Analysis of the Impact and Importance of Re-Wholesalers

in the Ornamentals Market

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INTRODUCTION AND OBJECTIVE

The total value of greenhouse and nursery crops sales in the United States increased about 18% from 2000 to 2006 according to the USDA, jumping from $13.71 billion to a $16.89 billion. Among others, an important factor that may affect nurserymen's selling opportunities is the kinds of market channels available. The knowledge about the individual participation of the marketing channels is indispensable for the development of an appropriate sales strategy to generate better income and profits. Furthermore, each channel has different requirements, scope in the market, preference of products, and terms and conditions of sales (Hampton, 2001). Brooker *et al*. reported results from a producer survey that addressed "Trade Flows and Marketing Practices within the United States Nursery Industry: 2003". Five marketing channels in this industry were identified: mass merchandisers, home centers, garden centers, landscape firms and re-wholesalers. From the same data, the current study calculations found that the average percentage of total sales across states in 2003 was led by landscape firms (33%), followed by the re-wholesalers (26%) and garden centers single location (16%), home centers (11%) garden center multiple locations (6%), and mass merchandisers (8%). Within these channels, some have had more growth than others

Nursery producers have different preferences among these channels. Generally, landscapers were viewed as good customers because they sell design and installation services, and usually are less sensitive to price. An advantage of selling to garden centers is the higher margins obtained mainly because these customers tend to be interested in quality and service. Both mass merchandisers and home centers offer a high volume channel with low price and standard quality.

Finally, the re-wholesaler channel was the second-leading channel, and the industry perception is that this channel is increasing in importance. This channel has several components. A common practice was the purchase and resale of plant material by one grower from another. And research has indicated that re-wholesalers may be used frequently by producers to expand their sales and/or to sell remaining inventory. Another concept in this channel, as discussed by Garber and Bondari, is the Horticultural Distribution Center (HDC) which is a "specialist that buys from the finishers and hold in a display yard", often serving landscapers or retailers.

Since one factor in producers' success is their relationship with the wholesale outlets, a complete understanding regarding the characteristics and preferences of the market/distribution channels is needed to keep their business on the right path based on tendencies in the industry. Few research studies have been conducted to demonstrate the performance of the re-wholesalers in the ornamental market at a national level. The lack of detailed information about activities, market participation, tendencies and opportunities is a barrier to better producer decisions and more 'optimal' results. This study will focus mainly on the analysis of re-wholesalers although the importance of this marketing channel in the industry is established.

Selection of better choices from among the alternative channels can improve the efficiency of production, sales, and profits based on the demand for price, quality, quantity, and service for the final client. For producers, a better understanding of their relationship with the outlets will contribute to better management strategies and production systems, and product combinations. It also may lead to improved service, quality and even price, which may imply increased sales.

The objective is to estimate the impacts of producers' business characteristics on market channel use with focus on the re-wholesaler channel in the United States.

LITERATURE REVIEW

Marketing and trade practices in the ornamental plants industry

The marketing of agricultural goods represents a functional process that lets producers allocate efficiently their products in the market. This represents a business activity where goods and services flow from the production unit point to where the final consumer is reached (Kohls and Uhl, 2002).

Information related to marketing in the ornamental industry from the producer's perspective has been limited (Brooker et al., 2000). Therefore, the necessity of a trustworthy information source led the Multi-state Regional Project S-1021 (a research committee of horticulturists and agricultural economists from land-grant universities who conduct research in the green industry) to sponsor four mail-back surveys to obtain a report of growers' marketing and trade practices of the years 1988, 1993, 1998 and 2003. This committee prepared the "Trade Flows and Marketing Practices within the United States Nursery Industry" (TFMP) report which is a series of four reports that included the analysis of the data collected from the surveys. The information collected from producers was about production systems, sales considerations (percentage of sales, producer's sale by type of wholesale outlet, selling methods), price determination factors, and advertising practices and expenditures. Through this period, the surveys have kept similar structure between each other and have only showed some differences in the selection of the participants and minor changes in the organization of the questions.

Analysis of Market Channel Use

The number, type and use of the marketing channels may vary with the characteristics of the industry and the geographic area where they operate. For instance, figure 1 shows the flow of ornamental products by region. In the Midwest, landscaper was the channel with the highest

percentage of sales with 52%, followed by re-wholesalers with 22.71%. Re-wholesalers were the largest channel in the South (28.57%) and the West (33.59%).

   Producers need to decide the use of one or a combination of outlets channels that gives the highest benefits considering the firm's constraints. A diverse set of variables and characteristics affects this decision. For instance, Ingram et al. (1980) affirmed that before producers start a business activity, the characteristics of market demand for nurseries products must be defined. Factors like size, diversity and location determine the species and size of plants to be produced. Outlets in different areas or regions could provide better markets for these products.

Figure1. Percent of sales through each wholesale outlet per region
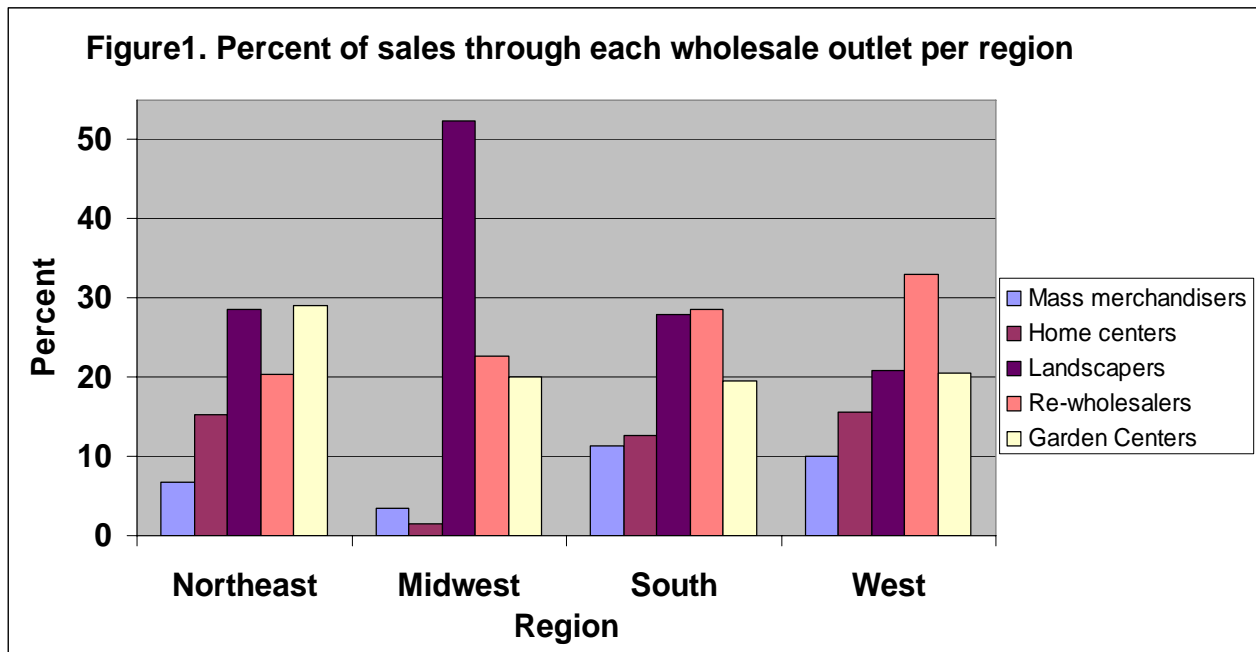
Source: National Nursery Survey 2004

   In their study, Hinson and Turner (1994) hypothesized that marketing channel choice was influenced by firms' characteristics such as age and size, propensity to negotiate, diversification, strategies, organizational structure, competitive pressures and location of the nursery. In general, direct retail sales were reflective of nurseries with small amounts of gross sales, thus the size of

the firm, measured on terms of sales, could affect sales strategy and the way how the producer reached the final client.

In a subsequent study, data collected in the 1999 National Nursery Survey of industry firms was used by Hampton (2001) to evaluate the market participation of each wholesale outlet in Louisiana. He hypothesized that market channel use was a function of business and market characteristics where the model should identify the factors affecting nursery producers' marketing strategy. The explanatory variables assumed to explain the proportion of sales were the following: acres, advertising expenditure, age, contract production sales, in-person sales, in-state sales, repeat customer sales, percentage of sales made by telephone, computer/electronic technology use (whether the firm had 3 or more computer functions), the type of market channel, and the use of a set of four or more channels. In this study, the tobit model with an Ordinary Least Square (OLS) regression analysis was considered appropriate. Hampton (2001) expected that producers would prefer to use garden centers because consumers pay a better price for quality products. As another preferred channel, landscapers offer services to the client that add value to the nursery products and therefore customers are less price-sensitive. In the case of mass merchandisers, they usually have suppliers with long term contracts and sell their products under a high volume and low price retail strategy, where price is a key factor in the business relationship. On the other hand, re-wholesalers usually are very price sensitive for purchasing activities since they need to be competitive in the market. Thus, producers would sell to landscapers and to other retailers who are less sensitive to changes in price. Therefore, the two first outlets were considered core marketing channels and re-wholesalers and mass merchandisers were considered growth marketing channels from a producer viewpoint. Generally, smaller producers were expected to concentrate ornamental goods in core marketing channels, using local and regional trade shows, walk-in customers at the

nursery site, and telephone sales as main selling activities. Meanwhile, larger nurseries attended more important or bigger trade shows, and used telephone and outside salespeople to develop new business (Hampton, 2001).

In Louisiana, separate models were estimated using $200,000 in sales as dividing line among small and large firms. This amount of sales was determined based on available sales categories, intuition and sample size. For small nurseries, re-wholesaler was the marketing channel with the greatest number of significant values. The age of small nurseries and contract production had an unexpected significant and positive impact on sales. This result implied that older nurseries were statistically more likely to sell through re-wholesalers. These sales were 17 percent lower if small nurseries sold to a diverse set of four or more marketing channels. Furthermore, a $100,000 increase in in-person sales and telephone sales would have, respectively, a 0.27 and 0.37 increase in percentage of sales to re-wholesalers.

The large nursery equation for re-wholesalers showed that the estimate for computer functions had an unexpected negative value, suggesting that large nurseries were less likely to sell their products to this channel when the firm used more of these functions (Hampton, 2001).

Analyses of regional differences

In the nursery industry, there is limited research about regional differences. For instance, Garber and Bondari (2000) affirmed that before their work, the regional/geographic differences in HDCs had not been analyzed in the lawn and garden center industry. Therefore, they included regional differences to determine the factors influencing HDCs decisions of plants purchases and the chance for growers to be better suppliers. Data obtained in 1998 were analyzed as a group and by four regions (Northeast, North Central, Southeast and West). From the results, responses among regions showed interesting trends. For example, the price for the West and South regions

had greater importance than for the North Central and Northeast regions; on the other hand, delivery of product on short notice had special importance in Northeast and Southeast regions.

Moreover, Hall and Pate (2000) highlighted that production of greenhouse and nursery products was concentrated in the West and South mainly because climate and demand factors (proximity to population areas). Hinson and Turner (1994) reaffirmed that the location may influence the marketing channel choice because of the longer production season, and large producers often are located in the southeast and west. States in the southeast and west had higher level of sales to re-wholesalers.

METHODOLOGY

The survey.

Data for this research was collected in the 2004 S1021 survey of nurseries regarding trade flows and marketing practices. This survey collected information of the previous calendar year (2003) and the instrument was based on the 1999 survey. For this survey, the list of the firms was obtained directly from the appropriate agricultural regulatory office in each state. Forty four states were included in the final list that contained a total of 15,588 firms after budget and statistical considerations. These states represented 93% of total cash receipts for greenhouse and nursery crops in the United States. The Dillman Protocol was used to design and implement the survey. This protocol maximizes response rates through a follow-up strategy that includes the initial questionnaire/explanation letter, a reminder post card mailed to those who had not answered at a given point in time, and a second questionnaire with a letter encouraging response. The total number of respondents to the survey was 2,485 firms, a 15.9% response rate.

Data Issues.

Many initial responses from this survey had incomplete or inconsistent information about the amount of sales, percent of wholesale and retail sales, and/or establishment year. In some cases values about sales and year were not reported or they had irrational values. In the following situations, the observations were not included in analysis:

- The target population was wholesale production nurseries, but lists obtained from the states contained unidentifiable small operations that were primarily retailers. The percentage of sales to wholesalers was used to identify these, and firms with retail sales of 70% or more were not included in the analysis. This reduced the number of observations in the data set from 2,485 to 1,338.

- The producer's primary marketing channel was not explicitly identified. However, the percentage of sales made through each of the wholesale channels was reported and the primary channel was assumed to be the outlet with the highest percentage of sales. In a few others cases, two or more channels had an equal percentage of sales. These ties were solved by considering three parameters calculated from the complete data set: 1) the highest average of the percentage of sales for each channel, 2) the correlation between channels and sales, and 3) the correlation between channels and plant group. The respondent's main channel was assigned subjectively after evaluation of the three criteria.

Variables.

The *independent variables* included in the models are described in table 1. The plant categories were organized by similar production characteristics in five groups. Group 1 included trees and shrubs; Group 2 included flowering annual and vegetable bedding and flowering potted plants; Group 3 included mostly vines and ground covers; Group 4 included foliage; and Group 5 included other materials.

The relationship of different business characteristics to main market channel was analyzed by size as measured sales, and classified into large and small nurseries. Intuition and a representative number of observations for both groups were the factors used to determine the $500,000 separator line. This division generated 556 observations for large nurseries and 782 observations for small nurseries.

Because these characteristics and the marketing strategy are assumed to vary depending on the region where the firm is located, dummy variables were created. The standard regional division by the U.S. Census Bureau (Northeast, Midwest, West and South) was used to group the states.

The variable age was created by subtracting the establishment year reported from the number 2003, which was the year when the survey was sent. The use of this variable was based on the assumption that older firms were expected to be larger, more experienced and to have a more diversified marketing strategy that would favor to commercialize with growth channels. These definitions from Hampton (2001) were based on the growth and volume of mass-merchandiser and re-wholesaler channels that had made them an important growth option for nursery growers. The next variable, the use of alternative computer technologies, was assumed to be related to diverse marketing activities and to have a positive relationship with growth channels (re-wholesalers and mass merchandisers). Furthermore, specialized computer functions may explain the use of a specific channel. Therefore, firms using bar coding and/or landscape design software functions were expected to be more willing to use growth channels and landscaper channel, respectively.

The variable trade shows identified the number of times a firm visited these events with product exhibitions. Since these events are costly and require certain stock of products and large nurseries are more likely to participate, this variable would have a positive impact on choosing a growth channel. The negotiation of sales may be more frequent between large nurseries and

growth channels, since re-wholesalers and mass merchandisers buy great volume of products and need to obtain the lowest possible price. The variable contract sales, that committed the grower to sell the plants before being planted, was expected to have a positive impact on sales to mass-merchandisers and negative for core channels.

Table 1 – Independent variables description

Variable	Description
Age	2003 minus the year established
Bar coding	Dummy: firm used computer to print bar codes for products (0 if false, 1 if true)
Landscape design software	Dummy: firm used landscape design software (CAD) (0 if false, 1 if true)
Computerization	Number of computer technology functions used, without CAD and BAR (11 maximum value)
Plants groups	Percentage of plant categories organized in five groups: gr1, gr2, gr3, gr4, gr5
Trade shows	Number or trade shows attended with an exhibit in 2003
Negotiated sales	Percent of negotiated sales, not including standard quantity discounts
Contract sales	Percent of sales are on contract
Other producers contract	Dummy: produce under contract for other producers (0 if false, 1 if true)
Retail garden center contract	Dummy: produce under contract for retail garden center customers (0 if false, 1 if true)
Mass merchandisers contract	Dummy: produce under contract for mass merchandisers (0 if false, 1 if true)
Cooperative contract	Dummy: produce under contract for cooperatives (0 if false, 1 if true)
Product uniqueness	Dummy: importance of product uniqueness for price determination (0 if not importance or minor importance, 1 if important or very important)
Web sites expenditures	Percent of advertising expenditure allocated on web sites
Trade shows expenditures	Percent of advertising expenditure allocated on trade shows
Sales	Total product sales

Four dummy variables were included in the model to identify the effects on the dependent variable of buyers contracting production with a firm. These buyers were: other producers, retail garden centers, mass-merchandisers and cooperatives. If other producers and mass merchandisers contracted production, the firm's choice was expected to be either of the two growth channels. The

next dummy variable about product uniqueness had value of one if the producer negotiated this kind of product. Firms selling plants with unique characteristics were expected to have larger percentages of landscaper and garden center clients.

Two variables indicating the percentage of expenditure allocated on web sites and trade shows were included because they were considered among other type of advertising, as the options more often used by large growers to pursue sales toward any of the growth channels. The variable sales was used to determine the size of nurseries. Larger growers are expected to have a marketing strategy more focused to increase sales to re-wholesalers and mass merchandisers.

Model Development

Standard regression analysis format was used to determine the impacts of nurseries' characteristics (the explanatory variables) on producers' choice of market channel (*dependent variable).* The multinomial logit model was considered the appropriate economic model for the case of qualitative dependent variables, since in this case a decision maker (producer) must choose between more than two alternatives (marketing channels). A Maximum Likelihood analysis was obtained by using the Proc Logistic command of the SAS program. Since the model was run without the intercept option, the regional dummies functioned as intercepts. Separate models were estimated for large and small nurseries. Model reports include marginal probabilities with statistical tests to indicate whether they have significant impacts on the probability of choosing a particular market channel. Re-wholesaler was the channel chose as comparison base.

The model included four categories (market channels) and could be algebraically showed as:

$$\log(P_j / P_1) = \beta_{j1} + \beta_{j1}X_i + \beta_{j1}Y_i + \ldots + \beta_{j1}Z_i$$

Where: i = firm, j = 4 categories (mass –merchandisers, home centers, garden centers, landscapers).

P_j = Log-odds of choice each category (j = (1) Mass merchandiser, j = (2) Home centers, j=

(3) Garden center, j= (4) Landscape firms)

P_1 = Baseline category (1 = (5) Re-wholesalers)

X, Y, Z = Explanatory (independent) variables

In words, the model will estimate the probability that the producers choose to sell their products through one of the marketing channels.

RESULTS

The multinomial logit model was used to determine which business characteristics of small and large firms explained the producer´s marketing channel choice. Table 2 shows the maximum likelihood estimates obtained from the two models. Results presented here contain some unusually large standard errors. These values may result from outliers in small samples in some situations (31 observations for small nurseries for mass merchandisers, and 12 home centers). Since we present preliminary analysis, the origin of this problem will be investigated.

Table 2. Estimates of Multinomial Logit Model: Results from large and small nurseries.

Variable	Mass Merchandiser / Re-wholesaler		Home Center / Re-wholesaler		Garden Center / Re-wholesaler		Landscaper / Re-wholesaler	
	Large nursery	Small nursery	Large nursery	Small nursery	Large nursery	Small nursery	Large nursery	Small nursery
Northeast	-1.858*	-0.584	-1.525*	0.355	0.261	0.538*	-0.501	0.061
	(0.980)	(0.839)	(0.903)	(0.753)	(0.402)	(0.328)	(0.364)	(0.291)
Midwest	0.364	-17.205	-0.931	0.222	-1.034*	0.573*	0.488	0.182
	(0.921)	(5600.6)	(1.376)	(0.981)	(0.594)	(0.350)	(0.390)	(0.285)
West	-0.134	1.121**	-1.899**	-1.273	-0.409	-0.481	-1.060**	-0.668**
	(0.615)	(0.556)	(0.908)	(1.211)	(0.373)	(0.349)	(0.337)	(0.285)
Age	-0.012	-0.018	-0.027*	0.002	-0.004	0.001	-0.009*	0.002
	(0.013)	(0.015)	(0.016)	(0.016)	(0.006)	(0.007)	(0.005)	(0.006)
Bar coding	0.864*	3.603**	2.275**	-16.834	0.035	0.270	-0.577*	-20.919
	(0.533)	(0.893)	(0.744)	(13685.7)	(0.355)	(0.849)	(0.321)	(12947.4)
CAD	1.843*	0.146	2.678**	-17.699	0.341	-0.107	1.748**	0.792*
	(1.123)	(1.238)	(1.169)	(10327.1)	(0.954)	(0.627)	(0.718)	(0.481)
Compu	-0.116	0.081	-0.221	-0.206	0.071	-0.066	0.068	0.043
	(0.123)	(0.126)	(0.165)	(0.174)	(0.075)	(0.061)	(0.064)	(0.049)
Group1	-0.033**	-0.031**	-0.030**	-0.034**	-0.003	0.002	0.012**	0.011**
	(0.009)	(0.010)	(0.011)	(0.016)	(0.005)	(0.004)	(0.004)	(0.003)

Group 2	0.000	0.016*	-0.016	0.020**	0.020**	0.023**	0.015**	0.001
	(0.010)	(0.008)	(0.014)	(0.010)	(0.007)	(0.005)	(0.007)	(0.006)
Group 3	-0.002	0.008	-0.014	0.019	0.031**	0.021**	0.026**	0.014**
	(0.012)	(0.011)	(0.016)	(0.012)	(0.008)	(0.006)	(0.008)	(0.006)
Group 4	-0.025**	-0.011	-0.034**	-12.058	-0.019**	-0.011	-0.012*	-0.012**
	(0.010)	(0.009)	(0.012)	(384.3)	(0.008)	(0.007)	(0.007)	(0.005)
Group 5	-0.029**	-0.017**	-0.060**	-0.014	-0.004	-0.004	0.003	0.000
	(0.010)	(0.007)	(0.017)	(0.009)	(0.006)	(0.004)	(0.005)	(0.003)
Trade shows	0.005	-0.315	-0.061	-15.641	0.030	0.079	-0.024	-0.239*
	(0.085)	(0.429)	(0.102)	(2767.7)	(0.053)	(0.131)	(0.047)	(0.134)
Negotiation	0.025**	0.001	0.026**	-0.014	0.006	-0.008**	0.007*	-0.007**
	(0.007)	(0.007)	(0.008)	(0.011)	(0.005)	(0.003)	(0.004)	(0.003)
Contract	0.005	-0.030**	-0.004	-0.005	-0.046**	-0.009*	-0.019**	-0.001
	(0.009)	(0.013)	(0.011)	(0.011)	(0.011)	(0.005)	(0.006)	(0.004)
Other producers contract	-0.976*	-1.237*	0.301	-1.437	-1.846**	-2.173**	-0.756**	-1.367**
	(0.570)	(0.703)	(0.639)	(0.901)	(0.443)	(0.366)	(0.320)	(0.261)
Garden center contract	-1.759**	1.138*	-1.422	2.332**	1.954**	2.062**	0.140	0.609**
	(0.806)	(0.650)	(0.868)	(0.716)	(0.460)	(0.323)	(0.416)	(0.307)
Mass Merchandiser contract	2.730**	2.132**	2.565**	1.343	-1.121*	-0.100	-1.302**	-1.059
	(0.634)	(0.791)	(0.718)	(1.113)	(0.652)	(0.632)	(0.621)	(0.703)
Cooperative contract	1.996	1.159	1.377	-16.466	1.602	1.702	0.519	1.937
	(1.457)	(3.119)	(1.771)	(27541.4)	(1.248)	(1.571)	(1.086)	(1.259)
Uniqueness	-0.030	-1.094**	-0.200	-1.706**	-0.067	-0.651**	-0.038	-0.397**
	(0.482)	(0.494)	(0.570)	(0.681)	(0.299)	(0.246)	(0.251)	(0.205)
Web site adv.	-0.043	0.013	-0.027	0.027*	-0.019*	0.015**	-0.009	0.005
	(0.027)	(0.014)	(0.034)	(0.016)	(0.011)	(0.007)	(0.010)	(0.007)
Trade show adv.	0.008	0.009	0.006	-0.020	-0.011**	-0.006	-0.013**	-0.004
	(0.008)	(0.014)	(0.009)	(0.070)	(0.006)	(0.006)	(0.005)	(0.005)
Sales	5.27E-09	-5.55E-06**	1.62E-07**	-4.56E-06	4.19E-09	-1.39E-07	3.08E-08	2.06E-06**
	5.01E-08	2.74E-06	4.74E-08	3.63E-06	3.53E-08	1.12E-06	3.12E-08	9.10E-07

*Estimated coefficient is significantly different from zero at the 0.10 level.
** At the 0.05 level.
Note: Re-wholesaler is the reference group and standard errors are in parenthesis.

Mass merchandisers: Only significant coefficients are included in discussion of results. For regional differences, the Northeast large firm model had a coefficient of -1.856, while the West small firm coefficient was 1.121. Since these estimates represent the log ratio of the probability of choosing mass merchandisers over the probability of choosing re-wholesalers, the negative

coefficient (inverse relationship) meant that large firms in the Northeast were less likely than firms of the same size located in the South to choose mass merchandisers over re-wholesalers. On the other hand, statistically the estimate for small nurseries in the West, relative to firms in the South, was 1.12 units higher for choosing this channel to re-wholesalers. For both sizes, providing bar codes on the container meant the grower was more likely to use mass merchandisers than the reference category. Similar choice was obtained for large firms using CAD software. The production of plants in groups 1, 4 and 5 for both firm sizes (except small for group 4) favors the choice toward re-wholesalers. Therefore, if nurseries increased in one percent the sales of plants of group 1, the multinomial log-odds for choosing mass merchandisers to re-wholesalers will reduce by 0.033 for large firms and by 0.031 for small firms. The opposite was obtained for negotiation of sales used for large firms. Small firms were more likely to use mass merchandisers than re-wholesalers if contract production was used. Firm size coefficients for selling under contract to other producers were negatively related, but selling under contract to mass merchandisers was positive and significant for both large and small firms. For selling under contract to garden centers, the large firm coefficient was significantly lower. Small producers that determined price based on the product uniqueness and increased total sales chose to use more re-wholesaler over mass merchandisers.

Home center: The variables Northeast and West had negative significant coefficients for large nurseries. This situation could suggest that re-wholesalers had high market share in these regions than in the South. Older large firms were more likely to use re-wholesalers than home centers. Because home centers' consumers have high priority on efficiency, this channel requires more organization and more technical support from their suppliers. Therefore, large firms who used a bar coding system and CAD software sold more product to this channel over re-wholesalers. For

large firms, selling plants in groups 1, 4 and 5 were significant and had more sales to re-wholesalers, and groups 2 and 3 had the same signs but were not significant. Large firms with higher percentages of negotiated sales had higher sales to home centers. Small firms using production contract with garden centers had higher sales to home centers. The same choice was found for large firms with mass merchandiser production contracts, but most of these coefficients were not significant. For small nurseries, uniqueness as an important component of pricing was associated with more sales to re-wholesalers. Thus, this channel might provide opportunity for small nurseries with unique products. Advertising on web sites was associated with increased use of home centers in the small nursery model. And, for large nurseries, increasing size as measured by sales suggests a higher portion of sales to home centers.

Garden Centers: In total three regional estimates were statistically different from zero for this garden center/re-wholesaler comparison. Small firms located in Northeast and Midwest were more likely to use garden centers to re-wholesalers than small producers in the South, meanwhile large firms in the Midwest would choose re-wholesalers. The production of plants from group 2 and 3 would favor the choice toward garden centers, oppositely for large firms selling plants of group 4. Small firms with higher negotiated sales tended to sell to re-wholesalers in lieu of garden centers; moreover both size firms would chose also that outlet if a production contract was signed. Different results were obtained for coefficients of growers using contracts with specific buyers. Small and large firms selling products to other producers through contracts were less likely to choose garden centers than re-wholesalers. The opposite relationship was identified for contracts signed with garden centers, which is clearly understood since we are considering this channel on the comparison analysis. Large producers used more re-wholesalers if a contract production with garden centers was signed. Small growers that determined price based on the product uniqueness

chose to use more re-wholesaler over garden centers. Advertising was significant for both large and small firm for choosing a particular marketing channel. Large firms using website ads would tend to sell to re-wholesalers over garden center and vice versa for small nurseries. Trade shows advertising also favored large firms in choosing re-wholesalers.

Landscaper: The variable West had negative significant coefficients for large and small nurseries. This situation could suggest that re-wholesalers had high market share in this region. The coefficient for age was negative and significant for large firms, so older large nurseries may sell more to re-wholesalers compared to landscapers. The use of bar coding system in large firms would favor the use of re-wholesalers to landscapers. The other computer function, landscape design software in large and small firms could reduce the log-odds of choosing re-wholesalers since both significant coefficients were positive.

The production of plants from group 4 would favor the choice toward re-wholesalers, meanwhile large firms and small firms producing group 1 and 3 plants would sell to landscapers.

The coefficient of advertising through trade shows was significant and negative for small nurseries, favoring the use of re-wholesalers. Small firms were more likely to use landscapers than re-wholesalers as the share of negotiated sales increased, but the opposite result was found for negotiated sales, in the large firm model.

The estimate for contract production was significant and negative for large firms. As selling under contract to other producers increased, both size firms would use more re-wholesalers, but contracting with garden centers increased the odds of selling to landscapers. Contracts between large firms and mass merchandisers would favor the use of re-wholesalers for selling ornamental products.

Determining price of products of small producers based on product uniqueness would favor the use of re-wholesaler over landscapers and these producers increasing the total sales statistically would choose more landscapers than the reference channel.

Conclusions

Although many factors like price and quantity affect consumers and producers business relationship in the nursery industry, producers´ decision about the best option where to allocate the products is affected also by the characteristics of each firm. This study confirmed that these characteristics have an effect on marketing channel choice. Firm size had a clear effect in this decision. Small and large firms with similar characteristics made different choices between channels, indicating different behaviors and incentives. Age, use of CAD software, overall number of computer/electronic applications, and contracting with cooperatives were less useful in explanation than anticipated.

We conclude that production of plant category groups 1, 4 and 5 increased the probability of choosing re-wholesalers over the other four channels considered. The use of re-wholesalers was clearly supported in the impacts of negotiated sales and contracting with other producers. There may be appropriate sales strategies will increase the business relationship with these middlemen. Since this kind of contracts is related with this channel, the activities of some growers as re-wholesalers were as confirmed. Generally, the fairly strong relationship of contracted production with higher tendencies to sell through re-wholesalers appears to be an important theme.

The finding that small firms using product uniqueness as an important base for price determination increased the use of re-wholesalers over other marketing channels was not expected and suggests need for further analysis.

Another interesting relationship is in the promotional area. There was little impact of market channel choice in the mass merchandiser or home center models, while both categories of promotion were related to the channel relationship for the garden center and the landscaper models.

Few studies have examined the choice of producers using the multinomial logit model. Therefore, this study provides important econometric information about characteristics of growers as they affect outlet choice. This may aid producers to understand the situation of the marketing sector in the ornamental industry. Finally, although these factors indicate how one channel may be favored over another, growers face other economic, institutional and managerial factors that affect their ability to use specific market channels.

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