or tincture concentrates. That concentrate is then added to brines when soaking the meats before cooking. It is also used in barbecue sauces or sprinkled over briquets when grilling meats. Most experts and consumers claim the liquid smoke is too pungent and too strong for long, slow cooking.
- 5) Several of those interviewed indicated their concerns over the impact the health risk warnings would be having on their industry. Unlike briquets, smokewoods and flavorwoods appear to be **currently** less impacted by the reported health concerns. But many in the industry are clearly approaching the future with caution in this area.