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# Managing Wholesale Nurseries in the Desert

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*Abstract: This study reports the management practices and strategies of wholesale nursery operations in Arizona. In this desert environment near large California competitors, Arizona firms attempt to differentiate their products and develop market niches as competitive strategies. Xeriscape using low-water-use plants is an evolving specialty product of the industry. Further industry and public education concerning xeriscape is necessary to strengthen this strategic advantage for these firms.*

*Key Words and Phrases: Wholesale nursery, Xeriscape, Management practices.*

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The ornamental horticulture industry represents an important component of the agricultural sector in the United States. A decade ago there were approximately 17,000 wholesale growers in the United States. By 1987 there were more than 21,000 wholesale growers with \$4.09 billion in wholesale sales (U.S. Department of Commerce, 1982; U.S. Department of Agriculture). Wholesale growers in California, Florida and Texas alone had sales of over \$1.6 billion. Florists, nurseries, garden centers, greenhouse growers, field growers, landscape construction and maintenance firms, sod farms, and the nursery sections of regional and national grocery and discount chain stores represent hundreds of thousands of employees and billions of dollars in sales. These related businesses often refer to themselves as the *green industry*.

A recent study of Arizona's green industry estimated that 1,097 firms employed 9,210 persons with a payroll of \$100 million, and generated sales of nearly \$500 million (Arizona State University). Between 1981 and 1991, the number of establishments providing landscape and horticultural services in Arizona grew from 347 to 962, an increase of 177 percent in ten years (U.S. Department of Commerce). These firms employed more than 6,000 people.

The economic well-being of the green industry is closely tied to the economic prosperity of the local region (Gineo, 1988a). Analysts have shown that the growth of this sector is dependent on rising household

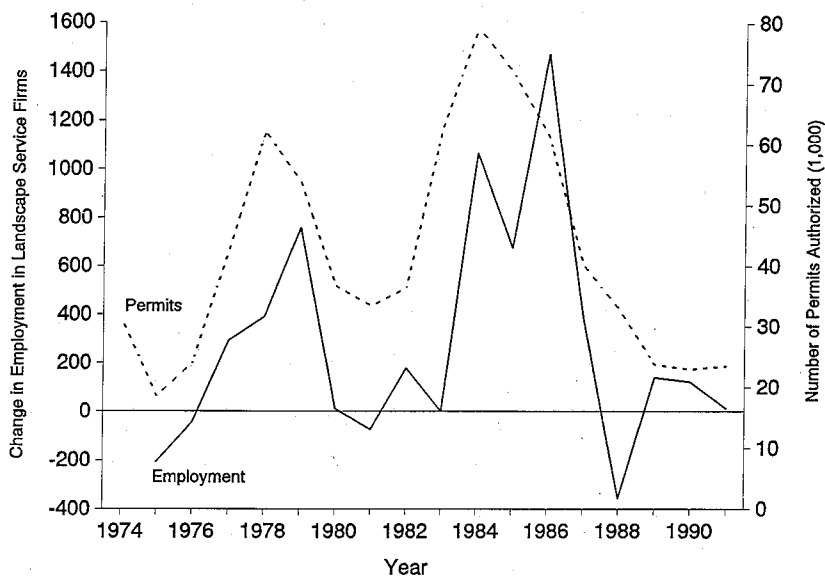
incomes and single family home construction starts (Gineo and Omamo). Education levels and age composition of the population along with consumer tastes also have been identified as important factors influencing economic growth in the ornamental horticulture sector. Some observers claim that although green industry prosperity will trace the peaks and valleys of general economic growth in the region, nurseries, sod farms and landscaping firms will continue to grow in numbers and size for two reasons. First, the individual consumer increasingly sees landscaping as a worthwhile leisure activity and is substituting gardening, lawn and plant care for other relatively more costly recreational activities. Secondly, industry and government are spending more money on landscaping outside factories and offices while taking equal care to maintain a natural plant-oriented environment inside office complexes.

Figure 1 illustrates these relationships. Permits for new, privately owned housing units and the net addition of employees in firms providing landscape and horticultural services are plotted for a desert region in Arizona. The pattern of authorized housing permits over these years reflects the significant population growth in the Phoenix and Tucson areas in the late 1970s, the impact of the recession in the early eighties, and the following economic recovery. It also reflects the slowdown in economic growth in Arizona beginning in 1985, and the plateauing of economic growth since 1989. Landscaping and horticultural employment changes follow similar trends. The decrease in employment in landscape services during the late 1980s may be attributable to cost cutting and policy choices in both the business and public sectors. Organizations may have reduced or eliminated their landscape maintenance staffs and contracted with specialized landscape firms during this period. Also, xeriscape or low-water-use landscapes became more popular as water and labor prices increased and were projected to increase further. Xeriscape is encouraged in new industrial and commercial construction due to established public water management goals in Phoenix and Tucson.

Despite its economic importance, the green industry remains on the periphery of agricultural policy discussions. Agricultural program development and resource allocations generally bypass this nontraditional sector in favor of more traditional agricultural enterprises. Why? A partial explanation is the lack of reliable secondary information about the enterprises in the green industry. It is impossible to formulate policy for a sector that is poorly understood and scarcely analyzed. Another possible explanation is that the green industry is believed to be meeting primarily the local demand for plant products and services and hence is not generating significant exports beyond the city limits or state line.

Figure 1.

*Relationship Between Housing Permits and Changes in Employment in Landscape Service Firms*



This paper descriptively analyzes a small but important component of the green industry: wholesale nurseries in an arid climate. Our definition of a wholesale nursery is a business enterprise that grows all or a significant portion of its plant material and sells its products to retailers, other wholesalers and landscaping firms. Arid implies an average annual rainfall in the major markets of 7 to 15 inches, distributed in summer and winter rainy seasons. The objective of this brief article is to summarize the production and marketing practices of the Arizona wholesale nursery industry. The strategy that Arizona wholesale nursery firms have pursued, given that adjacent California produces nearly one quarter of the value of all ornamental horticultural crops in the United States, may be of interest to fledgling industries in other states. In response to California competition and market dominance, a large number of Arizona nurseries have established a market niche in low-water-using plants.

## *Survey of Wholesale Nurseries*

In early 1989, researchers at the University of Arizona were contacted by colleagues at the University of Tennessee and asked to participate in a national survey of wholesale growers (Brooker and Turner). The questionnaire had already been developed. Most of the eastern and southern states had agreed to cooperate and the organizers were interested in greater representation from western states. The University of Arizona Departments of Agricultural Economics and Plant Sciences agreed to collaborate with this effort. Additional Arizona questions on xeriscape and consumer influence on product mix were inserted into the national questionnaire making the total questionnaire package of greater interest to the Arizona firms.

The national survey covered twenty-three states and focused on marketing practices and trade flows. Any comparisons across states from this national study must be made cautiously. Some state-level data include only wholesale nurseries while other state data include retail nurseries and/or growers. Sample sizes ranged from twelve firms in Mississippi to one-hundred-fifty in Georgia.

With the assistance of the Arizona Nursery Association, a mailing list of eighty-two wholesale nurseries was developed. Questionnaires were mailed to each firm following Dillman's methodology for mail surveys (Dillman). A follow-up postcard, a phone call, and another mailed questionnaire produced a response rate of 46 percent (thirty-eight completed questionnaires). The following discussion of the results provides a snapshot of a unique state-level nursery industry attempting to survive near a dominant competitor, California. Previous descriptive analyses have focused on national trends, failing to capture local competitive issues. These firms are the local survivors in a competitive regional marketplace.

## *General Characteristics*

The majority of the wholesale nurseries operating in Arizona in 1989 were established after 1970. Prior to this date most plant material was supplied by large-scale California firms and a handful of Arizona operations. Thirty-five percent of the Arizona growing operations were established between 1970 and 1979 while 51 percent began their businesses in the 1980s. Based on the results of the national survey, only Arkansas had a larger percentage of firms established in the 1980s. The dominant legal form of organization for Arizona's wholesale nurseries is the

corporation. Corporations represent nearly half the firms in the industry. Nationally, approximately 58 percent of all wholesale nursery firms are incorporated (Horticultural Research Institute). Partnerships and sole proprietorships equally represent the remaining firms in Arizona.

Arizona industry sales follow a bimodal distribution with 41 percent of the firms having gross sales of less than \$100,000 and 28 percent of the businesses reporting annual sales in excess of one million dollars (Figure 2). Nationally 57 percent of all wholesale nurseries have sales of less than \$100,000 and 5 percent have gross sales of more than one million dollars (Horticultural Research Institute). Arizona's industry has almost six times the percentage of big firms than for the nation as a whole. These larger Arizona firms hire twenty to forty plus full-time persons and rely on temporary help during busy planting and harvesting times of the year. The relatively smaller firms also rely on temporary labor but have less than ten permanent employees. Approximately 58 percent of the firms reported they used microcomputers for accounting purposes. Microcomputer-based word processing and inventory control tasks were reported by 37 percent and 32 percent of the firms, respectively.

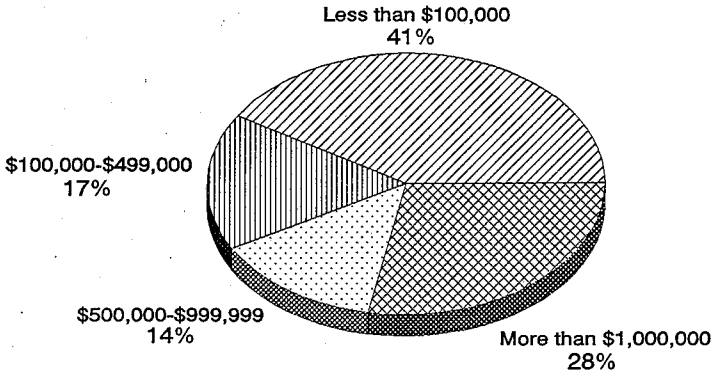
### ***Product Line***

Wholesale growers in this arid climate produce a diversified product line of evergreen trees and shrubs, vines and ground covers, deciduous trees and shrubs, roses and propagating material (e.g., liners, cuttings). Product diversification appears to be a management strategy for reducing risk and stabilizing the sales cycle throughout the year. However, there are growers who specialize in one particular type of plant. Three respondents noted that roses represented 100 percent of their sales, while three other growers specialized in evergreen trees. These specialized nurseries are low cost producers; they have been able to differentiate their product by selling quality plant material; and these growers concentrate on a specific segment of the buying public (Porter).

Most of the growers reported that plants in containers, as compared to balled, burlapped or potted plants, represented greater than 50 percent of their sales. Material is sold in one-, five-, fifteen-gallon containers or in boxes of various sizes. Only thirteen of the thirty-eight respondents reported any sales of plants in four-inch pots or flats. Most of the annuals continue to be imported from California.

Figure 2.  
*Percentage of Firms by Sales Volume*

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### *Xeriscape*

In addition to experiencing significant population growth in the 1970s and early 1980s, Arizona also began to step up water conservation efforts in the early 1980s after the enactment of the 1980 Groundwater Management Act and related legislation. Although outdoor residential and commercial use of water represent a small fraction of the total water use, subsequent laws and regulations were passed in the major cities that limited the amount of sod and other high-water-using vegetation that could be installed in new landscape. City and state government organizations also began conducting educational programs to encourage local residents' use of xeriscapes on their property. This provided some impetus for further developing low-water-using or xeriscape landscapes and for producing the low-water-using plants that such landscapes require. As neighboring states such as California and Nevada have experienced drought and become more conscious of the need for water conservation, opportunities for exporting low-water-using plants from Arizona have increased.

Similar opportunities exist for other states or regions to develop specialized nursery products. For example, communities concerned about air quality may consider legislation restricting what new plants can be grown based on their pollen and plant part production. A special niche may develop for low pollen plants and for reduced pollen varieties of

plants that currently produce high levels of pollen. There has already been work done to breed low-pollen producing olive varieties.

While Arizona wholesale growers do produce a diversified product line as noted previously, many firms in the industry have found a profitable market niche in the production of low-water-using plants. The industry reported that 51 percent of the plants they sold could be classified as low-water-use or xeriscape plants. The remaining plants were considered to be high-water-use plants. Twenty percent of the nurseries reported that they only sold plants which were acceptable for xeriscape. Eight percent of the firms noted that they did not grow and sell any low-water-use plants.

The respondents were asked to rank on a scale of 1-5 a list of popular southwestern plants. Rankings of 1 and 2 reflected low-water-use, a ranking of 3 represented medium-water-use, and rankings of 4 and 5 were chosen for high-water-use plants. Table 1 presents the average rankings and the coefficient of variation in the rankings. Red Bird of Paradise, Fairy Duster and Texas Ranger were ranked as the lowest water use plants. Hibiscus, Glossy Abelia and Evergreen Euonymus were considered by the growers to have the highest level of water use for the group.

The difference of opinion in the rankings is notable and is captured by the coefficient of variation. Red Bird of Paradise, Fairy Duster, Oleander and Japanese Privet have relatively high levels of variability associated with their rankings. For example, some growers ranked the Oleander as a low-water-use plant (ranking of 1) while other growers gave it a high-water use ranking (4). This result indicates that a consensus does not exist in the industry concerning what is and what is not a low-water-use plant. Before xeriscape can become the landscaping standard in the desert southwest, generally accepted guidelines on plant selection must be developed and followed by an effective public education program.

## ***Customers***

***Sales and Customer Influence.*** Figure 3 illustrates the distribution of industry sales. Twenty-six percent of grower sales go to re-wholesale firms, while 25 percent and 44 percent of the plant material is purchased by retailers and landscape firms, respectively. Approximately one-third of the nurseries focus their sales efforts on only one of these markets, while the remaining two-thirds of the growers produce products for two or all three types of customers.

The growers were asked in the local survey to rank the influence various individuals have on decisions affecting the nursery's product line. The



Table 1.

*Plant Water Requirement Rankings by Wholesale Nursery Managers*

Plant	Average Rank <sup>a</sup>	Coefficient of Variation <sup>b</sup>
Tobira ( <i>Pittosporum tobira</i> )	3.4	0.26
Pyracantha ( <i>Pyracantha</i> sp.)	2.9	0.26
Red Bird of Paradise ( <i>Caesalpinia pulcherrima</i> )	1.8	0.34
Fairy Duster ( <i>Calliandra California</i> )	1.8	0.39
Feather Cassia ( <i>Cassia artemisioides</i> )	2.0	0.26
Xylosma ( <i>Xylosma congestum</i> )	2.9	0.26
Pineapple Guava ( <i>Feijoa sellowiana</i> )	3.2	0.23
Glossy Abelia ( <i>Abelia grandiflora</i> )	3.8	0.20
Texas Ranger ( <i>Leucophyllum frutescens</i> )	1.9	0.21
True Myrtle ( <i>Myrtus communis</i> )	3.1	0.28
Common Oleander ( <i>Nerium oleander</i> )	2.6	0.38
Hibiscus ( <i>Rosa-sinensis</i> )	4.0	0.20
Evergreen Euonymous ( <i>Euonymus japonica</i> )	3.7	0.24
Japanese Privet ( <i>Ligustrum japonicum</i> )	3.3	0.31

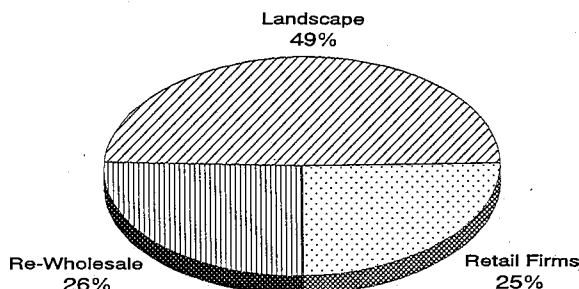
<sup>a</sup>Ranked as a value from 1 to 5 based on perceived water use, e.g., 1= low water use, 3= medium water use, 5= high water use.

<sup>b</sup>Standard deviation divided by the mean which produces a useful measure of relative variation in responses between plants.

reason for asking this question was to get a reading of the market power of various interest groups (e.g., water conservation advocacy groups) trying to reduce urban water use through the increased use of low-water-use plants. The influence rankings, in descending order of importance, are:

Figure 3.  
*Distribution of Industry by Customer*

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1. Final Consumers;
2. Landscape Contractors and Retail Nurseries (tied);
3. Landscape Architects;
4. Landscape Maintenance Firms;
5. City and County Planners; and
6. Water-Use Advisory Groups.

Not surprisingly, these results indicate that the customer buying directly from the nursery is the critical force influencing product mix. Based on these results, educational efforts by public officials to encourage the use of xeriscaping should be focused on home owners and landscaping firms.

**Market Distribution.** Arizona wholesale nurseries report a bimodal distribution of sales over the year, similar to the one reported by retail nurseries. A higher proportion of sales occur during February to May and September to November than during the summer (June-August) or winter (December-February) months. Yet because the wholesale grower does not depend entirely on the retail industry, and construction is a year-around business in Arizona, the spring/fall pattern is dampened somewhat by strong sales during the winter. The hot summer months represent a period when most wholesale nurseries report less than ten percent of their total annual sales.

The Arizona industry concentrates its sales efforts in the Arizona markets. Sixty-four percent of total sales by Arizona firms were in

Arizona. The other major destinations for sales were California (18.4%), Nevada (5.6%), and Texas (4.5%). Four firms reported that less than two percent of their total sales are to other countries (e.g., Mexico). The majority of the product is sold to retailers and landscaping firms in urban Arizona areas. Sixty-six percent of the firms indicated that they only sold plants on a wholesale basis. The remaining nurseries reported a wholesale/retail mix with the wholesale business representing more than 50 percent of their sales.

Nursery-owned trucks are by far the most popular mode of transportation in the wholesale nursery industry in Arizona. Wholesale growers are willing to transport their product over long distances (100 to 300 miles). Most respondents reported an undefined or no maximum radius of delivery. Only 18 percent of the firms enforced a delivery radius of less than 50 miles. Growers were asked, in an open-ended question, to list the major limitations to expanding their trading or delivery area. Their top four responses, in order of the importance, are:

1. Shipping;
2. Lack of Inventory;
3. Competition; and
4. Adaptability of Plant Material.

**Sales Management.** Thirty-five percent of the wholesale growers reported they had at least one full-time salesperson. Of these firms, nearly 60 percent had one salesperson while the other firms reported two to eight full-time employees dedicated to sales. Twenty-six percent of the firms reported using sales brokers to move their product. An additional sales tool is the trade show. Sixty-four percent of the nurseries were represented at one or more trade shows during a typical year. Yet few new orders were negotiated at these trade shows.

As already noted, only about 1 percent of all orders are made at trade shows. Telephone orders represent approximately 37 percent of all sales while in-person orders account for 61 percent of nursery sales in Arizona. Forty-six percent of all sales are negotiated orders. The remaining orders are non-negotiated. It is important to note that the respondents indicated that repeat customers accounted for at least \$85 for every \$100 of sales.

Product pricing is a critical responsibility of the nursery manager. The growers in this survey were asked to rank eight factors in order of importance in their pricing decisions. Their rankings, in descending order of importance, are:

1. Cost of Production;
2. Comparison to Other Growers;
3. Market Demand;
4. Grade of Plants;
5. Inventory Levels;
6. Last Year's Price;
7. Inflation; and
8. Time of Year.

Cost of production, rivalry and final consumer demand appear to be the driving forces behind price determination in Arizona's wholesale nurseries which supports Porter's model of strategic competition.

Advertising is an important sales management tool for all businesses (Gineo, 1988b). Most wholesale nurseries (67%) in Arizona spend 1 to 5 percent of total sales on advertising. This distribution is illustrated in Figure 4. The industry's advertising budget is allocated to the various types of advertising as follows. Suppose the industry had one dollar for advertising. Based on the responses to our survey, this dollar would be spent in the following manner:

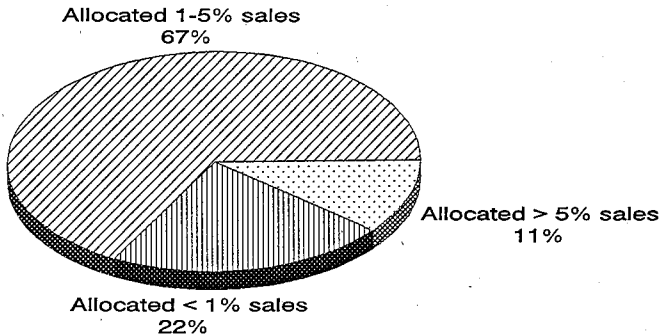
Yellow Pages	\$0.24
Newsletters	0.16
Trade Shows	0.10
Trade Journals	0.09
Newspaper	0.07
Catalogs	0.06
Other (e.g. Flyers, Radio, Billboards)	<u>0.28</u>
Advertising Budget	\$1.00

The yellow pages and more informal methods such as newsletters and flyers represent nearly \$0.45 for every dollar spent on advertising. The Arizona industry also considers trade journals and trade shows to be important advertising outlets. This type of advertising generates few sales but raises and maintains an awareness of the firm and its products in the minds of its existing and potential customers.

Figure 4.

*Distribution of Firms by Percentage of Annual Sales Allocated to Advertising*

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### *Economic Constraints*

An important section of the national questionnaire, not reported in Brooker and Turner, asked the grower to rank the five most important factors that limited the firm's expansion potential. Each of the five factors was assigned a value of 1 to 5, with a value of 1 representing the most limiting factor, 2 the second most limiting factor, etc. The top five factors in descending order of importance were market demand, competition, capital, land, and management. These results are similar to the rankings of the factors that limited the expansion of the delivery area. Clearly the product mix decisions made by wholesale nurseries are market driven. Also, rivalry and competition are everyday forces that must be recognized and managed. Strong competition from large California nurseries is a market reality. Inputs are important, particularly financing, as are land and management. These Arizona wholesale nurseries are intensive production enterprises requiring significant capital investments and progressive management if they are to be successful.

### ***Concluding Remarks***

The preceding discussion portrays the Arizona wholesale nursery industry as a dynamic component of Arizona's agricultural sector. The results from this study characterize an industry that places a heavy emphasis on the relationship between technology and human capital. Both are necessary conditions for a successful wholesale nursery. The most up-to-date technology can imply cost and quality advantages over competitors. Entrepreneurial and management skills are critical for exploiting these cost and quality advantages to develop new markets, expand market share or maintain a dominant position in the Arizona wholesale nursery industry.

The industry has flourished despite intense competition from California, the largest producer of ornamental horticultural products in the United States. Part of this success is due to growth in local demand, but part may also be attributed to developing unique product lines including desert and other low-water-using plants. Water conservation policies and regulations may have stimulated the expansion in the production of low-water-using plants. However, the lack of consensus between wholesale growers over the water use of certain plants indicates a need to develop more widely accepted standards and measures of water use. In a like manner, stricter air quality laws may create similar incentives for the industry to produce more low pollen varieties. Low-cost production and market niches (e.g., low-water-use and low-pollen varieties) are competitive strategies that may enable the Arizona industry to survive and prosper "next door" to nationally-dominant California competition.

A final comment for researchers working with the green industry. We are impressed by the heterogeneity of the nursery industry. Individual firms do not fit comfortably into definitions of wholesale nursery, retail nursery and landscape contractor. The Arizona experience indicates that wholesale nurseries may be all of the above, diversifying into several enterprises of the nursery industry to reduce dependence on any one sector of the economy. Future research should recognize and study this strategic portfolio balancing behavior by urban-oriented agriculture.

## Notes

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