

Gardening Consumer Segments Vary in Ecopractices

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Abstract. Savvy marketers rely on the principles of customer segmentation and product targeting to more efficiently allocate scarce resources and effectively reach groups of consumers with similar likes, preferences, or demands. Our objective was to identify and profile consumer segments with regard to their gardening purchases to determine whether there were differences in their ecofriendly attitudes and behaviors such as recycling. Our underlying hypothesis was that different types of gardeners may exhibit more environmentally friendly behavior, predisposing them to be more receptive to product innovations specifically designed to be ecofriendly. Researchers collected plant purchases, recycling attitudes and behaviors, and preferences for ecofriendly containers from 763 consumers in Indiana, Michigan, Minnesota, and Texas. A cluster analysis based on plant purchases yielded three consumer segments: low use, woody plant buyers, and herbaceous plant buyers. There were some differences with regard to recycling behaviors among consumers in the three groups, including recycling aluminum drinking cans, newspapers, magazines, use of energy-saving bulbs, and composting yard waste. Generally, herbaceous plant buyers were most ecofriendly followed by woody plant buyers and low use. Given these differences, there appears to be some merit in the future to segment consumers by plant purchases versus others to target specific types of ecofriendly products to them.

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Consumers are not all alike, often having different attitudes and preferences. Their behavior also differs with regard to purchase and use of products (Kotler and Armstrong, 2004). Groups of like-minded or similarly behaving consumers create markets. Thus, market segments typically have some common consumer characteristics that can be quantified and distinguish them from other segments, enabling marketers to more efficiently allocate scarce resources and more effectively direct product communications to them, creating more potentially profitable sales. Contemporary marketing practices contribute to corporate success, in part, as a result of the principles of market segmentation and product targeting.

Market segmentation capitalizes on the diversity of consumers and the products and services they demand. Product, service, or experience targeting is the practice of communicating specific product benefits or attributes to specific groups of consumers anticipating an outcome of profitable sales. Businesses that identify actionable market segments understand which key variables (attitudes, behaviors, specific product attributes, etc.) create the greatest distinction between segments while minimizing differences within a segment. Consumers of horticultural products are relatively diverse. Within a narrow range of edible and ornamental horticultural products, multiple studies showed that some consumers valued selected product attributes differently from other consumers, creating viable market segments (Behe, 2006a, 2006b; Behe et al., 2003, 2005a, 2005b, 2008; Dennis and Behe, 2007; Frank et al., 2001; Hall et al., 2010; Kelley et al., 2004; Mason et al., 2008; Simonne et al., 2006; Yue and Behe, 2008, 2010; Zagaden et al., 2008). Market segmentation for the purpose of targeting specific kinds of new products is beneficial to most firms, including horticultural firms.

Consumers may also think and act differently in response to new products and services, and products adapted to be more environmentally friendly are no different (Gladwin et al., 1995; Purser et al., 1995). Consumer demand for product-stewardship or environmentally conscious products and business practices is rapidly rising. An *e-Marketing* article reported that nine of 10 survey participants perceived themselves as environmentally responsible (Anonymous, 2007). Even Wal-Mart and Home Depot recognize that “being green” not only provides value to consumers but improves profits (Noon, 2005). Some consumers are willing to pay a premium price for green products and share attitudes that are favorable toward the environment (Engel and Potoschke, 1998; Hall et al., 2010; Laroche et al., 2001; Straugh and Roberts, 1999). With a price premium, the sale of ecofriendly products is assumed to bring profits to companies with a record of environmentally friendly practices (Russo and Fouts, 1997). Still, little is known about gardeners and their ecological attitudes, practices, or behaviors.

One emerging ecobehavior is the consumption of organically produced food. Highly visible in many mainstream outlets, organic foods appear in the aisles of most U.S. food retailers (Dimitri and Oberholtzer, 2009). Retail sales of organic meats, eggs, breads, grains, and beverages have increased exponentially from \$3.6 billion in 1997 to \$21.1 billion in 2008, or nearly 50% per year. Mainstream food retailers, including many supermarkets, club stores, and box stores, now sell organic products as manufacturers continue to develop a wider selection of them. The number of consumers of organic products has increased, but those consumers are not easily categorized. Consistently, consumers with a higher level of education purchase more organic products (Thompson and Kidwell, 1998; Yue et al., 2009).

Gardeners also have a higher education level than the average U.S. resident (Dennis and Behe, 2007). Perhaps consumption of organic products may be one ecobehavior that some gardeners engage in, contributing further to a predisposition to buying of other environmentally friendly products.

Within the last 5 years, the number and types of compostable or bioresin containers, often called "green" containers has increased (Lubick, 2007). These green containers may have been introduced, in part, to capitalize on a heightened environmental awareness related to high fuel prices (Kale et al., 2007). Hall et al. (2010) showed that consumer preferences for ecofriendly containers focused initially on plant container material composition, which was identified as the most important product attribute, comprising 33% of the purchase decision. Price, carbon footprint, and percent of waste products used in the manufacture of the container were less important to most consumers, in that order. Rice hull and straw containers were preferred over plastic, whereas the containers made from wheat, which were similar in appearance to plastic, were less preferred. The study also included consumer preference for the percent of the container material that was from recycled waste. Changing the percent of material made from recycled waste only resulted in a small change in consumer rating. Carbon footprint label had a similarly small influence on preference. The study helped plant producers, container producers, horticultural wholesalers, and retailers to better understand the market segments and their container preferences. However, containers are only one product attribute of plants, and there is more to the holistic picture of consumer preference.

Consumer participation in gardening and purchases of garden-related products are often described demographically. Researchers correlated income, age, gender, and home ownership with the likelihood of consumer participation and/or purchases (Butterfield, 2007; Dennis and Behe, 2007). Organizations such as the National Gardening Association (NGA) track consumer demographic information and purchasing statistics, including annual retail sales and the rate of growth in participation for selected gardening activities. The NGA's 2006 study showed lawn and garden retail sales totaled \$34 billion in 2006 with 91 million households participating in lawn and garden activities (Butterfield, 2007). Despite Americans spending \$34 billion on lawn and garden purchases, sales have leveled off since 2002. In 2002, Americans spent on average \$466 on lawn and garden materials but spent \$401 in 2006, down \$65 from 2002. The gardening activities on which the most money was spent in 2006 included landscaping (\$356), lawn care (\$171), water gardening (\$103), and tree care (\$129). Dennis and Behe (2007) showed that ethnicity and age greatly impacted gardening purchases and participation, especially at lower income strata. As income increased, the effects of age and ethnic heritage on gardening purchases and participation decreased. Caucasians aged older than

45 years generally participated more in gardening and made more purchases than younger consumers or ones from different ethnic backgrounds. As income level increased, the diversity of gardening behavior decreased.

Our objective was to identify and profile consumer segments with regard to their gardening purchases to determine whether there were differences in their ecofriendly behaviors. Our underlying hypothesis was that different types of gardeners may be more sensitive to environmental issues, making them more receptive to product innovations specifically designed to be more ecofriendly. Do some gardeners engage in a range of practices that are beneficial to the environment more so than other types of gardeners? If so, this might indicate a predisposition to be more receptive to communications (e.g., advertising) that focused on environmental benefits. If not, a homogenous message to all types of gardeners might be a more efficient use of limited communication resources. This study set out to fill this void in the literature.

Methods

Researchers developed an online survey instrument, adapting it from prior studies (Dennis and Behe, 2007). Many industries today conduct survey research using the Internet because there are several advantages to it over mail, telephone, or fax surveys. Advantages of web-based surveys are that they are potentially faster to conduct than telephone or face-to-face interviews, generate more accurate information with less human error, and are less expensive by several magnitudes because less labor is needed to create, deliver, and analyze the survey (McCullough, 1998). Thousands of surveys can be transmitted at a time, they are automatically coded, and the data are collected in a cost-effective manner (Cobanoglu et al., 2001). The instrument was reviewed and approved by the respective university committees involved with research on human subjects. It was pretested among a subset of consumers in College Station, TX, and adjustments made to the wording of several questions based on the feedback received. The survey was implemented during July 2009 by Knowledge Networks (Menlo Park, CA), who was used specifically on this project as a result of their web-enabled KnowledgePanel®, a probability-based consumer panel designed to be representative of the U.S. population.

All KnowledgePanel households have a known probability of selection. Initially, participants are chosen scientifically by a random selection of telephone numbers or addresses (using address-based sampling). Persons in selected households are then invited by telephone and mail to participate in the web-enabled panel. Those who agree to participate but are not already on the Internet are sent a laptop computer and receive an Internet service connection provided by Knowledge Networks. Although 74.2% of the U.S. population has Internet access at work or home (Internet World Stats, 2010), Knowledge Networks provides Internet access to potential respon-

dents without it, thereby eliminating that potential bias. People who already have computers and Internet service are permitted to participate using their own equipment. Panelists then receive unique log-in information for accessing surveys online and then are sent emails three to four times during the survey timeframe inviting them to participate in research.

The survey was administered through the Internet accessing a sample of 300 KnowledgePanel consumers from Indiana, Michigan, Minnesota, and Texas. Each set of 300 consumers exhibited average demographic characteristics reflective of the population at large in those respective states. Questions on the survey focused on the types of ornamental plant purchases made by consumers, recycling behaviors, preferences for various types of plant container materials (plastic, rice hull, straw, wheat, or OP47), and demographic characteristics. Data received from Knowledge Networks in spreadsheet format were imported into and analyzed using SPSS 17.0 (SPSS Inc., Chicago, IL) analysis of variance, conjoint, and cluster procedures.

Responses were collected from 1113 consumers, but only 763 were complete and, therefore, included in the subsequent analyses. Nearly one-fourth of the participants were from each state participating in the study: Indiana (24.4%), Michigan (27.2%), Minnesota (24.7%), and Texas (23.7%). Participants ranged in age from 18 to 92 years with a mean of 47.2 years old. Over half (52.3%) were married, 22.7% were never married, and 11.5% were divorced. Over one-third (36.5%) of the participants had completed only high school and an additional 24.1% had completed some college; an additional 15% had completed college and 7.6% had completed education beyond a bachelor's degree. Nearly 80% of the participants were Caucasian, 8.5% were African-American, 7.8% were Hispanic, and 4.5% were two or more races or from another ethnic background. Slightly more than 80% lived within the Metropolitan Statistical Area (MSA) classification, which is considered urban and suburban, and 19.4% were from outside those regions, which could be considered rural. Approximately 80% owned their home and 79.7% lived in a one-family detached residence. Participant household income was distributed among the 19 categories (with \$2,500 to \$10,000 increments) with the median in the \$60,000 to \$74,999 category (12.4%). No category had less than 1.7% of the participants included in it. Slightly more than 70% of the participants had Internet access.

Within the entire sample, 54.8% of the participants purchased annuals, 45.3% purchased perennials, 43.5% had purchased vegetable transplants or herbs, 19.2% had purchased flowering shrubs, 12.3% had purchased trees, and 24.5% had purchased indoor flowering plants. These were similar to Butterfield (2007) who showed that 33% of Americans participated in flower gardening, 30% participated in landscaping, and 22% participated in vegetable gardening. Of those buying flowering annuals, 10.9% were first-time buyers of annual plants. For perennials,

4.7% were first-time buyers of perennial plants. Among herb and vegetable purchasers, 5.1% were first-time buyers of vegetable or herb plants, but only 2.8% of flowering shrub buyers were first-time purchasers of those plants and 3.6% of tree purchasers were first-time buyers. Among indoor flowering plant purchasers, 2.7% were first-time purchasers. Given the recent anecdotal evidence that sales of plants that produce edible parts have increased, we were curious whether a substantial percentage of new or first-time purchasers might be identified, but this was not the case; there were more first-time annual plant purchasers than herb or vegetable buyers.

For subsequent analyses, consumers were clustered into three groups based on their purchase history of five outdoor plant categories using an agglomerative clustering procedure: flowering annuals, perennials, herbs and vegetable transplants, flowering shrubs, and trees (Table 1). The first cluster to emerge, "low use," was characterized by a low percentage (less than 25%) of its members (n = 341) buying perennials, herbs or vegetable transplants, flowering shrubs, and trees. No members of this group purchased flowering annual plants. The second cluster to emerge (n = 127) was labeled "woody plant buyers" because a high percentage of this segment had bought flowering shrubs and trees (evergreen or deciduous). This segment had a moderate percentage of individuals who had purchased flowering annual plants, perennial plants, herbs or vegetable transplants, and indoor flowering plants. The third cluster to emerge was labeled "herbaceous plant buyers" because a high percentage of this group (n = 295) had bought flowering annual plants, perennial plants, indoor flowering plants, and herbs or vegetable transplants. None of the herbaceous plant buyers had purchased any flowering shrubs. A greater percentage of low use members (34.9%) and herbaceous plant members (38.0%) spent \$1 to \$100 compared with woody plant members (10.4%) (F = 88.225, P = 0.0000), but a higher percentage of woody plant members (6.9%) and herbaceous plant members (6.8%) spent more than \$100 compared with low use members (3.0%). Woody plant members made the most number of trips to a store that resulted in a plant purchase (7.4) compared with herbaceous plant members (4.6) and low use members (3.0) (F = 58.185, P = 0.0000).

Demographically, the groups differed on most characteristics. Both woody plant buyers and herbaceous plant buyers had a higher percentage of women than men (Table 2), which was not the case for low use consumers who were predominantly male. Average age of woody plant buyers was higher than herbaceous plant buyers and both were higher than the mean age of consumers in the low use segment. Herbaceous plant buyers had achieved a higher level of education than low use or woody plant cluster members. Also consistent with Dennis and Behe (2007) was the high percentage of Caucasians, married individuals, and homeowners in the herbaceous plant and woody plant buyer

Table 1. Plant purchasing patterns of 763 respondents participating in a 2009 online survey regarding consumer recycling behavior.

| Plant type | Low use plant buyers ^a (n = 341) | Woody plant buyers (n = 127) | Herbaceous plant buyers (n = 295) | Significance level |
|---------------------------------|---|------------------------------|-----------------------------------|--------------------|
| Flowering annual plants | 0.0 | 29.1 | 70.9 | 0.0000 |
| Flowering perennial plants | 14.0 | 32.3 | 53.7 | 0.0000 |
| Herbs or vegetable transplants | 23.8 | 27.4 | 48.8 | 0.0000 |
| Flowering shrubs | 14.2 | 85.8 | 0.0 | 0.0000 |
| Trees (evergreen and deciduous) | 22.1 | 49.5 | 28.4 | 0.0000 |
| Indoor flowering plants | 16.4 | 31.2 | 52.4 | 0.0000 |

^aThe first cluster to emerge, "low use," was characterized by a low percentage of its members (n = 341) buying perennials, herbs or vegetable transplants, flowering shrubs, and trees. No members of this group purchased flowering annual plants. The second cluster to emerge (n = 127) was labeled "woody plant buyers" because a high percentage of this segment had bought flowering shrubs and trees (evergreen or deciduous). This segment had a moderate percentage who had purchased flowering annual plants, perennial plants, herbs or vegetable transplants, and indoor flowering plants. The third cluster to emerge was labeled "herbaceous plant buyers" because a high percentage of this group (n = 295) had bought flowering annual plants, perennial plants, indoor flowering plants, and herbs or vegetable transplants.

Table 2. Demographic characteristics of 763 respondents participating in a 2009 online survey regarding consumer recycling behavior.

| Demographic characteristic | Low use plant buyers (n = 341) | Woody plant buyers (n = 127) | Herbaceous plant buyers (n = 295) | Significance level |
|------------------------------|--------------------------------|------------------------------|-----------------------------------|--------------------|
| Gender (% female) | 45.8 | 60.6 | 56.7 | 0.0030 |
| Age (mean years old) | 43.6 | 52.8 | 49.0 | 0.0000 |
| Education (highest degree) | | | | 0.0600 |
| Percent high school graduate | 31.0 | 44.1 | 39.7 | |
| Percent college graduate | 14.8 | 13.4 | 16.0 | |
| Ethnicity | | | | 0.0010 |
| Percent Caucasian | 72.2 | 87.4 | 83.7 | |
| Percent Hispanic | 9.6 | 5.5 | 6.7 | |
| Percent African American | 12.2 | 3.9 | 6.3 | |
| Percent owning home | 72.2 | 87.4 | 83.7 | 0.0000 |
| Percent married | 37.4 | 66.1 | 63.7 | 0.0000 |

segments relative to the low use segment. There were no differences among the segment members with regard to the MSA status or access to the Internet. The demographic characteristics of the three segments were different and consistent with the findings of Dennis and Behe (2007).

One dimension of ecofriendly attitudes and behavior was evaluated by asking study participants if they had heard of the term sustainability. However, we found no difference in the percentage of each segment who had heard the term "sustainability" among the three segments (F = 0.183, P = 0.833). We also asked what percent of the consumer's food budget was devoted to organic products and found no differences (F = 0.724, P = 0.485).

However, some ecobehaviors did vary between the segments (Table 3). Researchers asked two questions about the purchase and disposal of beverage containers: water bottles and aluminum cans. We were interested to ascertain the percentage of each segment that purchased and recycled these beverage containers or simply did not purchase them; either could be construed as an ecofriendly decision. The hypothesis was that if the product was purchased and waste handled in an ecofriendly manner, the segment members may be more responsive to ecomarketing, packaging, or other messages consistent with their already observed ecobehaviors. Only one state (Michigan) has a mandatory recycling of aluminum cans, for which a de-

posit is paid on the can when it is purchased (Anonymous, 2010). More of the low use segment did not purchase aluminum drinking cans or bottled water compared with herbaceous plant and woody plant consumers. Fewer woody plant buyers always recycled aluminum drinking cans compared with herbaceous plant and low use buyers. However, we found no differences in the purchase and recycling of bottled water bottles (F = 1.715, P = 0.181).

There were differences between the three groups with regard to the purchase and recycling of newspapers and magazines (Table 3). More low use consumers did not purchase newspapers and magazines compared with woody plant and herbaceous plant buyers, but more low use consumers also never recycled them. However, a higher percentage of herbaceous plant buyers always recycled both newspapers and magazines compared with the other two groups.

Composting is a form of recycling and researchers asked study participants about their recycling of food and yard waste (Table 3). A low percentage of the three groups always composted food waste, but a higher percentage of low use and herbaceous plant consumers never composted food waste. We expected that a higher percentage of the low use consumer group would have no yard waste but were surprised to see the similarly high percentage of low use and herbaceous plant consumers to never compost yard waste.

A higher percentage of low use consumers (9.8%) did not purchase energy-saving light bulbs compared with herbaceous plant (4.1%) and woody plant (1.8%) consumers ($F = 9.938, P = 0.000$). A higher percentage of low use consumers “didn’t really care” about the use of post-consumer waste in products they purchased (8.9%) compared with woody plant (1.3%) and herbaceous plant (3.7%) consumers ($F = 8.840, P = 0.000$).

We asked participants several questions to assess their attitudes about recycling and buying products made from recycled products. Of the six questions asked, only one difference emerged. A lower percentage of woody plant buyers agreed or strongly agreed (10.5%) with the statement “Sorting household waste for recycling is too much of an inconvenience” compared with low use (23.8%) and herbaceous plant buyers (25.0%) ($F = 3.577, P = 0.029$). There were no differences in the percentage of consumers who agreed or strongly agreed with these five statements: “When purchasing products, I check to see whether the package is made from recycled material,” “A carbon intensive footprint for a product means it takes a lot of energy to manufacture or ship the product,” “I refuse to buy products from companies that are not environmentally friendly,” “Recycling plastic plant pots is of more importance than using compostable containers,” and “When buying products, I check to see whether the package is recyclable.”

Hall et al. (2010) identified five consumer segments with regard to their preferences for different types of container materials, prices, composition of waste products, and carbon footprint. Using a subset of that same data set, we hypothesized that consumers from different gardening segments may have a different perspective about containers and their attributes. Did these consumers express a different relative importance for container attributes and/or the use of different levels of those attributes? Results (Table 4) showed that, collectively, these three segments placed a slightly higher relative importance on price and carbon footprint than container material, but results were consistent with Hall et al.’s findings. Rice hull containers were more appealing than most other containers and plastic containers were less appealing to all consumer groups, consistent with Hall et al. (2010). However, this subset of consumers, all of whom were plant purchasers, liked the wheat (OP47) containers more than the entire sample but did not like the straw container. This may indicate a propensity for a plastic substitute (in this case, the OP47 looked very much like plastic). Straw containers may not have looked enough like existing alternatives to be readily acceptable to this subset of plant buyers.

The low use group was not very ecocentric. Although they had ecoattitudes similar to the other two groups and nearly one-fourth of this segment had heard the term “sustainability,” a low percentage engaged in ecofriendly behaviors. The highest percentage of this group never recycled any of the products listed in the study. Actions speak louder than

Table 3. Percent of 763 respondents participating in a 2009 online survey regarding consumer recycling behavior who engaged in selected ecofriendly behaviors.

| Ecofriendly behavior | Low use plant buyers (n = 341) | Woody plant buyers (n = 127) | Herbaceous plant buyers (n = 295) | Significance level |
|-----------------------|--------------------------------|------------------------------|-----------------------------------|--------------------|
| Recycle aluminum cans | | | | 0.003 |
| Always | 23.1 | 10.0 | 26.0 | |
| Never | 4.7 | 0.9 | 3.1 | |
| Do not purchase | 16.1 | 8.1 | 18.8 | |
| Recycle newspapers | | | | 0.000 |
| Always | 16.1 | 8.1 | 18.6 | |
| Never | 8.1 | 1.8 | 5.5 | |
| Do not purchase | 10.0 | 1.6 | 5.4 | |
| Recycle magazines | | | | 0.002 |
| Always | 14.2 | 6.1 | 15.9 | |
| Never | 9.5 | 2.9 | 7.3 | |
| Do not purchase | 9.5 | 1.4 | 5.0 | |
| Compost food waste | | | | 0.000 |
| Always | 3.0 | 2.3 | 3.1 | |
| Never | 39.4 | 12.4 | 32.8 | |
| Compost yard waste | | | | 0.000 |
| Always | 4.4 | 3.4 | 6.9 | |
| Never | 15.7 | 5.4 | 12.9 | |
| Have none | 15.8 | 1.4 | 7.5 | |
| Take reusable bags | | | | 0.045 |
| Always | 7.6 | 3.5 | 9.7 | |
| Never | 21.2 | 7.1 | 15.7 | |
| Recycle plant pots | | | | 0.000 |
| Always | 8.1 | 6.4 | 12.1 | |
| Never | 30.4 | 6.3 | 16.8 | |
| Recycle plant tags | | | | 0.000 |
| Always | 5.1 | 2.9 | 6.3 | |
| Never | 35.2 | 11.2 | 6.3 | |

Table 4. Relative importance of four container attributes and use scores for the attribute levels as evaluated by 763 respondents participating in a 2009 online survey regarding consumer recycling behavior.

| | Low use plant buyer (n = 341) | woody plant buyer (n = 127) | Herbaceous plant buyer (n = 295) | Hall et al. (total) |
|---------------------------------------|-------------------------------|-----------------------------|----------------------------------|---------------------|
| Relative importance (%) | | | | |
| Price | 28.9 | 31.7 | 33.2 | 24.3 |
| Container type | 28.7 | 29.0 | 21.7 | 33.3 |
| Percent waste | 10.4 | 5.7 | 8.0 | 19.0 |
| Carbon footprint | 32.1 | 33.6 | 37.2 | 23.4 |
| Relative use or part-worth score (SE) | | | | |
| Price | | | | |
| \$2.49 | 0.161 (0.047) | 0.243 (0.104) | 0.237 (0.101) | 0.21 |
| \$2.99 | 0.156 (0.052) | 0.260 (0.114) | 0.255 (0.110) | 0.21 |
| \$3.49 | -0.317 (0.054) | -0.503 (0.119) | -0.491 (0.115) | -0.43 |
| Container type | | | | |
| Plastic | -0.092 (0.061) | -0.343 (0.133) | -0.171 (0.130) | -0.21 |
| OP47 | -0.229 (0.057) | -0.302 (0.126) | -0.239 (0.122) | 0.25 |
| Rice hull | 0.244 (0.059) | 0.289 (0.130) | 0.249 (0.126) | 0.19 |
| Straw | 0.077 (0.057) | 0.355 (0.126) | 0.161 (0.122) | -0.23 |
| Percent waste | | | | |
| 0 | 0.099 (0.045) | -0.034 (0.099) | 0.030 (0.096) | 0.03 |
| 1% to 49% | -0.027 (0.057) | 0.085 (0.125) | 0.075 (0.122) | 0.04 |
| 50% or more | -0.072 (0.066) | -0.052 (0.144) | -0.104 (0.140) | -0.06 |
| Carbon footprint | | | | |
| Carbon-neutral | 0.020 (0.045) | 0.165 (0.099) | 0.274 (0.096) | 0.26 |
| Carbon-saving | 0.130 (0.053) | 0.321 (0.115) | 0.281 (0.112) | 0.24 |
| Carbon-intensive | -0.330 (0.057) | -0.487 (0.124) | -0.555 (0.120) | -0.50 |

attitudes. A higher percentage of them did not buy newspapers or magazines, but a lower percentage of those who did buy them recycled them. This group did not really care about the use of post-consumer waste in products and a higher percentage of them did not buy any energy-saving light bulbs or always took reusable bags to the grocery store. A higher percentage of them never composted food waste. Because few of them purchased newspapers and magazines, these

would not likely be effective means of communicating with them. Low users may not be appealing targets for ecofriendly plant containers or innovative plant-related products that build on the appeal of environmental friendliness or ecoresponsibility.

Woody plant buyers made nearly twice the number of trips to a store that resulted in plant purchases than the other two groups, but did not have a higher percentage of consumers who spent more than \$100 on plants

in the year before the study (data not shown). With a higher number of trips to the plant retailer, they may have been exposed more often to messages about composting and we observed a very low percentage of them who never composted food and yard waste. Also, a very low percentage of them never recycled plastic plant containers and tags. Almost none of them “didn’t really care” about the use of post-consumer waste in products. They were modest recyclers of aluminum drinking cans, newspapers, and magazines. Compared with herbaceous plant buyers, a lower percentage of woody plant buyers always recycled the seven products listed in the study. These behaviors make them better targets for ecofriendly products and plant production practices.

Herbaceous plant buyers were good recyclers of aluminum drinking cans, newspapers, and magazines, more so than woody plant buyers. A high percentage of them always composted yard waste but not food waste. Relative to the other two segments, a higher percentage of herbaceous plant buyers always recycled the seven products listed in the study. However, there is still likely some potential to educate the herbaceous plant buyers on the merits of composting food waste because many are already composting yard waste. It would appear as though this segment might have good potential for sales of composting equipment. They also appear to be reasonable targets for additional ecofriendly products, like plant containers.

Despite similar attitudes and having been exposed to the concept of sustainability, the two plant purchase segments appeared to engage in more ecofriendly behaviors more so than the low use segment. Hall et al. (2010) showed that the consumers had different preferences for plant containers, finding that the single most important factor influencing the consumer buying decision was container type followed by price, carbon footprint, and waste composition, respectively. Coupled with the results from this study, green industry participants now have a better understanding of the diversity of consumers to which they market products. Given the differences in ecobehaviors, there appears to be some merit in the future to segment consumers by plant purchases versus others to target specific types of ecofriendly products to them. Ecobehaviors may be a more effective means of reaching or connecting with consumers who have a greater propensity to purchase herbaceous or woody plants than those who purchase few plants. Because many firms lack the resources and ability to conduct this type of research on their own, this study has provided them with insights

regarding ecofriendly consumers that can be incorporated into their respective marketing strategies.

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