

Branding Awareness and Willingness-to-pay Associated with the Texas Superstar™ and Earth-Kind™ Brands in Texas

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Abstract. The environmental horticulture industry, also known as the Green Industry, is the second most important sector in the U.S. agricultural economy in terms of economic output and one of the fastest growing segments of agriculture; however, it has shifted from an average annual growth of 13.6% in the 1970s to an annual growth of less than 3% in the 2000s, which suggests the industry is facing a maturing marketplace. As an effort to help the industry stimulate demand, Texas A&M AgriLife developed the Texas Superstar™ and Earth-Kind™ brands. The aims of these plant promotion programs are to increase the demand for selected horticultural products, raise awareness among consumers of Texas-grown plant material, promote environmental responsibility, and increase producers' profitability by providing branding price premiums. Despite the considerable investments on research and marketing done thus far, no research has investigated the effectiveness of these branding efforts in terms of consumer behavior. This article evaluates brand awareness and willingness-to-pay for these two brands in Texas. The discrete choice models used were the Logit and Probit models on brand awareness and the Tobit model on the conditional willingness-to-pay. Results from this study show that consumer awareness of Texas Superstar™ and Earth-Kind™ in Texas is low, but the level of satisfaction among consumers is high. Furthermore, profiles of the consumers' behavioral and demographic characteristics that are more likely to influence brand awareness and willingness-to-pay were identified. The findings suggest that consumers who shop weekly or monthly for ornamental plants are more likely to be aware of programs such as Texas Superstar™ and Earth-Kind™. Also, those who live in South Texas were more likely to exhibit awareness of Earth-Kind™. Consumers who shopped for self-consumption purposes were willing to pay a discounted price for Texas Superstar™ and Earth-Kind™ plants compared with unbranded plants and those who were previously aware of the brands were willing to pay more. The two brands were effective in differentiating their products and thus creating price premiums. It was estimated that the willingness-to-pay for Earth-Kind™ and Texas Superstar™ for the average respondent was 10% higher than the willingness-to-pay for an unbranded plant.

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The U.S. green industry produced an economic impact of \$147.8 billion in output, \$95.1 billion in value-added, \$64.3 billion in labor income and generated 1.9 million jobs in 2002 (Hall et al., 2006). The impact of this industry in the U.S. economy is substantial as reflected on these economic indicators as well as on positive growth rates even during recessionary periods, yet it has experienced a gradual slowdown in growth in the past years (Hall et al., 2006). Floriculture and nursery crops average annual growth rate

decreased from 13.6% in the 1970s to an average growth of 9.9% per year in the 1980s to ≈2.9% in the 2000s, which may suggest that the market is maturing with an annual growth of less than 5% annually (Hall, 2008).

As markets mature, consumers are more demanding and competition is more intense. To remain competitive, producers need to become low-cost operators, increase customer value, or to differentiate in some way. In recent years, several brands have been established in the green industry (e.g., Sygenta flowers, Proven Winners™, Novalis™ Plants that Work™, Garden Splendor™), and several states have developed state-sponsored brands (e.g., Oklahoma Proven, Louisiana Select, Oregon Grown, Florida Plants of the Year) as a strategy to stimulate a saturated demand and increase profit margins.

The Texas green industry ranks third nationally in terms of output, value-added, and employment economic impacts. Palma and Hall (2009) estimated that in 2007, Texas produced \$13.5 billion in output, \$7.6 billion in value-added, and 157,990 jobs. Given the economic impacts of Texas' green industry in the U.S. economy and to support Texas producers' competitiveness, the Texas A&M University Agricultural Program in conjunction with other state and private collaborators started developing in 1989 the Texas Superstar™ program and in 1996 the Earth-Kind™ rose program. Both of these promotional and educational programs have been in the market for years now, and although substantial investments in research and marketing still need to be done by horticultural scientists, producers, sellers, and other partners to identify promising plant material, overcome production problems, and maintain credibility in the marketplace, no research has focused on analyzing consumer response with respect to these promotional/educational programs. Selected indicators of consumer awareness (i.e., sales statistics) have been recorded, but no emphasis has been given to consumers' brand awareness determinants and the consumers' willingness-to-pay (WTP) for Texas Superstar™ and Earth-Kind™ plant materials.

Research regarding the effects of brand awareness on consumer choice has shown that brand awareness precedes the development of concepts such as brand preference (Alreck and Settle, 1999), brand equity (Aaker, 1996), and brand attitude (Rossiter and Percy, 1987). Govindasamy et al. (1998) used a discrete choice model to measure the success of the Jersey Fresh Program (JFP), a state-sponsored marketing program in New Jersey, in terms of the program's awareness. As a result of the econometric analysis, the authors were able to provide a comprehensive study of the consumers' behavioral attitudes and demographic profiles. The results of this study showed the program was highly effective with awareness levels of ≈77%, and contrary to expectations, they found a significant negative relationship between older age groups and awareness of the JFP, which suggested the program was popular among young consumers (younger than 50 years of age).

According to Koелеmeijer et al. (1993), the increased popularity in the study of brand awareness, consumers' WTP, and consumers' response in general to horticultural brands is explained by the fact that branding has been less commonly used in horticultural goods and it could be considered a recent marketing strategy adopted by the industry. Some studies have suggested that a brand guarantee in horticultural products is not sufficient to increase added value, although it is important to keep market share; whereas others have found that consumers' WTP for a horticultural brand changes according to the product's attributes (Bagnara, 1996; Yue et al., 2009). For instance, Bagnara (1996) evaluated consumers' WTP for a brand that guaranteed peaches produced by integrated pest management techniques and found that consumers were more willing to penalize unbranded peaches than to pay for a branded product. Also, Yue et al. (2009) found that consumers' WTP for plants decreases when plants are labeled as invasive and increases when plants are labeled as native. They found that consumers' sociodemographics and attitudes significantly alter consumers' WTP for native and invasive attributes.

The main objective of this article is to explain consumers' brand awareness and WTP for the Texas Superstar™ and Earth-Kind™ promotional programs on the part of Texas' lawn and garden consumers.

Materials and Methods

An electronic mail survey was conducted in July 2008 to collect data regarding consumers' perceptions of branding efforts and WTP in the green industry. Before implementation, the survey was approved by the Institutional Review Board. Because the Texas Superstar™ and Earth-Kind™ programs target consumers in the state of Texas, the respondents' mailing list used included a representative sample of the Texas population. From the total sample of 880 individuals, ≈31% were actual consumers of the ornamental industry's products, lowering the final number of usable responses to 274. These responses correspond to consumers who bought any type of ornamental plants from July 2007 to July 2008.

The survey was divided into four major categories to measure consumers' behavioral and demographic variables. The first category included general consumer purchasing habits toward ornamental products, the second and third categories contained specific questions about the Texas Superstar™ and Earth-Kind™ programs, respectively, and the fourth category collected demographic information. The questions about consumer habits toward ornamentals measured regularity, purpose and place of purchase, number of monthly transactions if any, and the significance of several aspects that were assumed to influence the purchase decision. The regularity of purchase was measured on a weekly, monthly, yearly, or special occasion's basis, in which weekly and monthly was considered

as a high regularity. For each program, questions about brand awareness, level of satisfaction, intention of repurchase, WTP, and a rating of relevant features of the brand were included. The ranges of WTP for a branded plant versus an unbranded plant used in this study were: 0%, 1% to 10%, 11% to 20%, 21% to 30%, 31% to 40%, and 41% or more.

According to Bierlaire (1998), the complexity of human behavior suggests that a choice model should explicitly capture some level of uncertainty, and the assumption of deterministic decision rules of neoclassical economic theory presents strong limitations for practical applications. Thus, the Random Utility Theory (RUT), proposed by Daniel McFadden and Charles F. Manski in the 1970s, has played a major role as the theoretical basis for discrete choice modeling. In this context, the decision-maker is supposed to have incomplete information and therefore uncertainty is taken into account. McFadden (1974) describes the utility that individual i associates with alternative a as given by:

$$U_a^i = V_a^i + \varepsilon_a^i \quad [1]$$

where V_a^i is the deterministic component of the utility that reflects the representative tastes of the population and ε_a^i is the stochastic component that captures the uncertainty.

In marketing research, a rational individual is modeled as choosing the brand with the highest utility among those available on the purchase occasion and any difference between the consumer's actual choice and the choice predicted by the maximum utility rule can only be attributed to the random error that captures the researcher's uncertainty about the consumer's utility function (Pazgal et al., 2005). Gujarati (1995) acknowledges that the four most commonly used discrete choice models derived from RUT are the Linear Probability Model, the Logit model, the Probit model, and the Tobit or censored regression model. In this study, brand awareness for each program was estimated using Logit and Probit

models. Both of these binary response choice models are special cases of the form:

$$P(Y = 1|x) = G(\beta_0 + x\beta) = p(x) \quad [2]$$

where $0 < G < 1$ corresponds to the standard normal cumulative distribution (cdf) in the Probit model and to the standard logistic cdf in the Logit model. The main difference in these models is the interpretation of the estimated parameters, because the Logit model calculates the natural log of the odds ratio in favor of an event occurring, whereas the Probit model, evaluated at the inverse of the standard normal cdf, directly estimates the probability of the event (Wooldridge, 2000).

The general model specification for estimating the brand awareness of the i program (Texas Superstar™ or Earth-Kind™) as a function of its causal effects is given by:

$$\begin{aligned} Y_i = & \beta_0 + \beta_1 DAGE2 + \beta_2 DAGE3 \\ & + \beta_3 DAGE4 + \beta_4 GEN + \beta_5 MAR \\ & + \beta_6 DINC2 + \beta_7 REGU + \beta_8 PUR \\ & + \beta_9 DREG2 + \beta_{10} DREG3 + \varepsilon_i \end{aligned} \quad [3]$$

where the variables used in the brand awareness models are described in Table 1. The dependent variable in these models was a binary variable created for brand awareness ($Y_i = 0, 1$). The independent variables were age, gender, marital status, income, regularity and purpose of purchase, and region. To avoid perfect collinearity, the sum of the coefficient of the dummy variables was restricted to zero as in:

$$\sum_{k=1}^K \beta_{ik} = 0, \text{ to get } -\sum_{k=2}^K \beta_{ik} = \beta_{i1} \quad [4]$$

The second part of the analysis consisted of determining the WTP for the Texas Superstar™ and Earth-Kind™ programs. Because a customer's WTP for a desirable attribute of a product is expected to be always positive (i.e., greater than zero), the use of a censored model such as the Tobit model was appropriate. The model specification for estimating the WTP for Texas Superstar™-labeled produce

Table 1. List of variables used in the econometric analysis of the Texas Superstar™ and Earth-Kind™ brands.

Variable	Description
Y_i	Awareness of the i program (= 1 if true and 0 otherwise)
Z_i	Mean willingness-to-pay for the i program
Sociodemographic characteristics	
DAGE2	Age between 25 and 39 years old (= 1 if true and 0 otherwise)
DAGE3	Age between 40 and 55 years old (= 1 if true and 0 otherwise)
DAGE4	More than 55 years old (= 1 if true and 0 otherwise)
GEN	Gender (= 1 if female and 0 otherwise)
MAR	Marital status (= 1 if married and 0 otherwise)
DINC2	Income level (= 1 if income above \$50,000 and 0 otherwise)
Consumer habits	
REGU	Regularity of purchase (= 1 if weekly or monthly and 0 otherwise)
PUR	Purpose of the purchase (= 1 if self-consumption and 0 otherwise)
AWARE	Awareness of the i program (= 1 if true and 0 otherwise)
Region	
DREG2	Region: Central Texas (= 1 if true and 0 otherwise)
DREG3	Region: South Texas (= 1 if true and 0 otherwise)

and Earth-Kind™ program as a function of sociodemographic characteristics, consumer habits, and region is given by:

$$\begin{aligned} Z_i = & \beta_0 + \beta_1 DAGE2 + \beta_2 DAGE3 \\ & + \beta_3 DAGE4 + \beta_4 GEN + \beta_5 MAR \\ & + \beta_6 DINC2 + \beta_7 REGU + \beta_8 PUR \\ & + \beta_9 AWARE_i + \beta_{10} DREG2 \\ & + \beta_{11} DREG3 + \epsilon_i \end{aligned} \quad [5]$$

where the variables used in the WTP models are described in Table 1. The value of the dependent variable (Z_i) in these models was the corresponding conditional mean WTP for the i program (Texas Superstar™ or Earth-Kind™). The independent variables were brand awareness, age, gender, marital status, income, regularity and purpose of purchase, and region. Again, to prevent perfect collinearity, the sum of the coefficient of the dummy variables was restricted to zero as in Eq. 3.

Results

The usable sample fairly represented Texas' population based on sociodemographic characteristics, including marital status, gender, income, and age. Of the sample, 60% of respondents were married compared with 54% of the population in Texas. The percentage of females in the sample was 53% versus 50% for Texas. From the total number of respondents, 53% had an income of more than \$50,000 in contrast with 47% of the actual population and 55% of respondents were 25 to 55 years old compared with 43% of Texas (Table 2).

Respondents stated an overall low regularity of purchase of ornamental products with 78% of respondents buying yearly or on special occasions. Approximately 75% of respondents had zero to two transactions during the previous month of the survey. Thus, because the survey was done in July 2008, the average number of transactions for June 2008 was 1.8 transactions. Most ornamental products were purchased for self-consumption

purposes with 84% of respondents declaring that the reason of the purchase was self-consumption, a result consistent with Yue and Behe (2010). The preferred outlets to purchase ornamental products were garden centers (72%) followed by nurseries (40%), chain stores (32%), and supermarkets (30%).

The majority of consumers indicated they were unaware of Texas Superstar™ (88%) and Earth-Kind™ (86%); however, awareness among respondents of other plant promotional programs such as Wave™, Proven Winners™, and Plants that Work™ was similar; whereas 15% of respondents were aware of Plants that Work™, ≈14% were aware of Earth-Kind™. The awareness of Texas Superstar™ was identical to the awareness of Wave™ (12%), and the brand that exhibited the lowest level of awareness was Proven Winners™ (8%). Texas Superstar™ was most often recalled from in-store displays and the majority of respondents who had previously bought Texas Superstar™ plants were willing to pay a price premium for this brand. The distribution of WTP for Texas Superstar™ implied that ≈22% of respondents were willing to pay a premium of 1% to 10%, 28% were willing to pay 11% to 20% more, and 34% were willing to pay more than 21% for a Texas Superstar™ compared with an unbranded plant. Earth-Kind™ sources of awareness included suggestions of friends or relatives (37%), advertisement including in-store displays (30%), Internet/web site (10%), salesperson (13%), and other sources of awareness (10%), which included articles from the newspaper and the Dallas Arboretum. The percentage of consumers who found out about the program through word of mouth (37%) suggests a considerable level of importance for this source of awareness.

Regarding the Earth-Kind™ landscaping advised techniques, ≈48% of aware respondents had used at least one of them. Among the most popular landscaping practices were the selection of locally adapted plants, the use of organic matter in soil preparation, and the use of mulches. Some of the less used

techniques involved a more complex design of the landscape. For instance, respondents affirmed to pre-plan and design the landscape (47%), but few respondents hired landscape architectural services for this planning stage (11%). The greater part of respondents who were aware (44%) of Earth-Kind™ were willing to pay 1% to 10% more for an Earth-Kind™ plant relative to an unbranded plant. The distributions of WTP among aware and non-aware respondents of Texas Superstar™ and Earth-Kind™ suggested a positive relationship between the respondents' WTP and respondents' brand awareness.

Brand awareness results. The parameter estimates of the brand awareness models using Logit and Probit were identical in terms of significance and proportionally comparable in terms of value. Given this evidence, only the logistic results are discussed in this article. In all models, significance of the variables was considered at the 0.1, 0.05, and 0.01 levels.

The Logit results for the Texas Superstar™ brand awareness models are provided in Table 3. The goodness of fit of this model is indicated by the McFadden's R^2 of 0.19, which indicates that 19% of the total variability of the dependent variable from its mean is explained by the model. Additionally, the value of the likelihood ratio test was 36.5; thus, the null hypothesis that all slope coefficients are zero as a group (i.e., that the independent variables are non significant) is rejected ($P < 0.0001$). Regarding the extent of predictive accuracy, this model compared with a naïve model with a 0.5 cutoff predicts 238 of 268 (88.8%) of the observations correctly. That is, ≈238 of the survey participants were correctly classified as either aware or unaware of Texas Superstar™. The variable that measured regularity of purchase (REGU) was significant at the 0.01 level and had a positive relationship with brand awareness, which indicates that consumers who shopped regularly (weekly or monthly) for ornamentals were more likely to be aware of Texas Superstar™. Although this might seem an expected result, the magnitude of the increase in the likelihood of awareness caused by the presence of a high regularity of purchase should be noticed; when the variable REGU is present, the odds of the consumer being aware are 43 to 1. The variables DAGE3 (40 to 55 years old) and GEN (female gender) had negative signs and were significant at the 5% level, which suggests that consumers between 40 and 55 years old and females are less likely to be aware of Texas Superstar™. Because negative coefficients lead to odds ratios less than one, the presence of the variables DAGE3 and GEN lead to awareness being less likely to occur by 6% (odds ratio of 0.06/0.94) and 7% (odds ratio of 0.07/0.93) correspondingly.

The Logit results for the Earth-Kind™ brand awareness models are given in Table 3. The goodness of fit of this model is indicated by the McFadden's R^2 of 0.11, which indicates that 11% of the total variability of the dependent variable from its mean is explained by the model. Additionally, the value of the

Table 2. Comparison of variable statistics from the sample and actual Texas population.

Demographic variables		Survey data		Census data ^a
		Frequency	Percentage	Percentage
Marital status	Married	163	59.9	53.5
	Single	109	40.1	46.5
Gender	Male	129	47.3	49.8
	Female	144	52.7	50.2
Age	Younger than 25	35	12.9	38.1
	25 to 39	69	25.5	14.6 ^b
	40 to 55	81	29.9	28.1 ^c
	Older than 55	86	31.7	19.2 ^w
Income	Under \$25,000	45	16.4	26.7
	\$25,000 to \$50,000	85	31.0	26.6
	\$50,001 to \$75,000	57	20.8	17.9
	\$75,001 to \$99,999	36	13.1	11.3
	\$100,000 and above	51	18.6	17.5

^aSource: U.S. Census Bureau, 2000 and 2005–2007 American Community Survey.

^bAge 25 to 34 years.

^cAge 35 to 54 years.

^wAge 55 years or older.

likelihood ratio test was 24.6; thus, the null hypothesis that all slope coefficients are zero as a group is rejected ($P < 0.006$). Regarding the models' prediction of actual choice outcomes, this model compared with a naïve model with a 0.5 cutoff predicts 232 of 268 (86.5%) of the observations correctly; hence, ≈ 232 of the survey participants were correctly classified as either aware or unaware of Earth-Kind™. The coefficient for regularity of purchase (REGU) was positive and highly significant at the 0.01 level, meaning that consumers who shop weekly or monthly are more likely to be aware of Earth-Kind™. Again, the effect of the variable REGU on the probability ratio is considerable; the presence of high regularity of purchase (weekly or monthly) makes the respondent ≈ 13 times more likely to be aware of the

Earth-Kind™ program. Also, the significance of the variable DREG3 (South Texas region) indicated that consumers living in South Texas (Coastal Bend and South District) have higher probabilities of being aware of Earth-Kind™ than consumers living in any other districts. The odds ratio of DREG3 suggested that awareness of Earth-Kind™ is up to five times more likely to be present if the consumer resides in South Texas. An unexpected result was a negative relationship between the variables DAGE3 (40 to 55 years old) and DINC2 (income above \$50,000) and Earth-Kind™ awareness. The results imply that respondents between 40 and 55 years old and with high income levels are less likely to be aware of Earth-Kind™. Hence, results suggest that purchase of Earth-Kind™ roses and active participation in Earth-Kind™ cam-

paigns could be less likely for consumers with relatively high income and consumers in the 40 to 55 years of age group. The previous could be explained by the increasing participation of older and high-income-level citizens in the contract of professional lawn care services (Hall et al., 2006). The estimated impact of the presence of the variables DAGE3 and DINC2 is to make consumers less likely to be aware by 0.19 and 0.44, respectively.

Willingness-to-pay results. The estimated coefficients, SES, t-values, and marginal effects for the Tobit analysis of the Texas Superstar™ WTP model is presented in Table 4. The high significance of the SIGMA parameter suggests that for the data truncation, the lower limit level of zero cannot be ignored and the estimation method must deal

Table 3. Brand awareness parameter estimate results from Logit model for the Texas Superstar™ and Earth-Kind™ brands.

	Texas Superstar™				Earth-Kind™			
	Coefficient	SE	t-value	Odds ratio	Coefficient	SE	t-value	Odds ratio
Intercept	-1.8817***	0.6182	-3.0435		-1.4721***	0.5403	-2.7246	
Sociodemographic characteristics								
DAGE2 (25 to 39)	-0.0149	0.3615	-0.0414	0.9662	-0.2709	0.3380	-0.8014	0.5359
DAGE3 (40 to 55)	-1.2202**	0.4912	-2.4840	0.0602	-0.6993*	0.3719	-1.8801	0.1998
DAGE4 (older than 55)	-0.2857	0.3937	-0.7257	0.5180	-0.1885	0.3221	-0.5853	0.6478
GEN (female)	-1.1228**	0.4648	-2.4159	0.0754	-0.4682	0.3930	-1.1913	0.3402
MAR (married)	0.0917	0.4919	0.1864	1.2351	0.2199	0.4242	0.5184	1.6593
DINC2 (above \$50,000)	0.1318	0.2334	0.5645	1.3545	-0.3549*	0.2085	-1.7019	0.4417
Consumer habits								
REGU (weekly or monthly)	1.6371***	0.4716	3.4712	43.3651	1.1226**	0.4403	2.5499	13.2633
PUR (self-consumption)	-0.3622	0.5344	-0.6779	0.4343	-0.4899	0.4752	-1.0311	0.3236
Region								
DREG2 (Central Texas)	0.0952	0.2986	0.3190	1.2452	-0.2524	0.2591	-0.9741	0.5592
DREG3 (South Texas)	0.0639	0.4194	0.1524	1.1585	0.7382**	0.3174	2.3255	5.4723
Number of usable observations		268				268		
Log-likelihood (L_1)		-77.74				-95.25		
Likelihood ratio		36.52				24.67		
LR P value		0.0001				0.006		
McFadden's R^2		0.19				0.11		
Fraction of correct predictions		0.89				0.86		

*, **, ***Significant at $P \leq 0.1$, 0.05, or 0.01, respectively.

Table 4. Willingness-to-pay parameter estimate results from Tobit model for the Texas Superstar™ and Earth-Kind™ brands.

	Texas Superstar™				Earth-Kind™			
	Coefficient	SE	t-value	Marginal effects	Coefficient	SE	t-value	Marginal effects
Intercept	0.1516***	0.0315	4.8147		0.1373***	0.0314	4.3742	
Sociodemographic characteristics								
DAGE2 (25 to 39)	-0.0252	0.0175	-1.4339	-0.0593	-0.0098	0.0165	-0.5951	-0.0238
DAGE3 (40 to 55)	-0.0032	0.0167	-0.1907	-0.0075	-0.0173	0.0152	-1.1446	-0.0420
DAGE4 (older than 55)	-0.0136	0.0156	-0.8699	-0.0320	-0.0476***	0.0148	-3.2026	-0.1151
GEN (female)	0.0188	0.0201	0.9361	0.0444	0.0144	0.0187	0.7728	0.0349
MAR (married)	-0.0085	0.0204	-0.4166	-0.0201	-0.0139	0.0194	-0.7204	-0.0337
DINC2 (above \$50,000)	0.0029	0.0103	0.2868	0.0070	0.0009	0.0098	0.0961	0.0023
Consumer habits								
REGU (weekly or monthly)	0.0166	0.0237	0.6995	0.0391	0.0258	0.0221	1.1667	0.0624
PUR (self-consumption)	-0.0687**	0.0274	-2.5108	-0.1622	-0.0439*	0.0262	-1.6770	-0.1061
AWARE (brand aware)	0.0448*	0.0255	1.7574	0.1059	0.0429*	0.0221	1.9401	0.1037
Region								
DREG2 (Central Texas)	-0.0023	0.0129	-0.1813	-0.0055	0.0026	0.0123	0.2130	0.0063
DREG3 (South Texas)	-0.0006	0.0179	-0.0360	-0.0015	-0.0032	0.0168	-0.1897	-0.0077
SIGMA	0.1058***	0.0069	15.2602		0.1039***	0.0067	15.6130	
Number of usable observations		141				151		

*, **, ***Significant at $P \leq 0.1$, 0.05, or 0.01, respectively.

with the asymptotic distribution of the data (i.e., Tobit model). The coefficient of the variable PUR (Purpose is self-consumption) was found to have an inverse relationship with WTP and was significant at the 0.05 level. The described relationship and significance of this variable imply that if the purpose of the purchase of a Texas Superstar™ plant is defined as self-consumption, then there is a price discount for a Texas Superstar™ plant compared with an unbranded plant.

In reference to the marginal effects, when self-consumption is the purchase motive, consumers express a 16% price discount for Texas Superstar™; alternatively, when purchased as a gift, they are willing to pay a 16% price premium. The model estimation validated the positive effect of brand awareness on WTP; the coefficient of the variable TSAWARE (Awareness of Texas Superstar™) was positive and significant at a 90% confidence interval. The results suggest that, after controlling for sociodemographic and area variations, ornamental consumers aware of Texas Superstar™ plants were willing to pay a price premium that is 11% higher than the average price premium for Texas Superstar™. Moreover, the WTP for Texas Superstar™ of the average consumer was calculated at ≈10%.

The results for the Tobit estimation of the Earth-Kind™ WTP model are described in Table 4. The Tobit model appears to fit the data well as indicated by the high significance of the parameter SIGMA. The coefficient of the variable DAGE4 (older than 55 years) was greatly significant and had a negative effect on the program's WTP, indicating that consumers older than 55 years expressed a price discount for Earth-Kind™ plants compared with unbranded plants. This age group was willing to pay a price discount of 12% compared with the average price premium for Earth-Kind™ products. Comparable to the results of the Texas Superstar™ WTP model, the variables that measured purpose of purchase (PUR) and brand awareness in the Earth-Kind™ model (EKARE) had an influence on WTP. In the Earth-Kind™ WTP model, the coefficients associated to the variables PUR and EKARE were significant at the 0.1 level, the first implying a price discount of 10.6% for an Earth-Kind™ plant if the purpose of the purchase is self-consumption and the second supporting the finding that aware respondents are willing to pay more for branded products. If the purpose of the purchase for Earth-Kind™ products was for gifts, then there was a price premium of 10.6%, because the variable PUR is binary. The price discount from self-consumption purposes in Earth-Kind™ (10.6%) is less than the same effect in Texas Superstar™ (16%). However, the increase in WTP as a consequence of brand awareness is a close estimate for the two programs with an increase of 10% on the average WTP as a result of Earth-Kind™ awareness. The WTP for Earth-Kind™ of the average consumer was calculated at 9.9%.

The results may also be viewed as consumers WTP for sustainable practices. This implication is noteworthy given consumers'

increasing concern about sustainable horticulture and recent debate over sustainable labeling of plants by the horticulture industry (Yue et al., 2009).

Summary and Conclusions

Awareness of the Texas Superstar™ and Earth-Kind™ brands in Texas was found to be low, but the level of satisfaction among aware consumers was found to be high. Other national private brands had also low awareness among respondents. Consumers that are more likely to be aware of programs such as Texas Superstar™ and Earth-Kind™ are those who shop frequently (weekly or monthly) for ornamental plants. Also, a demographic characteristic of respondents who were up to five times more likely to be aware of Earth-Kind™ included those who lived in South Texas (Coastal Bend and South District). The results suggest that marketing programs might not be effectively reaching some demographic groups. These groups would include female consumers and those between 40 and 55 years old for the Texas Superstar™ brand and consumers between the same age group (40 to 55 years old) and those with an income of \$50,000 or more for the Earth-Kind™ program. A reason for this may be that consumers with relatively high income, females, and older age groups are relying more everyday in the contract of professional landscaping services and are less aware of the products available in the ornamentals market. Brand awareness among Texas consumers of Texas Superstar™ (12%) and Earth-Kind™ (14%) was found to be comparable to that of other private plant promotion programs such as Plants that Work™ (15%) and Wave™ (12%), whereas it was higher than consumers' awareness of Proven Winners™ (8%).

Regarding the WTP results, consumers who shopped for self-consumption purposes reported a price discount for Texas Superstar™ (16%) and Earth-Kind™ (10.6%) plants compared with unbranded plants; alternatively, because purpose was a binary variable, consumers purchasing products to give as gifts showed a price premium of 16% and 10.6% for Texas Superstar™ and Earth-Kind™, respectively. An additional sociodemographic characteristic with a price discount for Earth-Kind™ products included consumers of older than 55 years of age. We found that consumers who were previously aware of the brands were willing to pay more for the additional benefits they offer compared with an unbranded plant; Earth-Kind™ awareness increased WTP for Earth-Kind™ products by 10%, whereas Texas Superstar™ awareness increased WTP for Texas Superstar™ products by 11%. The WTP for Earth-Kind™ and Texas Superstar™ of the average respondent was 10%. Therefore, this research suggests a price premium of ≈10% for Earth-Kind™ and Texas Superstar™ products. Additionally, because the focus of these promotional/educational efforts, especially of the Earth-Kind™ pro-

gram, entails environmental sustainability, the results may also suggest an indication of consumers WTP for sustainability.

It can be concluded that marketing efforts should target those groups of consumers with higher WTP, that is, consumers with a profile of behavioral and demographic characteristics that are more likely to influence awareness of Texas Superstar™ and Earth-Kind™. The groups with higher odds of awareness include consumers who shop weekly or monthly and, for the Earth-Kind™ program, those who live in South Texas. The increase in the consumers' regularity of purchase could be achieved through promotional tactics, successful marketing campaigns have been done in other states of the United States that have proven to increase the frequency of purchase among ornamentals' consumers. For instance, in 2000, the Flower Promotion Organization launched a promotional effort to increase the buying frequency among existing female flower buyers on non-traditional holidays. Ward (2004) estimated the impact of this campaign and concluded that the promotions positively impacted the demand for flowers and effectively increased buyer frequency. Clearly, another option is targeting those groups that might not have been efficiently reached thus far. These groups include consumers between 40 and 55 years old, females, and consumers with an income above \$50,000. However, it should be noticed that the likelihood of awareness for these groups might be lower either because they have not been reached by past marketing efforts or because they are not a target group for this type of products. Hence, there might be more potential for increasing brand awareness and subsequently increasing market penetration in targeting those groups with the behavioral and demographic profile described earlier who are more prone to be aware of the Earth-Kind™ and Texas Superstar™ programs.

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