Retail Target Markets for Landscape Plants[1]

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Abstract

Merchandisers of landscape plants can increase the effectiveness of their marketing strategies by identifying target markets. Using a full information maximum likelihood tobit procedure, different types of retail outlets were shown to have different target markets in Georgia. The results lend support and empirical evidence to the premise that different retail outlet types have different target markets.

Index words: marketing, target markets, economics

Significance to the Nursery Industry

These results indicate different marketing strategies for three types of landscape plant, retail outlets. Large retailers and mass merchandisers should be aware of the curvilinear relationship between age and percentage of plants purchased from them. As persons mature, they buy increasing percentage of plants from large retailers. This relationship holds until the mid-forties when they begin purchasing fewer plants from large retailers. Age did not appear to have explanatory power for the other two retail outlets examined. Nonwhites appeared to purchase greater percentages of plants at large retailers. Finally, increased income was associated with lower purchase percentages.

Respondents with higher incomes and homes of greater market value were more likely to purchase plants at large garden centers than from large retailers. Nonmarried respondents were also found to purchase greater percentage of plants from large garden centers. On the other hand, married, white, females appear to be a target market for local garden centers. Strategies effective in reaching this group could prove profitable.

The results also indicate that a majority of the total change in percentage spent at large retailers resulting from a change in an explanatory factor would be generated by new customers. For large and local garden centers, the opposite occurs with the major contribution to change being generated by existing customers.

Introduction

Landscape horticulture grower cash receipts grew from 5.0% of all cash crop receipts in 1981 to 9.1% in 1986. Receipts were estimated to be about $7.0 billion or 11% of all cash crop receipts in 1987 (12). This rapid growth exerts pressure throughout the marketing system with the retail level experiencing the direct influence of changing demand and supply. Thus, the success of retail merchandisers in identifying target markets is important to all participants in the landscape plant marketing system.

Merchandisers of landscape plants attempt to differentiate themselves by offering different services and products. Consumer perception is also important in merchandiser differentiation. These perceptions are often influenced by advertising. Certain individuals can be targeted in advertising campaigns so as to maximize the efficiency of advertising expenditures. Information on these target consumers could be helpful to merchandisers as they make advertising decisions.

Research on retail store choice in general has investigated the influence of socio-economic variables, store characteristics and situational attributes on the decision where to purchase merchandise (3, 6, 7, 2). Bellenger et al. (3) recommended segmentation of female shoppers by age and education as an effective retail strategy. With respect to landscape plants, Turner (11) has investigated the influence of socio-economic characteristics on retail purchases, while Gineo (4) examined the characteristics of plants that influenced landscaper and retailer purchases.

The objective of this research was to investigate the socioeconomic characteristics of consumers that can be used by different types of landscape plant retailers to segment their market. This information can be used in identifying different target markets, which could lead to more efficient allocation of marketing and advertising resources.

Identifying target markets is important to retailers of landscape plants (9, 1). The success of various decisions, such as store location, product pricing, and advertising strategies, are dependent on a better understanding of clientele. Identifiable characteristics of consumers or situations are usually used to identify target markets.

In general, different methods used in the retailing literature to identify target markets have been multinomial logit (2), analysis of variance (7), stepwise discriminant analysis (3), and tobit models (6). When using a tobit estimation procedure to identify a target market, expenditures on a product are modeled as a function of socioeconomic characteristics of consumers and, perhaps, attributes of the product. But many of the consumers would not have purchased the specified product, therefore the sample would be truncated at zero purchases. That is, a portion of the sample would have zero expenditures on the product, causing parameter estimates from an ordinary least squares procedure to be biased. Instead, use of the tobit procedure developed by Tobin leads to unbiased and efficient parameter estimates for such an equation (5).

The situation of identifying target markets for several

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types of retail outlets of landscape plants cannot be accomplished simply by obtaining parameter estimates for each type of retail outlet model. This would require an assumption of independence between each model. That is, a consumer's expenditures on plants are independent of the type of retail outlet. Clearly, this assumption is not valid because an individual may purchase plants from several types of retail outlets.

One solution to the above problem would be to use a seemingly unrelated (SUR) tobit procedure to estimate parameters of each model. The estimates obtained would be more efficient than those from a single equation approach, but would still not be maximum likelihood estimates. In order to obtain maximum likelihood estimates, a standard technique of iterating the SUR regression system until convergence is followed. This technique is common in linear regressions and is easily adapted to the present problem. This approach, a full information maximum likelihood tobit (FIMLT), was used to estimate parameters for the following models.

(1) LRET = f(AGE, AGESQ, EDUC, MAR, RACE, INC, HMV, SEX),
(2) LGC = f(AGE, AGESQ, EDUC, MAR, RACE, INC, HMV, SEX),
(3) LOC = f(AGE, AGESQ, EDUC, MAR, RACE, INC, HMV, SEX),

where LRET, LGC, LOC represent the percentage of purchases at large retail, large garden centers, and local garden centers, respectively. Descriptions, means, standard deviations, and measurements of the explanatory factors are presented in Table 1.

Materials and Methods

A random telephone survey of Georgia residents was conducted in the fall of 1988 by the Survey Research Center at the University of Georgia. Of the total sample of 418, 232 had purchased landscape plants in 1988. The questionnaire included questions about the dollar amount of landscape plants purchased in 1988, the percent of purchases at different outlets, home ownership and market value of homes, and various other economic and demographic characteristics. These included family income, education, age, race, sex, and marital status.

The different outlets analyzed were large retail stores (K-Mart, Sears, etc.), large lawn and garden centers (Pikes, Franks, etc.), and local lawn and garden centers. Producers, mail order, and other outlets were cited by respondents but the percentage of plants purchased at these outlets was small relative to the first three outlets.

Results and Discussion

Parameter estimates for the FIMLT estimation procedure are presented in Table 2. The model for each retail outlet is discussed separately.

For large retail stores or mass merchandisers, the Georgia target market appears to be segmented by age, race, income, and the market value of homes, since these explanatory variables were significant at the .10 level. The significance and signs of AGE and AGESQ indicate that as age increases, the percentage of expenditures at large retail stores increases at a decreasing rate until age 45. After 45, increases in age decrease the percentage expected to be spent at large retail

Table 1. Different Retail Outlets and Factors Hypothesized to Explain the Percentage of Plants Purchased at Each in 1988.

Variables	Description	Mean	Standard Deviation	Midpoint	Measurement
LRET	Percentage of purchase at large, retail stores	32.62	37.7667		Percentage – (0–100)
LGC	Percentage of purchase at large garden centers	27.69	37.6061		Percentage – (0–100)
LOC	Percentage of purchase at local garden center	26.12	37.72		Percentage – (0–100)
AGE	Age of responsent	43.32	14.255		Years reported
AGESQ	Age squared	2079.2	1337.3		Year reported squared
EDUC	Highest level of schooling reported	15.272	3.6073		Amount reported
MAR	Marital status of respondent	.6810	.4670		
RACE	Race of respondent	.8319	.3747		
SEX	Gender of respondent	.5172	.5007		0 = female 1 = white
INC	Family income	38,136	17,097	2,500	0–4,999
				7,500	5,000–9,999
				12,500	10,000–14,999
				17,500	15,000–19,999
				22,500	20,000–24,999
				30,000	25,000–34,999
				42,500	35,000–49,999
				75,000	>50,000
HMV	Market value of home	78,879	71,131	5,000	0–10,000
				20,000	10,001–30,000
				45,000	30,001–60,000
				80,000	60,001–100,000
				125,000	100,001–150,000
				200,000	150,001–250,000
				375,000	>250,000

Table 2. Full Information Maximum Likelihood (FIML) Tobit Parameter Estimates and Student T-Values for the Percentage of Plants Purchased at Large Retail, Large Lawn and Garden Centers, and Local Garden Centers.

Factors (Independent Variables)	Different Outlets (Dependent Variables)		
	LRET	LGC	LOC
		Estimated Coefficients (student t-values)	
Intercept	35.3746	21.9970	−9.31807
	(.989)	(.701)	(−.212)
AGE	2.71419*[z]	−1.57191	−.280200
	(1.756)	(−1.159)	(−.147)
AGESQ	−.0294053*	.0159230	.00410808
	(−1.784)	(1.099)	(.202)
EDUC	.117217	1.28104	−1.42491
	(.115)	(1.430)	(−1.144)
MAR	−5.05980	−19.3406**	35.2652**
	(−.619)	(−2.731)	(3.409)
RACE	−23.7280**	10.5915	26.0621**
	(−2.489)	(1.263)	(2.167)
INCOME	−.000421561*	.000391149*	.0000702164
	(−1.703)	(1.804)	(.232)
HMV	−.000113530*	.0000965772**	−.0000347794
	(−1.947)	(1.891)	(−.490)
SEX	8.66512	7.15576	−22.0000**
	(1.279)	(1.204)	(−2.643)
Log likelihood function for total system	−998.154		

[z]*—Significant at the 0.1 level, **—significant at the 0.05 level.

stores. It appears that nonwhites were more likely to purchase plants at large retailers. Type of outlet patronized was correlated with income levels: lower income level buyers were more likely to patronize a mass outlet. Furthermore, there was a strong negative relationship between home market value and purchases at large retailers. That is, respondents with higher home market values purchased lower percentages of their plants from large retail stores.

As concerns large lawn and garden centers, marriage, income, and home market value were the significant explanatory factors. The results indicated that unmarried households with higher incomes and homes of greater market value purchased greater percentages of their plants from large garden centers. Age, education, race, and sex were not significant (0.10 level) explanatory factors associated with plant purchases at large garden centers.

In contrast, the percentage of plants purchased at local garden centers was significantly (0.10 level) explained by marriage, race, and sex. Being married, white and female appeared to identify the segment of the sample most likely to purchase higher percentages of plants from local garden centers. Other explanatory variables were not significant at a 0.10 level.

The tobit parameter estimates can be decomposed into two parts: one attributable to changes in existing customers' behavior and another due to changes in noncustomers' behavior (8). For large retail outlets, 40% of the total change indicated by a parameter estimate would be due to existing customers while 60% would be due to noncustomers becoming customers. On the other hand, for both large garden centers and local garden centers the percentages were reversed. That is, 60% of the total change indicated by a parameter estimate would be due to existing customers. Likewise, 40% of the total change would be associated with new customers. For example, the parameter estimates associated with marriage for the local garden center model indicated that a change from nonmarried to married, other things being equal, would increase the percentage spent at a local garden center by 35.26. Of this increase, 21.16 (60%) is attributed to existing customers while 14.10 (40%) is attributable to new customers.

This research is an initial attempt to identify target markets for different retail outlets of landscape plants. There appear to be definite differences in the demographic characteristics of these consumers. Additional research to identify why these different consumers select these types of retail outlets would further enhance retail operators' ability to develop profitable marketing strategies. Of course, the results of this analysis are applicable to the sample area (Georgia). Data from larger and different sample areas could be used to test the robustness of these results to other areas and time periods.

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Spectral Transmittance of Selected Greenhouse Construction and Nursery Shading Material[1]

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Abstract

Spectral transmittance properties of several greenhouse construction and shading materials were determined by measuring the quantity and quality of solar radiation transmission on non-clouded (sunny) days at solar noon. Spectral transmittance parameters included photosynthetic radiation (400–700 nm) and photomorphogenic radiation (660 nm (red light), 730 nm (far-red light), and 400–500 nm (blue light)). Light available for photosynthesis was measured as photosynthetic photon flux density (PPFD) and photosynthetic radiation (PI). Photomorphogenic radiation was measured as far-red/red (FR/R) and blue light. Greenhouse construction materials included glass, chambered acrylic, chambered polycarbonate, and inflated plastic film. Various shade materials of different colors were evaluated. Photosynthetically active radiation transmission of construction materials ranged from approximately 95% transmission of direct sunlight with Exolite to less than 50% with tinted Lexan. Far-red/red values of shade materials ranged from 0.94 for Enduro Green to 5.58 for Cravo LS-7.

Index words: Far-red:red ratio, photomorphogenesis, light quality, photosynthetic photon flux density, photosynthetic irradiance, phytochrome, blue-light

Significance in the Nursery Industry

The quantity of photosynthetic energy reaching a plant affects plant growth. Light levels can influence photosynthetic rates, but plant growth and form may also be affected.

Transmitted light quantity and quality varies among greenhouse construction and shading materials. Visual appearance of the materials is deceiving (e.g., similarly appearing green shading materials had vastly different spectral properties). These transmission differences may have very different effects on plant growth and development and may influence production practices. Although we did not measure plant growth under the different materials in this study, other research that we have conducted indicates a high far-red/red (FR/R) environment may be more suitable than one with a low FR/R transmittance when short, compact plants are desired while. Likewise, taller plants may be the result of a high FR/R environment. Growers need to be aware of the spectral filtering characteristics of construction and shading materials. Transmission specifications must be considered before installation or application of a material under which plants will be grown.

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Introduction

Greenhouse construction and nursery shading products reduce the solar radiation reaching plants grown under these materials. This reduction is often desirable and planned, especially in the summer when irradiance levels are high. Reducing solar radiation assists in cooling the greenhouse and protects plants from excessive heat and light. In general, the main concern in reducing light has been reduction of overall intensity of irradiance level. Little or no attention, however, has been directed at the effect construction and shading materials have on the alteration of spectral light quality.

Photosynthesis is active at wavelengths between 400 and 700 nm (7). In contrast, phytochrome activity and photomorphogenic development of plants is controlled by far-red/red light ratio (730 nm/660 nm) (1, 2, 3) and the amount of blue light (400–500 nm) (4, 6). Selectively altering light wavelengths can influence plant growth and morphology (1, 3, 5). Many plants grown under low far-red/red ratios are more compact and darker green than plants grown under high ratios (5). Exposure of plants to short-term end-of-day red or far-red light can induce profound changes in plant morphology (2). The objective of this study was to document different light filtering characteristics of some greenhouse construction and nursery shading materials.