Using Intercept and Telephone Survey Methods to Assess Consumer Awareness and Purchasing of Pennsylvania Gardener Selects

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SUMMARY. A consumer-research study was conducted in two locations in Pennsylvania utilizing two survey methods: intercept and telephone. This study was designed to assess: 1) what national brand name plant material participants purchased in the past; 2) the consumer's awareness of the Pennsylvania Gardener Selects (PGS) program; and 3) the gardening habits and demographics of Pennsylvania gardeners. The first survey was an intercept survey of 390 self-selected participants who attended Ag Progress Days (APD), a 3-day outdoor educational event and farm implement show from 20–22 Aug. 2002. The second survey was a telephone survey of 500 randomly selected households in the metro-Philadelphia area and was conducted from 20 Aug. through 17 Sept. 2002. Only responses from Pennsylvania gardeners were used in the analysis of the results. A comparison of survey results indicated that metro-Philadelphia-area participants spent more on plant material annually than APD participants, who primarily resided in rural locations. The results

showed that metro-Philadelphia-area gardeners tend to live in single-adult households and have one or more children, whereas APD gardeners tend to live in a household with two or more adults and have no children. Eighty-one percent of APD participants and 62% of metro-Philadelphia participants reported that they would be willing to purchase plant material that has been evaluated and chosen as being outstanding for use in all areas of Pennsylvania, a premise for the PGS program.

The effectiveness of current commodity-based business practices and the potential for marketing strategies, including branding, within the green industry have become popular topics for editorial columns and articles in trade magazines (Doeckel, 2002; Henne, 2002a). State plant-selection programs are one such branding effort. Since the establishment of the first state plant-selection program, Texas Superstars, in 1990, the idea of a state-branding program has been employed throughout the horticulture industry (Mackay et al., 2001). Growers in the Commonwealth of Pennsylvania have also realized the value of this opportunity and have created their own plant-selection program called "Pennsylvania Gardener Selects" (PGS) (Sellmer et al., 2003). The challenge for this and similar programs is to assess consumer awareness of the program and their willingness to purchase PGS products that, in turn, will determine the commercial success and potential future of the program.

Within the green industry, novice gardeners often struggle with knowing which plants are appropriate for their personal gardens (Doeckel, 2002). A goal of the PGS program is to combine the benefits of an aesthetically pleasing product that is ideal for use throughout Pennsylvania with an educational component. To be selected as PGS, plant material must meet predetermined requirements in all of the 44 display gardens throughout the state (Sellmer et al., 2003). Plants are evaluated based on flowering, foliage quality and condition, uniformity, plant form, and garden appeal (Sellmer et al., 2003). Only plants that perform exceptionally well throughout the season are labeled PGS. With the knowledge that PGS plants have been tested and then selected based on their ability to

withstand the environmental conditions found throughout all areas of the state, novice gardeners are assured that these plants are appropriate for their garden and that they will produce outstanding results. Consumers will be encouraged to continue purchasing this plant material as they become more familiar with the brand and if the perceived experience matches or surpasses an expected experience.

While growers will continue to produce a quality product, consumers must be made aware that such a product exists (Iacobucci, 2001). Marketing campaigns/strategies must be utilized to create product awareness and showcase the product's features, functions, uses, and benefits of the PGS-rated product. In order to connect with potential customers, this audience must first be identified and then targeted with ad campaigns, educational information and literature (Iacobucci, 2001). Narrowing promotions to specific consumer segments that are more likely to react to such efforts is key to success in today's marketplace. One strategy is to target competitor's customers and/or consumers who are not currently being pursued by the competition (Iacobucci, 2001). If these consumers are truly not satisfied with a company's products, then the opportunity exists to introduce a brand that does satisfy their needs.

Current promotional efforts for the PGS program are conducted through Pennsylvania Cooperative Extension mainly by Master Gardeners. Master Gardeners publish articles in local newspapers, gardening magazines, and extension publications that inform the public about program objectives and the latest PGS selections for the upcoming gardening year. With the development of an effective marketing program, Master Gardeners can use this information to promote their local programs and trial garden with greater success. The PGS marketing program can then be used as a model for other state promotional programs to increase awareness and at the same time produce educational benefits to the consumer.

A survey was conducted using two different consumer-research methods and at two locations in Pennsylvania to assess: 1) what national brand name plant material participants purchased in the past; 2) the consumer's awareness of the PGS program; and 3) the

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gardening habits and demographics of Pennsylvania gardeners. The Office of Research Protection at Pennsylvania State University approved this survey and resulting interactions with human participants.

Materials and methods

INTERCEPT SURVEY. The first survey was an intercept survey conducted over the 3-d period of 20–22 Aug. 2002, during Ag Progress Days at the Russell E. Larson Agricultural Research Center in Rock Springs, Pa.; over 50,000 people attend this event each year. The attendees were a diverse group ranging from producers to end-user consumers who have an interest in agriculture. Three hundred and ninety consumers were self-selected to participate in the survey and received one free annual bedding plant as an incentive for participating. It was projected that the survey incentive would attract respondents who had an interest in gardening and flowering plants, as well as individuals who would most likely be interested in PGS plant material at a retail outlet. The brief survey was administered at the Centre County and Pennsylvania State University visitor booth along the main thoroughway of the show. Respondents who participated in the 10-min survey answered questions concerning their gardening habits, familiarity with brand name potted-plant material and awareness of the PGS program. The demographics section included questions regarding income, age, education, county of residence, and household size.

TELEPHONE SURVEY. The second survey was a telephone survey conducted by TMR, Inc. (Parsippany, N.J.) from 20 Aug. through 17 Sept. 2002. Five hundred survey participants were chosen from randomly selected households in the metro-Philadelphia area, including Bucks, Chester, Delaware, Montgomery, and Philadelphia counties.

This region of Pennsylvania was chosen because it was one with diverse demographics including ethnicity, income, and education (Ligos, 2001). According to the 2001 Survey of Buying Power (Ligos, 2001), the metro-Philadelphia area was ranked fifth in the U.S. for effective buying income. Metro-Philadelphia was also ranked seventh as compared to other U.S. metro areas in their resemblance of overall U.S. demographics (Waldrop,

1992). Other metro-Pennsylvania areas either did not appear in these rankings or were ranked lower than the metro-Philadelphia area (Ligos, 2001; Waldrop, 1992). Based on these data, the metro-Philadelphia area offered the most appropriate location to conduct the research.

Participants answered questions similar to those asked in the intercept survey; however, due to time constraints, participants answered only a 5-min version of the intercept survey. For both surveys, the question “Do you have an area in your yard that you use as a garden?” was used to screen participants for survey analysis. Of those who answered the question at the intercept survey, 347 answered “yes,” while 43 answered “no.” In total, 400 completed questionnaires were obtained from telephone survey participants who answered “yes” to the screening question, while an additional 100 participants who responded “no” were still asked to answer demographic questions.

For both surveys, data was analyzed with SPSS version 11.0 (SPSS, Chicago) using the Mann-Whitney test ($P \leq 0.05$), and two-tailed t test ($P \leq 0.05$).

Results

INTERCEPT SURVEY. A majority of respondents at APD (80%) were female with an average of 51 years of age, with 50% of the participants between the ages of 42 and 62 years. A little over half of respondents had an income less than \$50,000/year (56%), and were high school graduates or attended some high school (59%). A majority of the participants (88%) lived in a household consisting of two or more adults, and 65% lived in households without any children. Ninety percent were residents of Pennsylvania, and were mostly from the south central region of Pennsylvania (30%), followed by the north central region (24%), and the capital (Harrisburg) region, with 17% from central Pennsylvania. The remaining participants were from other locations throughout the state.

A small percentage of Pennsylvania respondents (11%) did not designate a specific area in their yard for a garden; however, an overwhelming 89% did so. By answering “yes” to the screening question, “Do you have an area in your yard that you use as a garden?” these respondents were classified as

Pennsylvania gardeners for this survey. Participants who indicated that they were either from out of state and/or did not have an area in their yard designed for use as a garden, were not included in the analysis. These surveys were excluded because the focus of this study was to analyze responses from Pennsylvania gardeners; consumers who would potentially purchase PGS plant material and other branded plant material for their own use.

PARTICIPANTS IDENTIFIED AS PENNSYLVANIA GARDENERS. Ninety-five percent have purchased landscape plants in the past including perennials (85%), annuals (81%), and trees and shrubs (63%). These participants spent an average of \$146/year on landscape plant material, with half spending between \$50 and \$200/year. When asked how many hours they spent gardening each week during the months of May through August, participants reported, on average, spending 9.9 h/week in May (50%) spent between 3 to 10 h/week, 10.3 h/week in June (50% spent 3 to 12 h/week), 9.4 h/week in July (50% spent between 2 to 10 h/week), and 8.7 h/week in August (50% spent between 2 to 10 h/week).

A seven-point Likert scale (1=very uninterested, 7=very interested; Bruner II and Hensel, 1996) was used to quantify the participant's interest in gardening. The average participant rating was 6 with 50% of the responses rating between a 5 and 7, indicating a high level of interest in gardening. The average number of years participants had been gardening was 27, and when asked about their affiliation with either a gardening group or organization, including the Master Gardener program, only 4% stated that they belonged to either group.

To better understand consumer response to the preferences for the PGS program, Pennsylvania gardeners were asked if they would be interested in purchasing plant material that had been evaluated throughout Pennsylvania and selected as being outstanding plant material over other plant material available. An overwhelming 85% of participants said they would be interested in doing so.

Significant differences in gardening habits were also evident between males and females. Female participants purchased more perennial plant material (87%) in the past, than male participants (74%; Table 1). Males,

Table 1. Effect of gender, age, education, household income, number of adults, and number of children in the household on consumers' responses to questions about their gardening habits asked during a survey conducted on 20–22 Aug. 2002 at Ag Progress Days, Rock Springs, Pa. Responses reported are for those participants who reside in Pennsylvania that answered "yes" to the screening question "Do you have an area in your yard you use as a garden?"

Attribute	Gender		Age (years)		Education		Household income (K = 1000)		Adults in household (no.)		Children in household (no.)	
	Male	Female	≤51	≥52	High school	Some college	<\$50 K	>\$50 K	1	≥2	0	≥1
Sample size (no.)	61	246	152	148	172	122	153	121	35	262	197	110
Proportion of participants (%)	20	80	51	49	59	41	56	44	12	88	65	35
Purchased landscape plants in the past (%)	90	96	95	94	95	93	95	96	94	95	93	96
Plant material purchased in the past (%):												
Annuals	69	97	84	76	86	75*	82	81	77	82	78	87
Perennials	74	87*	87	82	84	89	84	88	87	85	82	91*
Trees and shrubs	66	62	65	62	65	61	62	65	69	63	64	64
Mean time spent gardening during the following months (h):												
May	12.5	9.2	9	11	10	10	10	10	12	10	10	10
June	12.5	9.7	10	11	10	10	10	10	12	10	11	10
July	10.1	9	10	9	10	9	10	9	11	9	10	9
August	8.9	8.7	8	9	9	8	10	8	10	9	9	9
Mean interest in gardening (1 = very uninterested; 7 = interested)	6	6	6	6	6	6	6	6	6.5	6*	6	6
Mean time gardening (years)	31	26*	17	36*	28	25	29	23*	26	27	32	18*
Affiliated with gardening group or Master Gardener program (%)	2	4	3	4	1	7*	4	3	3	4	4	3
Mean amount spent on plant material (\$/year)	164.95	149.91	171.98	133.16	149.04	159.70	121.62	187.54*	205.00	141.28	142.52	158.99
Purchased branded plant material in the past (%)	33	38	42	32	38	34	40	37	46	36	33	46*
Familiar with Pennsylvania Gardener Selects (PGS) (%)	31	13*	17	16	15	19	16	19	17	16	15	19
Have purchased PGS (%)	12	2*	4	3	4	6	3	4	3	5	4	5
Willing to purchase plants evaluated for Pennsylvania (%)	82	81	76	85	77	89*	81	85	89	81	77	88*

*Significantly different at $P \leq 0.05$ within categories (gender, education, etc.) based on two-tailed *t*-test and Mann-Whitney test.

however, reported gardening for a longer period of time, an average of 31 years compared to females, who had been gardening for an average of 26 years (Table 1). Males were also more familiar with PGS (31% as compared to 13% of females), and thus were more likely (12% vs. 2%) to have purchased PGS plant material than their female counterparts (Table 1).

Responses relating to age also yielded significant differences. Pennsylvania gardeners were segmented into two groups: those 51 years and younger and those 52 years and older. Participants, understandably, in the

≥52 years age group had been gardening for more years (average of 36 years) than the ≥51 years age group (average of 17 years; Table 1).

The responses were also compared based on educational level attained. Respondents who had a high school diploma or less were more likely to purchase annual plant material (86%), than those with some college education or more (75%; Table 1). Participants with at least some college education were more likely to be associated with a gardening group or the Master Gardener program (7%), as compared to those who only attended high school

(1%). Those with some college education (89%) expressed a greater willingness to purchase plants evaluated and chosen for Pennsylvania than those who only attended high school (77%; Table 1).

Differences were also apparent between participant segments based on household income (<\$50,000/year vs. >\$50,000/year). Those with an income below \$50,000/year have been gardening longer (mean of 29 years) than those with an income over \$50,000/year (mean of 23 years; Table 1). Participants from higher income households also spent more

on plant material annually (average of \$187.54/year) than participants from lower income households (average of \$121.62/year; Table 1).

Responses for households with one adult were compared with responses from households with two or more adults. Households with only one adult had a greater level of interest in gardening than households with two or more adults (average of 6.5 vs. average of 6, respectively; Table 1).

When responses were analyzed based on family size, participants with one or more children in their household averaged less gardening experience (an average of 18 years) than those with no children living in the household (an average of 32 years; Table 1). Participants with one or more children (46%) purchased branded plant material more often than those with no children (33%). Participants with one or more children in their household stated they would be more willing to purchase "selected plants" (88%) than those with no children (77%; Table 1).

NATIONAL-BRAND AWARENESS. Thirty-seven percent of participants had purchased branded plant material in the past. Of the national brand plant material purchased by participants, Martha Stewart was the most commonly purchased (60%) followed by Proven Winners (36%), Simply Beautiful (31%), Beds and Borders (21%), Flower Fields (13%), and Blooms of Bressingham (8%). Those who reported purchasing national brand plant material in the past had been gardening for fewer years (25 vs. 28 years, respectively), but they also had a greater interest in gardening (6.2 vs. 5.9, respectively; 1 = very uninterested, 7 = very interested) than those who did not purchase nationally branded plants. Participants who had purchased one or more of the national brands spent more on plant material annually (\$187.50/year) than those who did not purchase national-brand plant material (\$132.12/year).

PGS AWARENESS. Responses to survey questions were also compared between those who were familiar with PGS and those who were not, with few significant differences being noted. Those who were familiar with PGS (17% of Pennsylvania gardeners) were more likely to be associated with the Master Gardener program and/or other gardening groups (12%) than those who were not familiar with

PGS (2%). Ninety-two percent of the participants (13 participants) reported that they would purchase plant material evaluated and chosen for Pennsylvania. All participants who purchased national-brand name plant material were also aware of the PGS program, while only 21% of participants who purchased national-brand name plant material also purchased PGS. Of the 13 participants who were familiar with PGS, all stated they would purchase PGS plant material again. Comments from those individuals included: "very robust plants," "plants were very adapted to our climate," and "had no problem with the plants."

Participant responses were compared between those who purchased PGS plant material in the past and those who did not. Of those who purchased PGS plant material in the past, 13 participants were more likely to be a member of a gardener organization or group (23%) than those who did not purchase PGS (3%). It is significant that participants who purchased PGS plant material first became aware of the program through newspapers (35%), or from Master Gardeners (33%), gardening magazines (31%), other sources (24%), television (14%), and in-store promotions (4%).

TELEPHONE SURVEY. The average telephone survey participant's age was 47 years, with half (50%) between the ages of 44 and 67 years. A little less than half of the participants (44%) had an annual income of over \$50,000/year and were female (66%). Seventy percent had some college education; 73% lived in a household with only one adult; and 74% lived in a household with one or more children. Of the 100 participants who reported that they did not have an area in their yard they used as a garden, a majority (64%) were under the age of 47 years, lived in a single adult household (84%), and had an income of under \$50,000/year (60%). Just under half (45%) were male. As with the intercept survey, no further comparisons were made for those participants without an area in their yard designed for use as a garden.

PARTICIPANTS IDENTIFIED AS PENNSYLVANIA GARDENERS. Of those identified as Pennsylvania gardeners who answered "yes" to the screening question, 67% indicated they had purchased landscape plants in the past; however, only 3% were aware of the PGS program. When these participants

were asked if they would be willing to purchase landscape plant material that had been evaluated in trial gardens throughout Pennsylvania and that had been chosen as outstanding, 68% stated they would be willing to purchase these plants compared to other plant material offered.

Responses for individuals were then compared based on answers to demographic questions. The findings showed that males spent significantly more money annually on landscape plant material than females, \$267.87/year vs. \$180.50/year, respectively (Table 2). Participants with an annual income over \$50,000/year had a greater willingness to purchase plants evaluated and chosen for Pennsylvania (75%) as compared to those with an annual income below \$50,000/year (60%; Table 2). Participants who earned more than \$50,000/year were also more likely to have purchased landscape plants in the past year (78%) as compared to those who earned less than \$50,000/year (67%). Households with one or more children were significantly less likely to have purchased landscape plants in the past year (70%) than households with no children (80%; Table 2).

As with data collected through the intercept survey, two separate comparisons were made between individuals who were aware of the PGS program and those who were not, as well as between those who purchased PGS plant material in the past and those who did not. No significant differences were found.

COMPARISON FOR THE TWO SURVEY METHODS. Responses for Pennsylvania gardeners from both surveys were compared and analyzed for statistical differences. Based on demographics, the metro-Philadelphia-area respondents consisted of significantly fewer individuals who were 52 years of age and older (38%), and female (66%; Table 3). Conversely, significantly more respondents reported an income greater than \$50,000/year (56%), a level of education beyond high school (70%), living in a single adult household (73%), and living in a household without children (33%) than those who participated in the APD study (Table 3).

APD participants, however, were more likely to have purchased landscape plants in the past than metro-Philadelphia-area participants: 95% vs. 83%,

Table 2. Effect of gender, age, education, household income, number of adults, and number of children in the household on consumer responses to questions asked during a telephone survey conducted within the metro-Philadelphia, Pa., from 20 Aug. through 17 Sept. 2002 about their gardening habits. Responses reported are for those participants who reside in Pennsylvania that answered “yes” to the screening question “Do you have an area in your yard you use as a garden?”

Attribute	Gender		Age (years)		Education		Household income (K = 1000)		Adults in household (no.)		Children in household (no.)	
	Male	Female	≤47	≥48	High school	Some college	<\$50 K	>\$50 K	1	≥2	0	≥1
Sample size (no.)	136	264	199	201	119	281	224	176	293	107	131	269
Proportion of participants (%)	34	66	66	67	30	70	56	44	73	27	33	74
Purchased landscape plants this year (%)	68	75	76	70	67	75	67	78*	74	71	80	70*
Purchased landscape plants in the past (%)	81	86	86	82	80	86	80	87	86	79	88	83
Mean amount spent on plant material (\$/year)	267.87	180.50*	214.13	202.08	164.53	223.09	124.76	262.5	220.6	169.99	233.14	195.28
Familiar with Pennsylvania Gardener Selects (PGS) (%)	5	2	4	3	3	3	2	4	3	3	5	2
Willing to purchase plants chosen for Pennsylvania (%)	71	67	71	66	64	70	60	75*	69	66	73	66
Have purchased PGS (%)	33	33	27	40	0	44	0	44	33	33	33	33

*Significantly different at $P \leq 0.05$ within categories (gender, education, etc.) based on two-tailed t -test and Mann-Whitney test.

respectively (Table 3). APD participants also reported a greater willingness to purchase plants evaluated and chosen for Pennsylvania as compared to other plant material available for purchase (81%) than participants from the metro-Philadelphia area (62%). Metro-Philadelphia-area participants, however, spent more annually on landscape plant material (\$205.78/year) than their APD counterparts (\$152.89/year; Table 3).

Discussion

Responses for the intercept survey participants represent preferences for individuals who reside in central Pennsylvania and differ significantly from responses for metro-Philadelphia-area telephone-survey participants. As a result, two separate marketing strategies may be needed to target these distinctly different segments. Identifying and developing marketing strategies that target potential users of a product produce greater results and are more cost effective than focusing one strategy on all possible end-users (Iacobucci, 2001).

Statistics showed that residents in major metropolitan locations on the east coast and surrounding suburbs spent a larger amount of money on lawn and gardening activities (Fetto,

Table 3. Comparison of demographic data from surveys conducted at Ag Progress Days (APD), Rock Springs, Pa., and telephone survey conducted within metro-Philadelphia, Pa. Responses reported are for those participants who resided in Pennsylvania answered ‘yes’ to the screening question “Do you have an area in your yard you use as a garden?”

Attributes	APD	Metro-Philadelphia
Sample size (no.)	307	400
Participants age 52 years and older (%)	49	38*
Female participants (%)	80	66*
Income above \$50,000/year (%)	44	56*
Education beyond high school (%)	42	70*
Single adult household (%)	12	73*
Households without children (%)	65	33*
Purchased landscape plants in the past (%)	95	83*
Mean spent on plants (\$/year)	152.88	205.78*
Willing to purchase plants evaluated for Pennsylvania (%)	81	62*

*Significantly different at $P \leq 0.05$ within categories [participants age 52 years and older (%), female participants (%)] based on two-tailed t -test and Mann-Whitney test.

2003). Likewise, metro-Philadelphia-area participants spent more on plant material annually than central Pennsylvania participants who resided in more rural areas. This difference in spending may be the result of higher prices in metro areas, which can be a determining factor in the type and amount of materials purchased and the variety of plants available.

By assessing what other types of plant material participants purchase, we can continue to build a profile of our target market. Central Pennsylva-

nia participants who purchased PGS plant material also tended to purchase national-branded plant material. PGS is not necessarily in direct competition with national-brand programs, as many national brands have plant material that has been selected as PGS plant material as well. However, individuals who have purchased PGS plant material may recognize that the national-brand name gives PGS credibility in cases when they already trust the national brand. While a national-brand name gives PGS credibility, the program still needs to

establish a point of differentiation in order to have added value, command a higher price in the marketplace, and provide the benefit of increased revenue for retailers (Iacobucci, 2001).

The emotional experience desired by consumers needs to be understood in order to succeed in today's marketplace (Gobe, 2001). Current consumer trends have indicated that consumers are spending less time at home, and are requesting products that require minimal maintenance and give immediate results (Gibson and Greer, 2003).

This trend is rather apparent in the lives of busy parents. Central Pennsylvania households with one or more children tended to purchase more perennials than those without children. The reason for this may be that since perennials require less time and effort and do not need to be replanted each year, they are a better "time investment" for a young family. These households also have been gardening for fewer years and are less experienced gardeners. This may also explain why they purchase more national-brand name plants than those households without children. National-brand name plant materials have name recognition and take the guesswork out of gardening. For example, Flower Fields provides customers with suggested flower-color combinations (Henne, 2002b), requiring less experience on the part of the gardener. Central Pennsylvania households with children are also more willing to purchase plants evaluated and chosen for Pennsylvania than those without children. Busy parents may create a beautiful garden with less time and effort than in the past by using PGS plant material. As a result of the program's objectives and requirements, Pennsylvania consumers purchasing PGS plant material will be reassured that these plants have a better chance of surviving and flourishing in their home environment. This message can be used in marketing efforts to communicate the convenience, advantages, and quality of PGS plant material.

Gardeners with children are a potential target market for PGS. As well as addressing the time-saving benefits for PGS, promotional efforts may include informational literature on creating a children's garden or how to include children in gardening activities. This may attract young working parents who have time constraints yet wish to

spend as much time as they can with their children enjoying an activity, such as gardening, and combining it with an educational experience as well.

Connecting with the parental generation will lead to a relationship with the next generation (Popcorn and Marigold, 2001). When they grow up, children often use the same products as their parents, and by establishing a connection with today's family gardener, the PGS program will create fond memories for the future generation of gardeners and build brand loyalty (Popcorn and Marigold, 2001).

Before developing any of these concepts further there needs to be an assessment of current program perception. With a minority of participants being familiar with PGS and even less who actually purchase these plants, the question pertaining to willingness to purchase plant material evaluated and chosen for being outstanding throughout Pennsylvania increases in importance. Responses to this question help quantify the potential significance of the program. Eighty-one percent of central Pennsylvania participants and 62% of metro-Philadelphia-area participants claimed that they were more willing to purchase plant material evaluated and chosen for being an outstanding plant in all areas of Pennsylvania compared to other plant material available for purchase. With this strong foundation, the next step is clearly to make consumers more aware that such a program exists. Discovering the interest and intention to purchase PGS plant material by a majority of consumers can help communicate the benefits and function of a product concept. When a concept is useful and meets a consumer need, the product has a greater chance of succeeding if and when potential customers are aware of its existence (Iacobucci, 2001). Using the information acquired from consumers who have already invested in PGS plant material and recognizing that a majority of participants value the intent of the PGS program further supports the future development of a marketing strategy to effectively promote the benefits of PGS.

Current marketing efforts for PGS are grassroots campaigns focused primarily on the goal of educating the consumer. Dissemination of such information has been through newspaper articles, gardening magazines, and trade journal articles. These venues

are used according to the discretion of regional Master Gardeners and nurseries (Sellmer et al., 2003). Efforts with major newspaper publications within the metro-Philadelphia area were either greater and/or more effective than promotional methods used in central Pennsylvania. This was apparent as eight out of 10 metro-Philadelphia-area respondents stated they became aware of PGS through newspapers. The effectiveness of mass marketing through newspapers within the metro-Philadelphia area further suggests that similar marketing efforts should be tested in other regions of the Commonwealth.

The current PGS marketing effort has included only a few in-store promotions and displays as a method of interesting the public in this program. Only 1% of Pennsylvania gardeners who participated in the intercept survey and none of the Pennsylvania gardeners from the telephone survey became aware of PGS through this method, and thus none of these participants purchased PGS plant material. Studies have shown that promotions supported by in-store displays and advertising increase sales by 10 times as compared to promotions without such in-store displays (Lucas, 1996). This coincides with evidence that 70% of the buying decisions are made by consumers who primarily recognize a product because of its visual characteristics (Shoemaker, 2003). Successful PGS promotions will need to incorporate the support of the retailer appropriating space for promotional items.

Through these studies an understanding of potential target markets for PGS has begun. It is apparent that very few gardeners know that the PGS program exists; however, they are very interested in the concept, which is the foundation of the program. Through the few who are familiar with the program and those who have actually purchased PGS plant material, an understanding of currently successful marketing efforts has been identified and will continue to be used in the future.

Future surveys need to determine what reason or reasons prevent those familiar with PGS from purchasing the product for their home garden. Results from such inquiries will also establish whether participants residing in single adult households have different reasons for gardening than households with

two adults, and whether the presence of children has any bearing on purchasing branded plant material. In addition, an exploration of the consumer's willingness to pay for a product like PGS should be assessed to understand if this program could command a higher retail price. Understanding these motives will help create an effective marketing plan to reach out and connect with the target audience (Iacobucci, 2001). This will enable the product and subsequent promotions to be directed towards enhancing and reinforcing the consumer's desired experience, which, in turn, will increase consumer interest and enjoyment of gardening. It will also result in greater financial rewards for the program and the nursery industry (Gobe, 2001).

Literature cited

- Bruner II, G.C. and P.J. Hensel. 1996. Marketing scales handbook. Amer. Mktg. Assn., Chicago.
- Doeckel, B. 2002. Improving the retail experience for shoppers. *Greenhouse Grower* 20(9):140–141.
- Fetto, J. 2003. Ground rules: A look at the leading counties where gardeners take root in America. *Amer. Demographics* 25(3):22–23.
- Gibson, J. and L. Greer. 2003. Retailing potting mixes. *Greenhouse Grower* 21(4):86–89.
- Gobe, M. 2001. Emotional branding. Allworth, New York.
- Henne, L. 2002a. Branding in action: Proven winners. *Greenhouse Grower* 20(4):78–82.
- Henne, L. 2002b. Branding in action: Flower Fields®. *Greenhouse Grower* 20(5):94–103.
- Iacobucci, D. (ed.). 2001. Kellogg on marketing. Wiley, New York.
- Ligos, M. (ed.). 2001. 2001 survey of buying power and media markets. Sales and marketing management. Bill Publ., New York.
- Lucas, A. 1996. In-store trade promotions—Profit or loss? *J. Consumer Mktg.* 13(2):48–50.
- Mackay, W., S. George, T. Davis, M. Arnold, R.D. Lineberger, J. Parsons, L. Stein, and G. Grant. 2001. Texas Superstar and the coordinated educational and marketing assistance program (CEMAP): How we operate. *HortTechnology* 11(3):386–391.
- Popcorn, F. and L. Marigold. 2001. *Eveolution: Understanding women—Eight essential truths that work in your business and your life.* Hyperion, New York.
- Sellmer, J.C., R.D. Berghage, A.H. Michael, and T. Bilik. 2003. Pennsylvania Gardener Selects evaluation program. *J. Ext.* 41(1). 10 Apr. 2003. <<http://www.joe.org/joe/2003february/iw4.shtml>>.
- Shoemaker, M. 2003. Sights for store eyes. *Green Profit* 7(3):31.
- Waldrop, J. 1992. All-American markets. *Amer. Demographics* 14(1):24–30.

Influence of Soil and Nutrient Management on Growth and Quality of Collards

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ADDITIONAL INDEX WORDS. *Brassica oleracea*, tipburn, deep tillage, programmed-release fertilizers

SUMMARY. High temperature and humidity during summer months in the southeastern U.S., in addition to crop nutritional status, are suggested to be the primary reasons for tipburn incidence in collards (*Brassica oleracea* Acephala Group) adversely affecting their marketability. A 2-year study was conducted to evaluate the efficiency of grower's standard practice (GSP), GSP + gypsum, and a programmed-release fertilizer (PRF) under conventional and deep tillage on collard yield and tipburn incidence. Subsoiling significantly increased yield over conventional tillage. Nutrient supply through PRF did not increase the yields; however, it resulted in either similar or higher levels of macro- and micronutrient levels both in soils and collard tissue compared to GSP and GSP + gypsum treatments. The occurrence of tipburn in collards is dependent on several factors, including nutritional, physiological, and environmental stresses. Regression analyses of tipburn ratings at harvest time and the soil and tissue nutrient content suggested that 47% of the variation could be attributed to soil and tissue levels of sulfur (S), zinc (Zn), and phosphorus (P). It is important, therefore, to ensure an optimum supply of nutrients to the plants to maintain the quality of the yields. The advantage of PRF in sandy

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