The Strategic Marketing Institute

Rapid Opportunity Assessment: Nursery and Greenhouse Sector

Getachew Abate and H. Christopher Peterson, Director

March 2005

Acknowledgements:

This report was prepared as part of the work plan for the Great Lakes Agriculture Innovation Program funded by a USDA Rural Development Grant.

The Hale Group served as technical and market advisors to the project. They assisted in developing the methodology and approach for the paper. They provided key sales and growth rate estimates as well as critiques of drafts.

MSU
Product Center for Agriculture and Natural Resources
Room 80 Agriculture Hall, Michgan State University, East Lansing, MI 48824 (517) 432-4608
Envisioning, exploring and enpowering a profitable future for businesses and industries engaged in Michigan's agricultural, food and natural resource systems.

Table of Contents

1. Introduction

We are living in a dynamic world in which the consumption of and demand for new products are rapidly growing and changing. The consumer we have today is more educated, diverse, demanding and different from the consumer we had some two decades ago. The demand for goods and services is becoming more and more sophisticated. There is not only an increasing demand for more varieties, qualities, convenience, etc. on the marketplace, but also for more information on how goods are produced, processed and marketed.

The increasing globalization and liberalization of markets has also played a significant role in creating new trends and demands for goods and services including agricultural products. There are a variety of new products available in the U.S. market today that many consumers did not even know existed some twenty years ago.

In addition, with the growing information technology, communication across different geographical locations and access to new products has become a lot easier. There are a growing number of Internet sites, TV channels, magazines, etc. today that communicate new product trends, latest fashions, lifestyles, etc. to the U.S. consumer. These resources are used not only to purchase goods and services but also to learn and gather experiences how to use the items. This broad knowledge base and experience enabled the consumer to constantly demand for new innovations, new products, new varieties, etc.

As a result, existing agri-businesses are facing increasing competition and markets that demand more frequent innovation and higher quality products and services. People currently appear to have a wide range of knowledge on these domestic and global threats and challenges the agri-businesses are facing. The solutions to these challenges have, however, a tendency to stick to traditional economic approaches that mainly focus on cost and productivity measures or simply to changing the behavior of others (e.g., customers, government, competitors) rather than change what the industry/sector is doing. There are also blurred lines between threats and internal weaknesses that made it difficult in seeking solutions. These approaches ultimately do not appear to fix the problems, and many agricultural commodities are eventually suffering from low prices and profits.

Fundamental to future successes of agribusiness in this fast-paced economic system is to fully grasp contemporary product and service consumption patterns, their driving forces and growth opportunities that exist within and outside of the box. (1) Future agri-business and industry growth will primarily come from product innovations. Successful product innovation starts and ends with consumers purchasing something they want and need. So, agri-businesses can enhance profits by adapting their ideas, technologies and resources to the ever-changing consumer wants, needs and perceptions. Currently, these consumption patterns and their driving forces are not well understood and articulated. (2) Growth solutions and opportunities for most agri-businesses are viewed just with-in-the box, and thoughts are mostly caught up with threats and challenges. Firm and industry strengths are not well articulated and not connected with potential opportunities or there are no focused and well-defined approaches for their realizations. There seems to be lack of recognition for the need to look for non-traditional opportunities and solutions, partly due to the predominance of traditional views and industry culture not well prepared for change.

The argument here is that product innovations that meet the rapidly changing customer demand should be the key in the constant search for success in agribusinesses. New product development opportunities are not limited just to "physical" outputs. Opportunities can also be sought or spotted within the supply-chain system in product processing, marketing or branding or they can exist out of the box in a form of bundling one product with another, co-branding, cross-marketing, tie-ins, etc.

The purpose of this paper is to broadly identify and assess new product development and market opportunities for the nursery and greenhouse sector of Michigan, Ohio, and Wisconsin. The paper is intended for nursery and greenhouse growers, brokers, distributors, wholesalers and retailers who want to take advantage of new product development and market opportunities based upon consumers' wants and needs. In broader terms, the paper provides a wide range of product development and market opportunities that can be used as a basis to formulate industry-wide innovation strategies for the sector. Academic researchers and other partners that are active in the sector can also benefit from the outcome in a form of identified issues, challenges, opportunities, etc. in many nursery and greenhouse product categories that require further investigation, interpretation or analysis.

The paper is developed based on available public information and consumers' reports in different nursery and greenhouse product categories and details are presented and structured as follows. Sections 1 - 3 will briefly describe U.S. flower and plant consumption trends and major market drivers. Then in section 4, available public information is used to highlight new product introductions in recent years in the nursery and greenhouse sector. In section 5, product development opportunities in each category are summarized based upon market drivers. Sections 6-8 will look at retail market channel and branding opportunities, and implications on production practices. Finally a conclusion is made reflecting overall implications of these available opportunities for the fruit sector.

2. Consumption patterns and sales of nursery and greenhouse products

The nursery and greenhouse sector is very diverse. There are two major product categories that are included in this report: Floriculture and nursery products. Floriculture includes bedding and garden plants, potted flowering plants, cut flowers and foliage plants. The nursery part will mainly focus on ornamental trees and shrubs (broadleaf and coniferous evergreens; deciduous shade and flowering trees; and other ornaments – mainly fruits and nut plants for home use and Christmas trees). Other greenhouse crops not classified as floriculture such as vegetables, sod (turf grass), hydroponic plants, and transplant seedlings for commercial vegetable and fruit production will not be covered in this paper.

Flower and plant consumption in the U.S. has seen a significant increase over the past few years. An increasing number of Americans are now buying flowers and plants and there is a significant increase in purchase occasions (Pohmer, 2004). For example, in 2000-2003, consumer expenditure on floricultural products has shown an annual growth rate of 4.7%, up from 4.3% in 1995-1999. Similarly, in 2000-2003, purchase occasions have seen an annual growth rate of 2.7%, up from 1.3% in 1995-1999. In general, total retail sales for floricultural products have increased from $17.974 billion in 2000 to

$19.068 billion in 2003. Wholesale values per household have also increased from $34.20 in 1995 to $46.18 in 2004. During the same period, wholesale values per household for nursery products has increased from $110.95 to $139.23 (USDA/ERS, 2004b).

According to the USDA/ERS annual survey results in 36 major production states, wholesale value of floricultural production in 2004 has been estimated at $5.076 billion (Table 1). In general, the category has experienced a steady growth until 2002 before sales slightly declined in the past two years.

Bedding and garden plants remain the largest segment in the floriculture category. In 2004, sales of annuals had a 36% share within the segment, while share of herbaceous perennials was 12%. Also, sales of potted flowering plants have experienced a steady growth from 1995-2002 before showing a slight decline in the last two years. Sales were $820 million in 2004, up 20% from 1995. In 2004, cut flowers had 8% market share in the floriculture category. In general, sales form these products have been declining in recent years. The highest sales were exhibited in 1997. Sales in 2004 were $421 million, down 11% from 1997. Foliage plants represented 12% of the 2004 sales of floricultural products. Sales from these products have shown a significant increase in the past ten years, although slightly declined in the last two years. Sales of cut cultivated greens dropped from $127 million in 1999 to $108 million in 2004. Sales of propagative materials were estimated at $354.5 million in 2004, up 46% from 2000. In general this category has experienced a significant growth in the past five years, and growth appeared to be faster than any of the segments of finished floriculture production. Nursery crops represented 67% of the sales in the nursery and greenhouse sector in 2004. Sales from these products have shown a steady growth in the past ten years. Sales in 2004 were estimated at $10.226 billion, up 37% from 1995.

Table 1: Nursery and greenhouse crops: Value and quantity of sales at wholesale, by product category, 1995-2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004[1]
All nursery & greenhouse crops sales ($billion)	10.800	11.300	12.355	12.596	13.145	13.761	14.476	15.071	15.193	15.301
Total Floriculture Sales ($billion)[2]	3.329	3.407	3.896	3.948	4.097	4.577	4.803	5.09	5.069	5.076
Cut flowers	0.424	0.413	0.472	0.412	0.432	0.430	0.418	0.427	0.425	0.421
Potted flowering plants	0.681	0.684	0.723	0.737	0.759	0.800	0.825	0.844	0.829	0.820
Foliage plants	0.499	0.509	0.500	0.503	0.512	0.560	0.651	0.623	0.623	0.616
Bedding plants										
Bedding plants – annuals	1.292	1.359	1.669	1.779	1.840	1.661	1.681	1.790	1.805	1.823
Herbaceous perennials[3]	0.065	0.069	0.078	0.94	0.104	0.434	0.496	0.611	0.618	0.625
Cut cultivated greens	0.113	0.118	0.116	0.118	0.127	0.126	0.112	0.114	0.109	0.108
Propagative materials	---	---	---	---	---	0.243	0.314	0.346	0.351	0.354
Nursery &other greenhouse[4]	7.471	7.893	8.458	8.649	9.048	9.185	9.674	9.981	10.125	10.226
Quantities sold at wholesale, by category										
Bedding & garden plants (million units)	615.9	630.1	647.2	761.7	758.9	834.4	862.4	954.7	962.6	--
Potted flowering plants (million pots)	245.0	250.8	242.3	240.0	254.4	242.9	239.0	248.5	242.9	
Foliage plants (in hanging baskets, million pots)	22.7	19.7	20.1	16.0	20.6	21.0	21.3	20.0	19.3	
Cut flowers (million units)	696.3	622.8	646.7	540.5	433.6	830.8	792.8	829.5	794.5	

[1] USDA/ERS forecast; [2] Includes growers with sales between $10,0000 and $100,000; thus may not equal sum of sales of floriculture crop groups which are sold by growers with at least $100,000 in annual floriculture sales. Growers are located in 36 States surveyed by NASS. [3]From 1993-1999, herbaceous perennial plants include only hardy/garden chrysanthemums. All perennials are potted. [4] Estimate (cash receipt from greenhouse and nursery crops – value of floriculture); May include other greenhouse products such as vegetables, herbs, sod, hydroponic plants, and transplant seedlings for commercial vegetable and fruit production.

Source: USDA/ERS

In terms of quantity, there are differences among the product categories (Table 1). There is a general increase in the quantity of bedding plants sold over the past ten years. Flats, pots and hanging baskets combined together equally as one unit, there is a 56% growth between 1995 and 2003. The current trend of larger containers, which are now replacing both flats, and perhaps, even some smaller pots, may underscore the diminished numbers of additional plants being consumed in the last two years.

Potted flowering plants and foliage plants have relatively remained unchanged in the last few years. However, both categories appear to show a declining trend over a longer period of time. For example, there were 250.8 million units of potted flowering plants sold in 1996. That number for 2003 was 242.9 million. Similarly, for foliage plants the units have declined from 22.7 million in 1995 to 19.3 in 2003. Cut flowers show the same trend. In 1995, there were 696.3 million units of cut flowers sold at wholesale. That number is 794.5 million for 2003.

Overall, bedding and garden plants have seen a steady growth both in dollar and quantity in the past ten years. This trend also shows an increasing dominance of this segment in the floriculture category. Potted flowering plants show a moderate dollar increase. The diminishing numbers of these plants may reflect the dominance of sales of larger containers, pots and hanging baskets. Sales of foliage plants appeared to follow the trends of potted flowering plants. Cut flowers sales, both in dollar and number, show a relatively sharp decline in recent years, except for 2002 where numbers were a little higher in recent years. There are no figures available on quantities of ornamental trees and shrubs that show trends by categories. The results, in general, indicate the variation in market shares between the different nursery and greenhouse products.

Worldwide, cut flowers, propgative materials and other live plants and cuttings appear to be most affected by international trade. U.S. is the highest cut flower importing country. In the 1990s, imports of cut flowers have seen a significant increase, reaching $614.4 million in 1998. However, imports in recent years have been fluctuating between $565.5

million in 2001 and $611.2 million in 2003 (USDA/ERS, 2004a). Bedding plants and plug production are grown almost exclusively for domestic marketplace[1].

The market for propagative materials including live plants and cuttings has experienced a steady growth. There were 1.3 billion units of imported live plants and cuttings to the U.S. market in 2003, up from 900 million units in 1999. Similarly, the dollar amount has increased from $242 million in 1999 to $359 million in 2003. Canada and Costa Rica are the two top exporting countries of these products to the U.S. market (USDA/ERS, 2004a). Most of these imports are expected to be in the nursery category.

International trade regulations and live plant import-export procedures are affecting the market for nursery and greenhouse products. Longer plant inspection times at borders, increased bar coding and labeling demands from importing countries are some of the challenges exporters and importers are currently facing. For example, U.S. imposed point of origin labeling requirement seems to affect the Canadian export market[2].

In general, the international flower and plant production and marketing landscape is in transition and undergoing a significant change. For example, roses have been one of the leading products in the Netherlands until recently. The current situation is quite different. The fastest expansion in growing new rose varieties is now taking place in Eastern African countries. African rose growing is getting bigger and more important than rose growing in the Netherlands in surface area, production quantity and sales turnover[3]. In South America countries like Columbia and Ecuador are becoming important rose production regions for the market in North America[4]. Brazil has a plan to expand rose plantation on about 3,000 ha in the next 10 years. Taiwan is in the process of developing a large industrial park for phalaenopsis young plant production aimed at increasing its competitiveness among the world's leading orchid supplying countries[5].

The other most important international trend is the hunt for genetic materials. Many private companies and public organizations are currently looking for genetic resources

---

[1] http://www.floracultureintl.com/archive/articles/707.asp - Broersma, J. Mechanization drives success
[2] -- Broersma, J. Mechanization drives success
[3] http://www.floracultureintl.com/archive/articles/1157.asp - Kras, J. Dutch comfort
[4] http://www.floracultureintl.com/archive/articles/922.asp - Hamrick, D. and Laws, N. What's new with roses
[5] http://www.floracultureintl.com/archive/articles/948.asp - Fenton, L.N. The orchid heart of Asia.

(both cultivated species and wild flora) to develop commercial cultivars in different countries. Many plant genera, species or forms of plants that show ornamental potential are being investigated mainly through international collaborative projects between countries and breeding companies. For example, "Horticulture Development in Argentina" is a collaborative project between Japan and Argentina to explore, identify and breed different ornamental plants in Argentina[6]. In addition, the number of international organizations that assume different responsibilities in species and variety development, live plant marketing, etc. is on the rise.

3. Market drivers for nursery and greenhouse products

Overall, the demand for nursery and greenhouse products is shaped by a broad array of market forces. A combination of factors such as wellness, fashion/design, home ownership, convenience, value, ethnicity, indulgence and demographic structures, acting interdependently or independently influence consumption patterns and demand for nursery and greenhouse products.

Wellness

Wellness reflects the impacts of flowers, plants and gardening on the consumer's health and wellbeing. The role of plants in the pharmaceutical industry is well recorded through out the history of mankind. Beyond that recent literature has dealt with therapeutic plants, therapeutic landscape, therapeutic gardening etc. that have effects on human health and wellbeing. There are newly emerging therapeutic horticulture training and education programs focusing on the purposeful use of plants and plant-related activities to promote health and wellness.

The role of plants as anti-pollutants has also received a great attention in recent years. Houseplants have got an increasing recognition as efficient filters, removing both common and dangerous pollutants. There are also some studies that show the importance of plants at work places. Plants are found to be helpful especially in office buildings. There are some research works, which indicate that employees with plants in their offices

[6] http://www.floracultureintl.com/archive/articles/841.asp - Suarez, E.Y. Accessing Argentina's vast genetic potential.

are more productive and healthy[7]. There are also the well known flower purchase criteria such as lifting the mood, spur of the moment, bringing nature indoors, etc. that are popular in flower consumer research publications, which are all health- and wellness-related. Some survey results, for example, indicate that 20-30% of the consumers purchase cut flowers for these reasons[8].

The other important trend is ornamental organic. Although sales of and consumer demand for organically grown flowers and plants are still low, there are individuals or grower groups that are currently focusing on growing these products. For example, in the Netherlands, a group of growers who saw a great opportunity for organic cut flowers has formed an organic grower group[9]. Some of the organic products include helianthus, zantedeschia and others. In Germany currently about 10% of the market in ornamentals is ecological production[10]. That includes tree and shrub nurseries. However, there are no firms growing cut flowers or pot plants that employ organic production. There are also some signs of ecological ornamental production in the U.S. Organic flowers are currently appearing in some specialty food shops.

The nursery and greenhouse sector is also experiencing and embracing heirloom gardening. There are some efforts that involve the selection of classic plants and flowers associated with gardens from the late 19th century. For example, there was some interest in antique roses in recent years (Mintel, gardening products, 2001).

In general, gardening is viewed by many as the best way to improve health and relieve stress and as people try to do more with less time, they are always looking for ways to relax. Different research works show that homeowners primarily garden as a means to relax and for the peace and tranquility it offers. Others embrace it to stay active, get exercise and for its low-impact cardiovascular benefits. Researchers found that just looking at a plant can reduce individual stress levels, lower blood pressure and ease muscle tension (Mintel, gardening, 2001). According to Mintel's own consumer research about 91% of respondents reveal that they participate in some sort of garden-related

[7] http://www.floracultureintl.com/archive/articles/295.asp - Shoemaker, M. Consumer Buzz
[8] http://www.floracultureintl.com/archive/articles/657.asp - Shoemaker, M. Consumer Buzz
[9] http://www.floracultureintl.com/archive/articles/1154.asp - Broersma, J. Biosfeer
[10] http://www.floracultureintl.com/archive/articles/767.asp - Hamrick, D. German ornamental production

activity during the gardening season (Mintel, gardening, 2001). Thus, wellness is one of the key market drivers that could affect the market for nursery and greenhouse products.

Indulgence

Indulgence considers a broad array of flower and plant attributes designed to meet consumers' deeply felt desires, as opposed to their needs. In this market segment, the consumers have unique attachment to the products, and they are buying not the item but the experience expressed in some ways. These consumers will buy the product because they might have connection to the products since childhood, they may like gardening and working with the plants, etc. In this group, there are also luxury or impulse buyers who pursue their intense emotion in purchasing flowers and plants.

Holidays and special occasions are other aspects of indulgence that influence the market for flowers and plants. Calendar holidays such as Christmas, Mother's Day and Valentine's Day represent key selling periods for the floral business (Mintel, flowers and potted plants, 2001). Flowers are also given for non-calendar special events in order to communicate feelings of love, sympathy, hope, joy, congratulations, solidarity or friendship. According to the floralmarketresearch.com and Floral Cuttings, 33% of U.S. consumers purchase cut flowers for holidays and special occasions[11]. This consumption trend is the key to a continued success in marketing flowers and plants.

Convenience

Convenience refers to anything that makes life easier for the customer. It is thus becoming increasingly important for consumers when buying different flower and plant products. There are an increasing number of consumers who are busy and perceive that they have less time for feeding and watering plants. Some consumers want to buy plants and flowers that do not take weeks and months to mature. Others want to buy them in convenient containers and pots or they want products that are easily portable from one place to the other. One stop shopping is the current trend that affects flower and plant marketing. The convenience provided by one-stop shopping enables consumers to complete all their purchases in one shop or grocery that offers different food and non-

[11] http://www.floracultureintl.com/archive/articles/657.asp - Shoemaker, M. Consumer Buzz

food items including flowers and plants. This dramatic change in lifestyles has a significant influence on the production and marketing of flowers and plants.

Fashion, design and decoration

There are several American lifestyles that influence the U.S. consumer behavior of goods and services. In particular, trends in the fashion industry, and in home and garden design and decoration are major significant lifestyle trends that directly affect the consumption of and demand for flowers and plants.

Today, the idea of fashion goes beyond the selection of casual cloths, cosmetics or jewelry for many consumers. There are currently many other items - from the latest electronic equipment and satellite radios to seasonal bed linens, carpets and ring tones on cell phones - people are using to express themselves to the outside world. Recently, an article in the Wall Street Journal (02/04/05) focused on how these behavioral changes are affecting the apparel market. The report indicated that an increasing number of consumers are currently less and less interested in casual cloths and styles, focusing on items that give them more meaning to their life and make them more relaxed. Therefore, some apparel marketers have started to raise their market share offering a combination of products that includes wallpapers, carpeting, upholstered furniture and bedding– the idea of coordinated fashion. Flowers and plants are at the center of this dynamic changes and trends. Stressing the need for changes in the U.S. flower and plant marketing, Pohmer (2004) argued that floriculture is no longer in the plant and flower business. Rather it is in the fashion, decorating, lifestyle, well-being and emotion communication business. According to Mintel (flowers and potted plants, 2001), often, color trends in flowers parallel color trends in the home décor and gift market. Decorating with fresh cut flowers from the garden and cooking with organic produce and exotic herbs are becoming increasingly popular pursuits, especially as part of the social trends that include voluntary simplicity, nesting and cocooning (Mintel, gardening products, 2001).

In general, fashion is an increasingly important driver that has infiltrated every segment of the flower and plant market. Today, consumers want access to the season's hottest indoor and outdoor flowers and plants that are attractive, have more contemporary styles and unique floral patterns including those that are the rage in colors and sizes (Mintel, gardening products, 2001).

The new home and garden decoration trends are also supported by a variety of shows and promotional activities through TV networks such as the Home and Garden Television (HGTV) and the Food network which are becoming an effective medium for promoting plants and spotting potential trends. For example, the HGTV channel reached 80 million households in 2002, up from 6.5 million when it started in 1994 (Mintel, gardening, 2003). There are also a wide range of magazines and books that contributed to the awareness and increase in sales of plants and flowers. The Internet is also becoming an important medium not only in promoting flower and plant sales, but also in educating consumers how to use and arrange them in a very creative way. For example, the flower alive with possibilities[12] web site presents different seasonal 'flower recipes" focusing on cut flower arrangements that are based on different home decoration concepts. For example, recently, the web site displayed flower arrangements that range from "fall pumpkin flower arrangements" to "Soup Can Topiary or Easter egg baskets".

Overall, in the last few decades, use of flowers and plants has been associated with other fashion and lifestyle trends. Exotic flowers, plants, herbs, trees and ornamental grasses are also being incorporated into mainstream gardens as people strive to make their gardens beautiful havens where they can entertain guests or relax after a tiring day at work. For example bonsai trees, hoya plants and episcia, are now increasingly available on the market (Mintel, gardening products, 2001). This indicates that fashion and home design and decoration are becoming key market drivers that affect the flower and plant market.

Ethnicity

This market driver focuses on products that arise from the flower and plant traits of specific ethnic groups. In the 50s and 60s, the middle class defined the U.S. product market. Consumer products were marketed to the predominant, largely homogenous middle class. But since mid 80s U.S. consumers have become more diverse, with distinctly different consumption habits and the market is breaking up along regional,

[12] http://www.flowerpossibilities.com/newPoss.html

ethnic and demographic lines (Senauer, *et al.* 1991). Today, there is a significant growth and change in the ethnic mix of the U.S. population, with Hispanics and Asians being the fastest growing ethnics groups. The U.S. Hispanic population grew by 5.7 million in 1998-2003, and is expected to grow by 5.6 million in 2003-08, becoming an increasingly important demographic target (Mintel, canned fruit and vegetables, 2003; non-alcoholic beverages, volume II, 2004). In the 90s, Hispanics were not seen as an important consumer group, because their purchasing power was negligible. But in recent years, their income has shown a significant increase (Food system group, 2004).

In terms of flowers and plants in the ethnic market, one important aspect is the ethnic based garden accent - a term that includes many things and refers to a customer's habit in decorating gardens. In general, the garden accent is considered to be a significant sign that tells about the ethnic and cultural characteristics and background of the consumer. For example, Floraculture International conducted a survey with retailers to describe their garden accent customer - who buys what, and why[13]. Based on the findings the customers have been categorized into five distinct groups: the atmospheric affluent, the functional literate, the artistically inspired, the plastic fantastic and the emerging ethnic. The emerging ethnic groups are believed to shop for ties to their cultural traditions. For example, in some areas, Eastern Europeans are an emerging customer base and they are being identified by their ornate designs and colorful garden accents. Experts in the field agree that currently there are emerging garden cultures of Eastern Europe, the Middle East, and Central and South America that would be important and profitable new markets for flower and plant growers in the U.S.[13]

Value

Prices have significant effects on flower and plant expenditures and eventually play an important role in explaining part of the trends in marketing these products. For example, the flats in the bedding and garden segment are assumed to be cheaper flower products compared to the others. Therefore, they are increasingly available in mass merchandise stores. People with low income who tend to buy these flowers are attracted to these low-price super centers. But currently these products appear to be old fashioned. Although

[13] http://www.floracultureintl.com/archive/articles/651.asp - Beytes, C. Speaking with an accent

they may continue to appeal to a large number of consumers, shifts to container plants may affect future market shares for these products.

Home ownership and home improvement

Home ownership is one significant market driver that affects the market for flowers and plants. Homeownership rates have been increasing in recent years. From 1997-2002, existing home sales grew at annual average rate of 4.8%, while new home sales grew at 4.3% (Mintel, gardening, 2003). As homeowners continue to take care of their lawns and gardens, the rise on home building will have a positive effect on flower and plant marketing. For example, a survey by the national gardening association on gardening in America found that, in 2002, about 80% of the households participated in one or more Do-It-Yourself (DIY) lawn and garden activities, which is the highest level of participation in five years[14]. This activity will further be supported by the increasing number of people who would be staying at home (e.g., the soon-to-retire baby boomer generation). Experts in the nursery and greenhouse industry argue that with an increasing number of consumers expected to stay at home, gardening activity would remain strong in the coming years. As consumers stay at home, more of them will be working in their back yards (Holst, 2002a).

One other important factor that has a direct impact on the flower and plant market is the trend in the style and design of new housing units including size of internal compartments and available lots for outdoor gardening. For example, in Europe such as the Netherlands, potted flowers and plants on windowsills have been common until recently. But in newly constructed homes, windowsills are a fraction of the size in older homes, suitable only for a very small size pot. Because of this, the production and market is currently moving more toward larger, solitary plants[15].

In the U.S., most of the housing units are detached single-unit homes that allow relatively large lots for gardening. But even in the attached homes and multi-unit dwellings there are a broad array of options for gardening such as container gardens,

---

[14] http://www.floracultureintl.com/archive/articles/657.asp - Shoemaker, M. Consumer Buzz
[15] http://www.floracultureintl.com/archive/articles/65.asp - Hamrick, D. Beekenkamp ornamentals: Finely tuning the market

window boxes, or patio/deck plantings. The average lot size for single-unit housing in the U.S. is just over a third of an acre, which increased slightly in recent years (Mintel, gardening, 2003).

Demographic structure

This mainly refers to changes in the age, income, gender, region of residence and household structure of the U.S. population that affect flower and plant purchases.

One distinct pattern in the past few decades has been the decrease in the younger population and increase in the elderly population. Older people will be more concerned about health and would want flower and plant products that meet their special needs. In particular, the baby boomer generation, which enters its retirement age in the near future, will significantly affect the market for these products. Looking for something that makes them feel relaxed and look rested, gardening will remain popular among this generation. This bodes well for the nursery and greenhouse growers.

Middle-age consumers are practicing gardening more than any other age group. For example, in recent years, the heaviest floral consumers - those making frequent purchases per year - are found to be between 25 and 49 years of age (Mintel, flower and potted plants, 2001). The Mintel consumer research also characterizes the “typical gardener” as being white, female, and most likely with the household of income of $75,000 or more (Mintel, gardening, 2003). Regarding the younger generation, some of the arguments include that gardening is not a youth-oriented leisure pursuit of the young who are naturally more interested in music, shopping, surfing and cinema, among others (Mintel, gardening products, 2001).

Changes in household composition are the other demographic factors affecting consumer flower and plant purchase. In general, the average household size in the U.S. is declining. But there are still household size and purchasing habit variations among different demographic groups. So, identification of these various market segments would play an important role in raising sales from flower and plant products. There are also some other demographic factors that affect the flower and plant market. For example, people living in more urban areas tend to purchase more flowers than people in more rural regions.

This could in part be explained by a desire to brighten up more industrial urban surroundings (Mintel, flower and potted plants, 2001).

Besides the major market drivers discussed above, weather is the other most important factor that has an impact on the production and marketing of flowers and plants. A wet, dry or cold weather may force growers to scale back from planting or marketing specific crops. Similarly, consumers may partly depend on the weather to buy flowers and plants. Geographic location is the other factor. Most of the plants grow only under certain climatic and natural conditions.

4. Trends in new ornamental plant development and introduction

New plant development in the nursery and greenhouse sector is a complex process that is administered, managed and controlled by a broad array of public and private entities. Besides the complex basic research on plant materials and the breeding activities to develop ornamental plants, there are many rules and regulations that affect the domestic and international trade of live plants. So, capturing of new species, varieties or hybrid products that are entering the marketplace is very challenging.

In general, there are three major ways of developing and introducing new plants. First, plant breeders and other explorers can collect a totally new genera or species from the wild that can either be developed or directly marketed as an ornamental plant. Second, professional and amateur plant breeders can develop new varieties, hybrids, lines, etc. from the existing and known ornamental plants and make them available for sale. Third, growers, gardeners or other individuals can find natural mutations or hybrids growing in their greenhouses, gardens, localities, regions, etc. that can be sold as ornamental plants. The majority of the new flower and plant varieties in the nursery and greenhouse sector are developed by plant breeders.

Developing a new plant variety is a long process and, depending on many factors, it can take up to more than six years for a variety to be developed and sold to the consumer for the first time[16]. This report will not focus on the plant breeding part. Rather the idea of new flower and plant refers to those flowers and plants that are already developed by plant breeders and are available for sale to growers and eventually to consumers. In this sense new product development and introduction will solely reflect growers and propagators efforts and abilities to identify, select, grow and sell new flowers and plants from those that are made available as commercial ornamental plants by breeders. It also refers to the growers and propagators ability to introduce and market other new flowers and plants that can be directly sold to the consumer without the need to go through the plant breeding process.

Although there are no available databases and sources that provide a comprehensive picture of new plant introductions, it is believed that the past few decades have seen the development and introduction of many new flower and plant varieties and hybrids in the nursery and greenhouse sector. This report attempts to highlight some of these trends based on data available from public and private sources that are active in plant development within the sector.

New ornamental plant species, hybrids and varieties

Genetic resources are key raw materials for creating and developing commercial flowers and plants. In general, the global market for ornamental plants and flowers derived from these resources is estimated at $16,000-$19,000 million[17]. There are different national and international organizations such as the U.S. patent and trade mark office, the European Community Plant Variety Office (CPVO), the Convention on Biological Biodiversity (CBD), the Royalty Administration International (RAI) and the Union for Protection of Plant Varieties (UPOV), that are involved in the regulation, registration, patenting and licensing of new plant materials.

Data available from some of these organizations show a significant growth in the introduction of new species, hybrids and varieties in the nursery and greenhouse sector. For example, the CPVO provides applicants the rights for varieties of all botanical genera

---

[16] www.provenwinners.com/informationcenter/articles/content.cfm - Where new plants come from.
[17] http://www.floracultureintl.com/archive/articles/841.asp - Suarez, Y.E. Assessing Argentina's vast genetic potential.

and species including hybrids between genera and species. Between 1995 and 2003, more than 18,701 new variety applications were sent to CPVO for registration. Of these, more than 11,400 (about 61%) were for new ornamental varieties (table 2). This indicates the fact that most of the new plant species and varieties that are currently being developed and commercialized are entering the market in the nursery and greenhouse sector. Country-wise there were more than 1,900 applications in the U.S. captured by the organization, and the Netherlands is leading in the number of applications (6,840).

Table 2: Number of applications for community plant variety rights per year and per sector.

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**Total**
Vegetables	457	123	148	214	181	244	181	175	236	**1,959**
Ornamental	1,513	834	953	1,100	1,194	1,266	1,415	1,506	1,641	**11,422**
Fruit	233	61	77	104	95	95	117	124	142	**1,048**
Other agriculture	952	365	343	404	407	406	440	416	495	**4,228**
Miscellaneous	6	2	9	13	4	2	5	1	2	**44**
Total	**3,161**	**1,385**	**1,530**	**1,835**	**1,881**	**2,013**	**2,158**	**2,222**	**2,516**	**18,701**

Source: European Union community plant variety office

Since its establishment in 1994, the CPVO has processed applications for more than 400 different ornamental hybrids, species, and genera. In 2000 alone, it received applications for about 50 new species of ornamentals. The development was a result of an increasing interest by ornamental breeders who search for new plant species and varieties that can be commercially developed[18].

[18] http://www.cpvo.eu.int/

The UPOV also reports an increasing number of plant patents worldwide and particularly in the U.S. In 2003, 1,000 applications were filed for U.S. plant patents to protect asexually reproducible plant varieties and 994 plant patents were issued. By the end of 2003 there were 8,786 plant patents in force in the U.S., up from 6,431 in 1999. Also, during the same year, 342 applications have been filed to protect sexually reproducible plants varieties, and 318 certificates of protection were issued. By year-end 4,174 certificates were in force, up from 3,302 in 1999[19]. Applications to protect sexually reproducible plant varieties are filed with the U.S. Department of Agriculture, which grants certificates of protection for eligible varieties. Although these data include a broad array of new plant species, a significant portion of them are expected to be plant varieties in the nursery and greenhouse sector[20]. The Michigan Nursery and Landscape Association (MNLA) has an online list of thousands of plant varieties (bulbs, fruits, grasses, ground covers and vines, hostas, patio plants, perennials, azaleas, trees and shrubs, and water garden plants) by common names, botanical names, and company names[21] that can be used as buyers' guide.

Proven Winners, one of the leading international flower and plant marketers, has a list of 1,207 new ornamental plants that have been introduced in recent years[22]. The selection includes new varieties in a wide range of perennials and annuals. Growers, retailers and consumers can select plants by their flower and foliage color, size, exposure (sun, shade.), species/genera, etc. These are new varieties and hybrids introduced in more than 240 plant species.

Also, the U.S. National Arboretum has introduced many new ornamental and flowering trees and shrubs in recent years. In general, the Arboretum has released over 650 different woody and herbaceous plants to the American public through the nursery and floral industries in the last seven decades[23]. Overall, currently there are an increasing number of private companies that are introducing new ornamental plants in different parts pf the world.

---

19 http://www.upov.int/en/documents/c/38/C_38_07.pdf.
20 http://www.upov.int/en/publications/tg-rom/tg_index.htm
21 http://www.mnla.org/buyersguide/buyersguideBrowse.cfm - MNLA buyers guide
22 http://www.provenwinners.com/plants/?doSearch=1 Proven Winners plant search.
23 http://www.usna.usda.gov/Newintro/index.html - Arboretum plant introductions and releases.

Major characteristics of recently introduced ornamental plants

Breeders and growers of nursery and greenhouse products have been focusing on a wide range of areas in introducing new plant products to the marketplace. Some of the major characteristics of the new flowers and plants include the following.

(1) Flower and foliage color sophistications, texture and shapes are becoming dominant characteristics of many new ornamental plants. Especially, color is becoming one of the determining factors in new plant introductions. According to some experts, the sector is currently marked by a trend toward exotic and new colors that are increasing in popularity. It also follows color trends in the fashion and design industry. Therefore, there are currently new plants that are entering the market with some new exotic and unique colors and shapes. For example, it appears that there is a surge in the popularity of some warm colors like brown, orange and rusty reds in recent years. Color-block displays by TV garden channels and at some specialty retail stores like the Pottery Barn, West Elm, etc., and photos in consumer magazines have prompted the filtering of some unique colors like shades of purple, especially plum, through some nursery and greenhouse product retail shops[24].

(2) New flower and plant products, especially annuals that are currently entering the market are becoming near-mature and bigger. Although the previous market packs of six are still cheaper, they are in need of constant watering and feeding and take weeks to fill out and bloom vigorously. That is becoming a challenge for the busy consumer who does not have the time for these activities. Therefore growers and retailers are now introducing and selling bigger and near-mature plants. The larger plants have bigger root systems, reducing the effects of transplant shock and drying out. Since they are better performing plants, these plants are being sold at higher prices (Holst, 2002a; Higgins, 2004). In addition, the consumer is increasingly demanding for plants that have a long season of bloom (Brockman, 2004). Therefore flower longevity has also received great attention by breeders, propagators and growers.

(3) High energy cost and limited greenhouse spaces have compelled some growers to focus on fast growing varieties or on plants that require less space in the greenhouses.

[24] http://www.floracultureintl.com/archive/articles/295.asp - Shoemaker, M. Consumer buzz

This has led to the development of plants that grow fast and require less space. For example, Fides North America in Florida has introduced New Guinea Impatiens, geranium and dahlinova varieties that need less space per bench and are ready for sale faster than other related varieties. This has been seen as a main solution to reduce costs per unit greenhouse area (Holst, 2002a). Fischer nursery in Germany has introduced a yellow New Guinea impatiens with smaller flowers, smaller leaves and a compact habit for this purpose[25].

(4) There are a wide range of new ornamental plant varieties that are entering the market as plants suitable for specific seasons; e.g., spring, summer or fall varieties. In addition, many new varieties are designed to be suitable for specific geographical locations or climatic conditions (e.g., plants for dry, wet, cold or warm climate). For example, Proven Winners has recently introduced its Sunsatia, a unique selection of new hybrid Nemesias, in seven colors. The Sunsatia Cranberry, Pineapple, Lemon, Coconut, Peach and Banana are designed for sale in the North American market, while Sunsatia Blackberry is developed for European markets[26].

(5) There are new varieties that are entering the market as being resistant to certain diseases and pests. There are also some plants entering the market without growth regulators. For example, many new cut flower varieties of zantedeschia, including Red Sox, Hot Chocolate and Gold Finger, have entered as disease-resistant varieties in recent years. In addition, some breeders have focused on the development of naturally dwarf zantedeschia for the international pot plant industry, as many of the most commonly used regulators for pot zantedeschia became subject to restrictions. Some of the soon-to-be available disease resistant varieties will also include varieties with new colors (e.g., salmon, orange, fire engine red, whites, pinks)[27].

(6) Propagators and growers are currently offering new varieties in a package form with other improved and new supplies and technologies that help to maintain and improve plant quality. For example, the Royal van Zanten LLC in California has introduced a

[25] http://www.floracultureintl.com/archive/articles/81.asp - James, L. Strength in variety
[26] http://www.provenwinners.com/media/pressreleases/ - Proven winners awarded silver medals for new plants
[27] http://www.floracultureintl.com/archive/articles/1189.asp - Downing, T. and Fields, L. New Zealand zantedeschia story

range of new varieties in pot chrysanthemum cuttings. With the new varieties, the company also introduced a new way of growing, one that makes it a lot easier for the grower and can save labor (Holst, 2002). There are other plant products that are currently sold with specific type of soil, pot, or other supplies to be used for the plant.

(7) There is a new wave of plant labeling activities and promotional tags particularly on perennials. One of the problems in selling plant products, especially perennials, until very recently has been how to label them. So some propagators have started introducing colorful and informative perennial labels and tags that are used to identify perennials by the consumer and to educate buyers about the special characteristics of the plant (Holst, 2002b). For example, Fisher nursery in Germany found the difficulty to motivate growers to stick promotional tags and labels in each pot. So, the company has now introduced its own promotional pot programs for its growers.

(8) Also emerging are some multi-purpose varieties. For example, the Royal Van Zanten's mum in California has been introduced as an indoor/outdoor mum, which is a pot plant that can be planted in the garden after it has finished flowering inside.

(9) There are wide ranges of new varieties that are designed for container gardening. Especially, an increasing number of new perennials are entering the market in containers. For example, according to the National Gardening Association[28], there are some clematis varieties that are being introduced in containers. That includes *Clematis Konigskind* 'Climador', a perennial that has purple-blue, ruffled flowers that bloom for up to four months on vines that grow 4 to 5 feet long. There is also a rose-pink flowering version named *Clematis Rose Konigskind.* Another *Clematis* suitable for containers is the small, bell-shaped, violet-colored *Clematis integrifolia* 'Fascination'.

Container gardening is the new dominant trend

Container gardening appears to be the new dominant trend that affects the market for all kinds of flowers and plants; annuals, perennials, cut flowers, potted flowering plants, foliages, trees and shrubs, etc. Knowing its importance in plant marketing, major national and international players like Proven Winners have introduced expanded educational and

[28] http://www.garden.org/regional/report/national, *www. Parkseed.com and* *www.whiteflowerfarm.com*

promotion activities that support container gardening programs. For example, the Michigan State University horticulture gardening institute is working with Proven Winners to educate consumers and Master Gardeners about container gardening. Programs include online courses and different events that display different container design recipes (Sherman, 2002).

There are different container trends and preferences by consumers[29]. (1) Single-variety containers appear to be used by consumers who want to plant one variety to grow more substantial and impressive plant. With only one variety, it would be easier to provide the correct growing conditions for the plant. (2) Individuals who are cooking at home mainly prefer theme-based containers. These consumers want to create own seasoning containers, for example, by planting basil, oregano, garlic, chives, etc. together. (3) Consumers increasingly show preference towards larger containers. In particular, consumers are interested in purchasing bedding plants that are coming in larger containers. Therefore, currently there is an increasing number of nurseries and greenhouses that are carrying larger quantity containers – especially new forms of containers such as larger moss baskets are becoming common, and growers and retailers are charging higher prices for these (Holst, 2002a). (4) The other important trend is the desire by many consumers to have a group of multiple containers on a patio, deck or balcony or to use them indoor for parties, get together, etc.

In general, in some nurseries flats are becoming old-fashioned and they seem to be vanishing. For example, some nurseries that focused on flats in the previous years have now more than 80% of their production in larger size pots (4-inch pots and bigger). This has also led to the development of different pot sizes and mixes of plants within a container.

As container planting becomes one of the sector's fastest growing interest, perennials, and trees and shrubs have started getting a definite home among mixed containers and pots. Perennials and trees were often sold bare root, dormant or not bloom. Today, an increasing number of perennials are sold in containers in full bloom. Ornamental grasses have also received attention in this development (Holst, 2002b).

[29] .**(http://www.vivagarden.com/press/article081104.asp).**

Some features and examples of new plant introductions by category

In this part, an attempt is made to provide some examples of new variety introductions for the following categories: Annual bedding and garden plants, potted flowering plants, cut flowers, foliages, herbaceous perennials and ornamental trees and shrubs.

Annual bedding and garden plants

As mentioned in the previous section, the present consumer wants to have annual plants that can grow longer and bloom before they die. They also want annuals that can be mixed with perennials. Therefore many new annual varieties are entering the market technically as tender perennials, depending on the location, which can theoretically survive year after year. For example, Proven Winners has developed a line of petunia-like calibrachoa varieties and hybrids[30], which bloom all season without the need for removing the faded flowers. It has also introduced new hybrids of daisy that come in creamy whites, oranges and peaches, bearing names such as Orange Symphony and Lemon Symphony. One of the hottest new annuals, according to experts, for example, is a spiky, free-flowering plant called *angelonia*, sold as summer snapdragons. It comes in three colors: blue, white, and blue-white mix (Higgins, 2004).

The impatiens has also seen a transformation, with many new varieties of saturated pinks, magentas, red and other hot colors. Some even have a metallic sheen to the petals. Other annuals given a makeover are New Guinea impatiens, nemesias and petunias. In the last class, Proven Winners sells more than 20 petunia hybrids in its Supertunia line (Higgins, 2004).

In general, species-wise, petunias, begonias and impatiens appear to be top on the Proven Winners new variety and hybrid introductions list. There are about 65 petunia, 57 begonia, 38 impatiens varieties and hybrids that have been introduced in the North American market in recent years. New annual varieties with sophisticated colors and shapes are dominating the market. One clear advantage of these new varieties over the perennials is their ability to bloom longer, while most perennials bloom just for few weeks.

---

[30] http://www.provenwinners.com/plants/?doSearch=1

Potted flowering plants

Potted flowering plants include plants for indoor or patio use only, including plants grown from bulbs (USDA/ERS, 2004b). Plants intended for landscape use are not included. In general, potted flowering plants have expanded as consumers have embraced new varieties. Again here, new varieties and trendy flower colors are the most important characteristics that generate demand.

Some nurseries have found their niche in some new varieties. For example, there are new varieties for pot chrysanthemum that have demand and generate extra profit for growers. For example, as mentioned in the previous section, the Royal van Zanten LLC nursery in California has introduced a wide variety of new varieties in pot chrysanthemum. The Golden state bulb growers, also in California have increased sales of spring callas in recent years due to the introduction of new varieties. (Holst, 2002a).

One very important trend in the potted flowering plant segment is an increasing consumers' interest in orchids. In recent years, orchids have steadily increased their market share in the world floral market. In the U.S., orchids have become the second most popular flowering plant sold next to poinsettias. The bulk of potted orchids are phalaenopsis that are available in numerous colors and flower year round. There are many orchid breeders in different countries that supply liners to the orchid nurseries that flower the plants. In Europe there are some 300 commercial potted orchid growers and of these about 90 specialize exclusively in phalaenopsis[31]. The Hausermann's orchids greenhouse near Chigaco[32] produces between 200-300 species and hybrids of orchids that are long lasting (Holst, 2002e). Altogether, the company's website lists about 414 new varieties from phalaenopsis, cymbidium and other related species and hybrids.

Also the California Florida plant company recently introduced eleven commercial and patented varieties of its "Adorable" dwarf potted carnations. The varieties have been developed with an emphasis on strengthening characteristics such as natural resistance to viruses and pests. There are also eighteen new commercial varieties of its "Romance" dwarf potted carnations (Holst, 2002c).

[31] http://www.floracultureintl.com/archive/articles/1186.asp - Laws, N. The world's fascination with potted orchids
[32] http://www.orchidsbyhausermann.com/ - Orchids by Hausermann website

Cut flowers

Popular marketed cut flowers include standard carnations, roses, chrysanthemums, gladioli, tulips, orchids, lilies, alstroemeria, delphinium and larkspur, gerbera daisies, iris, lisianthus, and snapdragons (USDA/ERS, 2004b).

In terms of new products, there are many new cut flower cultivars and varieties that are being introduced by breeding companies in this category. There are high quality new cut flower varieties with longer vase life, and unique and new colors, petal shapes and fragrances. Also, there are plants selected for their shipping endurances, lateral buds and extended availability over a longer season. For example, in California there are new lily varieties and a wide range of new asters that are coming with most of these characteristics. Some companies have also detected a growing demand for cut flowers with unusual forms such as pods and thistles. Especially, these have become desirable characteristics for special events, parties and weddings. So, there are some exotic plants that are being introduced for their thistle flowers. One example is *Echinops exaltatus*, a plant that has a small, dense, round flower head of white tinged with blue that is very long-lasting. Another unusual spike flower is *Verbascum*, with yellow florets along a gray-green fuzzy stem, two to four feet in length. In addition, there are other new varieties from familiar plants. Evita' is, for example, a new soft pink variety of *Veronica* from Dramm & Echter in California. Indian Summer is a new sunflower from Ocean View Flowers, also in California. It has yellow-tipped rust petals and is about five inches in diameter[33].

Some companies are focusing on native cut flower varieties. For example, Jim Rider Flowers in Calififornia has added Delphinium cardinale to its new plant introductions. D. cardinale is a native of the California coast and has delicate peach or orange-red flowers which make a refreshing addition to garden-style arrangements[34].

Rose is the world’s leading cut flower. As in other floral categories, new varieties drive the business. Consumers’ color selection is the most significant factor in rose selling.

[33] http://www.ccfc.org/design/stories/consumertips/summervari.html - Summer varieties from California
[34] http://www.ccfc.org/design/stories/consumertips/summervari.html - Summer varieties from California

The California cut flower commission[35] reported that, due to the introduction of new varieties, today floral retailers could select up to 31 rose flavors just like ice cream. Currently, bright, vibrant colors – oranges, deep reds and hot pinks are in strong demand. One new variety that created a lot of attraction recently was Beauty by Oger, a large headed rose that is a subtle blending raspberry pink and mauve. Other new rose varieties include Anouschka from Obies Floral in California and neon pink Bugatti from Ocean Breeze Interntaional, also in California. These new varieties have eye-catching new pinks. There are also new orange roses that range from warm tropical orange to pumpkin and deep burnt red-orange. Circus is a yellow and red bi-color that appears orange when open, presenting a rainbow of color within a single bloom. Also bi-color roses continue to wow onlookers.

While the rose market is constantly shifting with new marketing approaches, genetically there are still so many undiscovered opportunities. It appears that there are many new excellent rose varieties that have wonderful colors and shapes but not commercialized yet. Thus growers who are mainly growing roses for local sales can benefit from specializing on specific new niche assortments that, for example, include plants with new and unique colors, fragrances, long stems, etc..

One other example is the zantedeschia industry, which is mentioned in the previous section. Currently most New Zealand zantedeschia growers specialize in long-stemmed varieties destined for the Japanese market, where yellow and gold are the two most important and traditional colors. For North American and European markets, there is strong demand for orange zantedeschia (particularly Treasure, Mango and Hot Shot). There are also some zantedeschia varieties (about ten colors) that are grown in California.[36]

Foliages

Foliage plants include plants in pots or hanging baskets for indoor or patio use. They are not intended for landscape use (USDA/ERS, 2004b).

[35] http://www.ccfc.org/
[36] http://www.ccfc.org/search/search.idq?CiRestriction=zantedeschia&CiMaxRecordsPerPage=10

There are different new foliage plant varieties and cultivars that have been introduced in recent decades (Chen, et al. 2002). For example, fern varieties grew from 21 in the 1980s to 54 at the end of the 1990s. Also, ficus and ivy plants showed a significant growth in the number of varieties during the same period. Foliage color has been the most important factor considered in developing the new varieties. Longevity has also been one of the focuses in developing the new varieties. Some of the new ficus cultivars offer appealing aesthetic appearances and perform much better under low light conditions. New ivy varieties have been introduced in various sizes, shapes, colors, and patterns of variegation making them an important houseplant. Recent introductions include cultivars such as Adams Choice, Bettina, Nina and Sara.

There are also new foliage species that are being introduced. For example, *Graptophyllum* is a new foliage plant that has been introduced recently by the Athens Select program[37]. The plant comes in Chocolate and Tricolor varieties. The leaves of the Chocolate *Graptophyllum* are glossy, dark-chocolate in color and variegated down the center of the leaf with an irregular cream-colored band. The Tricolor features green leaves and a variegated, irregular band of cream and pink down the middle of the leaf. There are also other new foliage species that have been introduced in recent years. That includes plants in the *Aracae, Liliaceae, and Orchidaceae* families.

Herbaceous perennials, and ornamental trees and shrubs

Overall, a wide variety of new perennial varieties and cultivars are entering the world market. In particular, the bedding and garden plant segment is growing from the introduction of new garden and herbaceous perennial varieties. Proven Winners has more than 240 new perennial varieties introduced in recent years[38]. The new hardy and green perennial varieties offer solutions for sun, part-shade and shade containers for the early spring, summer and autumn seasons.

The introduction of perennial varieties in recent years has been driven by the consumer's increasing interest in new plants. Perennials are being used in containers, mixed combinations of pots, either all perennial or perennials and annuals. Therefore, an

[37] http://msucares.com/news/print/sgnews/sg04/sg040826.html
[38] http://www.provenwinners.com/plants/?doSearch=1&viewType=Perennial - Proven Winners perennials

increasing number of growers of bedding plants, pot plants and cut flowers are considering for ways and means to integrate new perennial plants into their programs. These growers are increasingly adding perennials into their mix and more deliberate, directed breeding is going on, more than ever before (Holst, 2002b; Brockman, 2004). Increased plug production is also having a marked impact on the perennial industry. There are currently more productions from plugs (Brockman, 2004).

Trees and shrubs are the other most significant perennials that have seen a significant growth in new product development. There are many new species, varieties and cultivars that are entering the market every year with different and unique characteristics[39]. There are trees, which are fast growing when young, and tolerant of air pollution and reflected pavement heat. There are trees and shrubs that are disease resistant and easy to transplant. Some are trees and shrubs that are selected for their foliage colors. Others are ideal to shade a terrace or patio. Some are introduced as being seedless so there is no mess in the patio or does not become a weed in the garden. There are also new tree and shrub varieties with compact branching, heavy blooming, etc.

The Kennedy's country garden in Massachusetts has introduced different new tree and shrub varieties in 2004[40]. Albizia "Summer Chocolate" – is a new tree designed for smaller gardens. The "New Bradford" pear tree is a new variety that particularly carries all the traits of a flowering pear. But, its unique character is that unlike the white flowering pears, its branches do not have a tendency to break. There are also many new shrub varieties that have different colors, fragrances, etc.

There are hybrid flowering cherries, colorful conifers and nut trees that are coming with different foliage textures, colors, etc.[41] There are also unusual tree and shrub species that are being introduced and commercialized. Example includes shrubs such as Fragrant Sumac "Konza", Silky Dogwood "Indigo" and Ninebark "Nugget"; and trees like river birch "Little king" and Western larch. These are native trees and shrubs of eastern and northeastern U.S. and they are said to be especially suitable for organic gardening. There are also new ornamental grass varieties that are suitable for sun, shade, and container

[39] Snyder, R. The new trees and shrubs, Flower and garden magazine, 1984.
[40] http://www.kennedyscountrygardens.com/shrubs_n_trees.htm - New plant 2004 – Trees and shrubs.
[41] http://www.organicgardening.com/feature/0,7518,s1-5-18-182,00.html

combinations in different geographical locations. They also come in different sizes and shapes with diverse colors, forms and textures.

Other important nursery and greenhouse related products

There are two other important areas that are currently growing and affecting the market for nursery and greenhouse products. These are water gardening, and dried and processed flowers.

Water gardening: Water gardening is becoming popular right now and there are many plant varieties and cultivars that are available for use in garden pools and ponds. Plant characteristics vary by many factors including depth, sunlight or location in the water body (e.g., edge plants, floaters, submerged plants, etc.). There are different magazines, shows and other programs that educate consumers how to start and develop water gardening. Professional landscapers are currently widely incorporating water gardening in their planning and designing of gardens.

Dried and processed flowers: These products provide alternative opportunities for individuals who want to start a business in the nursery and greenhouse sector. Currently these items are mostly sold through mass merchandise retail stores. Price, selection and convenience are key drivers that affect the market for these products. There are also artificial flowers that are available for sale. These products are becoming important in some countries. For example, dried and processed flowers are important export products in Kenya. Artificial flowers are gaining some market in Japan. According to some sources, sales in recent years have increased by 500%. Popular choices are orchids, blue poinsettias and roses. Increased popularity is attributed to improved techniques that make artificial flowers look more realistic.[42] Water gardening, dried/processed flower and artificial flowers will not be covered in this report.

In general, there are some factors that are shaping new plant development and introduction in the nursery and greenhouse sector.

(1) Agreements between breeding companies and origin of species countries are shaping the development and supply of new species and varieties. One good example is the effort

[42] http://www.plantpatent.com/archive/archive004.html#news022

being made by Ball Horticultural, Illinois, to transform native species into commercial products in South Africa. Working with CBD, in 1999, the company entered a contractual agreement with the government of South Africa to explore, develop and promote the country's native ornamental species[43].

(2) There are new emerging alliances to promote the introduction and commercialization of new flowers and plant products. For example, some firms in Canada and the Netherlands have agreed to work together to promote new plant cultivars. The firms in Europe will be involved with European plant breeders to increase the availability of new varieties and handle sales administration and promotion in their region. The Canadian company will handle marketing and promotion of new plant varieties in the North American market[44]. Many small companies are also improving their position in the market by building strong net works with breeders for their plant programs.

Proven Winners is the other important international market power in the nursery and greenhouse sector. The Proven Winners firms have agreements with breeders to trial and introduce new varieties. The primary interest is to produce and market the best varieties at the international level[45].

(3) Even though plant-breeding companies are spending a lot of money to develop new varieties each year, currently there are some new varieties that are discovered by chance. For example, the national garden association reported the "Purple Majesty" ornamental millet, a 2003 All-America selections award winning plant that was found growing in agricultural field trial at the University of Nebraska[46]. Companies like the Ball Horticultural have established a program called Ball discoveries, a program through which the company assists individual discoverers to find out whether the new plant is unique and has the potential to be bred and developed as a commercial ornamental plant[47].

---

[43] http://www.floracultureintl.com/archive/articles/834.asp - Fenton, L.J. Looking for what we do not know how to ask for
[44] http://www.plantpatent.com/archive/archive001.html#news013.
[45] http://www.plantpatent.com/archive/archive001.html#news013,
[46] http://www.garden.org/regional/report/national
[47] http://www.balldiscoveries.com./

(4) Some large companies are using innovation teams to develop new products. For example, breeding companies like Fischer nursery in Germany have their own teams that focus on long-term vision, new ideas, innovations etc. within the industry.

(5) There are currently a broad array of national and international trade fairs and Pack Trials that are used as sources of genetic materials for ornamental production. Especially, pack trials have evolved into a very important marketing event for brokers, growers, and retailers to see new plant introductions and upcoming genetic resources in a natural greenhouse environment. California's pack trials are now considered one of the most important international pack trials. Experts say that currently almost all varieties showcased at pack trials make it to the retail faster than ever before. The time between new varieties are introduced and when they hit the retailers' bench is shortening. This is mainly attributed to an increasing popularity of the pack trials. They are becoming attractive not only to large growers and brokers, but also to local and small growers, large retail chains, garden centers, and other traders within the chain (Holst, 2002d).

5. New product development opportunities

The next four sections will briefly examine and summarize future new product development and market opportunities that are potentially available for growers, distributors, wholesalers and retailers of different plant products within the nursery and greenhouse sector. The present section, will deal with future product development opportunities that are identified based on consumption trends and market drivers. Here, opportunities in product categories are ranked by major market drivers such as wellness, indulgence, homeownership, fashion/design, convenience, ethnicity, value and demographic forces. The next section will briefly present future market opportunities to raise sales through different retail market channels. The third section will focus on opportunities in branding and sales of private label or in-store brand products. Finally, a brief description will be presented on the effects of these new opportunities on different production practices.

Opportunities in the first two sections are ranked as broad, selective and limited (matrix 1 and 2). A broad opportunity represents the existence of a high potential to raise gains from sales by introducing new products in this specific market segment or by using the specific retail market channel. Opportunities are selective, if the potential to raise gains are dependent on just part of the broader market segment or if the retail channel does not provide broad opportunities to distribute the product. Limited opportunities reflect low probabilities of raising sales in the specific market segments or by selling the product through the specific market channel. This may be due to a dying market segment or the retail channel's limited capacity or interest to carry the product. But "limited" does not mean that there are no opportunities at all. It only reflects the existence of a range of constraints to expand sales in this market segment or through this channel.

Matrix 1: Positioning product development opportunities by market drivers

	Wellness	**Fashion & design**	**Home-ownership**	**Conveni-ence**	**Value**	**Ethnicity**	**Demogra-phy**	**Indulgence**
Annual bedding plants	Selective	Broad	Broad	Selective	Broad	Limited	Selective	Selective
Potted flowering plants	Broad	Broad	Broad	Broad	Selective	Limited	Selective	Selective
Cut flowers	Broad	Broad	Limited	Broad	Limited	Selective	Broad	Broad
Foliage plants	Broad	Broad	Selective	Selective	Selective	Selective	Selective	Broad
Herbaceous perennials	Selective	Broad	Broad	Selective	Selective	Selective	Selective	Broad
Ornamental trees & shrubs	Selective	Broad	Broad	Selective	Limited	Selective	Selective	Selective

Annual bedding and garden plants – Selective to broad opportunities

The fashion/design, home ownership and value market segments would continue to provide broad product development opportunities to raise gains from sales of these plants. Especially, the fashion and design market segment will be key factor in raising sales from annual bedding plants. Most of the annuals will continue to enjoy from changes in fashion trends and seasonal garden designs. Following the fashion trend, using and arranging plants in the garden is undergoing a significant change. For example, unlike in previous years where annuals were planted separately, they are currently being integrated into the rest of the landscape; as attractive combination in pots, as eye-catching collection of foliage plants in sun or shade; and as full partners with perennials and shrubs in plant borders (Higgins, 2004). In particular, the dramatic increase in professional garden and lawn services (e.g., garden and landscape maintenance, landscape installation or construction, landscape design, tree care, etc.) may play a significant role in increasing gains from these products. For example, from 1998 to 2003, sales of professional garden and lawn services increased 61.6% in constant prices, the biggest increase being in landscape installation sub-segment (Mintel, gardening, 2003). In particular, professional outdoor landscaping projects have become popular among consumers who have seen gardens as extensions of their homes; an outdoor space that can be used for grilling, dining, and entertaining (Mintel, gardening, 2003). Therefore, the fashion and garden design and decoration segment would continue to provide broad product development opportunities for annual bedding plant growers. In the future, frequent fashion and garden design changes would expand the market for these plants benefiting those annual growers who focus on variety, color and other plant traits that are appealing to the consumer.

With an increasing rate of home building and rising role as a status symbol and retreat from a busy day, consumers are also increasingly spending more time decorating their gardens with plants and flowers. From 1998 to 2003, for example, the DIY market segment has shown an increase of 25.3% in constant prices (Mintel, gardening, 2003). This growth mainly relied on the growth in sales of single-family homes, especially in the growth of new homes. Growers who can introduce new annual bedding plants can continue to benefit from this trend.

In general, most of these plants particularly those in flats are not expensive. However, with an increasing demand for larger and near-mature annual bedding plants, in the future, some of the products will not be cheap any more. Despite this trend, however, the consumers appear to be willing to buy them to add them in their garden mixes. Value would thus be another important market driver to raise sales. Growers who can develop cheaper cultivars and make large-volume sales through mass merchandise stores can have broad opportunities to raise gains from sales.

Convenience, wellness and indulgence would have a selective role in raising sales of these products. As mentioned in the previous sections, in order to avoid constant watering and feeding and taking weeks to fill out and bloom, consumers are currently looking for larger near-mature bedding plants. Therefore, convenience-oriented consumers will not be attracted to some of the bedding and garden plants, particularly the flats. The wellness market segment will play a significant role in raising sales of these products. Currently, garden plants including annuals are well received by some health conscious consumers as plants that keep the environment clean and prevent pollution. But there are many potential consumers who are not aware of the health benefit of these plants. Therefore currently this market segment is not providing broad product development opportunity for growers. In the future, those annual varieties and cultivars that could be developed and introduced especially targeting this consumer group could broaden the market share in this market segment. In addition, growers and retailers can raise sales in this market segment through advertisement and market promotion.

Although there are some signs that annual bedding plants are becoming common as holiday floral gifts, mainly for Mother's day and Easter (Mintel, gardening products, 2001), they are not popular products for sale on most of the calendar and special holidays. Also, they are not widely suitable products for the impulse consumer. There are, however, some consumers who do have the experience with some of the plants and come back every year to buy them. But this market size does not seem to be large. Therefore product development opportunity in the indulgence market segment would be selective.

Demography will also have a selective role in raising sales in this product category. The younger generation, who is faced with time pressure to balance life between family and workplace, may not have enough time to work with annuals in the garden. In particular, the flats would not be appealing to this market segment. The baby boomer generation will, however, be in a pposition to allocate more time for gardening activities, providing broad product development opportunities for annual growers. In addition, middle-aged consumers who like gardening may be potential consumers of these plants.

Ethnicity would not have a significant role in raising sales from these products. Some ethnic groups may be interested in certain bedding plants. But this market segment is not expected to be large. For example, according to Mintel (gardening, 2003), the Hispanics and Blacks tend to have no adequate space for outdoor gardening. So, they may not be interested in buying these products.

In general, new annual bedding plants, especially those plants that enter the market in larger pots and containers appear to benefit from the overall trend. Today, there is an increasing demand for upscale annual bedding plants. In the future, consumers will purchase fewer bedding plants but what they purchase will be of higher quality in larger containers. The introduction of new product innovations that focus on plant mixes and arrangements could thus benefit future sales of these products.

There is also a new post 911 patriotism trend that affects the nursery and greenhouse sector. There are some special and unique colors (particularly within the blue, red and white category) that attract some consumers or fit into the spirit and mood of the general population. For example, a survey conducted by BIGresearch, found that 29.1% of the respondents have patriotic garden decorations[48]. Thus, in the future, bedding plant growers that focus on developing new varieties that meet consumer requirements and overall lifestyle trends would have broad opportunities to raise sales

Potted flowering plants – Broad opportunities with some selective opportunities

The wellness, fashion/design, homeownership and convenience market segment would provide broad product development opportunities for growers of potted flowering plants.

Especially, the wellness market segment would play an important role in providing broad product development opportunities for potted flowering plant growers. The presence of flowers and plants at workplaces, for example, could create a better environment that improves employees' idea generation ability, and their performances and problem solving skills[49]. Currently there are different promotional and consumer education programs that focus on flower therapy. For example, in May 2004, the Society of American Florists[50] has launched flower therapy campaigns using local radios, newspaper advertisements,

[48] http://www.floracultureintl.com/archive/articles/657.asp - Shoemaker, M. Consumer buzz
[49] http://www.aboutflowers.com/workplace/research.htm
[50] www.safnow.org/flowertherapy.cfm

banners and organizing different events to educate consumers. It has also developed different flower therapy tools and color palettes that focus primarily on the emotional benefits of flower colors expressed through color combinations in floral arrangements. With these promotional efforts, potted flowering plants and cut flower growers and retailers who can develop new potted flowering plants designed for this market segment would especially have broad market opportunities to raise gains from sales.

In the fashion/design market segment, individual consumers and offices, hotels, malls, etc. that can come up year after year with new interior and patio design and decoration concepts would continue to buy potted flowering plants to use them in their plant mixes. In the U.S. interior potted plants are not widely utilized, while people are traditionally used to exterior gardens. But these days there are some trends that show an increase in the consumption of selected indoor potted flowering plants. For example, the market for potted orchids is growing fast. This still shows the existence of untapped market for potted flowering plant growers. But growers need to develop potted flowering plants that meet U.S. consumers' desires and preferences. For example, in the case of orchids, some experts argue that large-flowered phalaenopsis are preferred in the U.S. and Japanese markets where consumers are not concerned by flower count[51]. In Europe, consumers prefer higher flower count and accept smaller flowers. On the other hand, it appears that retailers and wholesalers are interested in compact and branched mini-phalaenopsis, because there is less damage in transport and less breakage by the end-consumer in the store.

Homeowners will continue to buy potted flowering plants, providing broad opportunities for these products. Inspired by the fashion and design trend, new home buyers or builders would continue to use professional or DIY services to include potted flowering plants in their indoor mixes or in their patios.

In general, potted flowering plants are appealing to the convenience-oriented consumer. These are plants coming in pots, and they are relatively easy to move from place to place. So, growers can expand sales in this market segment by offering different varieties and

[51] http://www.floracultureintl.com/archive/articles/1186.asp - Laws, N. The world's fascination with potted orchids

color combinations. Large container and pot innovations that make plant handling and growing easier or packaging innovations that improve the outside look of the container maintaining and improving plant quality would help to increase sales in different market segments.

Value will have a selective role in raising sales from potted flowering plants. In general, in recent years, the U.S. consumer has shown a willingness to spend more on individual potted flowering plants (Mintel, flowers and potted plants, 2001). Therefore, even though some of these flowers are becoming very expensive, there appears to be an expanding market for the products. Growers who are able to produce high quality potted flowering plants with the required color, variety, shape, texture, etc. can thus continue to raise sales in this market segment. But, still this market segment will not provide broad product development opportunities.

Potted flowering plants would also be purchased by different demographic groups. But there are some plant selections and varieties that may not be convenient for all population groups. For example, most potted orchids require a continuous attention and care. Such plants would not be appealing to a family where both spouses work, because they will not have enough time to feed and water these plants. Therefore, demography would provide selective product development opportunity for potted flowering plant growers.

Potted flowering plants are not suitable products for the impulse purchaser. Also, purchase of these plants during holidays is relatively limited. Main purchasers of these plants in this market segment are those consumers who have some kind of experience and connection with the plant. But their numbers may not be very high. Therefore, the indulgence market segment provides selective product development opportunities for these plants. But there is still a potential to expand sales in this market segment, if growers are innovative enough to expand the use of these plants in different occasions by creating plant combinations or containers that are appealing to this consumer group. If that happens, growers of these plants have the potential to expand sales to the impulse purchasers that currently focus on cut flowers.

Ethnicity would provide limited opportunities. There may be some varieties, colors or plant sizes and shapes that may meet demands by different ethnic groups. But the size of this market would remain small, at least in the coming years.

Cut flowers - Broad opportunities with some selective opportunities

Cut flowers are sold in arrangements, single stems or as bunch bouquet. According to Pohmer (2004), about 46.5% of the dollar sales come from arrangements, while bunch bouquet and single stems account for 31% and 16%, respectively. But the transaction shares are different: Bunch bouquet (50%), single stems (27%) and arrangements (19%). There are two key factors that significantly affect the market for cut flowers: gift and holiday purchases.

The wellness, fashion/design, convenience, indulgence and demographic market segments are the most important market drivers that could provide broad product development opportunities for cut flower growers.

In general, cut flowers fit into the coordinated and seasonal fashion trend and mostly they are the key element in indoor designs and decorations. So if growers and retailers offer a wide range selection of colors, shapes and textures that meet different demands and trends in the fashion industry, they can raise sales from cut flowers. Much attention, however, needs to be given for the color trend. The cut flower market is also becoming tied with the sales of flower accessories and supplies. For example, in Japan the hot trends in cut flower arrangements and designs today include glass vases, with less, not more flowers and foliage in the vases, adding simplicity and romantic image to the arrangement [52].

As in the case of potted flowering plants, the wellness market segment would also provide broad market opportunities for cut flower growers. As health conscious consumers continue to learn more about the use of these plants, growers can raise gains from sales of these products. In addition, expanded use of these plants by health conscious employees in offices and other public and private buildings would help increase sales of these plants. In general, cut flowers, because of their color complexes

[52] http://www.floracultureintl.com/archive/articles/1151.asp - Hamrick, D. Japan's transitioning retail scene

and convenience in terms of portability, are well positioned to benefit from these consumer groups. Required are concerted promotional efforts to educate consumers, future research activities to find out different health- and wellness-related advantages of these plants and innovations to develop cut flower cultivars that meet the specific requirements of health conscious consumers.

Cut flowers are one of the most convenient floral products. They are coming well prepared and ready for use in arrangements, boutiques or consumers can buy them in single stems and they are easily transportable products. The only thing they need is frequent watering and feeding to keep them longer at home. But this would not be the determining factor while buying these products, since consumers purchase them knowing that they use them for few days or weeks. Therefore, convenience would provide broad product development opportunities for cut flower growers. In the future, packaging and vase innovations that help to create better feeding and watering technologies would make the products more convenient and help growers and retailers to increase sales.

Cut flowers are the leading floral products that are used as gift items, especially during calendar holidays and for special occasions. For example, they are the most popular type of Valentine's Day flower, representing about 80% of all Valentine's Day flower sales. In addition, consumers are increasingly buying cut flowers for non-holiday occasions that include weddings, funerals, get-well gifts, birthdays and anniversaries. Cut flowers are purchased to say thank you, good luck, welcome, etc. (Mintel, flower and potted plants, 2001). They are also becoming increasingly appealing to the impulse purchaser. Therefore, the indulgence market segment provides broad product development opportunities for cut flower growers.

In terms of demography, some studies suggest that there is a tendency that the baby boomers are leading in buying cut flowers (Mintel, flowers and potted plants, 2001). But, since these are plants that are partly purchased as gift items, it can be argued that, in the future they would be widely purchased by almost all demographic groups. In particular, those growers and retailers who can tie their floral sales with other gift items can attract many consumers in this market segment.

Ethnicity would play a selective role in selling cut flowers. According to Mintel consumer survey (flowers and potted plants, 2001), blacks are much less likely to buy cut flowers, while Hispanics' consumption tend to be light to moderate. But, since Hispanics tend to take holidays and special occasions very seriously, cut flower purchasing would be important at this time for cultural reasons. For example, industry analysts suggest that Hispanic consumers spend an average of $2,000 on flowers during La Quinceanera, the traditional Hispanic celebration for girls when they turn 15 (flowers and potted plants, 2001).

Value and homeownership would play a limited role in raising gains from sales of cut flowers. Although cut flowers are becoming relatively inexpensive, growers can raise gains, if they are able to sale large volume of flowers through discount stores. With an increasing competition from imports that continuously lower the price, it would be difficult for domestic growers to raise gains from volume-sales of these products. Also, cut flowers are not priority products that could be widely purchased by new homeowners.

Foliages – Selective to broad opportunities

Foliage plants are normally purchased for the buyer's own enjoyments and are mostly used for indoor and outdoor decorations. **The wellness, fashion/design and the indulgence market segment would provide broad product development opportunities for these plants.** Especially those foliage plants that are used as indoor plants by consumers could have a wide range of wellness and health-related benefit. There are different foliage plants that are being used indoors to clean air and prevent pollution. But currently advertising and market promotion activities in this regard are limited. Future product innovation and strong marketing activities in this market segment can provide broad product development opportunities for foliage plant growers.

As foliage plants continue to be widely used for interior decorations, the fashion and design market segment would play a significant role in selling these plants. Professional indoor designers and decorators will continue to mix different plant selections, varieties, colors, shapes, etc. applying different design elements for interior decorations. Planting arrangements and combinations based on resemblance, compatibility, or distinction of colors, sizes, growth habits, etc. will thus play a significant role in raising the market for foliage plants. In general, foliage plant growers who are able to introduce new varieties with unique colors and foliage textures would raise sales in this market segment.

In the indulgence market segment, foliage plant growers can continue to benefit from different consumer groups that purchase these plants for different purposes. Some consumers may want to have these plants, simply because they like them from experience or they know the performances of the plant from previous years. In addition, these plants are widely used in offices, churches, retail stores, hotel lobbies, and other large complexes like malls and corporations. Impulse purchasers can also buy these plants, in particular, if growers continue to be innovative in the introduction of new foliage complexes and textures that are appealing to this consumer group. In general, if supported by the introduction of new product innovations and strong advertising and market promotion activities, growers have broad opportunities to raise sales in this market segment. Also, although the market share now appears to be limited, in the future, growers of foliage plants can expand sales, if they are able to tie these products with other gift items.

Growers of these plants would also have product development opportunities in the homeownership market segment. New home owners will buy these plants to create different indoor and outdoor plant combinations. But opportunities in this market segment will not be broad. Convenience and ethnicity would also play a selective role in raising sales from these products. There is, however, still a potential to expand market shares in the convenience market segment. Packaging innovations combined with appropriate product innovations that can help to create foliage plants that are attractive to these consumers would broaden market shares for foliage plant growers.

In terms of value, since they are mostly coming as potted plants and in hanging baskets, foliage plants do not appear to be cheap plant products. Thus value would play just a selective role. Also, these plants are not expected to have an extended ethnic market. Different ethnic groups will continue buying some foliage plants. But this would not be expected to be a significant market segment that can broaden the market for foliage plants. One key issue in the ethnic market, not only for foliage plants, but also for all nursery and greenhouse products, is that, in order to raise sales in this market, growers and retailers need to find out the desires and interests of the different ethnic groups. This is not happening now. This will require conducting studies that analyze ethnic based flower and plant consumption patterns that help growers to identify and introduce product and packaging innovations so that they can develop and market flowers and plants in this market segment. As mentioned in the previous sections, this market segment has a huge potential to raise sales. What it requires is attention and innovation in different areas.

Foliage plants would also be purchased by various demographic groups who want to use them in their plant combinations. In particular, the baby boomer generation would be the main buyer of these products. According to Mintel (flower and potted plants, 2001), foliage plants appear to be attractive to older adults.

Herbaceous perennials – Selective to broad opportunities

This part focuses on perennials that are used in the bedding plant category. Perennial growing has undergone significant changes in the last three decades. According to some industry analysts, there were only perennial growers some three decades ago, but as the plants gained popularity, others have also taken interest mainly in the past two decades. Many woody plant and bedding plant nursery operations have expanded and are currently growing perennials. Experts expect that with the greenhouse's interest in perennials, production would grow fast in the coming years (Brockman, 2004).

The fashion/design, homeownership and indulgence market segments are the most significant market drivers that could provide broad product development opportunities for herbaceous perennial growers.

Following the overall fashion and design trend, using and arranging plants in the garden is undergoing a significant change. As mentioned in the previous sections, today professional landscapers and individuals are using different plant combinations based on container types, plant varieties, colors, foliage and flower textures, etc. to decorate their gardens. Herbaceous perennial growers will continue to benefit from this trend. In particular, innovative growers who can create unique combinations using these plants have broad opportunities to raise sales. These plants would also enjoy from year to year garden design changes, as the consumers try to cope with the new trends. Currently there are some signs that consumers incorporate perennials where shrubs and lawns were used before. An expanded marketing promotion activity and media involvement such as the HGTV may play a significant role in raising sales in this market segment.

Herbaceous perennial growers have broad opportunities to expand sales in the homeownership market segment. These plants are priority products for new homeowners who want to decorate their garden using different plant mixes. The steady growth in home sales and new home buildings would support gains from sales in this market segment.

Indulgence would provide broad product development opportunities for these plants. Consumers who see these plants in garden shows or in gardening magazines would continue to buy them to add more diversity in their garden plant selections. These plants may not be frequently purchased by the impulse purchaser. In addition, although some perennials are bought as holiday gift floral plants, currently the market does not appear to be broad. But, in the future, if creative growers and retailers develop new product and marketing innovations that make these products more attractive, there is a huge potential to raise sales. Perennials are, for example, part of the preferred floral gifts to new homeowners. Retailers and growers who could tie their perennials with other gift items designed for this consumer group can raise sales.

Herbaceous perennials tend to be less of a commodity than annuals. Although they are becoming relatively cheap compared to previous times, they are still more expensive compared to the low-price annual packs. There are also certain perennial specialties like a designer daylily or the latest hosta that are very expensive (Holst**,** 2002b). With the increasing demand for large containers that have high quality combinations of annuals and perennials, these plants would continue to be expensive for the consumer. So, value would have a limited role to raise gains from sales of these products.

In terms of convenience, since many perennials are currently coming as container plants, they are becoming easier for the consumer to handle. They are easier to install, move from place to place, etc. But there are still many plants that are coming bare root and still these plants need frequent watering, feeding, etc. So convenience will play a selective role.

In the demographic and ethnic market segment, again here, the baby boomer generation is expected to continue embracing gardening activities that include perennials. Currently, although there is an expansion of perennial production, still they are not produced by a wide range of demographic and ethnic groups.

One of the main challenges for perennials is the shorter blooming time they have compared to annuals. The consumer currently appears to be looking for more perennial varieties and selections that could bloom for longer period. So, in the future, growers who can supply perennials with these qualities will have broad opportunities to raise sales in various market segments. In addition, perennials that enter the market with multi-purpose uses such as those that can be used as blooming house plants before planting them in the garden may provide further enjoyment for the consumer adding value. The other challenge in this category would continue to be the difficulty to establish plant categories for different market segments. Garden centers have started grouping perennials by specific character traits. For example, some garden centers are selling them grouped as drought tolerant, shade lovers, fall bloomers, etc. (Holst, 2002b). But still product differentiation in this category requires a lot of work.

Ornamental trees and shrubs – Selective opportunities with some broad opportunities

Ornamental trees and shrubs are grown by nurseries that are producing them for sale. There are also some landscape nurseries that are growing the plants for their own landscape service. In general, the availability of broad tree and shrub varieties and selections is currently offering the consumer more choices in gardening. According to Mintel (gardening products, 2001), there are some leading plants that have high market share. For example, oaks tend to garner the highest sales among deciduous shade trees. Callery pear and crape myrtle (an Asian shrub of the loosestrife family widely grown in warm regions for flowers) dominate sales among deciduous flowering trees. Holly and azalea bushes lead in sales in the broadleaf evergreen category, while the juniper is number one in sales among coniferous evergreens. Roses, spireas and hibiscus are top in sales for deciduous shrubs.

The fashion/design and home ownership market segments are the most important market drivers that would provide broad product development opportunities for ornamental tree and shrub growers. Professional landscapers who focus on garden design and decoration are adding trees and shrubs in their seasonal design elements. The category benefits from this trend, which is changing frequently following the trend in the overall fashion and design industry. Individual consumers who are watching the trend increasingly try to copy what they see in this cutting edge commercial landscape design to add new colors to their garden using new tree and shrub varieties. The heavy use of ornamental grasses and perennial borders by designers and landscapers in recent years has, for example, helped open the eyes of many consumers (Holst, 2002b). Consumers who might change their garden design every season may replace some of their trees and shrubs by new arrivals. In particular, those consumers with large garden spaces would buy these plants to use them as shade trees, border plants or to add some color combinations in their plant mixes.

Homeownership, particularly the growth in new home building, would also be key in raising sales from these plants. These are consumers who would be happy to have gardens with the latest and newest plant varieties and color combinations. They also see trees and shrubs as part of their investment. So they are willing to buy quality plants in order to raise the value of their homes. Others are interested in having planting trees and shrubs that are attractive to different birds or other animals. These consumers are also the ones who can buy trees and shrubs they were not aware of in the previous years, setting a new trend in using ornamental trees and shrubs. So, innovative growers, retailers and landscapers who can develop new preferred varieties, and show and educate these consumer groups how to use these unique and new trees and shrubs would have broad opportunities to raise sales not only in this market segment but also in the others.

The indulgence market segment would provide selective market opportunities for trees and shrubs. These are products that are not widely used for impulse purchases. Consumers that have experience with the plant may also not be willing or able to buy these plants every year, because they have not enough space or the plants are expensive.

Wellness would play a selective role in increasing sales in this category. In general, outdoor plants create a healthy garden environment. In addition, some plants have an effect in reducing air pollutions and they help clean the air. Market promotional efforts that focus on the health impacts of garden trees and shrubs will help increase sales from these products.

Trees and shrubs are sold as bare-root, balled and container-grown plant materials. There is a growing market for container-grown trees and shrubs, making them easily portable from place to place, and providing the consumer more flexibility in their use. Despite this development, however, these plants are still relatively large and not easily movable from one place to the other. So, convenience would play a selective role in increasing sales in this category. In the future, besides the introduction of new varieties and selections, innovations that focus on plant management and container design may help improve sales for the convenience-oriented consumer.

Among the demographic groups, men and the older generation would be the main purchasers of trees and shrubs. According to the garden writers association (2004), men are the main purchasers of trees and shrubs. As mentioned earlier, many households would also see these plants as a significant investment. In general, this market segment would provide selective opportunities for tree and shrub growers.

Ethnicity would also play an important role in raising sales in this category. People with different ethnic background may want to have different garden design and outlook. For example, with their income increasing from year to year, Hispanics are becoming an important demographic segment that affects consumption patterns of goods and services. There are also some signs that indicate an increase in purchase of plants by this group. So, in the future, tree and shrub growers who can grow plant varieties that have demand within this group in their locality or region may raise sales. In addition, currently there are different ethnic groups from Eastern Europe, Asia and other regions that are purchasing houses in different parts of the country. Definitely, these groups would have their own tree and shrub preferences and garden and lawn designs that affect the future market for trees and shrubs. So, growers need to watch these trends and adjust their production based on the need by specific ethnic groups.

Value would have a limited role in raising sales of trees and shrubs. These are, in general, expensive products. They are also not suitable for sale in large quantities.

Due to their adaptability and lower-maintenance traits, native and tribal plants are currently becoming the focus of many nurseries and consumers. These plants, in particular, can provide niche alternatives for small growers.

In general, in addition to the product development opportunities discussed above, nursery and greenhouse growers could increase their market share using a variety of innovative ways and alternative market outlets. Some examples are listed below.

(1) Floral displays on balconies or in window boxes are common in other countries of Europe and Central and South America including Mexico, while it is not common in the U.S (Minetl, gardening, 2003). If growers and retailers introduce product innovations that support this trend (e.g., develop plants and varieties that fits into these spaces), and make a concerted effort to promote and educate consumers about gardening in limited spaces, this would be a new untapped market for ornamental plant growers. This may, in particular, provide a source of inspiration for consumers whose green spaces are limited. Even those with enough spaces would buy these products, if the varieties, sizes, arrangements etc. are appealing to them. There is, in fact, a huge market for such products in urban and sub-urban areas, where there are no enough outdoor green spaces.

In addition, flowers and plants in the U.S. are sold mainly to individual consumers**.** But experience from other countries show that there are still many other markets that can be developed for different nursery and greenhouse products. For example, in Germany, cemetery gardening is a vital segment within the German floriculture industry. About 7,500 companies provide cemetery gardening services. Approximately 18% of all flowers and plants sold in Germany are for cemetery use[53].

(2) There are also unique and niche ideas that are evolving to market flowers and plants. In Taiwan, for example, many small growers are working to find out their niche by thinking beyond the boundaries of their greenhouses. Some growers have thus introduced a concept called cut-your-own. For example, the Miau-ban garden combines leisure and

[53] http://www.floracultureintl.com/archive/articles/767.asp - Hamrick, D. German ornamental production

beauty to draw city dwellers into its nursery and greenhouse for an afternoon. A $3 entrance fee grants them tea, coffee and permission to cut six zantedeschia blooms from the surrounding fields. Visitors watch a video that shows them the correct cutting method, but they can also buy pre-cut zantedeschia[54].

Another example is the launch of a new consumer brand in the Netherlands. The Dekker Company that mainly markets Chrysanthemums has entered the consumer arena with "Kiku", a new program that supplies a self-merchandising shelf of trendy bouquets and arrangements to supermarkets in the Netherlands. Shelves are placed in the customer service area of the supermarkets, just past the checkout line (impulse-heavy section of the market). The idea is to catch an eye of shoppers as they pay for their groceries. They buy an arrangement in the checkout line and then pick it up as they walk out the door. These are flowers in décor-themed arrangements in trendy bags in the latest colors or sophisticated vases of glass or metal. Each arrangement and bouquet is given a "sell-by" date and current Kiku arrangements are guaranteed for eight days of freshness. To keep flower quality up and offerings fresh, shelves are updated every two weeks by Kiku staff. Depending on its success, the company has a plan to make Kiku available in gas stations and hospitals through out Europe in the coming years[55].

(3) In order to remain viable in off-season and to remain open year round, some small nurseries and greenhouses have expanded their offerings of lawn furniture, garden accessories, gardening-related books and gifts, crafts, Christmas decorations and other seasonal decorations (e.g. Halloween, Thanksgiving), and even canned or preserved foods and other food gifts (Mintel, gardening, 2003).

(4) In the U.S. there are some growers who have reinvented themselves as destination nurseries or farms, offering hay rides, corn mazes, apple picking, and other activities beyond simply selling plants (Mintel, gardening, 2003). This will allow growers to establish a loyal customer base for their flower and plant products.

The introduction of such niche ideas would help to expand sales from nursery and greenhouse products.

---

[54] http://www.floracultureintl.com/archive/articles/948.asp - Fenton, L.J. The orchid Herat of Asia.
[55] http://www.floraculturintl.com/archive/articles/1210.asp

6. Opportunities within the retail market

Matrix 2 presents a summary of market opportunities for growers of different nursery and greenhouse products to sell their products through a variety of retail market channels.

Matrix 2: Positioning opportunities by retail market channel

	Super markets	**Mass Mercha.**	**Home centers**	**Retail florists**	**Garden centers**	**Warehouse clubs**	**Internet**	**Others***
Bedding annuals	Broad	Broad	Broad	Limited	Selective	Limited	Limited	Broad
Potted flowering plants	Broad	Selective	Selective	Selective	Broad	Selective	Selective	Broad
Cut flowers	Broad	Selective	Selective	Broad	Limited	Selective	Broad	Selective
Foliages	Broad	Selective	Selective	Selective	Broad	Limited	Limited	Broad
Herbaceous perennials	Selective	selective	Broad	Selective	Broad	Limited	Limited	Broad
Ornamental trees and shrubs	Selective	Selective	Selective	Limited	Broad	Limited	Limited	Broad

* Others include nursery and greenhouse retail operations, professional garden and lawn services, specialty shops (convenience stores, drug stores), roadside stands, etc.

Annual bedding and garden plants – Broad opportunities with some limited opportunities

Annual bedding plant growers have broad opportunities to sell their products through supermarkets, mass merchandise stores and home centers. Currently there is a general migration of shoppers from garden centers and traditional shops to home centers and mass merchandisers. Consumers who want to combine their purchases of seeds, plants and other garden supplies such as garden tools and decorative items may normally go to mass merchandise stores or home centers (Mintel, gardening, 2003). In addition, supermarkets and specialty stores like drug stores tend to expand their garden offerings on a seasonal basis. Home centers and mass merchandise stores are market outlets that are primary choices for those consumers who want to buy cheap plant products. Thus, those growers who are especially focusing on flats can benefit from this retail market trend. Even those who are growing larger plants in pots have started getting an increasing access to these market outlets. For example, the cooperative of Maryland and Delaware growers supplied last spring the area Home Depot stores with 5 million annuals in 4-inch pots (Higgins, 2004). It also appears that the consumer is willing to pay high prices for larger container plants. One future challenge for bedding and garden plant growers to sell their products through these channels would, however, be the increasing demand for services. Nowadays these stores are demanding a lot of service from plant suppliers. Increasingly retailers are expecting growers to make smaller but more frequent deliveries to their stores, which ensure that the product looks a lot better (Holst, 2002a).

Despite the migration of some customers to supermarkets and discount stores, growers can still have selective opportunities to raise sales of annual bedding plants through garden centers. Until recently, outdoor bedding plants have been leading products in garden centers. But, as mentioned above, these products are increasingly available in other major retail outlets. Garden centers are currently attracting consumers who are mainly interested in plant selections and quality. These consumers would continue buying these plants in garden centers.

In the "other" category, retail operations in greenhouses and sales through the professional garden services play a significant role. The majority of professional garden/lawn services purchases are not made through retail channels. Purchases for these purposes are rather made directly through national, regional, or local garden and lawn care franchises or individual businesses (Mintel, gardening, 2003). These services are expected to make significant purchases of annual bedding plants to be used as mixes in garden installations. Retail operations at greenhouse could also provide broad opportunities to raise sales of annual bedding plants.

Other market outlets such as warehouse clubs, the Internet and retail florist shops will have limited roles in raising gains from sales of annual bedding plants. These are generally market outlets for plant products that are high quality, expensive and require complex plant arrangements. In addition, these outlets are commonly used for gift products. Annual bedding plants are normally plants that are not sold for gift purposes.

Growers of bedding plants have also broad opportunities to expand sales using alternative market outlets. They can, for example, benefit from different urban, village, street etc. decoration programs. There are currently many municipalities, communities, and urban, downtown, highway and road authorities that want to decorate their areas using plants and flowers. Working with these organizations who want to decorate their localities following the current fashion and decoration trends would improve sales in these markets. Some additional technologies and marketing innovations may also contribute to raise sales of these products. For example, as one of the spectacular greening projects in Shanghai, China, people are working on a unique "hanging garden" that is part of a recently constructed bridge that crosses one of the city's rivers[56]. New technologies, including the delivery of water along a layer of fabric that also supports the hanging flower garden, are being developed by a French architectural company. Such creative ideas are creating opportunities for the nursery and greenhouse sector in China. Today, in many parts of the country, farmers have replaced rice and vegetables with nursery and greenhouse products.

Potted flowering plants – Selective opportunities with some broad opportunities

Currently, potted flowering plants appear to be benefiting from a wide range of retail market outlets. Today, an increasing number of supermarkets and garden centers are selling potted flowering plants. For example, supermarket chains like Safeway, Albertson's Kroger, Ahold, etc. are even selling potted orchids. Kroger sells potted orchids in 2,200 stores in 18 divisions[57]. Upscale garden centers have also increased sales of potted flowering plants. Supermarkets and garden centers thus appear to be significant market outlets that would provide broad market opportunities for these plants.

The "other" market segment can also provide broad opportunities to raise sales in this category. Especially, sales through greenhouse retail operations and other specialty shops could raise gains. For example, orchid sales in specialty food stores like Whole foods, Wild Oats, and Trader Joes are growing[58]. Since most of these plants are designed for indoor and patio use, they may not broadly attract professional garden and lawn service providers that focus on outer space decorations. But, still these plants continue to benefit from the professionals' and DIY new garden design and decoration concepts who want to

---

[56] http://www.floracultureintl.com/archive/articles/1152.asp - Moody, H. Urben greening in China
[57] http://www.floracultureintl.com/archive/articles/1186.asp - Laws, N. The world's fascination with potted orchids
[58] http://www.floracultureintl.com/archive/articles/1186.asp - Laws, N. The world's fascination with potted orchids

create beautiful patios using mixes of potted flowering plants. In addition, sales could increase through those service providers who are involved in decorating malls, large corporation offices and indoor spaces of any other buildings using these plants. In this regard interiorscaping would be one significant area that needs to be supported through different market promotion efforts to broaden the market for potted flowering plants.

Mass merchandise stores and home centers are also expanding the pot plant market. For example, orchids used to be plants that are sold through florists and partly supermarkets. They were items once only for the high end consumers and mostly purchased by people who would grow them in their home greenhouses. But, very recently these plants have started entering the mass merchandise and home center retail channels including furniture stores like IKEA. This is because consumers are increasingly using orchids for home decoration (Holst, 2002e). Eventually, an increasing volume of potted orchids is being sold through mass-market retailers and supermarkets. Home improvement centers like the Home Depot and Lowe’s sell orchids. But, overall, the market opportunities for potted flowering plants through these markets would still be selective. Since these products are relatively expensive the channels would focus on selected products or suppliers that can provide volume products at cheaper prices. Also, customers who want to buy high quality potted flowering plants may not frequently use these market outlets.

Retail florist shops and warehouse clubs would also provide selective market opportunities for these products. Retail florist shops, with their ability to provide different services and plant combinations, have the ability to attract consumers who are interested in potted flowering plants. Membership markets like Costco and Sam’s clubs have increased their market share in selling potted flowering plants.

Internet marketers such as 1800Flower.com, calyxandcarolla.com and FTD.com sell potted orchids as well, although the highest quality, larger plants would be sold through the retail flower shops. However, the major challenge to raise sells through these market outlets is their limited capacity to carry large quantities of these products.

Cut flowers - Selective opportunities with some broad opportunities

Supermarkets, retail florist shops and the Internet would provide broad opportunities for cut flower growers. Retail florists continue to be the most popular flower distribution source, with many customers purchasing cut flowers through this market outlet. Consumers view florists' strengths as delivery, customization, sales help, courtesy and variety. Cut flowers are often purchased particularly during special occasions and emotional times for consumers. This provides florist shops with a specialized niche since they can give consumers the added customer service they may be looking for during a time of grieving or a time of celebration (Mintel, flowers and potted plants, 2001). They can also use 800-numbers, birthday or event reminders, frequent-buyer programs, floral education classes, and newsletters to attract consumers. In general, retail florists that can develop unique and distinct flower arrangement and selling kits for the niche and affluent markets that include weddings, funerals, special occasions, restaurants, corporations, etc. have broad opportunities to raise sales from these products.

In terms of cut flowers, supermarkets tend to be attractive destinations for impulse flower purchasers and for those who want to make one stop shopping. Some experts estimate that impulse purchases account for 80 to 90% of the supermarkets total floral sales[59]. Consumers who want to buy flowers for a gift during holidays would also visit these market outlets to buy cut flowers. These markets are also becoming aggressive in their marketing efforts to increase sales of these products. For example, florist staffs are now increasingly available in supermarkets. As a result, floral departments in supermarkets are becoming increasingly successful in suburban regions (Mintel, flowers and potted plants, 2001). These are, in general, areas with relatively high-income people. Overall, with this trend, cut flower growers will have broad opportunities to raise sales through these retail market outlets.

Today, many consumers are making Internet orders and purchases of cut flowers. According to the American Flower Endowment[60], in 2001, online buying supported about 9% of the dollar spent by consumers for cut flowers. The online expenditure for all floral products was only 3%. Consumers mainly buy flower arrangements online and use this access particularly when buying a floral gift. Also, the dollar spent by consumers when placing an online order (for flower arrangements) appears to be higher than the

---

[59] http://aggie-horticulture.tamu.edu/greenhose/nursery… - Capturing the impulse sale
[60] http:// http://www.flora-links.org/pdf/specificpurchase.pdf - Zavada, B. Understanding floral product buying patterns

amount spent at supermarkets and retail florist shops for these products. Convenience is the leading factor that contributed to an increase in online flower marketing. Thus, in the future, the Internet could provide broad opportunities for cut flower retailers and growers, if they focus on innovations that improve product handling, transport and delivery. In this market segment, retailers and growers could, in particular, target busy individuals and the older generation who may get it challenging to go out and look for flowers in other retail stores. This channel is also very useful to establish a loyal customer base and to improve relationships with long distance customers who want to buy new or the same product frequently. In addition, those retail stores who can be innovative in their floral arrangements and tie their floral products with other gift item can increase sales from these flowers.

Mass merchandisers and home centers are also increasing their sales of these products. These retail stores, in particular, are selling large quantities of cut flowers especially during calendar holidays. In addition, there may be some impulse purchasers who buy flowers in these stores, but they may not be in large numbers. Consumers who want to buy high quality cut flower arrangements and bouquets would not buy them in these stores. So there are just selective opportunities to raise sales of cut flowers through these market outlets. Cut flower growers could have broad opportunities to raise sales through these market outlets, if they are able to supply large quantities at discount prices.

Garden centers' role in raising sales from these products would be limited. In general, the overall dollar income and transaction of cut flowers in these markets appears to be very minimal. But there is still a possibility to raise market shares from cut flower sales through these outlets. In particular, garden centers that can expand their gift intended articles and focus on holiday sales could broaden their market share from selling cut flowers. Warehouse clubs could also provide selective opportunities for these products.

In addition, to the above market outlets, small cut flower growers can use roadside and local restaurants, hotels, offices, etc. to sell their products. The "other" market outlet, in general, could provide selective market opportunity to raise sales.

Foliages – Limited to selective opportunities

The market for foliage plants appears to follow the market for potted flowering plants. Garden centers, super markets and the “other” market segment would provide broad market opportunities for these plants.

Currently, foliage plants are not major items that are sold in garden centers. For example, according to the American Floral Endowment, in 2000-01 garden centers received about 10% their income from sales of foliage plants, while total transaction share for the plant remained at 9% during the same period. But, recent consumers’ interest in buying a combination of different plants, and above all, the rise in container planting appears to have helped garden centers to raise gains from sales of these products. In particular, those garden centers that are able to offer variety and high quality foliage plants combined with different plant arrangements will benefit from this trend.

As mentioned in the previous sections, supermarkets are becoming major retail outlets for nursery and greenhouse products. This trend would also support foliage plant growers. In particular, those growers work together with supermarkets to sell different plant combinations adding some design elements that increase the use of foliage plants would have broad opportunities to raise gains from sales.

In the “other” market segment landscapers and interiorscape firms who are working with individual consumers and with malls, hotels, and other businesses can improve sales of these plants. Retail operations at nurseries and greenhouses have also the opportunity to expand sales of these plants.

Retail florist shops would mainly use these products as additions in their pot plant designs and arrangements. In particular, plants with unique color and foliage textures would benefit from this market outlet. However, this market outlet would provide only selective opportunities for foliage plant growers.

Mass merchandisers and home centers are also expanding the market for foliage plants. Especially, home centers like Home Depot are even trying to introduce brand products focusing on foliage plants. However, these market outlets would carry products from selected suppliers or focus on specific varieties, colors, sizes, shapes, etc. Therefore, foliage plant growers would have selective opportunities to raise gains from sales through these market outlets. The Internet and warehouse club market segments would provide limited opportunities.

Herbaceous perennials – Selective to broad opportunities

Herbaceous perennial growers would have broad opportunities to raise sales through garden centers, home centers and the "other" market segment. Being one of the major retail outlets for bedding and garden plants, garden centers would continue to play a significant role in raising sales of herbaceous perennials. Especially garden centers that offer different plant varieties, unique foliage and flower colors, and make different arrangements and combinations with annuals that are attractive to consumers will have broad opportunities to raise sales.

Herbaceous perennials can also benefit from a continued use of professional and DIY service providers who want to add these plants in their garden design and decoration elements. This group may usually purchase the plants directly from growers or in home centers. Home centers would be the preferred market outlets to these consumers and others who also want to buy other items like garden supplies or building materials at one stop shopping. Those consumers, for example, new home owners, who want to buy large quantities of these products at discount prices, may also buy them in home centers. Therefore, home centers and the "other" market segment would provide broad opportunities for herbaceous perennials.

Retail florist shops, supermarkets and mass merchandise retail stores would continue to provide selective opportunities for these products. Florists may have space problems to carry large quantities and different varieties of herbaceous perennials. But they need them in their flower arrangements for different purposes. Herbaceous perennial growers would particularly benefit from those florists who can come up with unique ideas and flower recipes that enhance the use of herbaceous perennials in different plant mixes and container combinations.

Supermarkets are steadily increasing their plant assortments and overall plant sales. But, in terms of herbaceous perennials, they would still be selective and carry only limited number of varieties. Sales through these market outlets could be raised, if growers are in a position to offer different combinations of annuals and perennials as container plants that are attractive for the consumer who normally wants to make one stop shopping in these markets. Mass merchandise retail stores would also expand sales of these products. But, again here they will focus on selected varieties and assortments that are available in relatively large quantities and at discount prices. Individual growers who have supply agreements with these centers can increase gains from sales, if they are able to supply large quantities of these plants. The Internet and warehouse clubs would provide limited opportunities to raise sales of these products.

Ornamental trees and shrubs – Selective opportunities

Garden centers and the “other” market segment provide broad market opportunities for tree and shrub products.

Ornamental trees and shrubs are not suitable products for the impulse purchaser. They are normally purchased by consumers who have the experience with the plants or by those who are planning to have these plants in their garden. Consumers who are looking for variety and high quality trees and shrubs would continue to buy these products at garden centers. In particular, sales would be high, if the centers offer new varieties, colors, etc. of trees and shrubs that are appealing to the consumers.

These plants would also have broad opportunities in the “other” market segment. Trees and shrubs are plant products that are mostly needed by the professional landscapers. A significant portion of these plants is normally sold through professional garden and lawn service providers. Therefore, the other market segment would continue to provide broad opportunities for these plants.

Home centers, supermarkets and mass merchandise retail stores would tend to buy standardized plant products that fit into their space. Thus it will be challenging for tree and shrub growers to supply large volume of perfectly standardized and acceptable trees and shrubs for sale through these market outlets. In particular, those growers who want to focus on different varieties and species will have difficulties to meet the requirements of these retail stores. So growers in this category will have selective opportunities to raise sales through these market outlets. In addition, some of the stores may not have adequate parking lots that are required to be used for plant loading and unloading. But in the future, some of these market outlets, in particular, home centers would provide broad opportunities for these plants. Consumers who want to have one stop shopping would use these market outlets to purchase both plants and other home building and garden supplies. In addition, the middle-aged consumers who are active in building or buying new homes may continue to use the home centers as sources of their plants.

Retail florist shops, the Internet and warehouse clubs would provide limited market opportunities for these products. Retail florist shops are normally small to carry large volume of trees and shrubs. Similarly these are large-size plants that are expensive for Internet marketing. There are, however, some Internet uses to sell trees and shrubs. But the share is still very minimal.

Growers of trees and shrubs have an enormous opportunity to expand sales through other market outlets. There are many non-traditional market outlets that could be developed for this product segment. For example, the creation of green belts in residential quarters and increasing the amount of green spaces in urban and suburban areas are continuous goals of many municipal leaders and city and township planning commissions. There are also efforts to establish shelterbelts and environmental patch forests on city fringes by planting trees. Down town development agencies of big cities are currently struggling to bring nature to these areas. Ornamental trees and shrubs are key elements of these efforts. Establishment of long green corridors along major highways, ring roads, rivers, rail lines, etc. using ornamental trees is common in some places. Some cities are planting trees to reduce noise, create scenic spots and reduce air pollution. In many cities, downtown parks are being created and city center roads are being planted with trees, shrubs and other perennials. For example, some of the big cities have plans to cover a large portion of the cities land by trees, flowers and meadows. There are also other much bigger trends in some countries. For example, in China, some ancient cities are being transformed into a modern garden city, with hotels and public facilities being encouraged to follow the models of ancient gardens, incorporating pools, bridges and rockeries (Moody, d4, p1-2). All these are still untapped markets for ornamental tree and shrub growers.

Some major changes and trends in marketing nursery and greenhouse products

Following are some of the major emerging trends that will affect future market developments for products within this sector.

(1) Home centers are increasingly becoming more powerful in flower and plant marketing. Home centers such as the Home Depot are becoming more powerful in selling flowers and plants. Changes in the consumer's lifestyle have contributed to this. In particular, with the surge in the home building and improvement industry in the last decade, home center have taken advantage of the burgeoning consumer interest in gardening and landscaping (Mintel, gardening products, 2001). They have particularly benefited from offering consumers broad selections of lawn and garden items, including plants, tools and equipment, and fertilizers and chemicals. According to Pohmer (2004), for example, the dollar share of home centers has jumped from 3.9% in 1993 to 11.1% in 2003. Similarly, the share in the number of purchase occasions has increased from 5.3% to 12.4% during the same period. For mass merchandise stores the dollar share has increased from 7.7% to 8.3%, while the transaction share has increased from 12.9% to 15%. Supermarkets' shares have seen a growth from 12.7% to 17.4% in dollars and from 25.2% to 30.6% in transaction. In order to strengthen their position in retailing these products, some home centers like the Home Depot have already started working with growers to expand their in-store garden center. Home Depot is also in the process of restructuring its suppliers' channel. For example, until recently a grower was required to supply about 50% of the product to 100 stores. Now they are providing 80 – 100% not to more than 50 stores. In this way, small growers are now required to serve only a few stores[61].

In addition, the pay-by-scan method has started gaining acceptance in flower and plant marketing. The Home Depot has already started testing this program. By applying this method, payments are made for plants that sell and the supplier is required to make more drops per day and per week, while the home centers and mass merchandisers are not required to have large inventory in their stores. This approach would eventually help the

[61] http://www.floracultureintl.com/archive/articles/592.asp - Beytes, C. On the record with Bob Jacobson

retailers to have more accurate stocking, inventory tracking and loss prevention. Wal-Mart has already its own system that is used to track pallets in its supply chain.

There are also some other trends that support the growers' activity. Some home centers and mass merchandisers have started hiring qualified and trained staff in their nursery department. There are these days an increasing number of trained staff who are working in the stores garden centers tending to plants (watering, feeding, grooming, facing displays, etc.) Recently, the Wall Street Journal (03/03/05) reported that home depot has put more than 4,000 employees through a computerized gardening course organized by the University of Georgia.

Also in-store promotions are becoming increasingly popular as these markets attempt to gain more of a share of the flower market. Supermarkets are, for example, running in-store promotions that include free give-a-ways (Mintel, flowers and potted plants, 2001).

(2) Garden centers are becoming more up-scale. Garden centers are currently facing fierce competitions from supermarkets, home centers and mass merchandise stores. Market growth in recent years in these markets has been low. For example, the dollar share for garden centers has been 19.6% in 1993 and 20% in 2003, showing no change in ten years (Pohmer, 2004). The share in the number of purchase occasions has declined from 16.2% to 12.1% during the same period. So, in order to remain competitive, garden centers are changing themselves. They are not only adding more flowers and plants to their sales, but they are also focusing on high quality products, new varieties, colors, flower and foliage textures, etc. There are now an increasing number of upscale garden centers that are offering high-end flowers and plants such as potted orchids. Some garden centers are becoming a kaleidoscope of colors and assortments and they are working to improve their plant selections in order to attract consumers. For example, an upscale garden center in Japan is surrounded by free standing homes with gardens[62]. It has wide aisles, large assortments, appealing in-store displays and a broad range of outdoor trees, shrubs, perennials, ground covers and annuals. The front doors are flanked on both sides by an impressive display of fresh cut flowers.

[62] http://www.floracultureintl.com/archive/articles/1151.asp - Hamrick, D. Japan's transitioning retail scene

In addition, many nurseries and garden centers have expanded beyond greenhouses and are also selling tools and other related gardening products. Some have even added cafes and antique shops; others are providing how-to workshops that include landscaping advice (Wall Street Journal, 03/03/05). Some have joined cooperative organizations to receive wholesale discounts on various products and to obtain help with in-store promotions, advertising and other business functions (Mintel, gardening products, 2001). Some garden centers have also focused on plants and flowers that are indigenous to the region or locality.

(3) Growers expanding retail operation: Many growers these days are expanding their retail sales area. A retail operation on the front of a greenhouse is not only becoming a way to generate revenue for a grower, but also it has become a comprehensive marketing tool to raise sales of flowers and plants. Growers are using this sales area increasingly to test the market for their new products and trials, and get feedbacks to plan productions for the coming seasons. Some greenhouses have become very innovative in using these stands. For example, a manager of one nursery and garden center in Kentucky observed that geraniums were selling well at the retail center, especially prior to the Kentucky Derby. They talked to consumers and found out that people want to add colors to their patios for Derby parties. Then they decided to expand their geranium production designed for this special purpose. From their retail operations at greenhouses, some owners in Michigan also found that certain products did not have enough colors for the customer. So they cut back the production of these plants and changed their production to those plants that offered more attractive color to the consumer. Another grower with retail operation at the greenhouse in Kentucky discovered that purple Petunia are appealing to his local customers. The retail market outlets are also being used to expand the sales season for the grower (Holst, 2002f).

(4) Finding the niche for retail florist shops: Although their numbers are declining, retail florist shops still maintain a significant presence in the nursery and greenhouse sector. But in recent years, their market share has experienced a steady decline. For example, their dollar market share has declined from 34.5% in 1993 to 24.4% in 2003. Similarly, the share in the number of occasions has declined from 17.8% to 10.6% during the same period (Pohmer, 2004). The major challenges for these shops include energy prices, consumer-direct shipping and lack of customer loyalty.

Therefore, the future existence and growth of these shops depends on their ability to look for innovative solutions that support growth in their marketing activities. Location is one of the key factors that need to be considered. For example, the U.Goto florist in Tokyo is located not only in one of Tokyo's hottest business districts and is surrounded by trendy bars and clubs but also they cater to the area gift market[63]. These shops also need to be innovative in their flower arrangements, sales strategies, flower displays, etc. In the U.Goto florist shop, for example, one finds only the highest quality products that are displayed with fine design and fine furniture – including elegant paneling, imported tile and marble countertops form the backdrop of flowers and plants. The store is a demonstration of consumer trends and how those trends can be reflected in flowers and plants. The retail shop has a floral designer from the Netherlands.

Other retail shops are designed to attract a specific consumer group. Again another example from Tokyo, "the PLANTS*PLANTS shop is located in a high traffic corridor that thousands of people pass through and everything inside the store is designed to be small and easy to carry[64]. Design of the products and the store itself is geared towards young people, with bright colors and trendy looks[65].

Others are focusing on using different tricks of light, glass and mirror and other decoration elements to have a better look and eventually to attract consumers. These combinations can be used to manipulate the space and color in indoor and outdoor shaping, adding depth and illusion.

7. Branding

In contrast to most consumer products in the U.S., many flower and plant products are not marketed or recognized by brand names (Mintel, flowers and potted plants, 2001). Though several companies are interested in establishing a brand identity in the floral market (e.g., Dole, Sunkist, Gerald Stevens, Hallmark), this is still in its infancy.

---

[63] http://www.floracultureintl.com/archive/articles/1151.asp - Hamrick, D. Japan's transitioning retail scene
[64] http://www.floracultureintl.com/archive/articles/1151.asp - Hamrick, D. Japan's transitioning retail scene
[65] www.p2-plantsplants.com

Some of the challenges in branding flower and plant products include the following: (1) In order to be successful in brand names, the products need to be distinguished from others and have a relatively long successful commercial life. Due to the significant growth in royalty and license income for new breeding activities, although more new varieties have been introduced in recent decades, simultaneously the life cycle for these new varieties has decreased. (2) Branding requires the development of some kind of market power within the supply chain that influence the purchasing behavior of the consumer. This requires strong marketing and advertising efforts, which is currently challenging for individual growers. (3) Nursery and greenhouse associations and auction markets are faced with different challenges in developing a brand name for a specific variety. If the association or the auction market, for example, launches a rose, the gerberas or dianthus growers would ask for the same effort making it difficult for the organizations to meet such demands for a large number of flowers and plants. Some experts within the industry are also not interested in branding by variety because they think this encourages competitors to compete with you with me-too breeding. Surfinia petunia was mentioned as a good example for this. When Surfinia first came on the market, production has been increased and a lot of marketing and promotion work has been done to raise sales from the product. But now adays, many me-too productions have increased and flooded the market. Eventually, the product has become a commodity sold at commodity-based prices than at a higher, differentiated price. Wave petunia and Dragon Wing begonia have also seen the same trend.

There is also a sense that consumers do not care whether a specific plant product is sold using a brand name or not. Some companies within the sector have the feeling that consumers are not interested in brand or variety names. Rather they are looking for other characteristics such as color, price, etc.[66].

Despite these challenges, however, some of the flowers and plants that are currently sold in some home centers and mass merchandise stores are becoming less of a commodity. In addition, there are some emerging brand names and products within sector.

[66] http://www.floracultureintl.com/archive/articles/81.asp - James, L. Strength in variety

One important brand name is Proven Winners[67]. It is one of the most successful international brands that includes the growing and marketing of a comprehensive range of plants and flowers. Since its establishment in 1992, Proven Winners has significantly expanded its international presence. Now there is Proven Winners North America, Proven Winners Europe, Proven Winners Southeast Asia, and also Proven Winners in South Africa. Their plant products need to be tested and proved to be suitable for specific locations, and best performing, colorful and versatile before they bear the Proven Winner name. Proven Winners is working with more than 50 breeders to develop new plant selections and varieties. They are partnering with selected regional propagators and nursery and greenhouse growers to supply a variety of large quantities of different plants and flowers on the market. The Proven Winners group also sells a complementary brand called Proven Selections, which consists of regional favorite varieties that complement Proven Winners. There are currently many Proven Winners certified garden centers and propagators.

Simply Beautiful is another national brand name that was recently introduced by the Ball Horticultural company with products exclusive to the company. There are also some new in-store brands. For example, the Home Depot is trying to introduce a national brand program referred to as the Home Depot Viva brand. Viva focuses on outdoor plants and it is exclusive to Home Depot. It includes lines of herbs, vegetables, and other plants that have premium colors[68]. Products under the Viva brand are to be supplied by a group of regional and local small growers that come together to apply specific practices in plant growing and marketing. The Home Depot is also working to introduce another brand program called "Green Standards" that focuses on indoor plants. Specifically, this is a tropical foliage plant program coming from four or five different vendors. Products in the green standard line are indoor plants that are grown longer. The plants are coming with their own accessories including soil, pots, etc.[69]. Recently, Lowe's is also working with breeders to devise plant varieties for its new exclusive plant brand, Garden Club Select

[67] http://www.colorchoiceplants.com/about_us_pro.htm,
http://www.lovelandgardencenter.com/proven_winners.htm.

[68] (http://www.vivagarden.com/press/brands.asp, http://www.vivagarden.com/press/article.asp

[69] http://www.floracultureintl.com/archive/articles/592.asp - Beytes, C. On the record with Bob Johnson

(Wall Street Journal, 03/03/05). Other brands include a line of Martha Stewart garden products introduced by Kmart in 2001, ranging from gloves and clogs to actual plants, primarily annuals and roses (Mintel, gardening, 2003).

In general, the flower and plant market is currently highly fragmented and branding in the nursery and greenhouse sector is still at its early stage. Thus there are still broad opportunities for growers and retailers who want to develop national, regional or in-store brand products.

8. Impacts on production practices

Product innovation starts with the consumer. Wellness, indulgence, convenience, ethnicity, fashion/design, homeownership, value and demographic forces are the primary market drivers that can initiate new product development in the nursery and greenhouse sector. In the future, nursery and greenhouse growers who are market-driven and customer-focused will have broad opportunities to raise sales from their products.

Traditionally, many conventional nursery and greenhouse growers have done little to realize these opportunities. They are mostly focused on reducing costs to maximize profits from their existing operations. The opportunities listed in the previous sections are, however, strong indications of the significance of market oriented product innovations for their successes. The shift to market-driven production will result in developing numerous niche products, which can be exploited both by large and small growers. A differentiated product with high customer value reflected through the needs and wants of the ultimate consumer is the key to top success. With the increasing lifestyle changes and the dominance of the fashion and design industry, flowers and plants have broad opportunities to be part and parcel of indoor and outdoor design and decoration elements. They are also becoming important products in fulfilling plant demands of the new homeowner and other indulgent and convenient-oriented consumers. There are also many technological changes, and ethnic and demographic shifts and changes that are positively affecting the nursery and greenhouse sector.

In general, both large and small nursery and greenhouse growers, propagators and breeders have a broad range of opportunities to grow and market flowers and plants. In particular, many niche product and market opportunities and ideas in both perennials and annuals appear to exist for small growers who want to sell their products at farm stands and greenhouse retail operations or at any other local market. These growers can benefit from the willingness of an increasing number of consumers to pay a premium for unique and new flowers and plants. Thus growers who can make an effort to introduce new innovations to develop new varieties or hybrids, that have demand in a given region or locality, have many opportunities to raise sales. For example, small growers can have the market advantage of being able to supply fresher flowers, as well as being able to provide the hard-to-find or difficult-to-ship specialty flowers. There are also different opportunities for existing flower and plant businesses to make switches and adjustments in their current production practices.

Although limited in scope, organic gardening can also benefit from the current trend. Organic and ecological gardening may be attractive to some consumers who have the desire to have a garden free from pesticides and insecticides. Growers can also jump into new and untapped flower and plant production practices that may generate higher profits. There are, for example, hydroponics and water gardening practices that are emerging and expanding within the sector. For example, some companies in Brazil are growing roses and gerbera in coco peat pots[70].

9. Conclusion

The present paper centered on the broader identification of product development and market opportunities for the nursery and greenhouse sector in Michigan, Ohio and Wisconsin. The results from the rapid opportunity assessment show that there are a broad arrays of opportunities suitable for growers, brokers, wholesalers, distributors and retailers. These opportunities are driven by the changing consumer wants, needs and perceptions. Wellness, indulgence, fashion/design, convenience, home ownership, ethnicity, value and demographic changes are the primary market drivers that shape the consumption trend in the nursery and greenhouse sector. Understanding of these market trends is fundamental for individual businesses who want to develop and introduce new products.

[70] http://www.floracultureintl.com/archive/articles/178.asp

By listing potential product development and market opportunities for a wide variety of nursery and greenhouse products, the paper paves the way for new thinking and the search for new ways to product and market innovations in the nursery and greenhouse sector of the three states. It shows that opportunities are not limited within the box. Product innovations in other sectors are part of the solutions for successes businesses in the sector. The paper also presents a series of focus points that can be used to start thinking about the strategic benefits of these product innovations for sector. These opportunities can thus serve as a starting point for the industry to formulate and mange broader product innovation strategies and resources that secure greater success.

10. References

Brockman, T. Perennial market sees continued growth. *Greenhouse Buisness,* August, 2004, volume 10, No. 8.

Chen, J. et al. 2002. Development of new foliage plant cultivars. In. Janick, A. and Whipkey, A. (eds.). Trends in new crops and new uses. ASHS press, Alexandria, VA.

Food systems group. Hispanics at the store. http://www.vancepublishing.com/FSI/articles/0409/0409hispanic.htm (10/15/04).

Higgins, A. Nursery and plants get bigger and bigger, with prices to match. The Washington Post. 06/24/2004.

Holst, A. 2002a. Bedding, pot plant markets expand. *Greenhouse Business*, September, 2002, volume 8, No. 9.

Holst, A. 2002b. Perennials witness strong growth. *Greenhouse Business*, August, 2002, volume 8, No. 8.

Holst, A. 2002c. Carnations bring success to California grower. *Greenhouse Business,* September, 2002, volume 8, No. 9.

Holst, A. 2002d. Exhibitors see value in Pack Trials. *Greenhouse Business,* June, 2002, volume 8, No. 6.

Holst, A. 2002e.Orchids proved to be profitable crops. *Greenhouse Business,* June, 2002, volume 8, No. 6.

Holst, A. 2002f. Retail proving to be a marketing tool. *Greenhouse Business,* June, 2002, volume 9, No. 10.

http://aboutflowers.com/workplace/research.htm

http://aggie-horticulture.tamu.edu/greenhose/nursery.. Capturing the impulse sale.

http://www.balldiscoveries.com

http://ccfc.org/

http://ccfc.org/search/search.idq?CiRestriction=zantedeschia&CiMaxRecordsPerPage=10

http://msucares.com/news/print/sgnews/sg04/sg040826.html

http://www.ccfc.org/design/stories/consumertips/summervari.html - Summer varieties from California.

http://www.colorchoiceplants.com/about_us_pro.htm

http://www.cpvo.eu.int/ - European Union community plant variety office

http://www.floracultureintl.com/archive/articles/592.asp - Beytes, C. On the record with Bob Jacobson. Floraculture International.

http://www.floracultureintl.com/archive/articles/651.asp - Beytes, C. Speaking with an accent. Floraculture International.

http://www.floracultureintl.com/archive/articles/707.asp - Broersma, J. Mechanization drives success. Floraculture International.

http://www.floracultureintl.com/archive/articles/1154.asp - Broersma, J. Biosfeer. Floraculture International.

http://www.floracultureintl.com/archive/articles/1189.asp - Downing, T. and Fields, L. New Zealand zantedeschia story.

http://www.floracultureintl.com/archive/articles/948.asp - Fenton, L.N. The orchid heart of Asia. Floraculture International.

http://www.floracultureintl.com/archive/articles/834.asp - Fenton, L.J. Looking for what we do not know how to ask for. Floraculture International.

http://www.floracultureintl.com/archive/articles/1210.asp - Fenton, L.J. and Beytes, C. HortiFair 2004. Floraculture International.

http://www.floracultureintl.com/archive/articles/65.asp - Hamrick, D. Beekenkamp ornamentals: Finely tuning the market. Floraculture International.

http://www.floracultureintl.com/archive/articles/767.asp - Hamrick, D. German ornamental production. Floraculture International.

http://www.floracultureintl.com/archive/articles/922.asp - Hamrick, D. and Laws, N. What's new with roses, Floraculture International.

http://www.floracultureintl.com/archive/articles/1151.asp - Hamrick, D. Japan's transitioning retail scene. Floraculture International.

http://www.floracultureintl.com/archive/articles/81.asp - James, L. Strength in variety. Floraculture International.

http://www.floracultureintl.com/archive/articles/1157.asp - Kras, J. Dutch comfort, Floraculture International.

http://www.floracultureintl.com/archive/articles/1186.asp - Laws, N. The world's fascination with potted orchids. Floraculture International.

http://www.floracultureintl.com/archive/articles/1152.asp - Moody, H. Urban greening in China. Floraculture International.

http://www.floracultureintl.com/archive/articles/178.asp - Pizano, M. Ceara, Brazil: Europpe's newest flower source? Floraculture International.

http://www.floracultureintl.com/archive/articles/295.asp - Shoemaker, M. Consumer Buzz. Floraculture International.

http://www.floracultureintl.com/archive/articles/657.asp - Shoemaker, M. Consumer Buzz. Floraculture International.

http://www.floracultureintl.com/archive/articles/841.asp - Suarez, E.Y. Accessing Argentina's vast genetic potential. Floraculture International

http://www.flowerpossibilities.com/newPoss.html

http://www.flora-links.org/pdf/specificpurchase.pdf - Zavada, B. Understanding floral product buying patterns when purchasing birthday gifts. American Floral Endowment

http://www.garden.org/regional/report/national - National Garden Association, News.

http://www.kennedyscountrygardens.com/shrubs_n_trees.htm - New plant tree; Trees and shrubs.

http://www.lovelandgardencenter.com/proven_winners_htm

http://www.mnla.org/buyersguide/buyersguideBrowse.cfm - Michigan Nursery and Landscape Association – Buyers guide.

http://orchidsbyhausermann.com/ - Orchids by Hausermann web site.

http://organicgardening.com/feature/0,7518,s1-5-18-182,00.html

http://www.p2-plantsplants.com

http://parkseed.com – Parks Garden

http://plantpatent.com/archive/archive001.html#news013

http://plantpatent.com/archive/archive004.html#news022

http://www.provenwinners.com/informationcenter/articles/content.cfm - Proven Winners - Where new plants come from.

http://www.provenwinners.com/plants/?doSearch=1 – Proven Winners plant search

http://www.provenwinners.com/plants/?doSearch=1&viewType=Perennial – Proven winners perennials

http://www.provenwinners.com/media/pressreleases/ - Proven Winners awarded silver medals for new plants.

http://safnow.org/flowertherapy.cfm

http://www.upov.int/en/documents/c/38/C_38_07.pdf - Plant variety protection statistics

http://www.upov.int/en/publications/tg-rom/tg_index.htm - test guidelines

http://www.usna.usda.gov/Newintro/index.html - The U.S. National Arboretum – Plant introductions and releases

http://www.whiteflowerfarm.com – White flower farm.

http://www.vivagarden.com/presss/article081104.asp

http://www.vivagarden.com/presss/brands.asp

http://www.vivagarden.com/presss/article.asp

Mintel. Gardening, U.S., December, 2003.

______. Gardening products, U.S. July, 2001.

______. Flowers and potted plants, U.S., May, 2001.

Pohmer, S. U.S. Flower buyers : What do we know about them. Presented at the Seeley Conference, Cornell University, Ithaca, NY, June, 27, 2004. Pohmer consulting group/Flower promotion organization.

Senauer, et al. 1991. Food trends and the changing consumer. Eagan press, Minnesota, USA.

Sherman, J. 2002. MSU horticulture gardening institue launches new container gardening program. http://www.newsroom.msu.edu/site/indexer/1012/content.htm.

Snyder, R. 1984. The new trees and shrubs, Flower and garden magazine.

USDA/ERS, 2004a. Floriculture and nursery crops situations outlook yearbook, FLO-2004, June 2004. ,

USDA/ERS. 2004b. Floriculture and nursery crop outlook, electronic output report from ERS – www.ers.usda.gov, FLO-03, September 23, 2004.

Wall Street Journal. 02/04/05. Wardrobe malfunction : As consumers find other ways to splurge, apparel hits a snag.

Wall Street Journal. 03/03/05. The war of the roses.