

REGIONAL CONNECTIONS

Metropolitan Portland's Nursery Industry Cluster

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Executive Summary

The nursery products industry has been an important contributor to the economic health of the Portland metropolitan area in the past decade. The region's cluster of nursery businesses consists of more than 1,000 mostly small, locally owned firms, employing more than 10,000 workers, and generating annual sales of more than one half billion dollars annually. At a time when agriculture has struggled in the rest of the state and nation, the region's nursery products producers have flourished, growing almost twice as fast as the industry nationally, and becoming Oregon's leading agricultural product. Nursery products differ greatly from traditional agriculture. Most of the state's production is concentrated close to the most densely urbanized part of the state; rather than producing bulk commodities for the mass market, nurseries produce highly differentiated, high quality products, targeted at high end residential and commercial markets. While the region's mild climate provides an important advantage in growing large, healthy plants, the strong industry wide cooperation in marketing, quality improvement, and other services through the Oregon Association of Nurserymen is a key factor in the success of the cluster.

The nursery industry of the Portland metropolitan area is a national leader in the production of trees, shrubs and other live plants used in residential and commercial gardening and landscaping throughout the United States. Tightly concentrated on the fringes of the urbanized portion of the metropolitan region in the Northern Willamette Valley, the industry consists of more than 1,000 producers, many of which are small,

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Regional Connections work products include a technical report - "Progress of a Region: The Metropolitan Portland Economy in the 1990s"- briefings on the regional economy and a series of working papers summarizing the project's studies of the region's industry Clusters, including high technology, metals, creative services and nursery products.

For more information about Regional Connections, contact Ethan Seltzer at 503-725-5170 or visit our website at www.upa.pdx.edu/ims/regcon/regecon.html.

owner-operated firms. In all, the cluster employs more than 10,000 workers and has annual sales of over half a billion dollars.

The Oregon nursery products industry accounts for about 11 percent of all the nursery products produced in the United States. The sales by Oregon producers are growing at nearly twice the rate they are in the rest of the nation: more than nine percent annually in Oregon compared to about five percent nationally. The state has strong specializations in deciduous and conifer trees and shrubs but is a relatively small producer of cut flowers.

While the region's mild climate provides a critical competitive advantage in growing large, hardy plants, nursery products differ in important ways from traditional agriculture. Nurseries use land much more intensively, producing about ten times the output per acre than other farms. The industry markets the bulk of its products outside the local area, seeking out high-end markets by distinguishing itself based on product quality. Outside of Oregon, the most important markets are new residential and commercial development in the U.S. Midwest and East. The industry has benefited from a strong construction market, rising household incomes, and growing interest in attractive landscaping. Competitive success comes from product differentiation, a strong emphasis on marketing to key retailers and end consumers, and access to transportation, both for products and buyers. The region's nurseries also produce literally thousands of different products making new product development a key aspect of competition.

Metropolitan Portland's nurseries compose a vibrant industry cluster, reminiscent in many ways of the Italian industrial districts that helped popularize the industry cluster concept. It is composed overwhelmingly of small firms who possess a strong ethic of cooperation and a robust, widely recognized industry association which provides significant benefits and services to its members. A majority of the region's commercial nurseries are members of the Oregon Association of Nurserymen (OAN). The OAN organizes cooperative marketing efforts, including a nationally important trade show, a web site featuring over 3,000 plant varieties, quality improvement activities, transportation brokerage, research and development, and construction of an "Oregon Garden," a major tourist destination designed to showcase the industry's products. There are also strong social networks of informal cooperation among producers.

Oregon nurseries are essentially a metropolitan industry—about five-sixths of the state's output comes from the counties of metropolitan Portland plus Marion County. Easy access to freight transportation for its perishable product, plus the close proximity of most producers to buyers flying into Portland International Airport, are key locational advantages. In addition, the tight clustering of nursery product producers in the Northern Willamette Valley supports a strong base of specialized suppliers of equipment, inputs and services.

Like all agriculture, nurseries can only be established where the climate, soils and availability of water permit. In the metropolitan area, state land use and farmland protection laws have enabled producers to continue to be able to farm, even in the shadow of urban development.

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Metropolitan Portland's Nursery Industry Cluster

Introduction

The nursery industry is an anomaly in agriculture. We often picture farming as largely rural; most farmers grow a few commodity crops and sell them to processors or brokers for shipment to unknown consumers. This kind of agriculture, once a dominant part of Oregon's economy, has been declining in relative importance for decades. Nurseries turn these stereotypes on their head. Most of the state's nurseries are in the metro area, within a few miles of the urban growth boundary. These farms produce thousands of different plants, creating and marketing them more like fashion apparel than bulk commodities. And unlike the rest of agriculture, nursery products have been flourishing in recent years, growing faster than agriculture in general and faster than the Portland metropolitan economy. This diverse, rapidly growing, and urban-oriented, agricultural industry deserves a close look as a part of any effort to understand the region's economy.

We have studied the Portland area's nursery products firms as an industry cluster following the theoretical framework developed by Harvard professor Michael Porter in his 1990 book *The Competitive Advantage of Nations*. After an exhaustive study of the world's best firms in a variety of industries, Porter concluded that firms seldom achieve world-class status in isolation, and that with surprising regularity, the world's most competitive firms are found concentrated in relatively small geographic areas. The clustering of firm activity harnesses what Porter calls the diamond of competitive advantage: including firm rivalry, the availability of inputs, supporting industries, and demanding customers. Having many firms engaged in related activities promotes a rivalry that encourages continuous improvement but also enables cooperation among firms to resolve common problems. The presence of a critical mass of firms stimulates the development of related suppliers, making the whole industry more dynamic. Local demand also plays a role in the development of clusters, especially where local customers are particularly knowledgeable about the product produced. The availability of inputs, particularly skilled labor, tends to be greatest where there is a well-established industry. The interaction of rivalry, specialized inputs, demanding customers, and suppliers also bolsters industry competitiveness.

Much of this report is a compilation of data from a variety of different sources. These include data from the Oregon Association of Nurserymen, the U.S. Census of Agriculture, the corporate reporting firm of Dun and Bradstreet, and a special survey of nursery owners conducted by the Oregon Agricultural Statistics Service, as well as records gathered by the Oregon Employment Department. Each of these organizations uses different methods to gather their data, and different definitions of what constitutes a "nursery." Consequently, it is difficult if not impossible to accurately compare data from one source directly with another. For example, counts of the number of nurseries in Oregon range from about 4,200 farms (including Christmas Tree producers) according to the Census of Agriculture, to 271 "ornamental nursery product" reporting units with employment, as computed by the Oregon Employment Department.

The impetus for this report comes from the work of the Regional Connections Project of the Institute for Metropolitan Studies at Portland State University. The objective of this project is to develop a better understanding of metropolitan economy through study of clusters of firms in a variety of sectors including creative services, metals, high technology, and, in this report, nursery products. Our initial report, issued in April 1999, assessed the economic structure and performance of the region's economy in the 1990s and identified industry sectors driving the region's economic expansion.

We wish to extend our special thanks to industry experts who generously shared their time and expertise to provide background information for this report. John Aguirre, OAN's Executive Director, his predecessor, Clayton Hannon, and Jeff McIvor the Director of Marketing & Communications, all of whom have provided invaluable advice and direction, including access to OAN records and introductions to industry leaders who participated in focus groups and interviews for this study. We particularly wish to thank:

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The work of understanding the metropolitan Portland economy begun in the regional connections project in the past two years will be continued in the New Economy Observatory at the Institute for Metropolitan Studies at Portland State University. The Observatory will monitor changes in the performance and health of the regional economy, identify emerging trends in technology, the workforce, and private businesses that affect the economy, and continue to map the progress of the region's clusters.

This report is divided into five parts. Part I provides an overview of the industry, describing its key products and measuring its overall economic impact in terms of sales and employment. Part II examines the key role of markets and marketing in the success of the region's nurseries. Part III looks into the structure of the industry, its many small producers, and the key role of the Oregon Association of Nurserymen in promoting cooperation among firms. Part IV considers the final two aspects of the cluster, input availability and the presence of related and supporting industries. Part V summarizes the report's key findings and conclusions.

I. Dimensions of the Nursery Industry Cluster

The nursery products industry includes firms involved in growing and marketing ornamental trees, plants and shrubs. While Oregon has long had a strong nursery products industry, firms in this industry have exhibited extremely solid growth in the past decade. In fact, nursery products are Oregon's largest agricultural crops, accounting for more than 20 percent of gross farm sales. Further, the state's output of nursery products has increased much more rapidly than the industry nationally.

The nursery products industry is also sizable contributor to the metropolitan Portland economy. As outlined in Table 1 below, the region's nursery cluster is made up of about 1,000 firms employing more than 10,000 workers for a combined payroll approaching \$250,000,000.

These figures understate the full economic impact of the industry for a variety of reasons. Many nurseries are family owned and operated, and the income to these self-employed proprietors is not reflected in the wage earnings reported in Table 1. The U. S. Census of Agriculture counts more than 3,500-nursery producers statewide in 1997, with about 90 percent of these located in the Northern Willamette Valley. In addition, Employment Department data also excludes many temporary employees who work at nurseries but are employed by farm labor contractors. This temporary workforce is a significant source of labor in the industry, especially among the largest growers and during peak periods.

Table 1: Employment and Payroll, Nursery Cluster, Metro Portland & Marion County, 1998

Cluster Segment	Firms	Employment	Payroll
Nursery products	189	6,408	\$125,594,053
Landscape and horticultural consulting services	57	359	\$9,677,547
Lawn and garden services	520	3,226	\$72,750,989
Shrub and tree services	71	306	\$8,201,017
Wholesale flowers and florist supplies	56	791	\$15,772,050
Retail nursery and garden supply stores	97	740	\$15,898,208
Totals*	990	11,829	\$247,893,864

Source: Oregon Employment Department, 1998 Covered Employment and Payroll Data (*Does not include Clark County, Washington. The most recent data available, 1996, shows Clark County with totals for all segments of 137 firms 457 workers)

While peak production periods and seasonal variation is a factor in agricultural employment, the peak periods in nurseries are not as significant a factor as in row crops such as strawberries. Peak production time for nursery field crops is spread out, beginning in mid-March through early spring. Greenhouse crops run about six weeks behind, with landscape services experiencing a later secondary peak.

The largest single component of the cluster is the wholesale plant product industry, made up of firms that produce plants to be sold to other firms who sell them for residential and

commercial landscaping. This involves a broad range of clients. These include inter-industry sales to other producers, plant wholesalers and plant brokers. Sales to end-users include landscapers who work in new residential and industrial construction, as well as to retailers who sell directly to the public. This activity is represented in several Standard Industrial Classification (SIC) Codes that capture activity in production, distribution, retailing, and related services. These include:

SIC 0181	Ornamental floriculture and nursery products
SIC 0781	Landscape and horticulture consulting
SIC 0782	Lawn and Garden Services
SIC 0783	Ornamental Shrub and Tree Services
SIC 5193	Wholesale flowers and florists supplies
SIC 5261	Retail nursery, garden and supply stores

Portland's cluster of firms in these industries accounts for much of the activity in the state. Noted in Table 2 below, the region accounts for \$461,000,000 or 87 percent of the state's \$532,000,000 in nursery products sales for 1998. The region also accounts for more than 32,000 of the Oregon's 38,000 acres of nursery products.

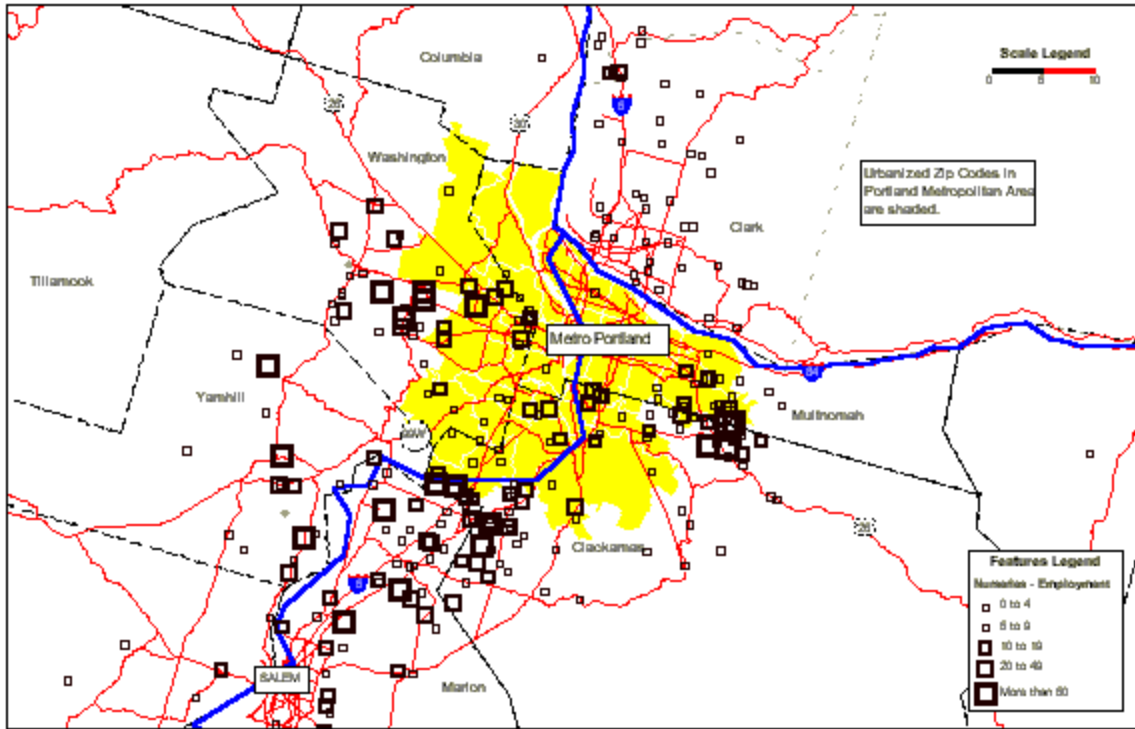
Table 2: Portland Region's Share of Oregon Nursery Industry, 1998

Counties	Acres	Sales
Clackamas	11,700	\$128,500,000
Marion	8,100	\$120,000,000
Multnomah	2,900	\$32,400,000
Washington	5,100	\$97,100,000
Yamhill	4,700	\$83,000,000
Total Portland Metro & Marion County	32,500	\$461,000,000
Total for State	38,130	\$532,000,000
Portland Region's Percentage of State	85%	87%

Source: Oregon Agricultural Statistics Service, 1998 Oregon Nursery and Greenhouse Survey.

As Map One illustrates, most of the region's nursery product producers are clustered in the northern end of the Willamette Valley on the periphery of the Portland metropolitan area. There are a few nursery operations in Clark County in the northern part of the metropolitan area and major concentrations in east Multnomah County, the southern part of Washington County, the northern and western edges of Clackamas County, and northern Marion County.

Map 1: The Nursery Industry in the Portland Metropolitan Area



Source: Dun and Bradstreet, (Environmental Systems Research Institute)

Nursery production is a much more intensive form of agriculture than typical farming and ranching operations in Oregon. Although nurseries account for a little more than one percent of all of the land devoted to agriculture in Oregon, they account for more than 20 percent of all agricultural output. On average, crop production generates about \$270 in farm sales per acre per year. In Table 3 below, nursery crops as defined by the U.S. Census of Agriculture, produce more than ten times that much, about \$2,800 per acre. In fact, more narrowly defined definitions of the industry indicate sales as high as \$14,000 per acre.

Table 3: Farms, Land in Farms and Farm Sales, Oregon, 1997

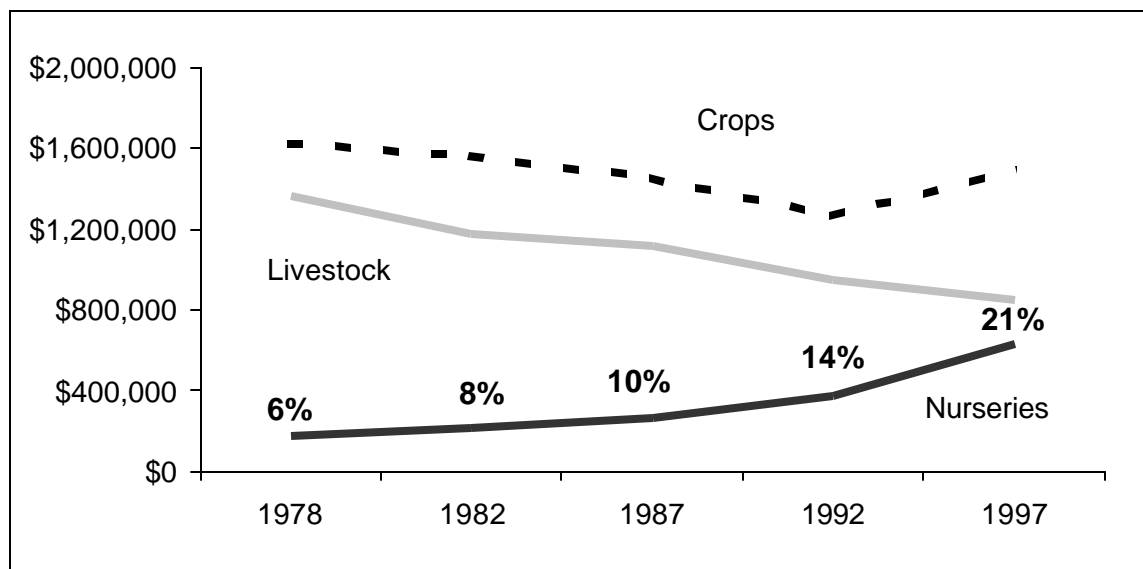
	Farms	Acres	Gross Sales (\$1,000)	Sales per Acre (\$)
Crop Production (except nurseries)	11,358	5,499,146	1,496,494	272
Animal Production	19,182	11,728,083	845,243	72.07
Nursery	3,490	222,064	627,457	2,826
Total, All Farms	34,030	17,449,293	2,989,184	137
Nursery as a Percent of Total	10.3%	1.3%	21.0%	

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture

The historical trajectory of this comparison to other forms of agriculture highlights the industry’s tremendous growth. Expanding from 958 nurseries on 51,000 acres in 1978 to

more than three times that number and acreage today, the industry has bucked the declining trend in general agriculture. Chart 1 illustrates real (inflation-adjusted) sales growth in Oregon agriculture by major commodity group, from 1978 through 1997. Dragged down largely by prices for their products that have failed to keep pace with inflation, the overall value of sales for most of agriculture has declined over the last two decades. The value of crop production, excluding nursery products is still less than it was in 1978; the value of livestock production has declined by more than a third from its level of two decades ago. In contrast, the value of nursery products has increased steadily in real terms, growing from less than \$200 million in 1978 to more than \$600 million in 1997. The total value of nursery products accounted for only about 6 percent of Oregon agricultural production in 1978 but was more than 20 percent in 1997.

Chart 1: Oregon Farm Sales by Product Category, 1978 to 1997



Source: U.S. Department of Agriculture, U.S. Census of Agriculture, various years (All sales figures adjusted for inflation through chain-weighting to 1997 dollars.)

Benefiting from the Portland region's mild climate, the intense productivity of Oregon nurseries has highlighted the importance of the presence of critical mass as a factor in Oregon's nursery products industry. Heavily concentrated in the Northern Willamette Valley, most producers are located on the periphery of the Portland metropolitan area. Critical location factors drawing these firms include access to region's transportation infrastructure, as well as the proximity to other firms and industry suppliers. In addition, growers interviewed for this study cited easy accessibility of nurseries to out-of-state buyers as a competitive advantage. With most nurseries less than a one-hour drive from Portland International Airport, industry buyers are able to view production facilities and inventory through on-site visits to multiple nurseries.

II. Markets for Nursery Products

A critical characteristic distinguishing nursery products from many other agricultural crops is the high degree of product differentiation and strong emphasis on marketing. Unlike wheat, cattle, milk, or other agricultural products, which are priced and sold as commodities and where there is little direct connection between growers, retailers and end customers, the nursery industry is characterized by enormous product diversity and strong ties between growers and retailers and end consumers. Understanding the nature of markets for nursery products is a key to explaining the success of the Oregon nursery products industry.

Oregon's Product Specialization and Quality Shape Markets

Industry members participating in focus groups conducted for this study viewed themselves as the nation's market leaders in "woody stem" product, a diverse range of live trees, shrubs, and ornamentals that are shipped across the country. In fact, through inter-industry sales of immature product and seedlings, growers suggested that a large share of the nation's trees spend some time in Oregon soil. Acclimatized by Oregon's weather, nurseries in the state are able to produce particularly hardy stock that has a long "shelf-life" that further expands their market reach.

The dominance of "woody stem" production is overwhelming. The top three categories of plant listings found in the Oregon Association of Nurserymen's (OAN) Buyer's Guide, the leading source of product information on the industry, are all woody stem products. In fact, of member firms listed in the directory, a large majority produce either shade and flowering trees, deciduous shrubs, trees and broadleaf evergreens, and conifers or a combination of all of the above. Soft stem products such as annuals, perennials and ground cover trail significantly in the listings.

A majority of the state's nursery products are shipped out-of-state. As noted in Table 44 below, the Mid-West, Northeast, and Mid-Atlantic regions are major markets. Some producers identified New York and New Jersey as particularly demanding markets for their most specialized products. Looking further south, the Atlanta area was identified as a "break-even point" where costs of shipping make Oregon products less competitive with locally grown material.

Table 4: Destination of Sales, Oregon Nurseries 1991-1995

Destination	1991		1995	
	Total Sales	Percent Market	Total Sales	Percent Market
Oregon	\$92,260,000	27%	\$126,435,000	30%
Upper Midwest	\$58,700,000	17%	\$68,915,000	16%
Northeast States	\$40,600,000	12%	\$51,375,000	12%
Washington	\$45,570,000	13%	\$47,410,000	11%
Mid Atlantic States	\$23,120,000	7%	\$32,107,000	8%
California	\$22,700,000	7%	\$30,911,000	7%
Western U.S.	\$25,460,000	7%	\$27,240,000	7%
Gulf States	\$10,410,000	3%	\$13,275,000	3%
Western Canada	\$11,010,000	3%	\$12,449,000	3%
Eastern Canada	\$10,250,000	3%	\$7,700,000	2%
Foreign Countries	\$920,000	0.3%	\$1,813,000	0.4%
Total	\$341,000,000		\$419,000,00	

Source: Oregon Agricultural Statistics Service, 1997 Oregon Nursery and Greenhouse Survey

Oregon competes in these markets on product quality and diversity. The wide variety of available plant species and their high quality attributable to Oregon's climate and relatively pest-free environment, gives producers an advantage in many Eastern markets. The perceived quality of Oregon products is a substantial marketing advantage. Some Oregon competitors--for example North Carolina and Ohio--can't sell their products in the West because of the danger of Japanese beetle infestations. This barrier is as much psychological as real and regulatory and is bound up with perceptions of the relative quality of Oregon products.

While they are an important market for some producers, making up almost of quarter of sales identified above, local Oregon consumers have decidedly different demands from national markets. Soft stem "color" products, such as pansies and petunias, often grown in greenhouses, are chiefly sold into local markets. The relatively fragile nature of the soft stem products, along with the lack of a climate-based advantage for Oregon in greenhouse production, means that the state does not compete nationally in this market segment. Oregon producers have built local demand for soft stem products, working with commercial landscaping services that apply new products in business, industrial and retail settings, building consumer awareness. Along with the efforts of retailers in marketing new and different products, the result has been that sales of these products have exploded in recent years, with some producers estimating that 70 percent of locally consumed products are soft stem plants.

With the exception of sales to Canada, nearly all Oregon nursery products are sold to consumers in the United States. Restriction in place on the sale or transportation between countries of live plant material with native soils attached generally precludes international trade in this area. While some segments such as cut flowers are traded internationally Oregon is not particularly involved in those markets. The industry has made efforts to open trade with Japan through an exchange of trade missions that will see a large Japanese delegation in attendance this year at Oregon's leading nursery trade show. Trade in items related to the industry is however, relatively important. Genetic material such as seeds, cuttings, and bulbs, as well as technology related to production

cross over national boundaries. European firms are also particularly important sources of advanced technology for the nursery industry.

Industry Performance and Oregon Market Share

The Oregon industry is a major contributor to total output of nursery products in the United States. Further its growth has considerably outpaced that of the nation during the 1990s. Data from the 1997 Census of Agriculture provide comparable data on production in Oregon and the rest of the nation, and are shown in Table 5 and Table 6.

Oregon accounts for about 11 percent of all nursery and greenhouse output nationally. As Table 5 illustrates, Oregon provides a quarter of all Christmas trees and significant shares of nursery crops, seed and bulbs. The state is a much smaller producer of floriculture crops, especially items like cut flowers. These data underscore Oregon’s relative concentration in the woody stemmed as opposed to soft stem products, the latter being heavily concentrated in the floriculture category.

Table 5: Nursery & Greenhouse Crop Sales, 1997, United States & Oregon

Product	Sales (\$1,000)		Oregon Share
	Oregon	U.S.	
Nursery crops	380,505	3,382,161	11.3%
Cut Christmas trees harvested	111,999	441,604	25.4%
Floriculture Crops	100,250	4,881,063	2.1%
Vegetable and flower seeds	18,228	124,099	14.7%
Bulbs, corms, rhizomes, and tubers (dry)	12,192	73,810	16.5%
All other	53,255	2,040,079	2.6%
Total	676,429	10,942,816	6.2%
Total (excluding Christmas Trees)	564,430	10,501,212	5.4%

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture
 (Note: Floriculture crops include bedding and garden plants, cut flowers and cut floral greens, foliage and potted flowering plants.)

Oregon’s sales of nursery and greenhouse products have grown much more rapidly than for the nation as a whole, as illustrated in Table 6. Within the narrower category of nursery crops, Oregon sales have grown nearly twice as fast as the national average over the five years ending in 1997: 9.3 percent compared to only 5.1 percent nationally. Sales in other crop categories have generally outperformed the nation as a whole as well.

Table 6: Annual Rate of Sales Growth, 1992 to 1997, United States & Oregon

Product	Sales Growth, 1992-97	
	Oregon	U.S.
Nursery crops	9.3%	5.1%
Cut Christmas trees harvested	NA	NA
Floriculture Crops	8.2%	6.8%
Vegetable and flower seeds	4.2%	2.9%
Bulbs, corms, rhizomes, and tubers (dry)	1.1%	6.8%
All other	NA	NA
Total	NA	NA
Total (excluding Christmas Trees)	8.8%	6.4%

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture

(Note: Prior to 1997 Christmas trees were not included in the nursery product classification used for the Census of Agriculture. Floriculture crops include bedding and garden plants, cut flowers and cut floral greens, foliage and potted flowering plants.)

Key Forces Driving Markets

The demand for Oregon nursery products is driven by homeowner purchases of landscaping materials, trees, shrubs and flowering plants. There was general agreement among nursery industry participants in focus groups conducted for this study that most of their products go into new construction. Thus, homeowners are the ultimate end users for much of Oregon's nursery stock.

This consumer demand has been a driving force in the industry over time. One long-time industry observer noted "...during the 1980's when times were harder, people were willing to give up meals out, but they kept working on their homes." Noting the value that these consumers have typically placed on convenience and low maintenance in selecting products, a grower articulated the challenge homeowners face: "...even though gardening is cited as the number one leisure activity, you don't go out and plant a shrub like you'd go fishing because its fun."

Increasingly however, with higher income households purchasing extensive landscaping, demand for high quality nursery products seems to be income elastic. Some growers attribute these upscale purchasing patterns to baby boomer desires for instant gratification in the form of large trees that will be the "best on the block" as soon as they are planted.

Consumers are also becoming more educated about nursery products. Cited as one of the top leisure activities, gardening and landscaping are increasingly viewed as desirable hobbies by many. Nursery producers agreed that consumers in general are much more educated and informed than in the past. Armed with information gleaned from garden shows on television, the Internet, and Martha Stewart, consumers arrive at garden centers looking for named varieties, and telling retailers what they want.

Notwithstanding evidence that Oregon has a sizable local market for nursery products, there was consensus among industry observers interviewed for this study that product availability and low prices have "spoiled" Oregon consumers. In addition, the local climate may serve to mediate consumer demand. One producer noted that "...everything

we plant here grows. In other places you plant two to get one, here we plant two and we get three.” Oregon consumers also know that the plants will grow so much here that they may buy smaller product than East Coast consumers who must contend with harsher climates and shorter growing seasons. One industry participant noted that “...here their worst problem is that they have to buy a chainsaw when they buy a rhododendron to keep it back.” In effect, Oregon consumers compete with producers “by not killing stuff.”

This anticipated future plant growth, along with the low price points expected by Oregon consumers, makes them a poor market for high-end nursery products. Growers indicated that most high-end product leaves the state where it can command premium prices in markets with motivated buyers. For example, one producer noted that sales from his high-end specialty mail order catalog are almost exclusively to the East Coast. Smaller “boutique” nurseries that sell directly to local consumers fill a market niche for more demanding local customers.

Nursery industry observers also identified intra-industry sales as equal in significance to consumer markets. Many Oregon producers sell their product not for immediate marketing. Instead, firms sell immature plants to other growers who raise them to be larger and more marketable. Some producers market “liner” stock, ready to replant specimens. Many of these are sold to other producers in Oregon, while others are shipped out-of-state for further growing.

Producers cited landscaping in commercial settings, particularly suburban office and industrial parks, as a substantial and growing market for Oregon nursery products. Encouraged by planning requirements that specify tree planting and vegetative cover, as well as by competition among commercial developers to provide more attractive landscapes, use of nursery products in commercial settings is increasing. This is a market frequently willing to invest in premium products. One observer noted that commercial customers “...don’t mind paying \$500 dollars for a tree...that would buckle the knees of a homeowner.” In addition, industry participants suggested that commercial landscaping also indirectly influences the demand for residential landscaping. After seeing good landscaping, and even particular plants, all day long, workers may then decide to buy them for their home.

New Product Development Results in Significant Diversity

Innovation and new product development and in the industry is undertaken by a number of different actors. New plant development departments are common at larger firms. Plant brokers often introduce exotic species from different parts of the globe. Some small firms and even individual plant collectors frequently hybridize new species.

Demand for various categories of products fluctuates with consumer tastes. Growers attempt to stay current with market trends, and also to introduce new or improved varieties of plants into the market. The frequency of fluctuations in market demand varies according to product segment. Soft stemmed products, with short growing cycles and short lives, fluctuate more than woody stem products that take longer to grow, and typically are much longer lived.

The market reaction to these different rates of new product development is illustrated in the sales by product categories listed below. The largest woody stem product-packaging category is bare root materials, product shipped with exposed roots. This shows significantly less growth in sales than the major soft stem category of greenhouse products. Container products, which are grown in their packaging with the soil that they are intended to be planted in, includes both soft and woody stem product types. Interestingly this most flexible packaging type shows the largest sales growth of all categories.

Table 7: Oregon Nursery and Greenhouse Gross Sales by plant material

Plant Material	Gross Sales		
	1997	1998	Percent Change
Greenhouse	\$95,800,000	\$105,900,000	11%
Container	\$171,300,000	\$188,500,000	10%
Balled & Burlaped	\$77,800,000	\$85,500,000	10%
Bare Root	\$105,400,000	\$109,700,000	4%
Other	\$41,700,000	\$42,400,000	2%
Total	\$492,000,000	\$532,000,000	8%

Source: Oregon Agricultural Statistics Service, 1998 and 1997 Oregon Nursery and Greenhouse Surveys

The sales growth in more flexible material types has coincided with technological changes in new product development. More rapid propagation techniques have sometimes triggered waves of interest in particular new varieties, encouraging unpredictable consumer demand. Many of these products start out at high prices but rapidly penetrate the market. When they become broadly planted, prices in the market decline.

One longtime industry watcher offered a fashion analogy in describing consumer taste. “Its like the clothing industry...you have a few foundation pieces that you buy year in and year out and accessories that are pulled in by landscape architects.” Another nursery industry veteran noted the change in consumers’ interest over time. He pointed out that when his mother landscaped her yard “...it was ten junipers and a plum, and it was a well landscaped yard for its day in ’59. Now, however, it is quite the thing to have the new plants.”

New products and novelty are particularly important in marketing. In response to consumer demand one industry observer noted trying to introduce a new product annually, often varieties brought in from overseas. The diversity of his product line has increased over time. “We used to call a trailing petunia anything that grew up and fell over, now we have ones that literally trail.” He has utilized products that originated overseas, for example bringing heliotrope into the market a few years ago. “The Greeks started it and everyone had forgotten but now purple [the heliotrope plant] is in.”

Historically it has been relatively easy to copy market leaders by propagating successful plants from cuttings, but technology and accepted practices are changing. Industry observers declared that plant patent laws are “...less adhered to than patents in Silicon

Valley.” Legally questionable propagation has not been uncommon. Today, however, with improved technology for verifying the genetic identity and origins of particular plants, and the rising costs of plant development, producers are putting more teeth into the enforcement of plant patents. The diverse product lines that are found in Table 8 indicate the industry’s commitment to new product development.

Table 8: OAN firms by number of plant listings

Plant listings	Firms
More than 500	9
250 to 499	14
100 to 249	58
50 to 99	60
20 to 49	76
10 to 19	54
under 10	108

Source: Authors tabulation from 1999-2000 OAN Directory and Buyer's Guide

Beyond efforts at trend setting, particular plant features may affect product development. Growers indicate that low-maintenance, disease resistant plants that do not require chemicals are very popular. Basket and containers that provide instant results are also in great demand. These require daily maintenance, but consumers are learning how to handle drip irrigation systems. Additionally, sales of dwarf varieties are on the rise, perhaps driven by the shrinking size of customers’ yards.

III. Industry Structure, Firm Rivalry and Cooperation

The nursery products industry is made up overwhelmingly of small firms. Nearly all businesses are locally owned often family-run enterprises. Their interests are connected through a strong cooperative spirit, epitomized by the Oregon Association of Nurserymen (OAN). The OAN not only provides a vehicle for lobbying for industry interests, and discussing policy issues, but also offers important services to its members, particularly in organizing large-scale joint marketing opportunities. Increasingly, the organization and the industry have gotten involved in raising quality standards, increasing research and development, brokering transportation services, and addressing public policy issues related to the environment.

Firm Structure

Table 9 shows the distribution of firms with employment in the nursery products industry. Small firms of fewer than 100 workers make up 98 percent of the firms in the region's nursery cluster. These small firms account for a smaller majority, 65 percent, of employment in the cluster. These numbers leave out a substantial number of the smallest operators that have no reportable employment, such as small owner-operator nurseries that rely solely on family or contract labor. There are approximately 2,500 other nursery products producers who have no employment subject to state employment laws, and are therefore not reported in Table 9.

Table 9: Employment and firms by size, Metro Portland and Marion County, 1998

Firm Size	Firms	Percentages	Employment	Percentages
200 or more	7	1%	2,412	20%
100-199	14	1%	1,796	15%
50-99	23	2%	1,592	13%
25-49	53	5%	1,813	15%
10—24	150	15%	2,143	18%
Fewer than 10	737	74%	1,855	16%
Total	990		11,829	

Source: Oregon Employment Department, 1998 Firm Level Employment Data, and Calculated from annual averages (Does not include Clark County)

Because there are hundreds of firms in the industry and thousands of different plant varieties, few firms produce more than a small fraction of all of the different varieties. Competition tends to be based on product specialization and marketing, rather than on lowest price for a standard commodity. Because no single producer can offer buyers a complete range of plant types, producers find it useful to cooperate on marketing, both informally, by referring buyers to other firms with complementary product lines, and formally through pooling market efforts through their industry association. In addition, there are significant inter-industry sales among producers. Some firms also specialize in a particular stage in the plant life cycle for example: propagating cuttings, growing seedlings, or raising small plants to marketable size. As a result, Oregon firms often buy and sell to one another as well as to out-of-state customers.

When these figures are broken out by industry segment, some differences are apparent. In nursery production large firms of more than 100 workers make up less than ten percent of the total. This means that the top 20 firms account for about half of the more than 3,000 workers in the industry.

Table 10: Employment and firms by size and industry segment, Portland Metro and Marion County, 1998

	Nursery	All Other Categories*	Totals
Distribution of Firms			
100 or more	16	5	21
10-99	106	128	234
9 or fewer	68	671	739
Total	190	804	994
Distribution of employment.			
100 & over	3,164	1,044	4,208
10-99	2,944	2,750	5,694
9 or fewer	301	1,554	1,855
Total	6,409	5,438	11,757

Source: Oregon Employment Department, 1998 Firm Level Employment Data, calculated from annual averages. (*All other includes landscaping, retail nursery and garden stores and tree services. Data does not include Clark County, Washington.)

Another perspective of the distribution of firms can be gained by examining firm size by annual sales level as reported in the Census of Agriculture. Table shows the distribution of nurseries by annual sales level in 1992 and 1997. (Because of a change in industry classification between 1992 and 1997, this table shows only “nursery crops” and excludes floriculture, bulbs and Christmas trees). The total number of nurseries remained virtually unchanged over this five-year period. The number of nurseries with sales of \$1 million or more increased by more than 50 percent, from 42 in 1992 to 69 in 1997.

While most producers are very small (two-thirds sell less than \$40,000 per year in nursery products), the bulk of industry output is accounted for by the largest operations. Only about one in five nurseries have annual sales of more than \$100,000 per year, but together they account for about 95 percent of all sales. The number of nurseries with annual sales of less than \$100,000 has actually decreased, while the number with sales over \$100,000 has increased, from 244 in 1992 to 288 in 1997.

Table 11: Nursery Farms and Sales by Annual Sales Level, Oregon, 1992 and 1997

Annual Sales Level	1992		1997	
	Farms	Sales (\$1,000)	Farms	Sales (\$1,000)
Less than \$2,500	218	265	196	239
\$2,500 to \$9,999	298	1,588	303	1,756
\$10,000 to \$39,999	345	6,733	313	6,363
\$40,000 to \$99,999	132	8,166	132	7,926
\$100,000 to \$199,999	85	11,768	72	9,924
\$200,000 to \$499,999	84	27,128	98	29,393
\$500,000 to \$999,999	33	22,410	49	34,877
\$1 million or more	42	161,258	69	290,027
Total	1,237	239,316	1,232	380,505

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture

While small firms have long characterized the industry, the scale of nursery operations may be increasing. As reported by Dun and Bradstreet in Table 2 below, large operations are found in a range of industry segments. This is true in trees, for example, which with long production cycles are capital intensive endeavors. Noting the entry of large, out-of-state operations such as Monrovia in Dayton, industry observers suggested that significant restructuring might be under way.

Table 12: Largest Firms by Employment, Metro Portland, Marion County, 1998

Firm	Location	Employment	Segment	Specialization
Monrovia Nursery	Dayton	250 plus	Nursery	Greenhouse, New Products
Hines Nurseries & Gardens	Forest Grove	250 plus	Nursery	Ornamentals & Container
J. Frank Schmidt & Son	Boring	100 to 250	Nursery	Trees
D Wells Nursery	Aurora	100 to 250	Nursery	Conifers, Deciduous Seedlings
Carlton Plants	Dayton	100 to 250	Nursery	Trees
Oregon Roses	Hillsboro	100 to 250	Nursery	Roses
Bailey Nurseries	Yamhill	100 to 250	Nursery	Trees & Shrubs
Iseli Nurseries	Boring	100 to 250	Nursery	Trees
Cedar Landscape	Hillsboro	100 to 250	Landscaping	Services
Dennis Seven Dees	Portland	100 to 250	Landscaping	Retail & Services

Source: Dun and Bradstreet, (Environmental Systems Research Institute) 1998

In addition to an increasing profile for larger firms, industry observers perceive some consolidation among smaller operations. One grower noted "...we're not getting the number of new people in the industry like we did 20 years ago, but the industry is getting bigger, so we're consolidating. The big are getting bigger." This perception notwithstanding, data from the U.S. Census of Agriculture indicates that the number of nurseries has been stable, with slightly more than 1,200 producers in both 1992 and 1997 (Table 1).

There is also some concern among industry members that the current difficulties in traditional agriculture may encourage other farmers to enter the nursery business. One nursery grower noted that "...with the rest of ag [sic] in the ditch they're trying

everything.” Historically, however, only a few nurseries, such as A.R. Spada Farms of Saint Paul, switched from other agriculture categories to nursery stock. In fact, nursery operators are skeptical that many traditional farmers will successfully make the transition.

New entrants face significant barriers in converting to the nursery business. One nursery producer observed that “...they [farmers] have a land base and planting equipment, but they don’t have the market.” They must adjust to critical differences in time to market and marketing channels. Many nursery products require a multi-year growing cycle, sometimes as long as five to 20 years. This requires a far different financial structure than single season agricultural crops. Marketing represents an even a more formidable challenge. Unlike the commodity markets found in general agriculture, nursery products involve few large institutional buyers meaning that nursery operators must be much more closely connected to their end consumers.

Cooperation and Competition

While the region’s nursery industry cluster is composed overwhelmingly of small, locally owned firms, the industry is characterized by strong cooperation, especially in marketing, quality improvement, and research and development. An “us against the world” attitude bolsters cooperation in the industry.

The industry’s relatively compact location has facilitated this cohesiveness. As one OAN member expressed, “...with an industry 90 miles long and 60 miles wide any two of us can be together in an hour.” California’s industry association, by contrast, has to fly people to meetings. “New Jersey, Pennsylvania, North Carolina, and Ohio are viewed as our competitors more than our neighbors are.” Growers note that such competitor states are closer geographically to markets. Also, Oregon’s minimum wage is higher than other states. As one producer noted this means that “...we’ve got to be more competitive...we can’t be on our own, a lone soldier out fighting this war.”

When considered apart from categories such as cut flowers, or foliage plants, which make up a major share of both California and Florida’s production, Oregon producers perceive themselves as the overall market leaders. Producers noted that not only does California consume much of what it produces, but also it is being challenged significantly by cut flower production from Columbia. Even within the broad Census of Agriculture categories listed below in Table 13, there are categories, such as Christmas Trees, where Oregon leads the nation.

While Oregon’s plant stock is similar to California’s, Oregon’s cooler weather acclimates plants better for shipment to many markets with short growing seasons, where hardiness is has added market value. One large producer, active in both states, indicated that early orders are generally placed for the hardier Oregon stock. California stock does not get ordered until late in the season.

Table 13: Market Share in Nursery and Related Products, Oregon and Selected States, 1997

Product Category	United States	Oregon	Share	California	Share	Florida	Share
	Sales (\$1,000)	Sales (\$1,000)		Sales (\$1,000)		Sales (\$1,000)	
Bedding/Garden plants	\$2,392,495	\$56,243	2%	\$324,730	14%	\$154,885	6%
Cut flowers and cut florist greens	\$717,612	\$15,229	2%	\$368,056	51%	\$175,341	24%
Foliage plants	\$703,232	\$3,681	1%	\$134,880	19%	\$386,735	55%
Potted flowering plants	\$1,067,724	\$25,098	2%	\$220,146	21%	\$126,250	12%
Cut Christmas trees harvested	\$441,604	\$111,999	25%	-	0%	\$2,529	1%
Nursery crops	\$3,382,161	\$380,505	11%	\$660,558	20%	\$385,448	11%
Sod harvested	\$800,694	-	0%	\$124,487	16%	\$127,803	16%
Vegetable and flower seeds	\$124,099	\$18,228	15%	\$44,677	36%	\$15,682	13%
Greenhouse vegetables	\$217,317	-	0%	\$64,910	30%	-	0%
TOTALS	\$9,846,938	\$610,983	6%	\$1,942,444	20%	\$1,374,673	14%

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture
(Note: Share is each state's share of total United States sales.)

The Oregon Association of Nurserymen

As outlined in Table below, large majorities of nursery growers in the cluster are members of the Oregon Association of Nurserymen (OAN). Statewide the organization represents more than 1,400 nursery stock producers, retailers, landscapers, and allied companies in the nursery and greenhouse industry.

Table 14: Metro Portland Firms' Membership in OAN

Cluster segment	Estimated Percentage of firms in OAN
Nursery Products	75%
Wholesale flowers and florist supplies	35%
Retail nursery and garden stores	21%
Lawn and garden services	12%
Landscape and horticultural consulting	8%
Shrub and tree services	2%

Source: Calculated from the 1999-200 OAN Directory and Buyer's Guide, and Oregon Employment Department, 1998 Firm Level Employment Data, (Does not include Yamhill, Marion, and Clark Counties)

The OAN is at the center of nursery industry cooperation. Members interviewed for this project describe the organization as bringing the industry together as "one happy family," providing the main organizational voice for the industry to government and the public, as well as a wide range of direct services to members.

The cooperative spirit extends beyond direct participation in the industry association. Firms often jointly attend trade shows in other parts of the country and socialize with one another when they do so. It is common for firms to refer buyers to other Oregon nurseries when they cannot fill orders. Nursery operators reported that nearly everyone

has an “open door” policy, routinely allowing competitors to visit their growing operations.

One producer credited the centrality of the OAN’s role in comments for this study. “While we have a business to run they run the business of our business.” In addition to providing a social structure that encourages cooperation among member firms, the OAN maintains an active marketing program and is extremely active in the state legislature, taking the lead in dealing with a number of agricultural issues.

The OAN’s members perceive it to be much more effective than industry organizations in other states and other agricultural industry associations. The OAN generates less than 20 percent of its budget from member dues. One half of its revenues are derived from trade shows, with another quarter coming from ad revenues in publications. With a professional staff of only 11 people, the organization returns two-thirds of their budget to members in direct services.

History

The OAN and the industry are closely intertwined and trace their roots back into the state’s early history. In fact, Oregon’s nursery industry traces its beginnings to 1847, 12 years before Oregon was admitted to the union. In that year Henderson Luelling arrived in Oregon from Iowa with a wagonload of young plants and seeds. Not only did his family of ten survive the seven-month trip along the Oregon Trail, but so did about 500 of the 700 small trees and other specimens they brought with them. Joined later by two other families of transplanted Midwesterners, within ten years their Milwaukee nursery was offering more than 60 varieties of trees for sale between \$1.00 and \$1.50 a piece.

With their success, word spread quickly that Oregon’s fertile Willamette Valley, blessed with rich soil, abundant rainfall and moderate temperatures, was an agricultural paradise. The nursery industry’s significance was recognized in the late 1880s, with the development of a horticultural department at Oregon Agricultural College in Corvallis. At the beginning of the 20th century, Oregon’s nursery industry consisted of about 1,000 acres with a crop value of over \$150,000. Ten years later, acreage had more than doubled and the value of production, including a fledgling greenhouse and florist industry, topped \$1 million for the first time.

About this time the industry began to organize. The Oregon Association of Nurserymen was founded in 1893 and was active through the turn of the century. The group was succeeded in 1903 by the Pacific Coast Association of Nurserymen. Including operators in Oregon, Washington, Idaho, California, Montana, and British Columbia this regional entity, as well as a local group of growers, the Portland Nursery Club, were active through the early twentieth century.

By the 1930s, Oregon’s nursery industry had become a large and diversified with over 1,200 growers producing crops ranging from seeds and bulbs to greenhouse plants and traditional ornamentals. This period was an extremely important in the industry’s development. Buoyed by growing demand and improvements in transportation methods,

many of the region's small and mostly family run nurseries began expanding their scope of operations by exporting their product to other parts of the country.

In this expansive atmosphere the modern-day OAN was founded in 1933. The organization was successful in the ensuing years in gaining legislative support for horticultural research relating to nursery and ornamental crops. For example in 1935, a Nursery Advisory Board within the Oregon Department of Agriculture was appointed to work with state agricultural staff and Oregon State College faculty.

Spurred on by the housing construction boom following World War II, the wholesale value of plant material in Oregon jumped 78 percent between 1940 and 1950, according to U.S. Bureau of Census reports. In 1948, Oregon's nursery industry sold an estimated \$4.5 million worth of trees and shrubs and the 1949 Horticultural Census listed Oregon as the nation's ninth-leading producer of nursery stock.

This rapid growth manifested itself in several ways during the 1950s. The OAN hired its first executive secretary, Charles Potter, in 1956, and helped organize the North Willamette Experiment Station. The industry also became more active in its marketing efforts by organizing and participating in various gardening and flower shows. With the industry's growth trajectory continuing on to today their emphasis on such marketing efforts has continued to expand.

Cooperative Industry Marketing

Acting independently, growers use a variety of means to market their product including catalogs, the Internet, direct marketing, and in house and independent sales representatives. The OAN helps magnify their efforts through cooperative efforts.

The OAN Directory and Buyer's Guide---in a searchable on-line version at (www.nurseryguide.com) and in a paper directory---presents thousands of listings for products, services, and member firms. The OAN receives an average of 6,000 user visits to its web site monthly and distributes more than 6,000 hard copies of the guide over the course of a year.

The OAN has sponsored the Farwest Show nursery trade shows for the last 28 years. The annual event in Portland is North America's top attended nursery and greenhouse tradeshow with over 15,000 registered attendees in 1999. Featuring 640 exhibitors and 870 booths, the show draws attendees and exhibitors from across the nation. This year a Japanese delegation will be in attendance as part of an ongoing exchange.

Growers report that not only does the OAN's Farwest show have a significant national following, but also the OAN is the only state nursery association participating in every major trade show. This means that even the smallest producer is represented at every show because of the OAN.

The OAN has also sponsored an annual Yard, Garden, and Patio Show in Portland for the last 13 years. With 1999 record paid attendance of 40,000 the show is the largest consumer trade show of its kind produced by a voluntary membership organization.

The OAN is also active in gardening related projects in the community. It played a key role in conceiving the Oregon Garden. In partnership with the City of Silverton the project, which will eventually encompass 240 acres, will be a facility to showcase the wealth and diversity of plant material found in Oregon. Among its landscaped displays will be an environmental laboratory for education, research, and the public.

An Industry Voice in Public Policy

The OAN is an active voice in state and local political processes. The organization's relationship with government, regulatory agencies, and educational institutions is uncommon in agriculture as well as among other nursery associations across the country. Their effectiveness is enhanced by the industry's proximity to one another and to Salem: "...if a legislative issue comes up we can have ten people there in an hour."

The quality of Oregon products is a major selling point in out-of-state markets. Oregon products are frequently healthier, hardier, and more disease resistant than those of their competitors. Protecting the health of the growing environment and maintaining high standards for products shipped out-of-state is a critical importance to the industry.

Oregon's nursery product inspection system gives Oregon growers a comparative advantage of the marketplace. Oregon's inspection program is well regarded in other states and quickly places products in other markets. The program itself funded from assessments on growers and costs approximately \$1.6 million per year. The OAN pushed for the state legislature to expand an existing inspection program in nearly 1990s. One producer recalled the process that initiated the program stating that when "...we needed more inspections we went to the ODA [Oregon Department of Agriculture] and said we will pay for it...they didn't know what to do, no one ever does that."

Recently the OAN persuaded the state legislature to add an additional self-assessment fee to the license charges that have supported the inspection program. Administered by the ODA Nursery Advisory Board, this program now raises approximately \$180,000 a year for research largely through the Oregon State University Extension Service which supports work in pest control, environmental quality, and other research of interest to the industry.

The OAN has also been active in environmental issues as well. The organization and its members work actively on the development of techniques to reduce water consumption and increase recycling, which both lowers production costs and reduces runoff.

When the Oregon Department of Environmental Quality (DEQ) proposed strict measures to reduce runoff from nurseries, the OAN worked with the agency to modify the plan to develop standards and techniques that would produce the desired environmental improvements at lower cost to nursery operators. Eventually the OAN persuaded the Oregon Legislature to move regulatory authority for non-point sources to the Oregon Department of Agriculture. The innovative nature of the industry's plan has been the recognized by the state DEQ and by the federal Environmental Protection Agency.

Dealing with this issue in an aggressive way has given the industry a competitive advantage over nurseries in other states that have not resolved this pollution issue.

IV. Supply Chain and Industry Inputs

The strong concentration of nurseries in the Northern Willamette Valley creates a ready market for firms that provide inputs, supplies and equipment for plant cultivation and propagation. In turn, the diverse array of supporting industries makes it easy for local producers to find competitive sources of everything from potting soil and chemicals, to specialized equipment and expert technical advice.

Industry Suppliers

Nursery production requires a variety of specialized equipment, inputs and services that are provided to nurseries by firms in other industries.

Table 15: Examples of Service and Supply Categories and Firms

Category	Examples	Typical Supplier Firms
Inputs	Bark Product, Containers, Pots, and Packaging Materials, Agricultural Chemicals	Pro-Gro Mixes, Sherwood Teufel Nursery, Portland SePro Corp, Folsom, CA
Equipment	Greenhouse Systems, Tractors, Harvesting Machinery	OBC Northwest, Canby Fischer-Ernst Group., St. Paul
Services	Soil Analysis, Transportation Brokerage, Contract Labor	Applied Horticultural Consulting, Lake Oswego Cargo Master, Clackamas Brown & Dutton, Woodburn

Source: Authors

Table 46 notes that the region's nursery product cluster includes a significant concentration of service and supply firms. As listed in the OAN directory these include business and consulting services as well as transportation, landscape and other services. A large majority of these firms located in metropolitan Portland. Supply listings include chemical, soil and natural products as well as hard goods including production systems such as greenhouse materials, tools and equipment, retail products and equipment. A majority of these were located outside of the region.

Table 46: OAN Service and Supply Listings by Firm Location

Categories	Portland Metro	Marion	Other OR	Out of state	Canada
Services	57 (71%)	9 (11%)	3 (3%)	12 (15%)	0
Supplies	54 (29%)	27 (14%)	23 (15%)	54 (29%)	6 (3%)

Source: Author's tabulations from 1999-2000 OAN Directory and Buyer's Guide

The U.S. Census of Agriculture, which reports more than one-quarter billion dollars expended, indicates the impact of these expenditures on the state economy. Based on focus group interviews with nursery industry members, labor expenditures, reflected in both the contract and hired farm labor categories below, and transportation, reflected in the machine hire and rental and other production categories stand out as two of the most significant expenses for the industry.

Table 57: Oregon Nursery Production Expenses, 1997

Category	Sales (\$1,000)	Percent
Hired Farm Labor	189,457	46%
Seeds, bulbs, plants, and trees	28,964	7%
Repair and maintenance	23,498	6%
Interest	17,930	4%
Petroleum Products	13,302	3%
Contract Labor	12,406	3%
Commercial fertilizer	10,133	2%
Agricultural chemicals	9,587	2%
Machine hire and rental	8,015	2%
Cash rent	7,341	2%
Property taxes	6,702	2%
Electricity	5,805	1%
All other production expenses	79,475	19%
Total expenses	333,140	

Source: U.S. Department of Agriculture, 1997 U.S. Census of Agriculture

Labor Supply

As the data on nursery production expenses indicates labor is the industry's single most costly purchased input. The industry is critically dependent on an abundant supply of manual laborers to do the difficult work of planting, tending and packaging live plants. Firms employ most of their workers directly, but typically meet seasonal workloads by hiring additional workers, often entire work crews, through farm labor contractors.

The labor force for the nursery industry is overwhelmingly Hispanic. Few native Anglo workers are interested in working in the manual labor jobs in the nursery industry. Growers also perceive that the Hispanic workforce has a strong work ethic. Maintaining a stable—and some growers suggested, documented—workforce is significant for the industry which is busy year-round, unlike general agriculture. Growers were generally concerned that the public has no understanding of the type and amount of workforce the industry needs.

The entrance of several large suppliers like Monrovia nurseries has led to a general upgrading of labor standards in the industry. Monrovia provides childcare, language training and health-care benefits to its employees. This has led many other producers to do the same. Groups of growers have participated in the Nursery Education Consortium, pooling resources to subsidize customized instruction and education programs for their workers through Portland Community College and other institutions.

Mechanization

While labor is still a major factor in the industry, some producers are working to mechanize aspects of their operation in order to cut costs and increase productivity in order to compete against producers elsewhere with lower-cost labor. Much of the growth of the industry during the 1990s has been propelled by the expansion of container nurseries based on technology originally pioneered in Europe.

Oregon producers follow trends in marketing and production techniques in Europe. Focus group participants noted that European farms are small and largely produce in greenhouses. In addition to these factors innovation from Europe in robotics is driven by high labor costs. In many cases growers have bought specialized machinery from European producers. Specialized tractors for narrow row agriculture are now available. They formerly had to be cut down from larger tractors designed for other uses.

Transportation and Distribution

Live plants are a bulky, fragile, and perishable product. Quickly and inexpensively transporting trees, shrubs and plants to distant Eastern and Midwestern markets is critical to the competitiveness of the industry. To provide time sensitive deliveries truck transportation is overwhelming the mode of choice for shipping nursery products. Shipment sizes tend to be truckload or less than truckload in size, transport direct from farms to wholesalers or directly to retailers.

Transportation brokers are a particularly important supplier industry to nursery producers. More than 20 such brokers are listed in the OAN Buyer's Guide and Directory. The association coordinates product shipments with those brokers through a "partial load program." Through fax and email they connect growers with brokers willing to take less than truckload deliveries to markets specified by shippers. Filling some 800 requests last year, the program mostly serves smaller producers. However, even some larger producers are using the system and breaking their shipments into smaller quantities to provide more "just in time" service to their customers.

Railroad transport was historically an important means of moving product to market. In fact, one of Oregon's oldest nurseries, ORENCO—the Oregon Nursery Company—was established on a rail line in Washington County. Today however rail transportation is no longer well suited to the nursery industry. Products cannot be feasibly shipped by rail because of the relatively small sizes of shipments and the fact rail shipments do not always arrive quickly enough to assure that product doesn't die en route.

Land and Water

As with almost any crop, arable land, appropriate climate and adequate water are essential to successful agriculture. The mild climate of the Northern Willamette Valley is a key advantage to nursery products producers: the long growing season allows them to grow larger, more robust plants that command premium prices in distant markets with shorter growing seasons.

Water availability is a key influence on the development potential of any particular parcel of land. The construction of Scoggins Dam on the Tualatin River provided additional supplies of water that has facilitated recent industry growth in Washington County. Concern about water pollution and water consumption has led many growers to develop water recycling.

Oregon land use policies, particularly exclusive farm use zoning and the adoption of Urban Growth Boundaries play a crucial role in influencing the availability of land for

nursery production. The urban growth boundary limits the growth of housing and urban commercial activity, keeping land prices affordable for farming, and mitigating many potential conflicts between agricultural and urban uses. Exclusive farm use zones tend to limit rural residential development, and coupled with favorable property tax treatment of farmland, make nursery production economical.

Other Products and Services

Local agriculture suppliers have traditionally catered to the needs of row crop producers. With the decline of row crops, suppliers like equipment dealers, seed and fertilizer dealers and others have been supported by the growth of the nursery industry. These local agricultural suppliers, who used to be indifferent to the needs of the nursery industry, now cater to the industry offering both specialized equipment and often having specialized staff to advise growers on agricultural techniques.

Growers identified sales representatives as working for intermediary firms as well as specific product lines are in the area, sometimes county by county. While not giving enough focus in the past one grower said, "...they've learned to come our way." In particular, with new regulations in place, advice from fertilizer and chemical producers is important. They all are trying to reduce the use of chemicals.

Proximity to Oregon's wood products industry provides an abundant, low cost source of bark. Bark, a byproduct of wood processing, generally makes up 80 percent of container nursery planting mix. One producer noted that "...bark costs \$7.50 a yard here and \$25 a yard in California." Along with bark, other bulky products, such as pots and containers, would present a problem for the industry if they were not available locally.

V. Conclusions

The region's mild climate, fertile soils and abundant water were the keys to the initial development of the nursery industry in the Northern Willamette Valley. Today, the industry's success hinges on the ability of local nurseries, individually and collectively, to market their products, particularly to high end residential and commercial consumers outside the state.

Underlying economic and demographic forces as well as evolving consumer tastes have all been favorable to the industry growth. Residential and commercial construction markets have been robust during the 1990s, and well-landscaped homes and office parks have become increasingly fashionable. Continued rising incomes and desires for "greener" public and private spaces are likely to propel industry growth in years to come.

A key to the region's development, especially in recent years, has been that owner-operators of nurseries have understood marketing and merchandising. Their ability to identify market trends and to respond quickly, and to establish and maintain effective national transportation and distribution channels in the face of major changes in retailing through the evolution of "big box" retail home centers is evidence of the industry's adaptiveness and market savvy.

Long term pressures to change and adapt are likely to come from environmental and labor issues. Expansion of the urban area—so far held in check by the Metro Urban Growth Boundary—reduces the land available for nurseries, which have historically clustered on the fringes of the metro area. Water quality and availability are pressing issues in the Portland metropolitan area, and the pressure to better use water and minimize pollution are likely to increase as the urban population grows and the region wrestles with the challenge of restoring native salmon runs. The price and availability of labor are also key challenges to the local nursery industry. Low unemployment rates and the availability of good paying jobs in nearby urban firms may increase the competition for the industry's traditional Hispanic workforce. Rising labor costs will place pressure on profits and encourage firms to raise efficiency and pursue mechanization.

All these issues—understanding and adapting to future market changes, maintaining an adequate land and water base for the industry, coping with environmental challenges, and responding to higher labor costs—will require firms in this industry to be flexible and adaptive. The past may not be a reliable guide to the future, but the industry's recent ability to flourish at a time that much of agriculture has struggled in facing similar challenges is a hopeful sign for this important part of the region's—and the state's—economy.

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