

HOW TO DESIGN A NEW TYPE OF PLANT LABEL TO INCREASE SALES OF NATIVE
PLANTS WITH NEGATIVE POT APPEARANCE AT THE POINT OF SALE

by

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(Under the Direction of Brad Davis)

ABSTRACT

The sales of native plants cannot compete with the sales of non-native plants. Further, fall and winter sales of immature and hibernating plants in containers are even lower at retail and wholesale plant nurseries in the United States despite these seasons being the best time to plant. The low sales during the fall and winter seem to be the result of a lack of consumer interest due to the plants' negative visual appearance, but the real reason is consumers' misunderstanding of these plants. In addition, most plant labels do not provide adequate information to consumers and rely too heavily on photos of flowers. This research designs a new labeling system to communicate healthy, vigorous, and aesthetic aspects of plants in strong roots, growth over time, all seasons, design features, and a brochure design that is based on their ecological and functional virtues. A survey was conducted of master gardeners in Georgia to test the potential impact of the new labeling system. Results indicate increased interest in purchase and deeper understanding of plants' uses, even during dormant months.

INDEX WORDS: Native plants marketing, negative pot appearance, consumer preferences

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CHAPTER 1

INTRODUCTION

Native plants are essential to the ecosystem since they are well adapted to the climate and soils, can improve the soil and provide wildlife habitats, provide the base of the food chain for all other living organisms, and have been shown to be linked to region specific insect populations (Tallamy, 2011). For these reasons, the green industry sells many native plants, and the Ecological Landscape Alliance and many native plant societies pay considerable attention to advertising, selling, and marketing native plants to encourage consumers to purchase them. However, sale numbers of native plants are still low, especially in fall and winter. Some reasons for these low sales are explained below.

Some native potted evergreens are bulky and not as attractive as nonnative shrubs and annuals; they are too small to show mature beauty and the strong vitality. Furthermore, the immature deciduous native plants in pots that have only one or two stems seem unattractive and unhealthy due to uncompleted growth. Moreover, immature hibernating plants give a more negative impression, since they often appear to uninformed consumers as dead and or unlikely to survive, given their browning or even absent leaves. Thus, the negative appearance of immature and hibernating potted native plants is a hurdle that prevents the green industry (especially retail and wholesale plant nurseries and garden centers) from selling native plants and consumers from buying them, especially in fall and winter.

However, the best time to plant native plants in milder climates such as the southeastern and west coast United States is when they are immature and hibernating in the fall since plant roots can establish in warmer soil without the increased water demands of warmer months. However, during this same time of year, the plants may have their worst visual appearance in containers or ball and burlap at the point of sale (POS). Thus, the landscape architect plays an important role in acting as a bridge between the sellers and the consumers to fill knowledge gaps. Landscape architects should educate consumers that the best time to plant native plants is often in fall or winter when the plants are immature and hibernating.

Many labels have been designed by the native plant societies to sell these potted plants. However, there are some shortages in even these more focused labels. For instance, plant photos on the labels often differ greatly from the existing plant and may not be effective in convincing consumers to purchase. Thus, this research will suggest better ways in designing labels that can help solve consumers' misunderstandings. In this research, two surveys were conducted. The first survey was a small-scale survey conducted among classmates to develop the main survey. The second survey was the main survey. The first part of the main survey was conducted to investigate consumers' attitudes toward and misunderstandings about native plants with negative pot appearances. The results of this study were used to improve the design of future plant labels to show plant roots, growth process and change over time, and design features to help consumers develop a thorough understanding of the plants in order to solve their concerns and worries about whether these plants are alive and will survive. Moreover, the labels show the aesthetic, ecological, and spatial advantages of using native plants and help consumers learn about the long-term benefits of these potted native plants. The second part of the main survey included the new plant labels and

was used to examine the impact of the new labels on consumers' interest in and purchase of these native plants with negative pot appearances.

This paper contains four main sections. The first section contains research question identification, including the specific issues, concept definition, and research methods (Chapters One and Two). The second section shows the process of research in terms of finding the shortages of the current research through a literature review and a search for facts about consumers' preference by means of market research (Chapters Three and Four). The third section introduces the new ideas of labels mainly based on market research (Chapter Five). Finally, the fourth section contains the new labels design, survey, results and conclusion. (Chapters Six, Seven, Eight, and Nine).

Research Questions

Retail stores and botanical gardens often experience difficulty in selling native plants out of season, which may be due to their nontraditional and less exciting appearance compared to exotic options (i.e., native plants' *negative appearance*). This difficulty has long been discussed by horticulturists, including here at the University of Georgia (UGA). Specifically, Professor Brad Davis in the Master of Landscape Architecture program at UGA has begun to focus on finding ways to increase sales through label design. Informed by this background, the main question to be answered in this research is as follows:

How can new label designs be used to enhance the negative appearance of native potted plants during fall and winter and improve sales?

This question necessitates the examination of the following main issues:

- (1) What are the main signs of native plants' negative appearance during fall and winter?
- (2) How do these negative appearances affect sales or consumers' desire to purchase?

(3) What are consumers' attitudes? What are the main factors affecting consumers' preferences?

(4) Why do merchants sell native plants during fall and winter when they are not performing well? That is, are there benefits to planting and selling native plants in the fall and winter?

(5) What motivates merchants to sell native plants despite underperformance in sales?

(6) What are the main labeling methods currently in use?

(7) What difficulties do the existing label methods have in promoting sales of native plants? Moreover, what values of native plants are not revealed in existing label designs?

Main Concept Definitions

The section below defines key terms in relation to “Native plants with negative pot appearances” that are used throughout the thesis.

Native Plant

Native plant refers to plants that were present in the US prior to the European settlement (Tallamy 2020).

Negative

The plants illustrated in Figure 1.1 can be considered examples of plants with a negative appearance. Nonetheless, they are living and healthy—they are merely dormant. Thus, the question arises of who and why ascribed these plants the word “negative.” Consumers have demonstrably low interest in these plants, but sellers continue to sell them. What quality of these plants motivates sellers to sell them even when they are not performing well?



Figure 1.1. *Plants in State Botanical Garden of Georgia with negative pot appearance*

The word "negative" indicates an individual's subjective evaluation. The standards by which people evaluate a thing or experience as positive or negative primarily originate from their spiritual world, which comprises both emotion and rationality. People's instinctive needs inform their emotions, including the need for health (and healthy living) and happiness, including pleasant aesthetic visual experiences. In contrast, rationality derives from realistic demands and knowledge. Aesthetic experiences are usually influenced by culture, which helps form both traditions and psychological preferences. To understand how aesthetic evaluations occur, it is important to understand the influence mechanisms of emotion and rationality on people's judgment. Generally, in the moment, emotion will play a leading role in the evaluation, whereas over the long term, rationality plays an important role. The richer the individual's knowledge is, the greater the role of rationality, but the role of emotion in such evaluation will not disappear.

Subjective evaluations are often blinded by emotion and limited knowledge, which can lead to misunderstandings and even to adverse effects. One example of such effects is treated in

this thesis, which proposes that, due to people's emotional needs and limited knowledge, native plants have not been given the attention from consumers that they deserve.

According to the above principle, "negative" in the context of this research is defined as an unpleasant subjective feeling or ideologically less recognized subjective understanding of plants that lack color (including flowers) and perfect form. Because color and form in plants are signs of life and health, they fulfill consumers' visual aesthetic needs and needs for healthiness.

However, consumers may be blinded by their aesthetic preferences and limited knowledge of native plants, resulting in several misunderstandings and, consequently, a negative evaluation of such plants. First, and most commonly, although consumers may rationally prioritize the health and easy maintenance of plants when selecting them for purchase, they may nonetheless be carried away emotionally by the first impression of whether a plant is visually attractive at the moment of purchase. Second, uninformed consumers often mistake the color and form of hibernating plants as indicating that such plants are dead because they do not know that such plants have strong roots and that autumn and winter are the best seasons to plant them. Many consumers prefer to buy fast-growing plants, although these often have detrimental ecological effects.

Therefore, to change consumers' "negative" impression of native plants, it is necessary to change their aesthetic preferences, which—driven by a lack of information about native plants—are generally too focused on visual color and form. Consumers need to be educated to recognize the various forms of beauty of native plants, including the beauty of strong roots, the beauty of each growth phase, the beauty of flourishing, and the beauty arising from the trust and expectation of life that accompanies the choice to plant a living thing. Such education will enrich people's aesthetic experiences and increase their knowledge of native plants.

Pot Appearance

“Pot appearance” in this research context refers to the appearance of immature and hibernating potted native plants. This category does not include bonsai.

Negative Pot Appearance

“Negative pot appearance” in this research context refers to consumers’ dissatisfaction with immature and hibernating potted native plants.

The appearance of immature potted native plants, which may appear sprawling or overly small, may indicate to uninformed consumers that these plants are unhealthy due to uncompleted growth and lack the ability to show mature beauty and strong vitality. These assumptions may lead to consumers’ negative impressions of the plant. For instance, consumers usually have a negative impression of sweet shrubs just with two or three stems. A small juniper in a container is not as beautiful as a mature juniper. Moreover, consumers seek instant gratification of their aesthetic needs when shopping for plants, especially visual aesthetic needs such as desires for interesting colors and shapes. Consumers may experience negative feelings about native plants when they learn about the slow growth rate of some immature potted native plants. For example, the indigo bush (*Amorpha fruticosa*) requires 15 years or more to grow to full size, but it has important ecological functions, such as nitrogen fixation. Thus, an important question arises: Will consumers have the necessary patience to wait for native plants to grow and appreciate their slow but steady pace?

Hibernating immature plants can also prompt a more negative consumer impression, since they can look to uninformed eyes as though they are dead or unlikely to survive planting. Of course, such plants do not spark an immediately gratifying aesthetic experience. However, they maintain strong root systems even during hibernation, which keep the plant healthy and,

consequently, also benefit the ecosystem in which they are planted. Autumn and winter are the best seasons to plant native plants and thus also the best time to sell and buy them, despite their lackluster appearance during these seasons.

Thus, to alter consumers’ “negative” attitudes regarding immature and hibernating potted plants, their aesthetic preference should be guided from a focus primarily on immediate visual beauty and instant enjoyment to an understanding of healthy beauty and long-term benefit, including the ecological and functional benefits that accompany the plants’ growth and change over time.

Table 1.1 Aspects of horticultural performance in order of importance to South African consumers (Middleton 2015)

Statements on survey questionnaire	Respondents concurring with statement (%)
1 Plant quality (total appearance, health and attractiveness)	95
2 Good garden performance (flower and leaf production)	95
3 Climate suitability	85
4 Plant longevity	82
5 Plants must be suitable for 'water-wise' practices	76
6 Pest and disease resistance	76

According to a consumer preference study conducted by Middleton (2013), consumers shopping for plants “tend to regard compact growth or bushiness as a sign of a healthy plant.” Nearly all respondents (97%) in Middleton’s survey stated that “their customers highly valued the neat appearance of plants, displaying such characteristics as bushiness, non-straggling growth forms, and dense, compact shapes. The quality of the plant (overall appearance, health, attractiveness) and good

garden performance (flowers, leaves) were equally rated as the two more important marketing criteria (94% of respondents)” (Middleton 2013). In this survey, consumers considered neat appearance to be as important as flowers, although in most real-world situations, they are more easily carried away by flowers and colorful plants than by healthy but less colorful plants. Nonetheless, Middleton’s survey reflects that some consumers rationally appreciated the beauty of health or the beauty of life conveyed by the physical form of the plants. Unfortunately, many hibernating native plants with ecological significance do not have dense and compact form or a traditionally neat appearance, and their lack of such traditional beauty indicators might be perceived negatively by consumers. Thus, the definition of healthy beauty need to be further expanded to include the plants’ roots, growth, vitality and ecological and functional virtues. Figures 1.2 and 1.3 illustrate cases of consumer struggles to understand the appearance of a healthy but hibernating plant.



Figure 1.2 *Sweet shrub bought on Amazon (positive review)*

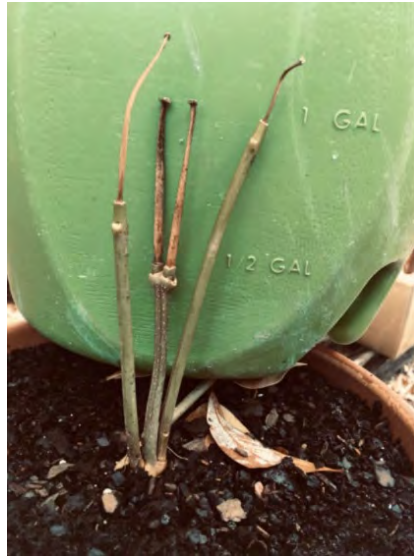


Figure 1.3 *Sweet shrub bought on Amazon (dormant)*

An Amazon consumer bought this plant in June, and the plant was in great condition, resulting in a five-star review. However, another consumer also bought the same plant in November. He said, “I was excited to find this shrub and ordered it. It came with 2 leaves (yellow), this is after 1 week. I know that it is dormant but I expected better. Hopefully it will survive.” The consumer who bought this shrub in summer gave this shrub five stars since the plants met his or her aesthetic requirements and provided instant aesthetic gratification. Although the consumer who bought the shrub in winter only gave it one star, his/her comment on the importance of “research!!!!!!” reflects that s/he understood the value of this native plant even though it was dormant and was willing to visualize the beauty of the plant as it grows in the future (“growth beauty”). The green industry should target and advocate for these types of consumers, who are willing to appreciate plants’ growth beauty.

Consumer Attitudes and Preferences

Consumers' Negative Attitudes Towards Native Plants Evidenced by Low Sales of Native Plants with a Negative Pot Appearance

This section discusses several research studies that have focused on investigating consumers' attitudes towards plants with a negative pot appearance. Several studies, including those discussed below, have shown evidence that such plants often see low sales, thereby supporting the argument of this thesis that negative pot appearance may be at least the part of reason why consumers' lack enthusiasm for native plants in fall and winter.

As shown in Table 1.2, a survey from the Netherlands shows the differing sale numbers for the same plants in different seasons. May to September is the peak time of sale in a year.

Table 1.2 Frequency distributions of the number of purchases and expenditure on plants for 1000 households (Tilburg 1984)

Four-weekly periods	Proportion of purchases (%)		Proportion of expenditure (%)		Proportion of the advertising budget (%)		Month
	1972/1973	1973/1974	1972/1973	1973/1974	1972/1973 ^a	1973/1974 ^a	
13	7.0	6.2	8.1	7.3	4.4	6.5	Dec.
1	7.2	7.0	7.4	7.0	4.9	7.3	Jan.
2	8.6	8.4	8.8	8.0	3.8	5.1	Feb.
3	9.7	9.4	9.1	8.4	4.7	6.7	Mar.
4	10.5	11.1	9.9	9.4	3.3	6.0	Apr.
5	10.1	10.3	11.0	11.4	17.8	10.3	May
6	8.1	7.6	7.7	7.6			
7	5.7	6.1	4.9	6.0	9.5	11.4	Jun.
8	6.1	5.7	5.9	5.4	9.2	10.1	Jul.
9	6.7	7.1	5.9	6.5	7.6	9.0	Aug.
10	7.1	7.2	6.7	7.1	13.4	10.3	Sep.
11	7.1	7.3	7.8	8.2	9.1	8.9	Oct.
12	6.2	6.5	6.8	7.7	12.5	8.5	Nov.

^a Monthly data

Note. (This data is same as most consumers in the US in terms of psychology, but not regarding climate and culture).

As shown in Figure 1.4, the period from mid-May through September is the peak sales period for live plants. In a 2016 survey, Greenhouse Grower Retailing (GGR) asked growers and retailers to share their pricing methods. The data clearly showed that sellers are most likely to hold sales in summer and least likely to do so in winter.

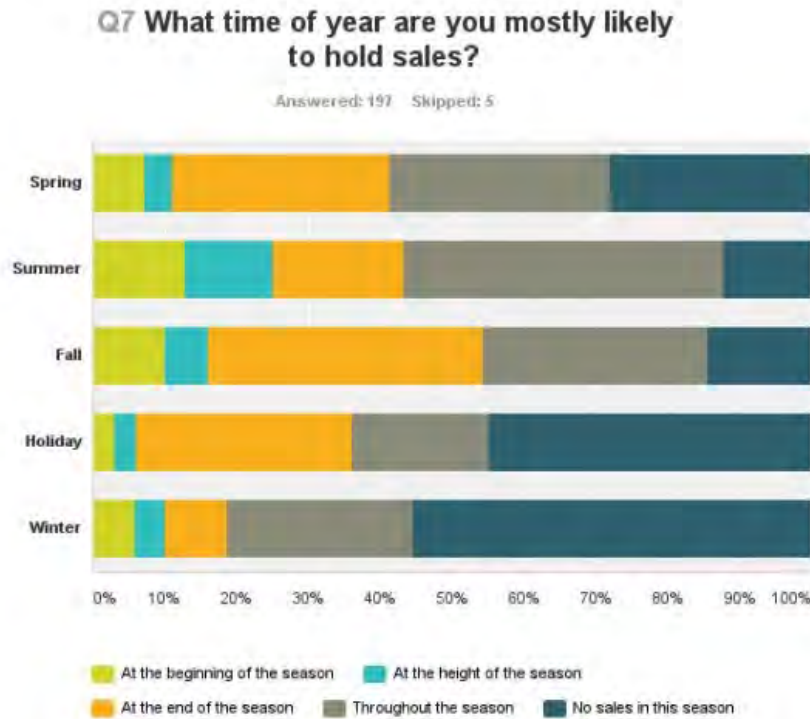


Figure 1.4 *Time of year sellers mostly likely to hold sales (Miller, 2016)*

Many nurseries do offer discounts on plants in fall and winter. According to research by Edge of the Woods Native Plants, the sellers in nurseries stated that the reason behind this strategy is because many plants look bedraggled and unattractive after blooming in the summer. Nurseries are also likely to reduce staff during the colder months in anticipation of lower sales and fewer customers. Keeping reduced inventory is important in making the nursery manageable for owners and remaining cold-season staff.

Moreover, as illustrated by market research on the selection criteria used by consumers when choosing what plants to buy, consumers prefer plants with flowers and a tidy (bushy, dense and compact) appearance. Since hibernating and immature plants do not have flowers and leaves and have only a few stems, these plants do not meet consumers' selection standards. Thus, not many consumers purchase plants in the fall and winter. This problem is also exacerbated by the negative pot appearances of many plants during this season, whether native or not.

Although some sellers offer discounts in fall and winter because they want to remove inventory and save money on the costs of heating and winter coverage, the negative pot appearance of native plants is still an important factor that must be addressed to encourage consumers to purchase such plants during the appropriate seasons (fall and winter).

Changing Consumers' Preferences at the Point of Sale (POS)

Although native plants have numerous ecological and health benefits, these benefits cannot be realized if consumers do not purchase and plant them. Thus, boosting the sale of these plants is important. Since the low sales volume of native plants is a result of consumers' negative attitudes towards them, changing and improving consumers' preferences needs to happen at the POS to boost sales.

Changing consumers' preference through effective labeling at the POS

Consumers often do not have sufficient knowledge about plants' ecological benefits without the aid of an educated landscape designer. Thus, they need the help of educated landscape designers when purchasing plants. However, many plant sales occur at garden centers, where individuals or business owners purchase plants for their own landscapes without the aid of a landscape architect. Therefore, information must be available to help educate buyers on the



Figure 1.6 *Native grass point of sale display at participating garden center in Minnesota marketing study, 2016-17* (Narem et al. 2018)

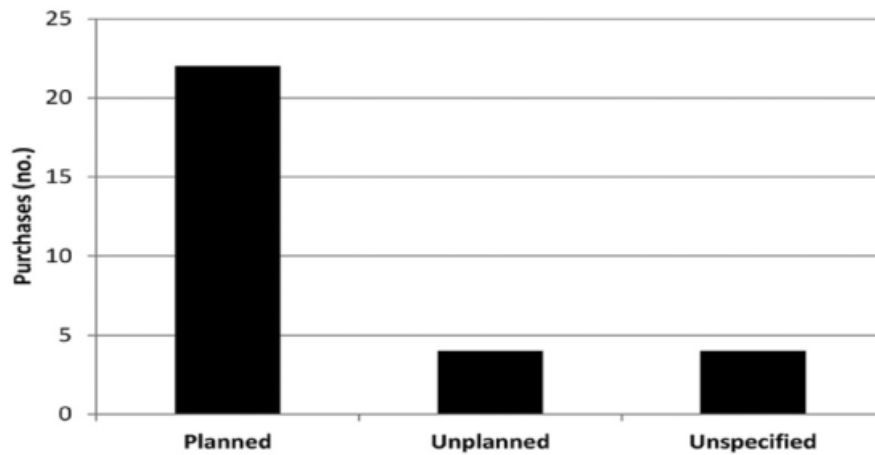


Figure 1.7 *Number of planned and unplanned purchases after seeing POS display* (Narem et al. 2018)

Figures 1.5 through 1.7 illustrate a marketing study that was designed to help educate customers on the benefits of native grasses through visual information provided by labeling and signage at POS displays. This study was conducted over the course of two years at five Minnesota garden centers, where “POS display posters and plant tags listing four benefits of native grasses were displayed at the garden center in 2016 and 2017” (Narem et al. 2018). According to the study’s authors, their results indicated that “seeing the POS display increased the likelihood of a native grass purchase. A total of 152 respondents indicated they saw the native grass POS display, 22 made a planned purchase, and 4 made an unplanned purchase“ (Narem et al. 2018).

The above mentioned study has some differences from the research in this thesis, although its approach and results were informative for the present work. The above research created labels for native grasses that are sold when the grasses are still green. The research design in this thesis creates labels for native plants when they have negative pot appearances and are dormant. For instance, this research designed labels for native grasses when they are brown and immature. Thus, the labels in this research will show additional key information on topics such as plants' roots, growth process, seasonal changes, and design features. Moreover, the labels employed in this research will also contain information on the ecological benefits of the native grasses, such as attracting wildlife and stabilizing soil.

A New Labeling System for Immature and Hibernating Potted Native Plants

Traditional labels on the market usually only show the flowers or mature beauty of plants, thereby catering to consumers’ traditional aesthetic preferences, which are affected by subjective emotion and an overly strong focus on color and form. However, the gap between the negative pot appearance of immature and hibernating native plants in containers and plant photos showing their mature beauty is often so great that systematic information should be provided on the label to fill

the gap. Although consumers tend to get carried away by their emotional aesthetic preferences for flowers and color, they are also motivated by plant health, which should not be underestimated as it one of the factors behind why consumers increasingly prefer ecologically friendly plants over flowering plants that may be less beneficial for their environment. Information about plants' benefits to environmental health should be given on the label to help arouse consumers' rational pursuit of health. Since immature and hibernating native plants may appear unhealthy and unattractive to consumers despite their true vitality, the new labeling approach needs to systematically display the signs of these plants' health to encourage consumers to pursue the value of health over aesthetic appearance. This kind of label is essentially an exploration of the healthy beauty of plants and their contributions to the environment and human beings.

Root and Growth Process Label

Native plants' root and growth process should be shown on their labels to convince consumers that, despite their unappealing appearances, hibernating or immature plants in the pots are still alive. Due to a lack of information, many consumers mistakenly assume that hibernating plants are dead and cannot survive, making them unlikely to purchase such plants. Consumers need to be provided with information that will help them to understand that hibernating or immature native plants will survive and become attractive and useful.

Furthermore, consumers need to know that the roots of native plants establish themselves the best in the fall or winter. And, although the immature native plants do not look as good as mature plants, the optimal time to purchase and plant them is in the fall and winter. The label should also indicate information that these plants' growth processes can bring health benefits to consumers and their yards. For instance, the indigo bush can improve soil health and nutrition as it grows.

Seasonal Beauty Label

Plants' appearances change across seasons as an adaptive mechanism to allow the plant to remain healthy over time. In particular, their dormancy is an effective way to conserve energy. A landscape architect must ensure that a designed landscape will be beautiful throughout the year. Even though grasses may turn brown in the winter, landscape architects appreciate the beauty of the brown phase and use it to create texture in a landscape. However, in sales, plants are more likely to be sold when they are at the stage of peak beauty. Garden centers categorize plants by when they bloom, whether in spring, summer, fall, or winter. The plants that do not bloom during the current season are often forgotten, left to languish in the corners of garden centers and nurseries. Moreover, when garden centers label plants, they often only provide information on the plant's flowers. This type of labeling reflects that people often only appreciate the peak beauty of plants, such as when they are flowering, and have difficulty appreciating immature or hibernating plants. Thus, it is necessary to use seasonal labels to let consumers know that the plants can be beautiful year-round and that they should expect and even appreciate that these plants go through brown or dormant stages as living things. More importantly, these seasonal beauty labels can explain the hardiness of native plants, such as whether they can endure the cold fall and winter and then bloom in the spring or summer.

Design Feature Labels

Design feature label that shows functional benefits

Landscape architects use plants both functionally and decoratively. In landscape design, evergreen plants can be used as fences and grasses as edging. Shrubs can be used as dominant features in a small yard. Despite this functionality, garden centers rarely include design features on plant labels. To educate consumers on these lesser-known benefits, landscape architects should

teach consumers how to use plants in multiple ways, which can be achieved through design feature labels.

Design feature label that shows ecological value

Moreover, more well-informed consumers may inquire about a plant's general value to the landscape. Consumers appreciate plants that have ecological benefits, are hardy, adapt to poor soil, and save water, among other attributes. Consumers also like to use plants spatially. Consumers are often not superficial in their uses and expectations of plants and often appreciate many values of plants beyond flowers. Thus, design feature labels can educate consumers about the many values of native plants.

CHAPTER TWO

RESEARCH METHODS

This chapter discusses the research methods used in the current investigation of native plants, negative pot appearance, and labeling approaches.

Literature Review

The goal of the literature review is to examine previous approaches and solutions to the problem under study in this thesis. For example, the benefits of planting native plants in autumn and winter, despite their negative pot appearance, have been convincingly demonstrated, and “native plants” have been clearly defined as well. However, this thesis proposes its own definition of “negative” according to facts, experience, disciplinary perspectives (psychology and philosophy), and related concepts (“consumer preference”).

Also, the literature review investigated the current solutions and labels that were addressing the low sale of native plants with negative pot appearances and found that the shortages of current solutions and labels were due to a lack of research about consumer preferences.

Market Research

The literature review clarifies that consumer preference is the essential foundation for effective label design. Since there is not enough research about consumer preferences in the literature review, market research is needed to understand consumers' preferences further.

Since marketing research is a research methodology that obtains firsthand information about consumers' preferences, rather than simply speculating about them, it often generates new,

effective ideas for labeling plants to meet consumer demand. Market research includes observations at the POS and interviews with consumers.

The problems that are found in the research may be universal, but the situation will vary from place to place. The current study concerns local native plants, so an understanding of some local situations through an investigation of marketing is needed.

1. Understand local native plants' situation in various sale markets, including fall sales at nurseries and sales on Home Depot, and through investigation and research, four native plants were identified as the plant label case study objects.
2. Understand the buyer's needs for native plants as an essential basis for designing labels by analyzing Home depots' reviews and conversations with homeowner's during visits to their yards.
3. Understand consumers' misunderstandings of immature, deciduous and hibernating plants.
4. Understand the labeling situation of different plant markets, especially conditions of labels from native plant sales, and create new labels according to the shortages of current labels.
5. Understand how a new label can solve consumers' misunderstanding of plants with a negative appearance and pursue research toward whether the newly designed labels could increase sales.

Case Studies

Given its time limitations, this research focused on several typical examples, evergreen, immature shrubs and trees, and warm-season grasses that conform to the conceptual definition of native plants with negative pot appearances.

According to a staff member at the Mimsie Lanier Center at the State Botanical Garden of Georgia (SBGG), indigo bushes and sideoats grama grasses had the lowest consumer demand during SBGG's fall plant sales. The staff speculated that the yellowish appearance of the warm-season grasses and the sparse leaves of immature, hibernating native shrubs give consumers the misconception that these plants are dying (Alley, 2021).

Among the evergreens, two kinds of junipers with the lowest sales at Home Depot experienced similar challenges as the indigo bush and sideoats grama grass.

In the case study, observation was very important. In general, observation is the only way to eliminate subjective assumptions and examine the object of study without preconceived notions. In the context of this research, observation of the plants' growth was the basis for creating a new labeling system. Thus, to observe these four case-study plants, the author bought them from a plant sale at the State Botanical Garden of Georgia. At first, the author also had a prejudice against these seemingly "ugly" plants—the author thought they were unattractive. Nonetheless, after buying the four kinds of plants from the Botanical Garden and observing them for nearly six months from last November to this June, the author's personal biases gradually disappeared. The author also discovered through successive daily observations that these plants had considerable value beyond merely their physical appearance. For example, they can put forth buds and leaves in fall and winter; they also have the strong vitality to grow roots in poor soil.

In this case study, marketing research first be conducted to gather information on the sales of these four plants during fall and winter. Data on consumer preferences collected from market research will be used to determine the shortcomings of the existing labels on the market. Based on the results from market research and the literature review, a new type of label was designed to provide a more comprehensive and aesthetically appealing demonstration of native

plants' value. Finally, a survey was carried out to test the effectiveness of new labels to see if the new design can enhance consumers' interest in purchasing these plants.

Survey

In this research, two surveys were conducted. The first survey was a miniature survey among classmates to develop the main survey. The second survey was the main survey. The first part of the main survey was conducted to investigate consumers' attitudes and misunderstandings regarding the appearance of potted native plants. The second part of the main survey included the new plant labels and will examine the impact of these new labels on consumers' interest in and purchase of these native plants with negative pot appearances. This research used an online survey instead of on-site testing to allow for the collection of more data and written feedback, thereby leading to a clearer understanding of consumers' preferences. The results of the survey were collected, presented, and discussed. Then, the results were used as a basis for designing improved plant labels as a final result, which this study proposes plant sellers use to improve their sales of native plants.

CHAPTER THREE

LITERATURE REVIEW: NO EFFECTIVE LABELING SOLUTIONS DUE TO LACK OF RESEARCH ON CONSUMER PREFERENCES

The importance of labeling native plants has been increasingly recognized and emphasized by scholars and sellers alike. However, there is still a lack of professional support from landscape architects with emphasis on plant designs and consumer preferences to design labels. Numerous surveys have revealed that consumer education is important to improving plant sales; an example is shown in Table 3.1.

Table 3.1 Inadequate education responsible for low sales of native plants (Brzuszek & Harkess 2009)

Stated information resources	Responses (no.)	Valid responses (%)
Better consumer education	45	37.2
Individual plant tags	27	22.3
Multiple methods	18	14.9
Brochures	16	13.2
Not sure	5	3.9
Bench tags	3	2.5
Posters	3	2.5
Websites	3	2.5
Periodic information sent	1	1.0
No answer	8	—
Total SD = 2,997	129	100.0

Improved consumer education ranked highest among the types of information about native plants that could be beneficial at retail outlets (Brzuszek & Harkess 2009). Thus, inadequate education can be considered an important reason for the low sales of native plants.

The green industry has found that plant tags and labels are important as educational tools and has advocated for the use of labels to educate consumers about native plants. Despite this emphasis, however, the industry has not explained how label design can help improve sales. Although surveys conducted by the green industry have shown the advantages of native plants, they have failed to provide examples of how to design labels for such plants, particularly evergreens. Thus, nurseries and plant sellers have failed to label native plants with consumer-friendly text and graphics.

Landscape architects who do planting design possess knowledge of native plants and consumer preferences can support the design of effective labels. Therefore, the green industry should enlist the help of design professionals such as landscape architects, who can help demonstrate to consumers how native plants can be used both for their visual beauty and the support they provide to the ecosystem.

Labeling Evergreen Native Plants: Shortcomings and Solutions

The Ecological Landscape Alliance (ELA) provided solutions for using native plants functionally, thereby minimizing the focus on visual appeal. For example, they have suggested that consumers use American holly to create a nicely clipped hedge, sourwood to design a drive alley, and other design-oriented options. The ELA found that some consumers were already gardening with some of these native plants (Lafleur & Smarr, 2010). However, the ELA has not conducted research on how to express plants' functional benefits through label design.

One study reporting on a green industry marketing survey (see Table 3.2) found that lack of consumer interest and unfamiliarity with native plants were the top reasons for low sales of native plants at nurseries (Brzuszek & Harkess 2009).

Table 3.2 Low consumer interest a reason for low sale of native plants (Brzuszek & Harkess 2009)

Stated reasons why customers do not purchase more natives	Responses (no.)	Valid responses (%)
Not enough customer interest	47	36.4
Not familiar with natives	26	20.2
No answer	19	14.7
Natives sell by trends	15	11.6
Too few sources to purchase	10	7.8
Too few species available	7	5.4
Insufficient quantities of plants	3	2.3
Prices are not competitive	2	1.6
Total SD = 2.413	129	100.0

Consumer preferences also drive the sales of native plants. In a southern United States green industry survey of native plant marketing that was conducted in 2007 (see Table 3.3), client request was the most significant reason for the consumer purchase of native plants (21.7%), followed by ecological reasons (17.8%), adaptability to difficult site conditions (16.3%) and low maintenance rationale (13.2%).

Table 3.3 Low maintenance, ecological reasons, and adaptability to difficult sites ranked highest among reasons why consumers purchase native plants (Brzuszek & Harkess 2009)

Stated reasons for customers purchasing native plants	Responses (no.)	Valid responses (%)
Client request	28	21.7
Low maintenance	23	17.8
Ecological reasons	21	16.3
Best adapted to difficult sites	20	15.5
No answer	17	13.2
Aesthetics or beauty	12	9.3
Other nonstated reasons	4	3.1
All of the above	2	1.6
Drought resistance	1	0.8
Regulatory codes	1	0.8
Total SD = 1.946	129	100.0

Thus, the green industry has long understood that it is essential to label native plants to show their design features and ecological benefits. Nevertheless, although industry surveys have shown the advantages of native plants and the reasons why consumers may purchase them, the research to date has not provided examples of how to design labels for evergreen native plants. Thus, nurseries and plant retailers have failed to help consumers discover the qualities of evergreen native plants through labeling that includes consumer-friendly text and graphics. The green industry needs the help of design professionals such as landscape architects, who can demonstrate how native plants can be used both for beauty and ecosystem support.

Labeling Hibernating and Immature Native Plants: Shortcomings and Solutions

Many native shrubs have very negative pot appearances in the fall and winter, despite these seasons being the ideal time for planting. There are three explanations for the potentially negative appearances of native plants during this period: First, many native plants are deciduous; second, native plants may hibernate during these seasons; and third, native plants may be immature during these seasons. This section provides a more detailed explanation of these reasons.

As shown in Figure 3.1, deciduous native plants lose their leaves in colder seasons. The pot appearances of such plants would be better if these plants were sold in spring or summer, but fall and winter are the preferable planting seasons. Thus, these plants have a negative pot appearance in fall and winter.



Figure 3.1 *Indigo bushes at the State Botanical Garden of Georgia*

Furthermore, since native plants are generally hibernating at the time of sale (usually in fall and winter), they usually only have only a few branches, as shown in Figure 3.2. Moreover, native plants are often immature at the POS and thus do not have as many branches as their full-size counterparts. Immature plants often have only one or two branches, which appears worrisome to consumers, who lack an understanding of immature native plants' natural appearances.



Figure 3.2. *Indigo bush with only two branches*

For instance, the indigo bush shown in Figure 3.2 was approximately two years old at the time of sale but had only two branches. Consumers at the plant sale were confused as to whether this plant will grow into a shrub or a tree. Consumers likely struggle to imagine that such small potted native plants can grow to full size and develop as many branches as the mature version (see Figure 3.3).



Figure 3.3. *Indigo bush in full growth* (photo from <https://www.waterwiseplants.org/>)

Like native shrubs, many native grasses have negative pot appearance at the time of sale, which usually occurs in the fall and winter. Two main factors are responsible for this negative pot appearance. First, these grasses are warm-season grasses, so they are largely brown in the fall and winter (see Figure 3.4). Because many plants turn brown when they are undernourished or dying, consumers often assume that a brown appearance indicates a plant's poor health. Second, these grasses do not have fruits (such as the oats of sideoats grama grass) in winter, so consumers may negatively evaluate their appearance since they are not fruiting and thus do not show the typically expected signs of life.



Figure 3.4. *Hibernating sideoats grama grass*

Moreover, many of these plants have a negative pot appearance even in spring and summer if they are not flowering or bearing fruit. This negative appearance to consumers is a key reason why big-box stores and even garden centers sell so many annuals, which are always in bloom during the sales season, as well as nonnative species that have evergreen or colorful foliage all year. Because these native deciduous plants do not adhere to typical consumer expectations of healthy plant appearance, it is necessary to develop improved labels to educate consumers.

Consumers usually demonstrate low interest in native plants that are hibernating and immature, as evidenced by the 2% reply rate to the UGA Botanical Garden fall native plant survey. This low rate reflects that consumers lack interest in these plants. Moreover, in the real-world market, people usually do not tend to spend time examining dormant potted plants unless they are avid gardeners or regular shoppers. When asked if they want to buy dormant or immature native plants, consumers usually immediately reply that they are not interested. Some consumers struggle to understand these plants.

It should also be mentioned that most sellers want to sell these native plants with negative pot appearance quickly. The first question should be what prevents these plants from being sold

before fall, such as in spring or summer? If all the native plants with a negative pot appearance in stock at POSs were sold before the fall, no plants would remain to develop the negative pot appearance that occurs later in the year. However, one potential problem is that these plants are often not traditionally attractive even in spring and summer as they are often immature when sold. To address this situation, native plants with a negative pot appearance earlier in their life cycles could be sold after they reach three years old, when they show more typical growth and beauty. Mature plants can also maintain more branches in the fall and winter, resulting in a less negative pot appearance. Nonetheless, although the plants with a negative pot appearance might look more appealing after three years, when they have developed more branches, many sellers still try to sell them when the plants are approximately one or two years old to save money. As shown in Figure 3.5, many sellers use overwintering houses to store stock in containers and balls.



Figure 3.5. “*Care of Nursery Stock in Retail Outlets*” (Kennedy, 1914)

Plastic overwintering houses such as that pictured save nurseries money, since they can spend less on maintaining the temperature in the overwintering house as they sell their stock of hibernating plants.

Some sellers do not care about whether they can sell plants with a negative pot appearance, since they are likely to earn more money by selling more profitable plants with more showy flowers and leaves. Since studies have shown that many consumers do not care about these plants since they misunderstand them, who cares about selling these plants? In other words, who wants to take responsibility for them?

Fortunately, native plant societies help fill this gap. Many native plant sales have been held in recent years. As shown in Figure 3.6, these native plant societies have often designed attractive plant labels for these plants to offset their negative pot appearance.



Figure 3.6. *Washington Native Plant Society's Spring 2020 native plants sale*

For example, as shown in Figure 3.6, the Washington Native Plant Society's labels showed the plants' flowers or other special features of interest, such as attractive leaves or fruit. Some labels showed the whole plant during the peak season, when its appearance was the most attractive. Some labels also showed the interactions between plants and wildlife, such as bees and butterflies. Additional examples of native plant societies' labeling techniques are shown in Figures 3.7 and 3.8.



Figure 3.7. *Friends of Ballona Wetlands plant sale*



Figure 3.8. *Friends of Ballona Wetlands plant sale labels*

Designers of existing labels emphasize traditional aesthetic value in describing the plants for sale, prioritizing color and form. Thus, there is no way for these labels, which only highlight flowers and other traditionally attractive features, can change negative consumer attitudes towards native plants. Even worse, this labeling approach will mislead consumers into buying these plants only in certain seasons, not when native plants should be planted.

As these figures illustrate, native plant sales have used many types of labels. These sellers have created their own standards for labeling native plants. The labels need to show soil, water, and light requirements. If space on the label allows, illustrations of the plants' flowers and fruits can be included. One shortcoming of this type of labeling is the dramatic contrast between the illustration or photograph on the label compared to the appearance of the existing plant. All the labels at these native plant sales attempted to show the plants' future beauty through these illustrations. However, due to this difference, such labels may not fully convince consumers that native plants with a negative pot appearance are alive and will survive. For instance, when out-of-season shrubs such as winterberry holly are hibernating and have no fruits or leaves, uneducated consumers might not believe the image on the label, which shows the most attractive version of the plant, full of fruits and leaves. Similar issues may also be observed for out-of-season grasses, which are often brown during the fall and winter, and immature plants, which may take years to reach the mature beauty pictured on the label. Thus, this type of label alone is unlikely to increase plant sales.

In addition to assurance that the plants they purchase are alive and will survive and grow when planted, consumers also want to know the value and benefits of the plants they buy. Native plants have spatial, aesthetic and ecological value. To demonstrate this value to consumers, labels should include photographs or illustrations of design features that can be created through the use of native plants. However, the labels currently on the market for native plants usually do not include design features.

In conclusion, the existing labels for native plants inform consumers about these plants' future beauty, which is a needed first step. However, since these labels do not illustrate the process of how native plants with a negative pot appearance reach the stages of future beauty,

such labels might not successfully convince consumers to believe the labels and purchase these plants.

CHAPTER FOUR

MARKET RESEARCH: IDENTIFYING CONSUMER PREFERENCES AND MISUNDERSTANDINGS

The literature review has clarified that consumer preferences are the essential foundation of effective label design. However, since the literature review also revealed that there is currently insufficient research about consumer preferences in the field of native plants with a negative pot appearance, market research is needed to develop a more complete and nuanced understanding of consumer preferences.

Consumer Reviews of Evergreen Plants

Reasons Why Consumers Dislike/Like Evergreens

This thesis used reviews on Home Depot's website as a proxy for plant popularity. At Home Depot, evergreen plants such as cypress and boxwood varieties tended to sell in low numbers. These plants had an average of 20 to 30 customer ratings, dramatically fewer than the average of 600 ratings that appeared for annual flowering plants. For example, as shown in Figure 4.1, a native wintergreen boxwood plant received only 35 customer ratings.

Compare



2.25 Gal. Wintergreen
Boxwood Shrub Plant

Model# 14092

★★★★★ (35)

\$36⁹⁸

Figure 4.1. *Low number of ratings for wintergreen boxwood* (photo from Athens, GA Home Depot webpage)

Similarly, the native Yucca only received 23 ratings on the Home Depot website.



2.25 Gal. Color Guard Yucca Plant
with Creamy White and Dark Green
Foliage

\$36⁹⁸

★★★★★ (23)

Figure 4.2. *Low number of ratings for yucca* (photo from Atlanta, GA Home Depot webpage)



Figure 4.3. *High number of ratings for hydrangea* (photo from Atlanta, GA Home Depot webpage)

Moreover, nonnative flowering annuals received far more customer ratings than native evergreen plants. For example, the nonnative dipladenias pictured in Figure 4.4 received 1038 and 667 ratings, respectively.

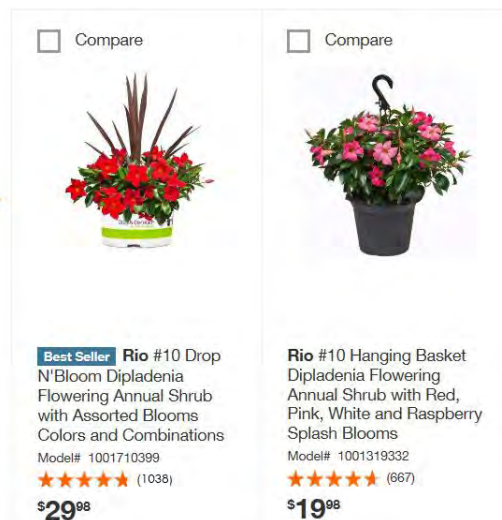


Figure 4.4. *High number of ratings for dipladenia* (photo from Atlanta, GA Home Depot webpage)

The drop n' bloom dipladenia received a total of 1038 customer ratings: 866 were five-star ratings, 119 were four stars, 54 were three stars, 7 were two stars, and 12 were one star. Just seven of the 1038 ratings awarded this annual two stars and only 12 awarded it one star. The customer complaints associated with these low ratings explained that the flowers failed or faded quickly, and they stated that the goal for their purchase of this plant was to enjoy its flowers.

On Home Depot's website, evergreen plants, including cypress, boxwood, and yucca, had few customer ratings overall, which likely reflects a low number of sales. One reason for their low sales volume is likely because these plants are less colorful than flowering plants. However, in the review section for each plant, customers have also submitted photos that show the many advantages of using evergreen plants in landscaping. For example, evergreens last for up to four seasons, can be used as borders, prevent animals from entering a yard, and some even have the potential to grow very large and function as fencing, as illustrated by the consumer photo in Figure 4.5.



Figure 4.5. *Wintergreen boxwood* (from Atlanta, GA Home Depot web page)

Unlike the evergreen plants, which received relatively few consumer ratings online, flowering plants on the Home Depot website received considerable numbers of consumer ratings. For example, a beautifully flowering hydrangea (see Figure 4.3) received 157 consumer ratings.

Identifying Consumer Misunderstandings of Immature/Hibernating Deciduous Plants

Consumers hold numerous misperceptions of native plants, particularly immature and/or hibernating deciduous plants, which have a decidedly negative pot appearance. For example, the UGA Botanical Garden fall native plant survey had a response rate of just 2%, reflecting consumers' low interest in these plants. To learn more about consumers' perceptions of native plants, the author interviewed five classmates, who demonstrated several misunderstandings of about plants. The three most common reasons why they did not understand plants with a negative pot appearance are as follows:

1. The plant seemed dead and weak.
2. They did not know how the plant could serve them and what the value of the plant was.
3. They did not think that they could grow and maintain the plant. They preferred that professional staff raise the plant.

CHAPTER FIVE

NEW LABELING IDEAS BASED ON MARKET RESEARCH AND OBSERVATION

This chapter presents new labeling ideas based on market research (including the author's interviews with homeowners and classmates) and on the author's experience of observing plants as a case study.

Evergreen Labels Should Emphasize Function by Illustrating Design Features

Consumers usually do not prefer evergreen plants since the plants are not as colorful as the more popular flowering plants. Despite their plainer appearance, evergreens offer functional value to landscapes, and some consumers enjoy using evergreens functionally in their planting designs. This type of value is what the new labels should promote.

Homeowners Want to Know How to use Evergreen Plants Spatially

Evergreen plants can be used spatially to create fencing and other design elements in landscapes. Thus, the focus of the planting instructions given on the new evergreen labels should be determined. This section employed consumer ratings and reviews on the Home Depot website as representative of ways in which typical consumers plant evergreens. Figures 5.1 and 5.2 are typical images posted by consumers on the Home Depot website.



Figure 5.1. *Pencil holly* (from the Atlanta, GA Home Depot web page)



Figure 5.2. *Alternate view of pencil holly* (from the Atlanta, GA Home Depot web page)

One homeowner who had purchased evergreen plants commented: “Arrived safely packaged and in good condition. Planted them the next day and so far they are looking healthy and green. Not currently the height I want but they will be in a few years. It’s a slow growing plant. (I wanted the root structure to grow with the plant, hoping that makes them stronger). My goal is to get these about 6 ft high on the property line of my house” (Zoey 2020).



Figure 5.3. *Arborvitae green giant shrub* (from the Atlanta, GA Home Depot web page)

Figure 5.3 is another image posted by a customer who bought evergreen plants. This homeowner commented: “Ordered on sale from Home Depot online, order was shipped and delivered in great shape. Only problem was I ordered 7 trees to make a privacy screen between my neighborhoods and was confused to how far apart to plant them from each other and posted a question and the nursery said 5’ and the instructions said 9’-10’ so I planted them 9’ apart. It looks great” (Robt 2020).

Homeowners use plants to prevent deer and dogs from entering their yards



Figure 5.4. *Nandina* (from the Atlanta, GA Home Depot web page)

Another homeowner commented that an evergreen purchased at the Home Depot did not suffer transplant shock as one of the multiple benefits it offered. “Used as a broader edging around pools, driveways or landscaping features such as flower beds or accent doorways, BEST

FEATURE: Animals steer well clear of this plant. Deer attempted to eat one of mine but quickly gave up. They must know the plant is toxic to eat. Have 25 of these planted in early May in full sun in extremely sandy soil and all are doing 100% or better! Oh, and the deer? Never touch them! Have watched them walk right past my entire landscape of these plants and never showed any interest in eating them at all!! Beautiful plant with the two different shades of green. Highly recommend” (Customer 2020).

Homeowners prefer low-maintenance, ecologically appropriate and functional plants

As part of the user research conducted in this thesis, three homeowners invited us to visit their yards. The first homeowner cared mainly about low maintenance when she chose her plants. She perceived the functionality of the plants as their primary value. For example, she used mondo grass to fill the gaps in her pathways, and she used vinca plants to cover a hill and stabilize the soil.

Although neither mondo grass nor vinca are native plants, they catered to the homeowner’s needs in term of functional plantings. Accordingly, this study sought out native plants that have similar functions in order to provide this information on their labels, which will teach consumers that various native plants have similar functions to nonnative species.



Figure 5.5. *Homeowner’s yard showing vinca stabilizing hill soil (photo by the author)*



Figure 5.6. *Homeowner's yard showing mondo grasses filling gaps in path* (photo by the author)

People usually have a low interest in evergreen native plants, especially when the plants are immature. However, the design features highlighted in the photos posted by customers on the Home Depot website encourage a new approach to the creation of plant labels. Instead of showing close-up pictures of the plants, the label can more effectively attract consumers' interest with a more comprehensive image by showing design features in which plants can be used spatially, functionally, and ecologically

Labels for Immature and Hibernating Plants Should Emphasize Signs of Life and the Beauty of Health

The signs of life and the beauty of native plants' health in all life stages could be explained through label information on the plant's roots, growth process, seasonal changes and design features. This approach will highlight the value of native plants to compensate for the negative appearance of the potted native plants and encourage customers to understand their realistic merits.

Root Beauty Label

It can be difficult to prove that a plant is alive when it is hibernating in the fall. However, it is crucial to prove to the consumers that the plant is alive. This is the first step and the first item that should be reflected on the plant's label. Existing native plant sales labels usually do not show

evidence that the plant is alive, so this critical piece of information needs to be added. Sellers in the nurseries might know that the plants are hibernating, and they may assume that this is common knowledge and that customers will not confuse a hibernating plant with a dead one. However, even educated people might not be able to understand that the plant is hibernating and, consequently, may be unable to distinguish between dead and hibernating plants. To address this misconception, the label needs to teach consumers who lack this specific knowledge, which will help improve their understanding of native plants.



Figure 5.7. *Severe examples of plants with negative pot appearance*

Figure 5.7 shows several of the most severe examples of plants with a negative pot appearance at the UGA State Botanical Garden. These plants included three shrubs—indigo bush, eastern bluestar, and sweet shrub—and one grass, sideoats grama grass. Two potted indigo bushes are featured in Figure 5.7. One of the indigo bushes had a few leaves, which proved that the plant was alive, but the other shrubs did not appear to show any evidence that they were alive. The sideoats grama grass was brown and very dry and appeared to be dead.

One question that plant labels should consider is how to prove to consumers that the labeled plants are alive. There are two ways to achieve that goal. For shrubs with woody stems, consumers can peel a small piece of skin from the branch to see if the inside is green, which shows that the plant is alive. If the interior is grey or black, the plant is likely dead. However, this behavior will hurt the plant, particularly if performed by uneducated customers.

A more common way to test whether plants are alive is to check their roots. If the root is white or yellow and very clear, the plant is alive. If the root is black or muddy, the plant is likely dead. This process of checking the roots can be applied to any plant. For example, it is appropriate to check the stem of an indigo bush to see if it is alive. However, for grasses without branches, such as sideoats grama, checking their roots is the only way to tell whether the plant is alive. Moreover, for immature shrubs such as the eastern bluestar in Figure 5.8, it is difficult to peel the skin from the plant's thin stem. Thus, checking the plant's roots will be the best way to determine whether it is still alive.

Sellers at the UGA State Botanical Garden already knew the importance of showing consumers the plants' roots to prove that the plants were alive. This process helped consumers to overcome the misunderstanding regarding the native plants' confusing appearance during hibernation or immature growth stages.



Figure 5.8. *Immature eastern blue star*

The eastern blue star in Figure 5.8 appeared to be dead since the plant was out of season and hibernating. Moreover, the plant was immature. Understandably, many consumers considered this plant to be dead.



Figure 5.9. *Eastern blue star roots*

However, as shown in Figure 5.9, the plant's roots clearly showed that the plant was alive, since the roots were yellow and very clear, an indicator of plant health. Figure 5.9 illustrates the beauty of healthy roots. Aesthetically, the root system of hibernating plants is strong and beautiful, which sharply contrasts with the part aboveground, and this contrast will be a striking surprise for

customers. The author also experienced this surprise, which prompted admiration and curiosity to explore the roots of plants that she had taken home from the UGA Botanical Garden.



Figure 5.10. *Indigo bush* from plant sale

The author took several pictures of an indigo bush that she had bought at the UGA State Botanical Garden native plant sale (see Figures 5.10 and 5.11). This indigo bush was out of season, hibernating and immature, so this plant seemed at first glance to be dead.



Figure 5.11. *Indigo bush* roots

However, as shown in Figure 5.11, the indigo bush's roots showed that it was alive. When the author lifted the plant from the pot, the soil was gathered together densely within the root fibers. The soil density proved that the roots were healthy and that the plant was alive. Furthermore, the roots were tangled at the bottom, which showed that the roots were long enough to take root in soil and that the plant was very healthy. The tangled and compressed roots are storing energy for the growth. The roots were tangled because the indigo bush was in a 4-inch pot when it was purchased and needed at least a 6-inch pot. Transplanting this plant into a larger pot or planting it directly in a garden would provide the roots with more space to grow.

The sideoats grama grass in the pot shown in Figure 5.12 was out of season and immature. Thus, consumers might reasonably think, based on its negative pot appearance, that the plant was dead. However, as shown in Figure 5.13, the plant's roots were yellow and clear, which proved that the grass was alive and healthy.



Figure 5.12. *Sideoats grama grass from plant sale*



Figure 5.13. *Sideoats grama grass roots*

An effectively designed label should teach consumers that a healthy plant's roots have their own unique beauty and appeal. Additionally, the label should note that it is essential to repot many plants to larger pots for better growth.

Growth Process Beauty Label

People usually only see plants in their mature phases. For instance, people who go to a park usually see mature oaks. Even as landscape architecture students, we usually learn about plants in their mature phases. For instance, the sweet shrubs and hydrangeas taught in classes usually have already developed their mature forms. However, the habit of seeing plants in their mature forms and stages poses difficulty for people in understanding plants as living things, since plants are often considered only as finished decorations.

In contrast, maintenance staff who perform routine maintenance of these plants, such as watering and pruning, usually have deeper emotional connections with the plants, and they love plants from the bottom of their hearts. The reason for this deep bond is that through actions such as pruning, they realize the beauty of growth, life, and the strong vitality of plants.

It is exciting to prune dead parts from plants to boost the growth of the plant as a whole. It is even more exciting and, indeed, an honor to watch plants grow from an incomplete form to a complete one. For instance, the indigo bush grows from its immature size, just one or two stems, and gradually develops more stems to reach its mature form. Watching plants' growth brings people a deep and real understanding of plants. Thus, new labels should highlight the growth beauty of plants to arouse people's positive emotions towards the plant and strengthen people's emotional connection with native plants.

Seasonal Beauty Label

A landscape architect's responsibility is to ensure that his or her designs will reflect natural beauty across all seasons. Even though certain grasses and plants turn brown in the winter, landscape architects appreciate the beauty of a variety of colors in different phases and try to display this beauty through their designs. However, in plant sales, the plants are more likely to a) be sold when they are at the stage of peak beauty and b) have that peak beauty reflected on their labels. Plants are grouped into spring, summer, fall, and winter blooming categories. The plants that do not bloom during the current season will often not be offered for sale at all or will be left neglected in garden centers and nurseries. Labeling that highlights only the plant's blooming, mature beauty might reflect that consumers only appreciate the peak beauty of plants, such as when the plants are flowering. Labeling that highlights seasonal beauty instead could address this consumer misperception.

How can we bridge the gap between landscape designers and sellers? One approach is to find a more universal understanding that can be shared by both groups. One example is the meanings of seasonal changes in plants. The seasonal change of plants reflects their wisdom in adapting to the environment and allowing themselves to experience the life cycle. This kind of

wisdom is also needed by human beings, and such wisdom is often part of the personal or spiritual appeal of the beauty of plants' seasonal changes and the circle of life. Only when people see a plant's whole life cycle can they truly consider and appreciate plants as living things.

To attain this understanding, it is necessary to use seasonal labels to show consumers the beauty of plants' changes over time to help them experience the different beauty of each season and the beauty of the circle of life. Moreover, effective labels can teach consumers to understand and appreciate the brown or skeleton phases of these plants, as it is precisely because of their negative pot appearance that plants can survive cold temperatures in the fall and winter and then bloom in the spring or summer.

Design Feature Label

A landscape architect uses plants both functionally and decoratively based on their health and ecological benefits. For example, evergreen plants can be used as fences, grasses can be used at the edges of a design, and bushes can be used as a dominant feature in a small yard. At plant sales, it is rare to see plant labels that include design features, so landscape architects should use plant labels to teach consumers how to use plants from multiple perspectives.

Although consumers are often undereducated about native plants, they are often not particularly superficial and likely appreciate many attributes of plants beyond flowers. Consumers also appreciate plants that have ecological benefits and are hardy even in poor soil, arid climates, and other difficult growth situations. Consumers also like to use plants spatially. To encourage consumers to consider native plants more deeply, landscape architects should show potential design features on labels to teach consumers about the multiple values of plants.

Ecological Contributions Label

Native plants are vital because they create multiple ecological benefits. Consumers typically discuss native plants in terms of attracting birds and bees and enriching the ecological system. Despite this narrow focus, however, there are many other ecological contributions that may be less obvious but more critical to the ecosystem. These features should be included on the new native plant labels. For example, native plants have deeper and stronger roots, which help stabilize the soil. Native plants also tend to have stronger roots that save more water and require less maintenance once they are established (see Figure 5.14).

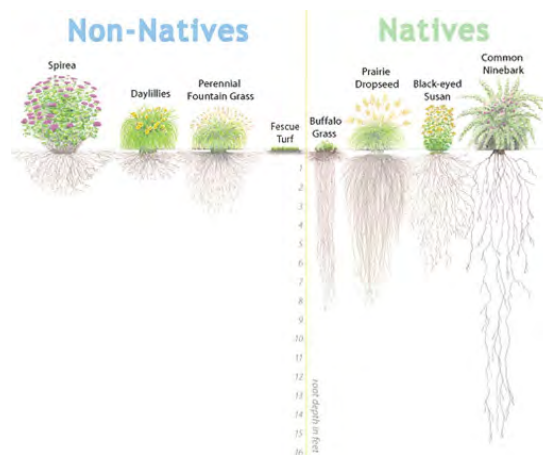


Figure 5.14. *Root systems of nonnative and native plants* (image from Reduce Your Storm Water website)

As Figure 5.14 illustrates, native plants often have deeper roots than nonnative plants. Native plants also typically have deeper roots than exotic plants, which allow for better absorption of nutrients. Moreover, some native plants can even help improve the soil through their roots; for instance, the indigo bush is a nitrogen fixer.

As we all know, native plants have experienced a long history of evolution and have the ability to coexist with other species, so they will make individual contributions to environmental health. The virtue of their health contributions to the landscape needs to be explored and provided on new labeling. This approach requires cooperation between botanists and landscape architects.

Label Indicating Optimal Time to Plant Trees and Shrubs (Fall)

It is easier to sell plants when they are not hibernating, since they have fewer leaves and flowers during the hibernation period. However, although it is more difficult to sell plants when they are hibernating, is it nonetheless still necessary to sell them during this time because the optimal time to plant trees and shrubs is in the fall, especially in the southeastern United States. In the fall, although plants may appear to be unattractive aboveground, their roots underground develop deeper and faster in the cold weather since the plants devote all of their energies to the development of their roots when they do not need to develop any shoots, buds, or leaves.

The redesigned label should indicate that plants can grow better when planted in the fall than in the spring. If native plants are planted in spring, they need to adapt to the new soil and tolerate the hot summer weather simultaneously, which poses a considerable challenge, especially to immature plants. However, when native plants are planted in the fall, their roots can adapt to the new soil over the winter, and once the plant is established, the plant only needs to adapt to hot weather when spring and summer arrive. Thus, it is essential that plant labels provide clear, effective information on the roots of hibernating native plants and encourage consumers to buy and plant these plants in the late fall.

CHAPTER SIX

NEW LABEL DESIGNS TO SATISFY CONSUMER PREFERENCES, SOLVE MISUNDERSTANDINGS AND INCREASE INTEREST

The new label designs were developed gradually based on the consumer preferences derived from market research and the new label ideas generated from the consumer preference. The new label design aims to meet three aspects of consumers' needs: to satisfy their preferences, solve misunderstandings, and increase interest.

The first two aspects have been the subject of numerous previous studies, resulting in a considerable amount of clear information. Many studies have considered the aspects of plants that most interest consumers, with scholarly research categorizing these aspects into three broad themes: 1) people's traditional interest in the beauty of color and form; 2) the surprise of contrast; 3) the interaction between people and plants. These three main aspects of interest were also used to design the survey that guided the research in this thesis.

Label Designs for Immature Evergreen Plants Highlighting Design Features with Spatial and Ecological Benefits

As mentioned in earlier chapters, this thesis uses customer ratings and reviews on the Home Depot website to illustrate consumer preferences and their uses of plants within their landscape designs. For example, the growth process of juniper and the sizes the plant can reach can be shocking for less-informed consumers. The growth process offers numerous benefits, including spatial benefits. For example, junipers can be used as fences. The new labels were

designed in consideration of these consumer preferences and needs. Figure 6.1 shows the new label design for a juniper plant.

Juniper



Figure 6.1. *New label for juniper*

The comments on Home Depot’s website show that consumers like to use evergreen plants as fences for their yards, which is a spatial use. However, consumers may not know the mature sizes of these evergreen plants, which include their mature width and height. Thus, the labels of evergreen plants need to show this size information to provide consumers with sufficient information to make an appropriate decision about whether the plants are appropriate for the desired use or function.

Common juniper (*Juniperus communis*), eastern red cedar (*Juniperus virginia*) and Degroot’s spire arborvitae (*Thuja occidentalis* ‘*Degroot’s Spire*’) are evergreens that can be used by consumers as fences. The most suitable height and width for a fence are approximately 6 feet wide and 12 feet high. Because a tall person is approximately 6 feet tall, the length from the left fingertip to the right fingertip will also be approximately 6 feet. Thus, an image of a person between these plants can illustrate to consumers the needed spacing distance for planting. When the juniper reaches 12 feet tall, it will be twice the height of the person. Furthermore, since the juniper will grow to 3-6 feet wide, all the gaps between trees will be filled. Twelve feet is a

comfortable height since this height is taller than a person (6 feet tall) but not too tall, which could cause the consumer to feel overwhelmed.

The label also shows the image of a person in orange to express a mood of warmth and excitement. The label also shows the different stages of beauty of these evergreen plants. When the plant is immature, it can be considered a low fence. When it matures, it can become a tall, dense fence for the yard.

Blue Rug Juniper

As shown by the homeowner visits conducted for this thesis, it is clear that homeowners prefer plants that have ecological functions, such as stabilizing the soil on a slope. The homeowners interviewed in this research chose several nonnative species to stabilize the hills on their property. Thus, it is necessary to label native plants that have similar functions in order to encourage consumers to choose native plants over nonnative species.

As an example of this goal, the author chose to create a new label for blue rug juniper (see Figure 6.2). The growth of blue rug juniper can be surprising to consumers, but this growth process offers ecological benefits such as stabilizing the soil. The new label shows the process of how this juniper stabilizes hill soil. People usually do not see an example of this stabilizing process provided on plant labeling since they usually only see junipers when they are mature and cover large expanses of ground.



Figure 6.2. *New label for blue rug juniper* (images from Amazon)

The first image on the label shows immature junipers when they are approximately 6 inches wide and 6 inches tall. The second image shows how these junipers grow, expand, and reach approximately 4 or 5 feet wide when they are mature. The third photo shows the stage of full maturity, when these junipers fill all the gaps between plants and reach a density of 6 inches.

Label Designs for Immature Hibernating Deciduous Native Plants Highlighting Life Beauty

Immature hibernating deciduous native plants may appear to be dead to uninformed consumers, so their labels should simultaneously address this misunderstanding and show the plant's life beauty.

Growth Process/Beauty Label (Plants Grow Even in Winter)

The existing labels designed for plants with a negative pot appearance usually do not show the plant's growth processes. Instead, these labels usually show the whole plant in its maturity. Moreover, illustrations on these labels usually reflect the season in which the plant is most traditionally beautiful or show only the most beautiful parts of the plant, such as flowers or leaves.

However, consumers likely struggle with understanding the following:

- 1) How a plant will change over time and become more beautiful in maturity.

This confusion is why consumers usually doubt whether hibernating and/or immature native plants would survive.

- 2) Whether the plant will work well over a long period.
- 3) What the plant will look like as it approaches maturity.

For instance, in the case of the indigo bush purchased by the author at the State Botanical Garden of Georgia native plant sale (see Figure 6.3), which only had two stems, consumers would likely struggle to understand and trust the labels (including photos) that show the plant in its full growth and mature beauty (see Figure 6.4).



Figure 6.3. *Indigo bush* from plant sale (photo by author)



Figure 6.4. *Indigo bush* in summer (photo from jiovi.com)

While the indigo bush is immature, it is necessary to show consumers its growth process, which includes how the stems multiply over time, how the plant grows shoots and buds and how it grows leaves. The growth process needs to be illustrated step by step to help consumers fully understand its logic and purchase this plant with confidence. Moreover, consumers need to know that dilapidated-looking plants like this indigo bush can grow even in winter.

Consumers who see the indigo bush in Figure 6.3 will likely not understand:

- 1) how the plant will grow or what its eventual size and form will be;
- 2) where the plant will grow other stems;
- 3) where the plant will grow leaves;
- 4) what the leaves will look like;
- 5) the speed of growth.



Figure 6.5. *Indigo bush developing buds after one month in winter* (photo by author)

It is important to show consumers the beauty of the plant during the entire growth process. Consumers do not usually see or understand the stages of a plant's growth when they are considering a purchase. For example, despite its unattractive visual appearance during the sale

season, this indigo bush grows and establishes its roots in winter and begins to bud in late winter or early spring. If consumers can see this growth process illustrated on the label, accompanied by text that explains that indigo bushes grow over the winter, that image and information will encourage them to purchase this indigo bush even in the late fall so that they can observe this plant growing over the winter. People might consider such vitality as a new kind of beauty through this approach to labeling. As Figure 6.5 shows, that leaves could even grow during the cold winter was stunning to the author. Watching plants grow from bare stems to having leaves shows the birth of life. As Figure 6.6 shows, this splitting of the bud predicts that this plant will be able to develop many leaves.



Figure 6.6. *Indigo bush growing three leaves after 1.5 months in winter* (photo by author)

Figure 6.7 shows the indigo bush from the native plant sale a few days after the photo in Figure 6.6. This plant is clearly healthy and growing strong. If the label can adequately convey to the consumer the speed at which this plant grows, consumers may understand its true vigor and will no longer doubt whether it can survive.



Figure 6.7. *Indigo bush growing multiple leaves after two months in winter* (photo by author)

Figure 6.7 shows the beauty of multidirectional leaves on the growing indigo bush. Uninformed consumers might not observe or understand the beauty that this plant reveals through these small details. These leaves, which are now growing in several directions, reveal this indigo bush's vigor, as multidirectional leaves allow the plant to obtain maximum sunlight and energy. An understanding of the growth process of this plant's leaves, based on label information, can assuage consumers' doubts as to whether this plant can survive and may even prompt excitement to watch the plant grow over the cold winter months.

The redesigned label for the indigo bush should show that the plant grows from a single stem to two and then more (see Figure 6.8) because consumers might question whether a single-branched, apparently scrawny indigo bush could develop additional stems. The label can show different stages in the plant's growth, which could address consumers' questions and concerns.



Figure 6.8. *Indigo bush with two stems*

Finally, the label should show the late fall, winter, and spring versions of the mature indigo bush when the leaves grow only on the top.



Figure 6.9. *Indigo bush with leaves on the top* (photo from www.buyvatrees.com)

The indigo bush pictured in Figure 6.9 might not be as traditionally attractive as when the plant is full of leaves (or even flowers), but the clear illustration of its branches will help inform practical consumers about how they can prune this plant. Because the photographs on the label are authentic across the life cycle and offer practical information, the label will help convince consumers who are considering purchasing this plant.

In addition to evergreens and shrubs, it is essential to show the growth process of native grasses on their labels. For instance, this potted sideoats grama grass was immature when it was sold, so it would not be appropriate to put a photograph of mature grass on its label without some explanation.



Figure 6.10. *Sideoats grama grass* from plant sale



Figure 6.11. *Mature sideoats grama grass* (photo from garden.org)

The redesigned label should include photographs of the immature plant in all four seasons, even when it is in the pot, to provide consumers with a full understanding of the plant's growth stages and encourage them to purchase this plant. Figures 6.12, 6.13, 6.14, and 6.15 illustrate this labeling approach. Sideoats grama grass has beauty even in its roots, as shown in Figure 6.13; the brown blades of the grass begin to stand more erect as the roots dig deeper.



Figure 6.12 *Sideoats grama grass in winter*



Figure 6.13 *Sideoats grama grass in spring*



Figure 6.14 *Sideoats grama grass in summer*



Figure 6.15 *Sideoats grama grass in fall*

The sideoats grama grass pictured in these illustrations is a warm-season grass, which means it will only turn green when the weather is warm, typically around May. Thus, the label should show the color phases of this plant from the time of purchase through the remaining seasons. This labeling approach could help convince consumers of the beauty and value of this plant at the time of purchase.

Sideoats grama grass can be unattractive in the winter due to its brown color. Many consumers who understand native plants prune this plant in winter, which allows it to grow better in the spring.



Figure 6.16. *Immature sideoats grama grass in pot* (photo from txsmartscape.com)

Providing a photo of an immature potted sideoats grama grass that has oats (see Figure 6.16) will show consumers that they do not need to wait for this grass to mature in order to see the beautiful oats that this plant produces.

Seasonal Beauty Label

Existing labels for native plants usually only depict the beauty of plants in optimal seasons. However, plants have different beauties in different seasons. Labels can help consumers appreciate native plants' various attributes in all seasons, thereby solving consumer misconceptions that these plants have no value when they are less traditionally attractive.

For example, the indigo bush has beautiful flowers in the summer, so summer might typically be considered the best season to show the plant's full beauty. However, the pure green color of the indigo bush's leaves is also attractive in the spring. The golden leaves have mature beauty in fall, and the structure of the branches in the winter is unique. Figures 6.17, 6.18, 6.19, and 6.20 illustrate the appearance of the indigo bush across all four seasons.



Figure 6.17. *Indigo bush in spring* (photo from www.waterwiseplants.org)



Figure 6.18. *Indigo bush in summer* (photo from jiovi.com)



Figure 6.19. *Indigo bush in fall* (photo from www.istockphoto.com)



Figure 6.20. *Indigo bush in winter* (photo from www.waterwiseplants.org)

Labels should show consumers how a plant looks throughout the year, which will explain why it may not have leaves at the time of purchase. When consumers learn that certain plants have no leaves in the winter, they will learn that the plant is deciduous and hibernating.

Sideoats grama grass is famous for its sideoats. Consumers will likely struggle to imagine how the grass, which is brown at the time of purchase, will turn green and later display these prized oats. Existing labels usually highlight the sideoats, which is this plant's most striking detail. However, to fully understand their purchase of this plant and its potential design features, consumers must see photographs of this plant in all four seasons on the label. Examples of images that could be used to illustrate this plant's yearly life cycle are shown in Figures 6.21, 6.22, 6.23, and 6.24.

The seasonal change of plants is stunning since it reflects the power of the life cycle, the wisdom of the plants, and the endurance mechanism of dormancy in the fall and winter to enable the plants to live longer. Plant sales usually only display plants at their peak beauty, and only plants' flowers are labeled. However, this kind of labeling will mislead consumers and fail to encourage them to respect the plant as a living thing with various beauties in all seasons.

Grass even has beauty in winter. Grasses in the winter at the borders (see Figure 6.23) look like soldiers, standing stiffly by anchoring their roots deeply into the soil and earth.



Figure 6.21 *Sideoats grama grass in summer*

(photo from mowildflowers-net.3dcartstores.com)



Figure 6.22. *Sideoats grama grass in fall* (photo from www.amwua.org)



Figure 6.23. *Sideoats grama grass in winter* (photo from watersmartplants.com)



Figure 6.24. *Sideoats grama grass in spring* (photo from garden.org)

Furthermore, labels should show the texture and the low overall height of the plant and illustrate how the grasses move in the wind. Seasonal labels communicate the changing appearances of grasses in the context of a homeowner's landscape in the different seasons. This information is important as such seasonal changes are often why consumers select grasses for planting. Images conveying this information are provided in Figures 6.25, 6.26, 6.27, and 6.28.



Figure 6.25. *Bouteloua curtipendula* (*sideoats grama*) (photo from Mountain States Wholesale Nursery)



Figure 6.26. *Alternate view of Bouteloua curtipendula* (*sideoats grama*) (photo from Mountain States Wholesale Nursery)



Figure 6.27. *Great medium-size grasses* (photo from Fine Gardening)



Figure 6.28. *Types of ornamental grasses* (photo from Dambly's Garden Center)

Design Feature Label

Most existing labels for plants do not show the plant's design possibilities, eventual size and form, or seasonal changes. Instead, the labels currently on the market only show a close-up image of the plant, which may create a skewed impression for consumers and lead to a poor understanding of the possible and best uses of the plant. Much crucial information may not be present on a typical plant label. For instance, Figures 6.29 and 6.30 illustrate the sizes of indigo bushes and sideoats grama grass in relation to sidewalks and ornamental design features.



Figure 6.29. *Design feature created with indigo bush* (photo from www.alamy.com)



Figure 6.30. *Design feature created with sideoats grama grass* (photo from garden.org)

In particular, mature plant size is important information that consumers care about, especially new gardeners. Some plant labels may indicate plant size with a number in inches or feet, but these abstract measurements are not as clear as showing the plant beside measurable landscape elements such as a path, steps or—even better—a scale figure in the landscape. The indigo bush in Figure 6.30 is approximately six feet high, which is half the plant’s full mature height of twelve feet. Nonetheless, the photos in Figures 6.30 and 6.31 provide consumers with a helpful visual impression of the mature size of the indigo bush and the sideoats grama grass.

Brochure and Sequence Design

This new type of label will systematically arrange images that show plants’ beauty as a life form, including their life cycle, survival, health, and ecological contributions. Thus, to communicate this extensive information, a sequence design in a trifold brochure was created.

Brochure Design

The brochure design aims to match the beautiful style of the plant with the label sequence. For example, the brochure shown in Figure 6.31, which contains several concentric circles, was chosen here since the circles match the shape of the indigo bush and flow elegantly between pages.



Figure 6.31. *Trifold brochure design*

(photo from www.lasvegascolor.com/tri-fold-brochure-design/)

Moreover, when looking at the first page of this brochure, consumers can see only half of the upper circle, which prompts their curiosity about what will be on the next page and encourages them to open the brochure to the next page.

Sequence Design

The sequence design, shown in Figure 6.32, shows the growth process, then the seasonal changes, and then the design features of the plant in the brochure.



Figure 6.32. *Sequential brochure for indigo bush*

The healthy root needs to be shown on the first page to prove to consumers that this indigo bush is alive.

There are three rounds for seeing the plant's growth and change. In the first round it grows from immature to mature. In the second round it is changing in four seasons. Finally, in the third round it is nicely planted in a design feature.

The brochure would be very long if it showed all this information in a single line, so it was considered preferable to separate the three rounds across three lines.

The root label and three rounds solve three misunderstandings and increase interest.

1. The root label overcomes the misunderstanding about whether this plant is alive. The roots will be shown in clear pots in order to make them more attractive to consumers.

2. The growth process illustration solves the question of whether this plant will survive. The growth process will show the beauty of the different stages of plant growth and will show the plant's eventual size and form.

3. The seasonal changes and design features solve what forms of value this plant offers.

Since the sequence of questions is arranged in a sequence of vitality, survival, and value, the solutions should be arranged in the same sequence on each label for consumers to understand the new label better.

The texts will be written in the first person. For instance, "I am alive, see my healthy roots," "See Me Grow in Winter," and "See Me Grow In Different Seasons."



Figure 6.33. "CSS Wavy Background Using SVG"



Figure 6.34. *Sequential brochure for sideoats grama grass*

A brochure full of wavy shapes was chosen here since the waves can flow between pages. Also, the wavy shapes were chosen since they can let consumers imagine how grasses grow on the ground. Grasses usually move in wind and provide a soft visual presence in the landscape.

There are three important components in the proposed brochure. The first graphic shows the seasonal changes and beauty in the container. The second graphic shows the plant in a larger landscape context and seasonal changes. The third graphic provides additional design inspiration to help the consumer imagine all possible design uses of the plant.

The brochure will be very long if showing all information in a single line, so it will be better to separate the three rounds and put them in three lines.

The three rounds solve three misunderstandings (or questions) from consumers.

1. The growing process is solving the question of whether this plant is alive and will survive
2. The seasonal changes and design features solve what values this plant can bring.

Since the sequence of questions is arranged in a sequence of vitality, survival and value, the solutions should be arranged in the same sequence for consumers to understand the new label better.

The texts will be spoken in the first person. For instance, “See Me Grow Here”.

Interaction Design

The interaction design aims to increase consumers’ interest in and understanding of the plant, for example, the function and size of the indigo bush.



Figure 6.35. *Interaction brochure for indigo bush*

Existing labels usually only show the plants themselves and lack illustrations of the natural interactions between plants and people. Consumers may be more willing to purchase plants if they can visualize the relationship between themselves and the plants and the benefits they can derive from the interactive process of plants’ growth. The new label for the indigo bush (Figure 6.35) reflects that the beauty arising from the trust and expectation of life that accompanies the choice

to plant a living thing is powerful. People will be more patient in discovering a plant's full beauty if they consider plants as living things instead of decorations. Native plants may not be able to bring instant satisfaction. However, as they observe the plants' growth over time, consumers can be encouraged in their own lives by seeing the plants' strong spirit in overcoming difficulties.

Current labels lack certain elements that would reflect the interaction between people and plants in the labels. For example, one important element that existing native plant labels usually do not show is the size of the plant.



Figure 6.36. *Mature indigo bush* (photo from gettingmoreontheground.com)

Figure 6.36 illustrates a full-sized indigo bush, which is approximately 12 feet tall. The person in the photo provides a reference point to clarify the plant's true size in comparison to the average person.

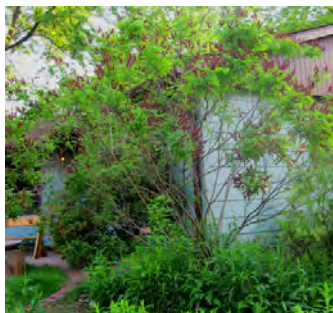


Figure 6.37. *Large indigo bush by a house* (photo from goodnaturedlandscapes.com)

Figure 6.37 offers another perspective that illustrates the full size of the indigo bush when it matures. The height of the house in the background of the photo clearly shows that the indigo bush is approximately 10-12 feet high. Design software such as Adobe Photoshop or Illustrator could be used to add people to the image to provide a sense of visual scale.

Another component that is lacking in current labels in the market is information on the plant's functions. Consumers may have more interest in buying a plant if the label informs them about its ecological benefits, which for native plants often include the plant's ability to adapt to any soil and even improve the soil. For instance, indigo bushes can fix nitrogen, a function that is even more vital in the fall and winter. Sideoats grama grass can grow in pure gravel and in salty or even garbage soil. These plants' functions in terms of adapting and improving soil can be even more substantial when these plants are hibernating and immature, which can be included on the labels to inform consumers. These benefits might encourage consumers to buy potted native plants even in fall or winter. Moreover, since the interaction labels illustrate the benefits that plants offer during the growth process, they can encourage consumers to purchase immature and hibernating plants in order to watch them grow.

The design of the interaction brochure contains three components: A person, multiple green dots that express that the plant can fix nitrogen and improve the soil, and a plant in different growth stages (one branch, two branches, multiple branches but few leaves, and multiple branches with many leaves). These growth stages are illustrated in Figures 6.38, 6.39, 6.40, and 6.41.

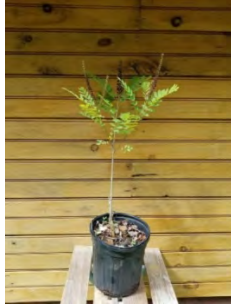


Figure 6.38. *Indigo bush in pot*



Figure 6.39. *Indigo bush with two stems*



Figure 6.40. *Indigo bush with multiple stems*



Figure 6.41. *Indigo bush with mutiple stems and many leaves*

These four images reflect the four growth stages of the indigo bush. These are not the most stunning images of this plant, but they reflect the plant's unique beauty across all phases of its growth.

For this brochure, two images of girls were selected. One girl is approximately five years old, and the other is approximately twenty years old. This comparison is used to illustrate that an indigo bush takes approximately fifteen years to reach full maturity.



Figure 6.42. *Image of a five-year-old girl*




Figure 6.43. *Image of a twenty-year-old girl*

CHAPTER SEVEN

PLANT LABELING SURVEY TO IMPROVE SALES

This chapter presents the plant labeling survey and the images that served as visual aids to the participants. Images of the survey as it appeared online for participants are provided.

Survey for Evergreen Plants



What is your interest level in this plant?



0 10 20 30 40 50 60 70 80 90 100

Read the statements below, select all that apply to the plant above

<input type="checkbox"/> I do not know how tall it will grow	<input type="checkbox"/> I do not know how wide it will grow	<input type="checkbox"/> I do not know where to plant it	<input type="checkbox"/> I want to purchase it	<input type="checkbox"/> I do not want to purchase it
--	--	--	--	---

← →

Figure 7.1. *Survey for juniper*

What is your interest level in this plant after reading the graphics?

0 10 20 30 40 50 60 70 80 90 100

Now that you have read the graphics, select the choices below that apply.

I now know how tall it will grow	I now know how wide it will grow	I now know where to plant it	I want to purchase it	I do not want to purchase it
----------------------------------	----------------------------------	------------------------------	-----------------------	------------------------------

What other information do you need to buy this plant? Other comments?

← →

Figure 7.2. Survey for juniper (part 2)



What is your interest level in this plant?

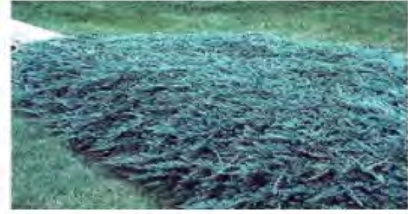
0 10 20 30 40 50 60 70 80 90 100

Read the statements below, select all that apply to the plant above

I do not know how tall it will grow	I do not know how wide it will grow	I do not know where to plant it	I do not know its ecological benefits	I want to purchase it	I do not want to purchase it
-------------------------------------	-------------------------------------	---------------------------------	---------------------------------------	-----------------------	------------------------------



Figure 7.3. Survey for blue rug juniper



What is your interest level after reading the graphics?

0 10 20 30 40 50 60 70 80 90 100

Now that you have read the graphics, select the choices below that apply.

I now know how tall it will grow	I now know how wide it will grow	I now know where to plant it	I now know it can stabilize the soil on a hill	I want to purchase it	I do not want to purchase it
----------------------------------	----------------------------------	------------------------------	--	-----------------------	------------------------------

What other information do you need to buy this plant? Other comments?



Figure 7.4. Survey for blue rug juniper (part 2)

Survey for Deciduous or Warm-Season Plants



What is your interest level in this plant?

0 10 20 30 40 50 60 70 80 90 100

Read the statements below, select all that apply to the plant above

It looks dead	I do not think it will survive	It looks beautiful	I do not know how to use it spatially	I do not know its ecological value	I do not know its aesthetic appearance in the future	I want to purchase it	I do not want to purchase it
---------------	--------------------------------	--------------------	---------------------------------------	------------------------------------	--	-----------------------	------------------------------



Figure 7.5. Survey for sideoats grama grass



What is your interest level in this plant after reading the graphics?

0 10 20 30 40 50 60 70 80 90 100

Now that you have read the graphics, select the choices below that apply.

I now know this grass is not dead	I now know this grass will survive	It is hibernating	It is immature	I now know this grass can create pretty design features	I now know this grass can attract birds	I want to purchase the plant	I do not want to purchase the plant
-----------------------------------	------------------------------------	-------------------	----------------	---	---	------------------------------	-------------------------------------

What other information do you need to buy this plant? Other comments?



Figure 7.6. Survey for sideoats grama grass (part 2)



What is your interest level in this plant?

0 10 20 30 40 50 60 70 80 90 100

Read the statements below, select all that apply to the plant above

<input type="checkbox"/> It looks dead	<input type="checkbox"/> I do not think it can survive	<input type="checkbox"/> It looks beautiful	<input type="checkbox"/> I do not know how to use it spatially	<input type="checkbox"/> I do not know its ecological value	<input type="checkbox"/> I do not know its aesthetic appearance in the future	<input type="checkbox"/> I do not know how big it will get	<input type="checkbox"/> I do not know where it will grow	<input type="checkbox"/> I want to purchase the plant	<input type="checkbox"/> I do not want to purchase the plant
--	--	---	--	---	---	--	---	---	--



Figure 7.7. Survey for indigo bush



What is your interest level in this plant after reading the graphics?



Now that you have read the graphics, select the choices below that apply.

I now know this bush is not dead	I now know this bush will survive	It is hibernating	It is immature	I now know this bush can create pretty design features	I want to purchase the plant	I do not want to purchase the plant
----------------------------------	-----------------------------------	-------------------	----------------	--	------------------------------	-------------------------------------



Figure 7.8. Survey for indigo bush (part 2)

Now that you have read the graphics, select the choices below that apply.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I now know this bush is not dead	I now know this bush will survive	It is hibernating	It is immature	I now know this bush can create pretty design features	I now know this bush can improve soil	I want to purchase the plant	I do not want to purchase the plant

What other information do you need to buy this plant? Other comments?

Do you often plant in the fall?

<input type="checkbox"/>	<input type="checkbox"/>
Yes	No

Does this label help you understand why fall is the best time to plant?

<input type="checkbox"/>	<input type="checkbox"/>
Yes	No



Figure 7.9. Survey for indigo bush (part 3)

Survey Question Design

One question at the beginning of the survey assessed participants' initial interest level. This question was asked after consumers (readers) initially viewed the potted plants without seeing the labels.

This initial question ascertained participants' base level of interest. This approach is necessary because asking only about increased interest levels would leave distinctions between the "before" and "after" levels of interest unclear. It was determined that there should be two or three questions:

1. What is your initial interest level?
2. What is your interest level after learning more?
3. The next and most important question: Do you want to buy this plant?

Following the third initial question, other questions were asked for clarification, for instance, "Does this label help you understand how to use the plant?"

The survey questions also sought to determine whether consumers hold certain universal misunderstandings about native plants with a negative pot appearance. For instance:

1. Do you think this plant is dead?
2. Do you think this plant can survive?
3. Do you think this plant has value (aesthetic, functional, ecological value)?

These questions were asked twice: the first time was before consumers saw the labels, and the second was after consumers saw the labels. Thus, the survey was able to compare whether the redesigned labels addressed consumers' misunderstandings. The question "Do you want to buy this plant?" was asked twice. The survey results were also able to determine whether consumer misunderstandings were preventing consumers from buying these plants.

For the evergreen plants, the survey questions included:

1. Do you know how tall this plant will get?
2. Do you know how wide this plant will get?
3. Do you know where to plant it?
4. Do you know its ecological and functional value?

These questions were asked twice in order to compare consumer views before and after encountering the new labels.

Finally, the survey included an open text-entry question: “What other information do you need to buy this plant? Other comments?” This question allowed the researcher to determine what other aspects consumers pay attention to but that the labels and the survey may have overlooked.

Survey Introduction Design

The introduction is an important part of the survey design because it can quickly attract participants’ interest. The survey was emailed as a link to a Qualtrics online survey. The title and the introduction were designed to attract participants’ attention to encourage them to click the survey link and participate.

The survey was sent to people on the survey list for the Mimsie Lanier Center for Native Plants. People on the list were often well-educated people who know more than the average consumer purchasing plants at garden centers or big-box stores such as Home Depot or Lowe’s. This potential sample bias is a possible limitation of the survey, but the benefit of asking this select group to complete the survey was that they offered a more educated opinion and also had a vested interest in seeing sales of native plants increase.

The title of the email with the survey link was: “Guess which one I become in the future? – hibernating plant survey.” The introduction was: “I am hibernating now. So, can you guess which I become in the future? Please choose among A,B,C,D. If you want to know the answer, just click the link below, thanks.” We allowed consumers to guess which image represented the future version of this plant since this process highlighted the plant’s potential growth, which we hoped would increase consumers’ interest in the plant’s growth as a form of value..

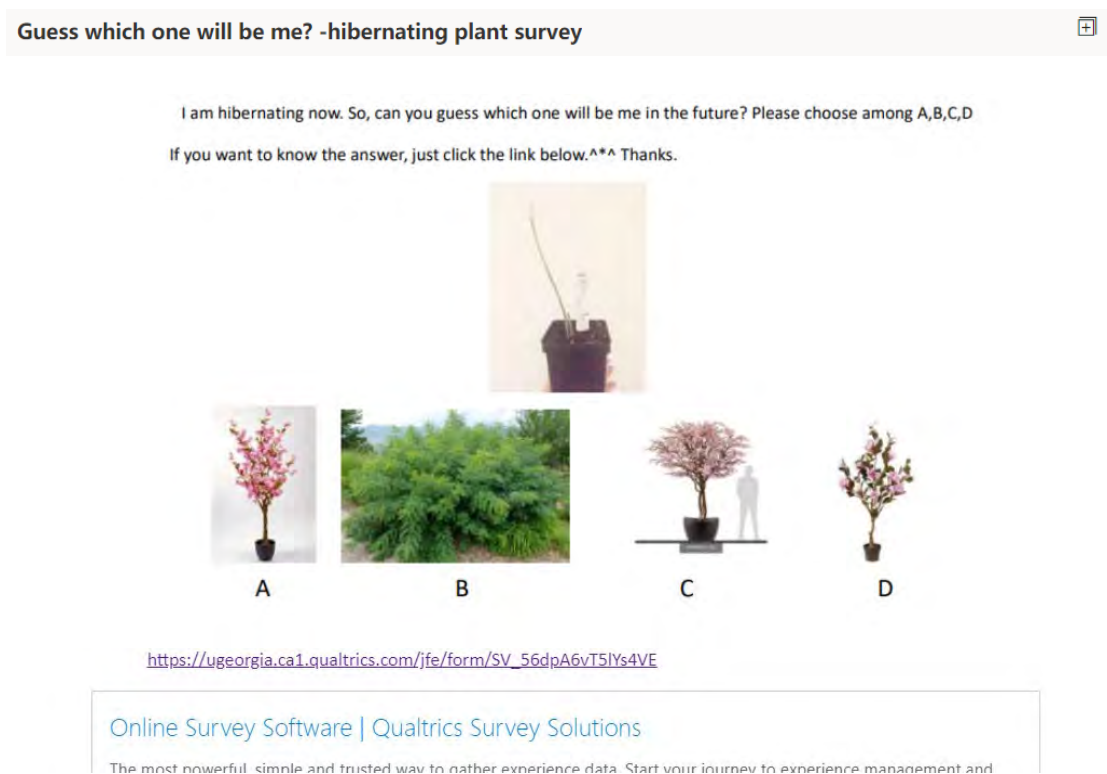


Figure 7.10. Survey introduction

CHAPTER EIGHT
SURVEY RESULTS AND DISCUSSION

Basic Survey Information

This survey was sent out via UGA listserv to the Georgia Plant Conservation Alliance (approximately 270 individuals), the Georgia Native Plant Initiative (approximately 90 individuals), State Botanical Garden staff (approximately 35 individuals), enrollees in the Certificate in Native Plants, the Georgia Botanical Society, the Georgia Native Plant Society, and other state Plant Conservation Alliances in Alabama, Tennessee, Kentucky, North Carolina, and South Carolina. Moreover, this survey was approved by UGA's Institutional Review Board (IRB) before distribution. The IRB approval number was PROJECT00003770.

The platform used to design and collect data for the survey was Qualtrics, and 187 people responded to the survey. The survey did not request survey takers to complete all the questions before returning the survey, so approximately 140 of the 187 responses had complete results.

The goal of this survey was to test consumers' attitudes before and after encountering the new label designs. In this research, the first part of the survey was conducted to investigate consumers' attitudes and misunderstandings regarding the appearance of potted native plants. The second part of the survey included the new plant labels and examined the impact of these new labels on consumers' attitudes, interest and purchase likelihood of these native plants with negative pot appearances.

The first part of the survey in this thesis sought to investigate consumers' understanding of native plants with a negative pot appearance. From the perspective of knowledge, the survey found

that the consumers had multiple misunderstandings about these plants, including that they looked dead, did not look likely to survive and had no value (aesthetic, ecological and spatial value). From the perspective of aesthetics, consumers had “negative” impressions of these plants, as they said the plants were not beautiful.

More respondents were willing to answer questions about hibernating plants that appear more conventionally attractive in spring, summer and fall, such as sideoats grama grass and indigo bush. Fewer survey takers were interested in evergreen plants that do not change much over the course of a year, such as junipers. This difference shows that there is more potential to increase sales by relabeling hibernating and immature plants than evergreens.

The results show that the new labels significantly affected hibernating plants, since the consumer interest levels in these plants increased from 30 to 80. Moreover, the new labels were also helpful for increasing consumers’ interest in evergreens, although the increases were less dramatic than for the indigo bush and sideoats grama grass.

Results for Sideoats Grama Grass

Q2 - What is your interest level in this plant?

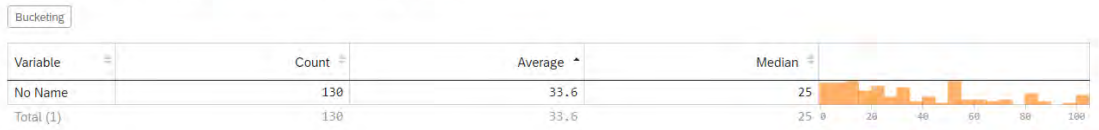
Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	0.00	100.00	33.58	28.27	799.11	130

Q5 - What is your interest level in this plant after reading the graphics?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	10.00	100.00	83.47	17.34	300.81	140

Figure 8.1. *Increased level of interest in sideoats grama grass*

Summary of **What is your interest level in this plant?**



Summary of **What is your interest level in this plant after reading the graphics?**

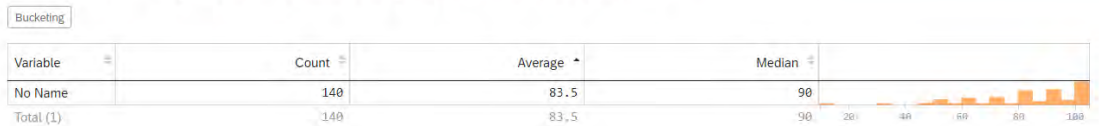
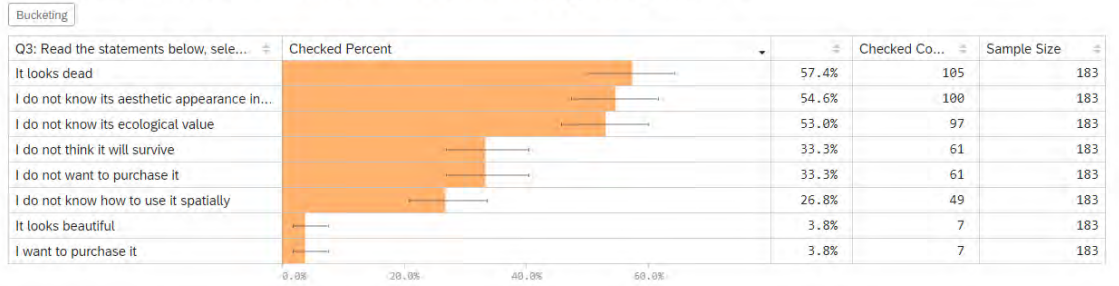


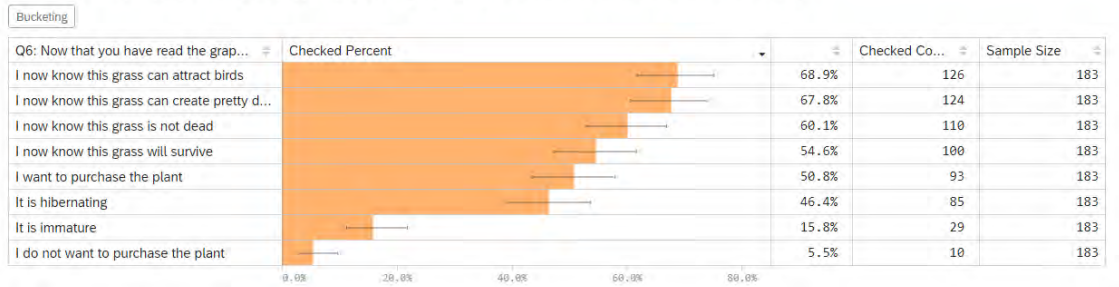
Figure 8.2. Increased level of interest in sideoats grama grass (part 2)

The results for sideoats grama grass were strong. The interest level increased from 33.58 to 83.47.

Summary of **Q3: Read the statements below, select all that apply to the plant above**



Summary of **Q6: Now that you have read the graphics, select the choices below that apply.**



Figure

8.3. Before-and-after comparison of consumer preferences for sideoats grama grass

Q3 - Read the statements below, select all that apply to the plant above

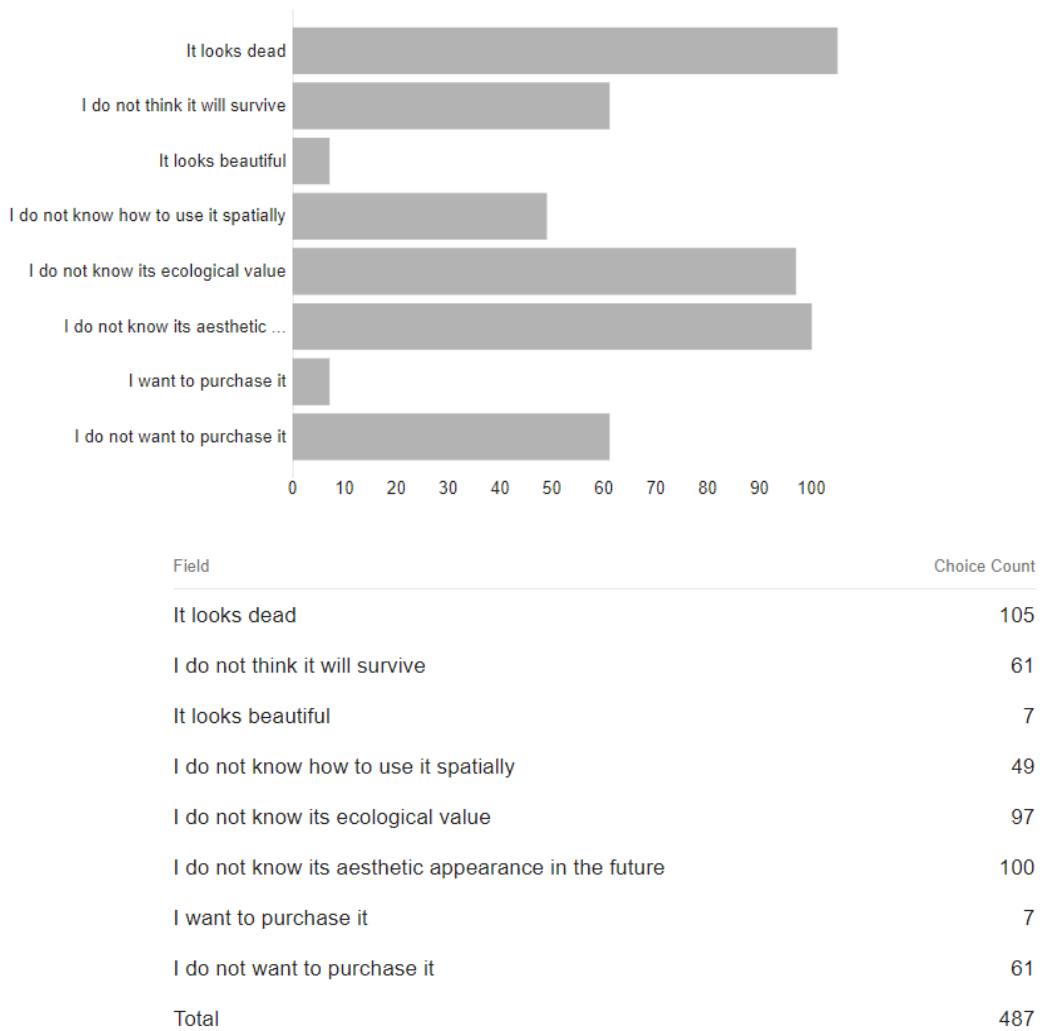


Figure 8.4. *Consumer preferences for sideoats grama grass before survey*

The answers to this question showed that people’s main misunderstandings of potted hibernating warm-season grass were that a) it is dead, b) it cannot survive, and c) it has no value. These misunderstandings were universal and commonly prevented consumers from buying plants. Only seven people wanted to buy this plant, whereas 61 did not want to buy it.

Q6 - Now that you have read the graphics, select the choices below that apply.



Figure 8.5. *Consumer preferences for sideoats grama grass after survey*

This question shows that the consumer misunderstanding that the plant is dead can be solved by showing the roots of the grass. The misunderstanding that the plant cannot survive can be solved by illustrating the seasonal changes of the grass. Moreover, the misunderstanding that the plant has no value can be solved by showing the attractive design features offered by this grass within a larger landscape context. Ninety-three people wanted to buy this grass after viewing the

new labels, which showed the misunderstandings that had prevented them from purchasing the plants had been solved.



Figure 8.6. *Keyword bubble diagram for sideoats grama grass* (created with text IQ function of Qualtrics)



Figure 8.7. Keyword cloud for *sideoats grama grass* (created with text IQ function of Qualtrics)

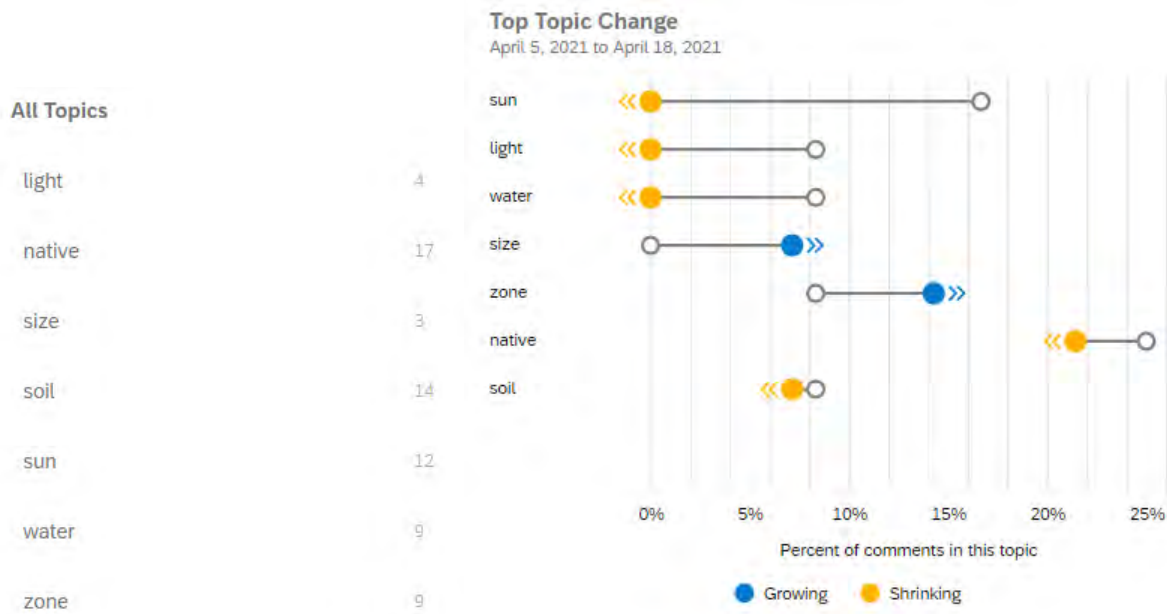


Figure 8.8. Keyword changes for *sideoats grama grass*

Table 8.1 Keyword percentages for sideoats grama grass

All topics	82	Percentage
native	17	20.73%
soil	14	17.07%
sun	12	14.63%
zone	9	10.98%
water	9	10.98%
light	4	4.88%
size	3	3.66%

Table 8.2 Total keyword percentages for sideoats grama grass

Q7 - Topics Page Options ▾

#	Field	Choice Count
zone	zone	8.11% 9
water	water	8.11% 9
sun	sun	10.81% 12
soil	soil	12.61% 14
size	size	2.70% 3
native	native	15.32% 17
light	light	3.60% 4
Unknown	Unknown	38.74% 43

111

Although the chart above reflects the total number of keywords as 111, there were 82 unique comments, 39 of which included multiple keywords. Keywords that appear multiple

times are native, soil, sun, zone, water, light and size. These keywords appear 68 times in total. Another 43 comments contain keywords including spread, maintenance, and fertilizer.

Results for Indigo Bush

Q9 - What is your interest level in this plant?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	0.00	100.00	48.60	28.50	812.32	129

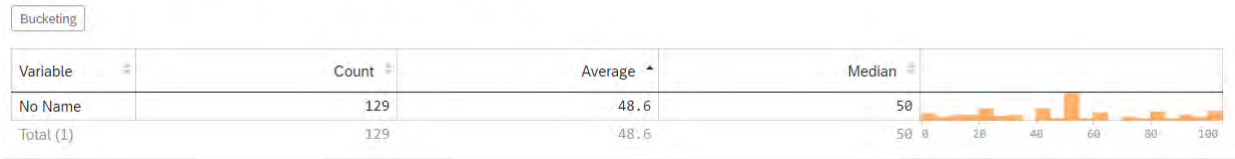
Q12 - What is your interest level in this plant after reading the graphics?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	0.00	100.00	81.69	18.61	346.48	129

Figure 8.9. *Increased level of interest in indigo bush*

The results for the indigo bush were also strong. As shown in Figure 8.10, the interest level increased considerably, from 48.60 to 81.69.

Summary of **What is your interest level in this plant?**



What is your interest level in this plant after reading the graphics?

Filters Notes Export

Summary of **What is your interest level in this plant after reading the graphics?**

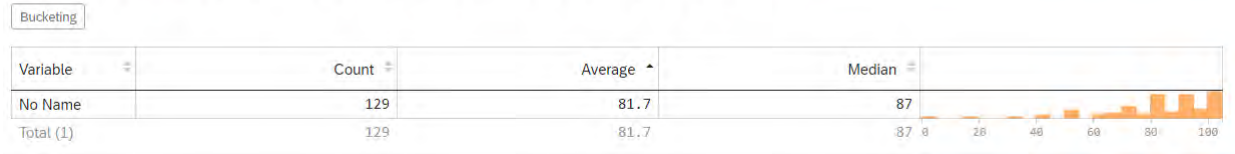
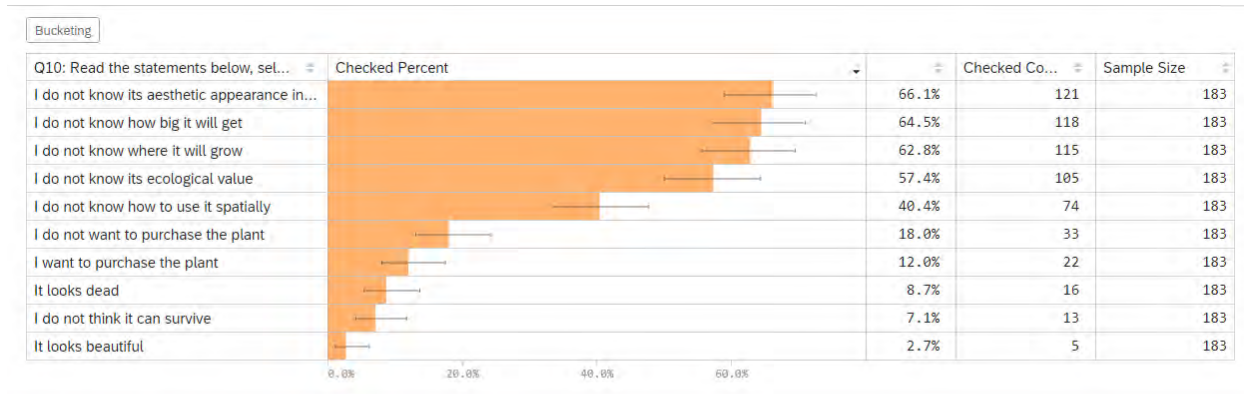
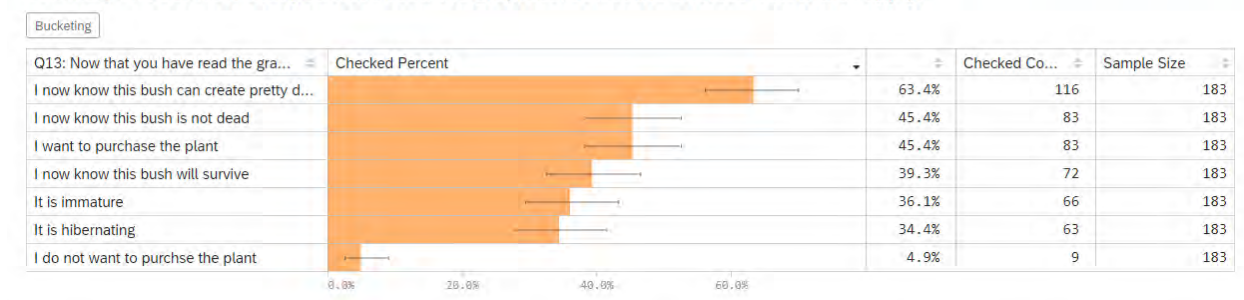


Figure 8.10. *Increased level of interest in indigo bush (part 2)*



Q13: Now that you have read the graphics, select the choices below that apply. [Filters](#) [Notes](#) [Export](#)

Summary of Q13: Now that you have read the graphics, select the choices below that apply.



Q15: Now that you have read the graphics, select the choices below that apply. [Filters](#) [Notes](#) [Export](#)

Summary of Q15: Now that you have read the graphics, select the choices below that apply.

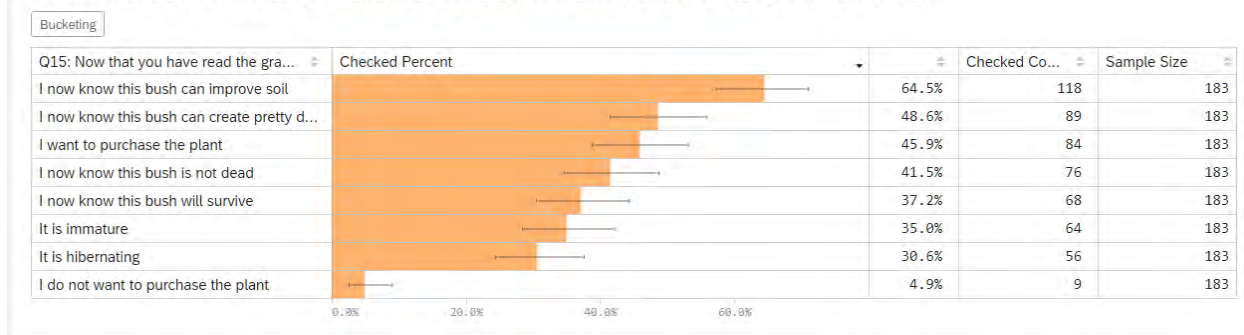


Figure 8.11. Before-and-after comparison of consumer preferences for indigo bush

Q10 - Read the statements below, select all that apply to the plant above

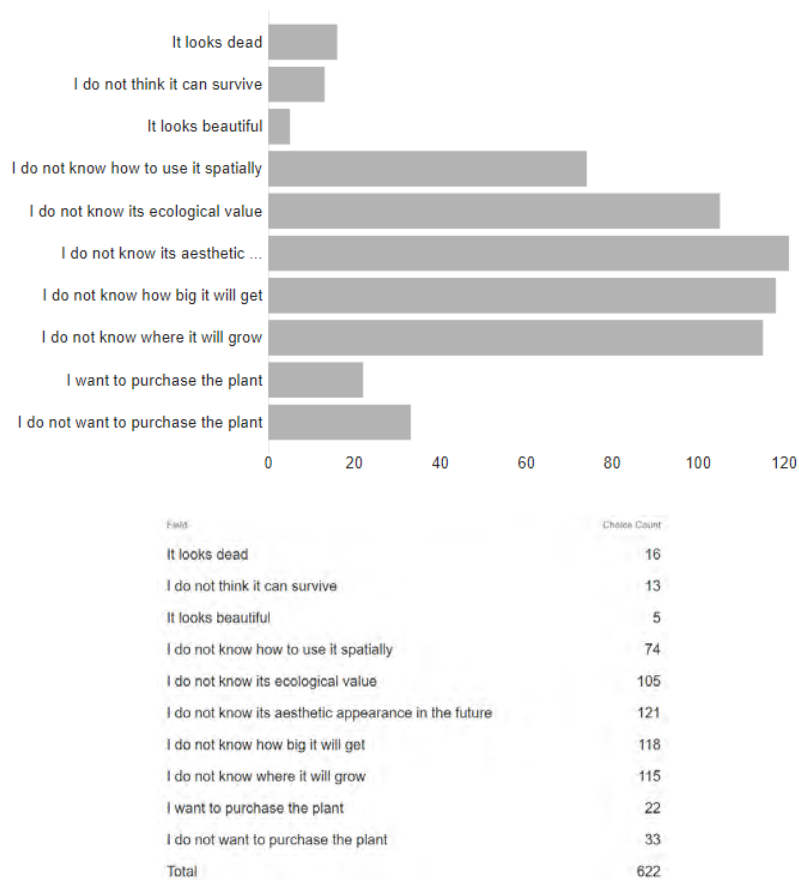


Figure 8.12. *Consumer preferences for indigo bush before survey*

People’s misunderstandings of the indigo bush were different from those regarding the sideoats grama grass. They did not think the shrub was dead. Nonetheless, although they thought it was alive, their misunderstandings or worries were about the mature (future) appearance and value of this plant. Thus, only 22 people voted that they wanted to buy this plant. It is possible that the introduction changed some consumers’ minds about the indigo bush. The introduction showed that the potted indigo bush had a future, so consumers who had thought it was dead were able to realize that the bush was not dead and selected “do not know how big this bush will get”

instead of “this bush is dead.” However, since there numerous consumers still selected “I think this bush is dead” even after reading the introduction, the misunderstanding as to whether the bush was dead still existed despite the new approach.

Q13 - Now that you have read the graphics, select the choices below that apply.

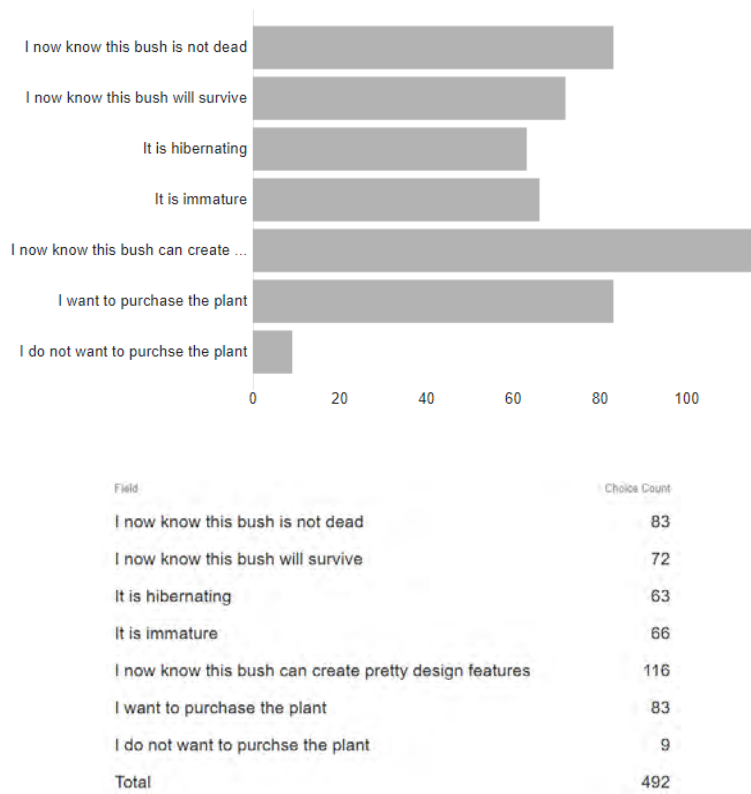
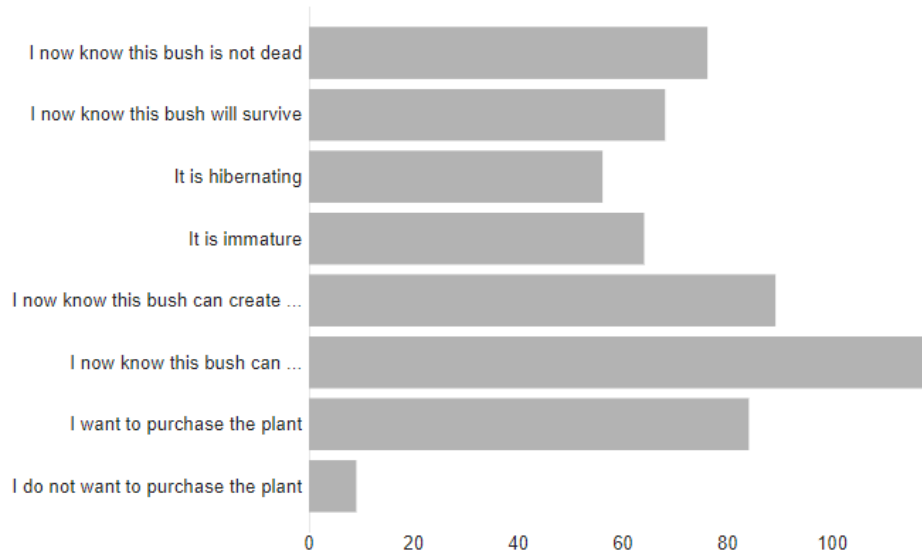


Figure 8.13. *Consumer preferences for indigo bush after survey*

Consumers’ worries about this plant's mature appearance and values were successfully solved by showing the seasonal changes and design features of this plant. After the educational information was provided, eighty-three people responded that they wanted to buy this plant.

The first version of the indigo bush label focused more on the plant itself, and 116 people responded that this label showed the design features of the plant.

Q15 - Now that you have read the graphics, select the choices below that apply.



Field	Choice Count
I now know this bush is not dead	76
I now know this bush will survive	68
It is hibernating	56
It is immature	64
I now know this bush can create pretty design features	89
I now know this bush can improve soil	118
I want to purchase the plant	84
I do not want to purchase the plant	9
Total	564

Figure 8.14. Consumer preferences for indigo bush after survey (part 2)

The second version of the indigo bush label focused more on the ecological value of the plant. A total of 118 people voted that they knew that this plant could improve soil after reading the label.



Figure 8.15. *Keyword bubble diagram for indigo bush*



Figure 8.16. *Keyword cloud for indigo bush*

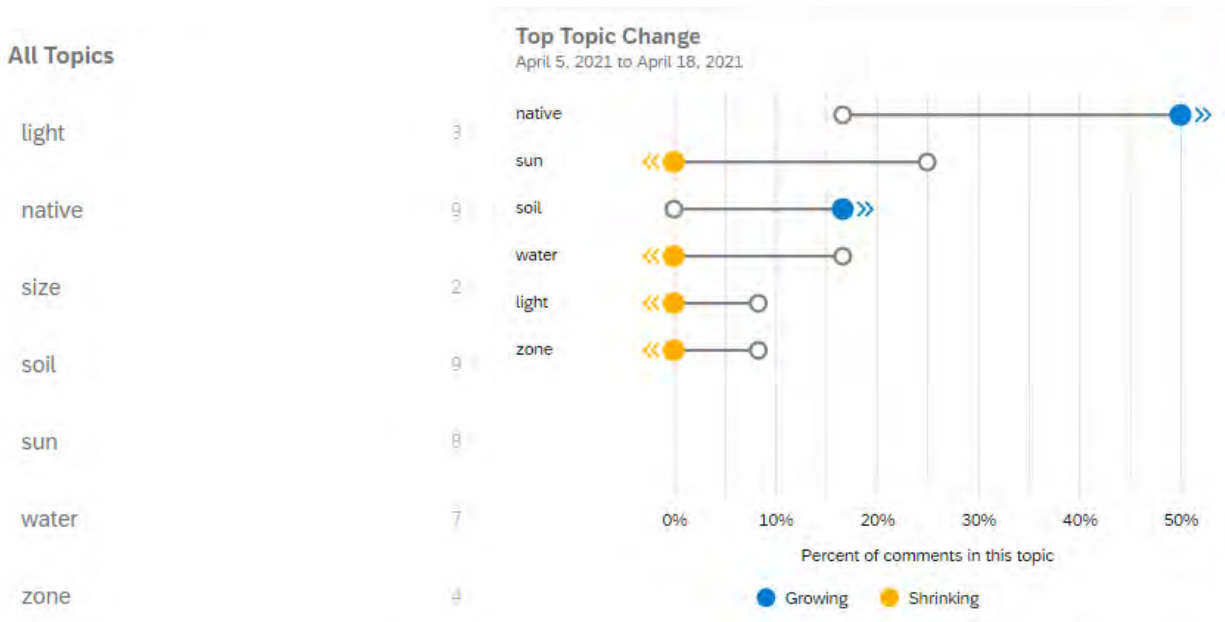


Figure 8.17. *Keyword changes for indigo bush*

Table 8.3 Keyword percentages for indigo bush

All topics	52	Percentage
native	9	17.31%
soil	9	17.31%
sun	8	15.38%
water	7	13.46%
zone	4	
light	3	5.77%
size	2	3.85%

Table 8.4 Total keyword percentages for indigo bush

Q16 - Topics

Page Options ▾

#	Field	Choice Count
Unknown	Unknown	34.38% 22
native	native	14.06% 9
soil	soil	14.06% 9
sun	sun	12.50% 8
water	water	10.94% 7
zone	zone	6.25% 4
light	light	4.69% 3
size	size	3.13% 2

64

The total number of unique comments was 52. The chart above shows the total number of keywords as 64, since 30 comments included multiple keywords. Keywords that appeared multiple times were native, soil, sun, zone, water, light and size. These keywords appeared 42 times in total. A total of 22 comments contain other keywords, including big, large, attract, and pollinate.

Results for Juniper

Q20 - What is your interest level in this plant?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	5.00	100.00	63.29	26.74	715.06	133

Q24 - What is your interest level in this plant after reading the graphics?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
1	0.00	100.00	67.10	27.62	762.79	126

Figure 8.18. *Increased level of interest in juniper*

The interest level in the common juniper increased slightly, from 63.29 to 67.10. This improvement was not as dramatic as those for sideoats grama grass and indigo bush. We assumed that as long as we advertised the functionality of the evergreen plant, both the interest level and sale would increase. However, the consumer concerns about buying evergreen plants were more complex than we thought.

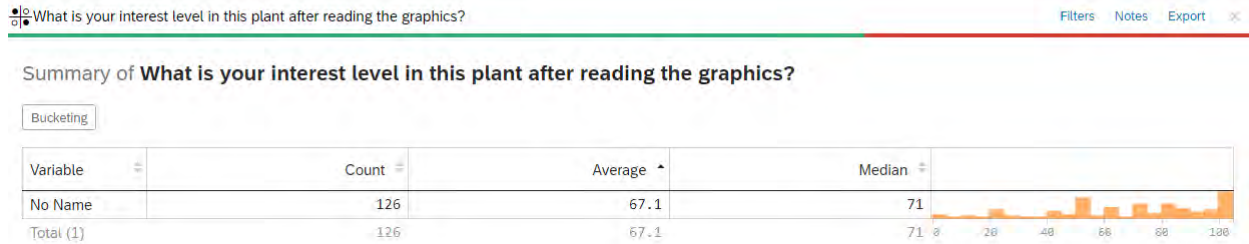
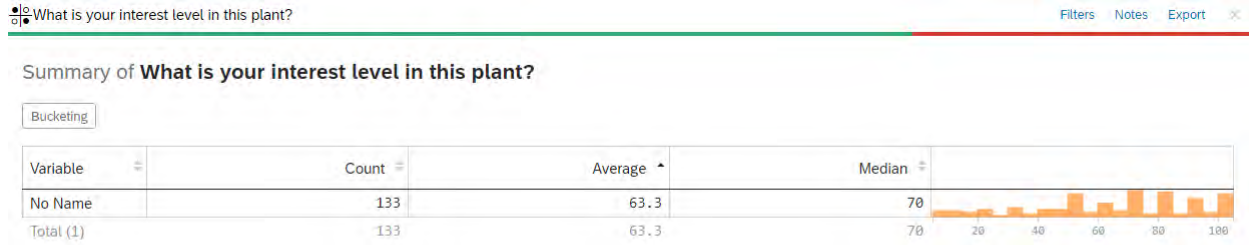


Figure 8.19. *Increased level of interest in juniper (part 2)*

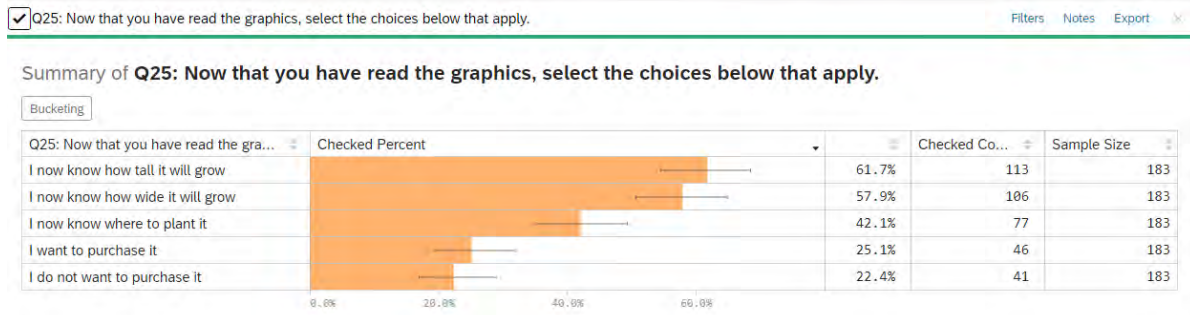
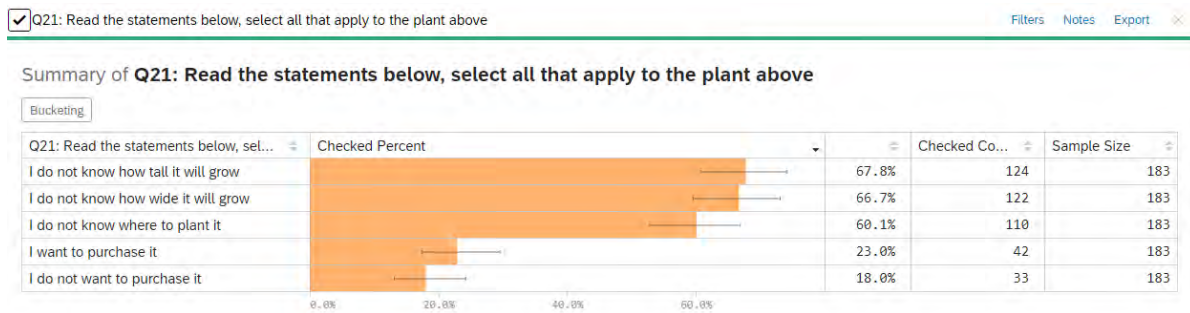
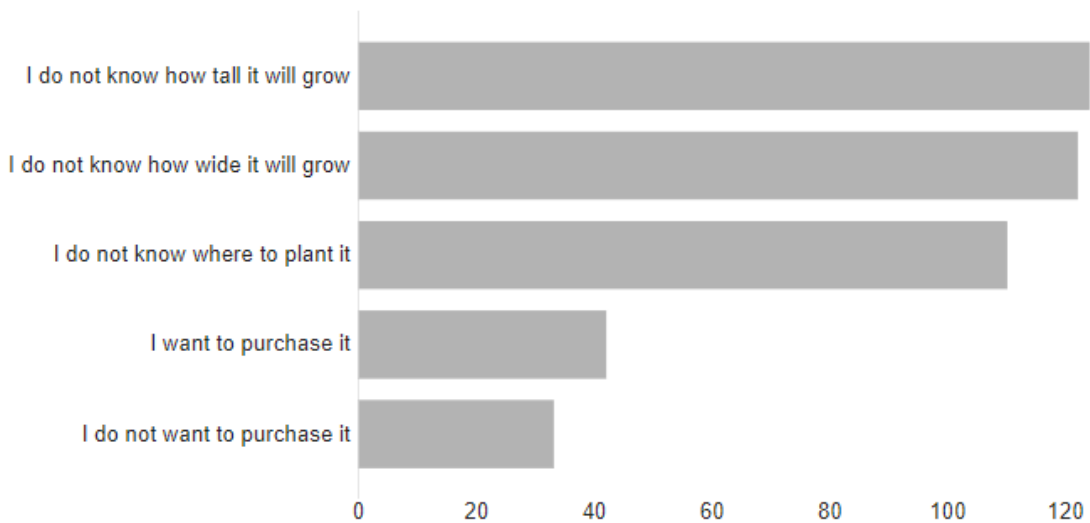


Figure 8.20. *Before-and-after comparison of consumer preferences for juniper*

Q21 - Read the statements below, select all that apply to the plant above



Field	Choice Count
I do not know how tall it will grow	124
I do not know how wide it will grow	122
I do not know where to plant it	110
I want to purchase it	42
I do not want to purchase it	33
Total	431

Figure 8.21. *Consumer preferences for juniper before survey*

Similar to our initial assumptions, many people/consumers did not know how tall or how wide this juniper would grow, nor where to plant it. A total of 42 people voted that they wanted to buy this plant before being introduced to the new information.

Q25 - Now that you have read the graphics, select the choices below that apply.

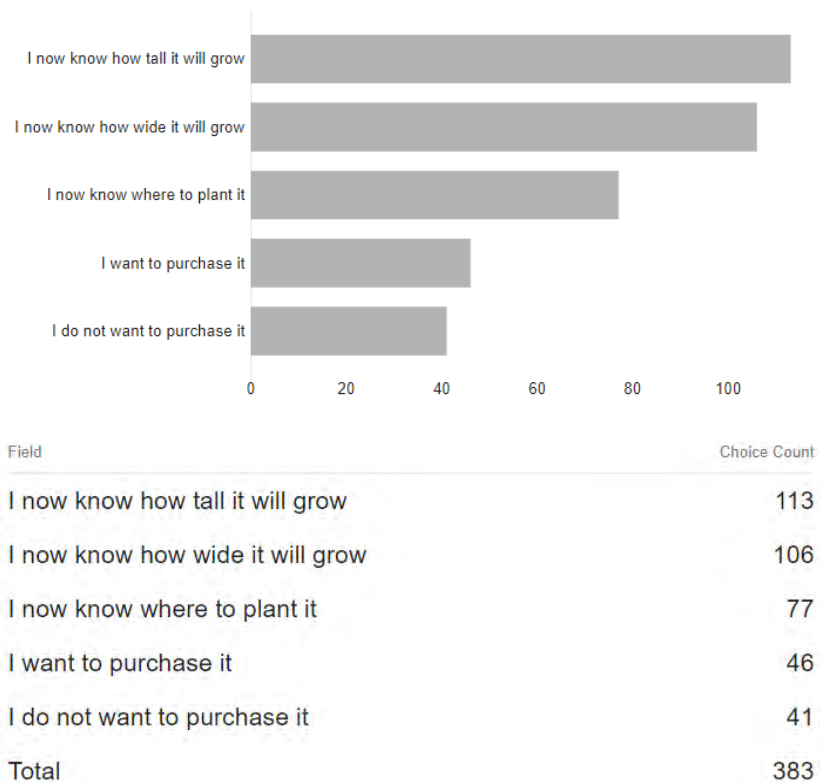


Figure 8.22. *Consumer preferences for juniper after survey*

After reading the label, most people knew how tall and how wide this juniper would grow, which was a good thing, but they still did not want to buy the plant. The interest level also did not increase considerably. Thus, we can conclude that illustrating the spatial functionality of this evergreen plant, such as using this plant to construct yard fences, is not the key to increasing people’s interest in this juniper. Another interpretation is that the spatial functionality of this plant is still attractive to consumers, but some concerns or misunderstandings needed to be solved before they could pay attention to this function.

There were two main concerns about purchasing this juniper:

1. Is it native?
2. If it grows too tall, people usually do not have a place for it to survive.

Below were some typical questions consumers asked about whether this juniper was native:

1. Juniper...don't think it's native
2. I do not plant plants that are not native of this part of GA
3. It's not native to our outer coastal plain...Not interested
4. If I garden in Georgia and your picture looks like England or British Columbia- I know better and will not buy the plants as many plants that do well in these climates do not do well in the southeast.

From these questions, we found that people did not think juniper was a native plant. Moreover, the definitions of native were limited to the southeastern US, Georgia, or even specific regions of Georgia, such as the coastal plains.

The following are some questions and concerns that people had about the final size of this juniper:

1. Don't need anything this tall and narrow
2. I am looking to design a natural setting in my yard. This looks highly manicured, so it is difficult for me to know how this relates to a natural setting.
3. I wouldn't buy this because I don't have room for such big trees but the infographics is very helpful for picturing actual size.
4. Not an understory plant, therefore I would not have a place for it.



Figure 8.23. *Keyword diagram for juniper*



Figure 8.24. *Keyword cloud for juniper*

What we can learn from these concerns is that people do not prefer evergreen plants that they consider too tall. They often do not have space in their yards and gardens for such plants.

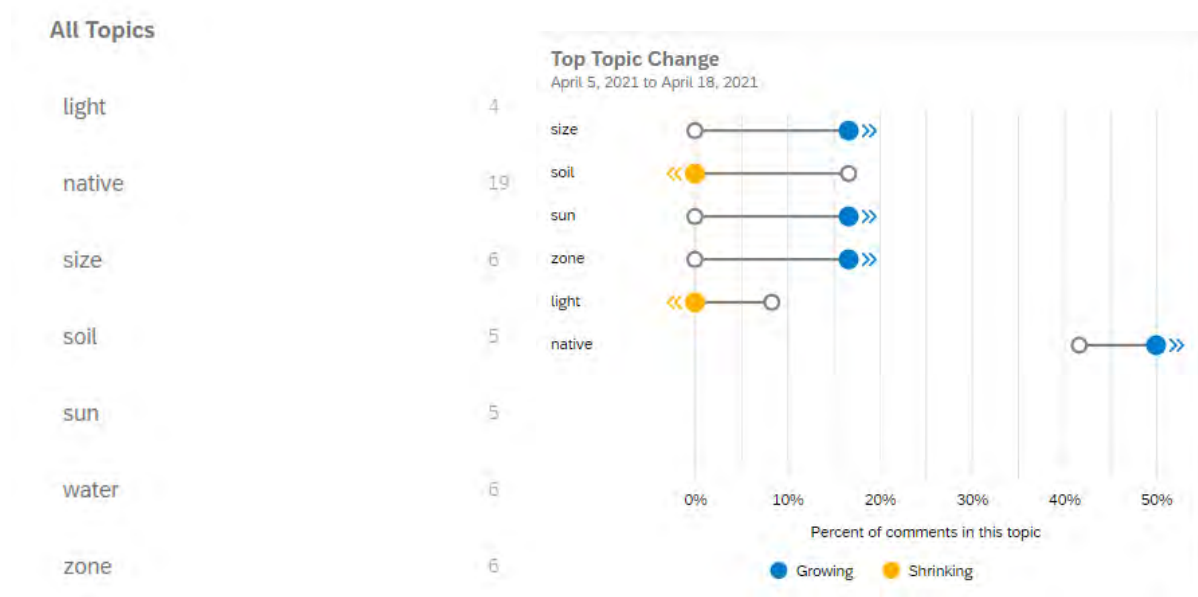


Figure 8.25 *Keyword changes for juniper*

Table 8.5 *Keyword percentages for juniper*

All topics	54	Percentage
native	19	35.19%
zone	6	11.11%
size	6	11.11%
water	6	11.11%
soil	5	9.26%
sun	5	9.26%
light	4	7.41%

Table 8.6 Total keyword percentages for juniper

Q26 - Topics

Page Options ▾

#	Field	Choice Count
Unknown	Unknown	28.17% 20
native	native	26.76% 19
size	size	8.45% 6
water	water	8.45% 6
zone	zone	8.45% 6
soil	soil	7.04% 5
sun	sun	7.04% 5
light	light	5.63% 4

71

The total number of unique comments was 54. The chart above shows the total number of keywords as 71, since 34 comments included multiple keywords. Keywords that appeared multiple times included native, soil, sun, zone, water, light and size. These keywords appeared a total of 51 times. A total of 20 comments contained other keywords, including natural and look.

Results for Blue Rug Juniper

Q28 - What is your interest level in this plant?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
18	5.00	100.00	53.68	24.86	618.19	121

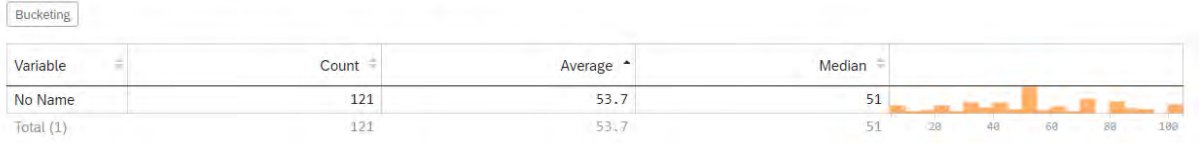
Q31 - What is your interest level after reading the graphics?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses
4	0.00	100.00	61.56	28.49	811.81	109

Figure 8.26. *Increased level of interest in blue rug juniper*

The consumer interest level in the blue rug juniper increased moderately, from 53.68 to 61.6. This improvement was not as dramatic as those for sideoats grama grass or the indigo bush. We assumed that advertising the ecological functionality of the evergreen plant, such as its role in stabilizing hill soil, would increase both the interest level and purchase intent. However, the consumer concerns regarding buying this plant were also more complex than we initially thought.

Summary of **What is your interest level in this plant?**



Summary of **What is your interest level after reading the graphics?**

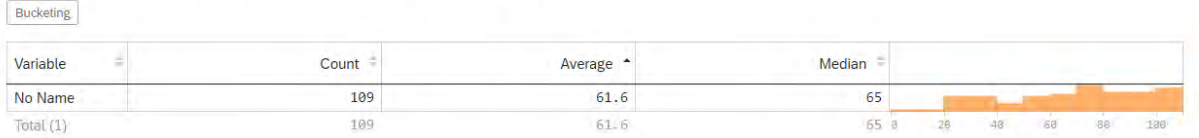
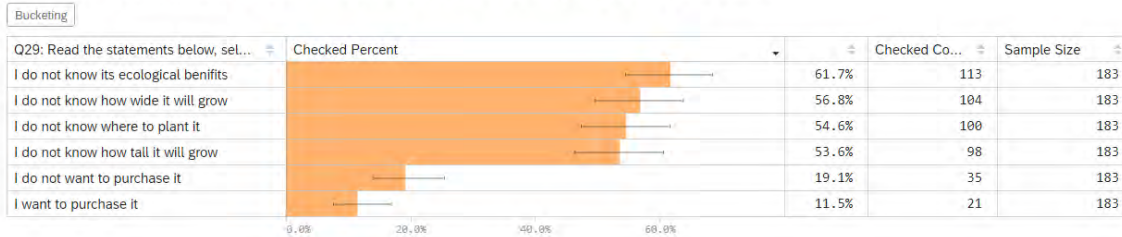


Figure 8.27. *Increased level of interest in blue rug juniper (part 2)*

Summary of **Q29: Read the statements below, select all that apply to the plant above**



Summary of **Q32: Now that you have read the graphics, select the choices below that apply.**

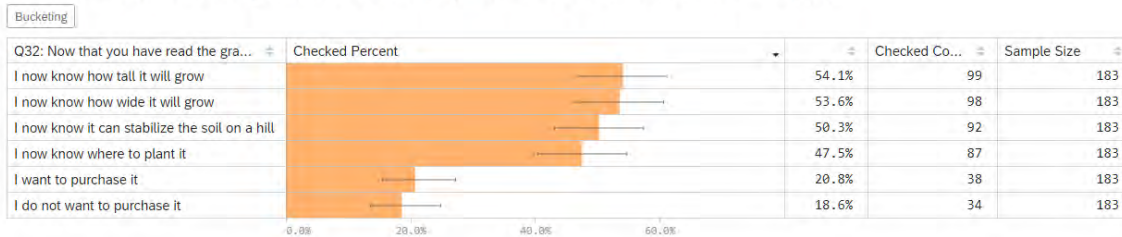


Figure 8.28. *Before-and-after comparison of consumer preferences for blue rug juniper*

Q29 - Read the statements below, select all that apply to the plant above



Figure 8.29. Consumer preferences for blue rug juniper before survey

Similar to our initial assumptions, many people/consumers did not know how tall or how wide this juniper would grow, nor where to plant it. A total of 21 people initially responded that they wanted to buy this plant.

Q32 - Now that you have read the graphics, select the choices below that apply.



Figure 8.30. Consumer preferences for blue rug juniper after survey

After reading the label, most people knew how tall and how wide this juniper would grow, which was a good thing, but they still did not want to buy this juniper. The interest level also did not increase considerably.

Thus, we can conclude that illustrating the ecological functionality of this evergreen plant, for example, its usefulness in stabilizing hills, is not key to increasing people's interest in this juniper. Another explanation is that the ecological function of this plant is still attractive to consumers, but some concerns need to be solved before they can pay attention to this function.

There were three main concerns about purchasing the juniper:

1. Is it native?
2. If it grows wide, consumers do not have enough place for it to thrive.
3. Is it invasive? Will it become a problem later?

(Concerns about stabilizing the hill were similar to those about the expansion of invasive plants).

Below are some questions that consumers asked about whether this juniper is native:

1. Juniper...don't think it's native
2. I do not plant plants that are not native to this part of GA

The following are some concerns people had about how large this plant grows:

1. May not have a need or place for it to thrive.
2. I don't like using this plant in my yard or in design work so I wouldn't buy it.

Finally, one consumer asked an important question: Will it escape and become a problem for the landscape?

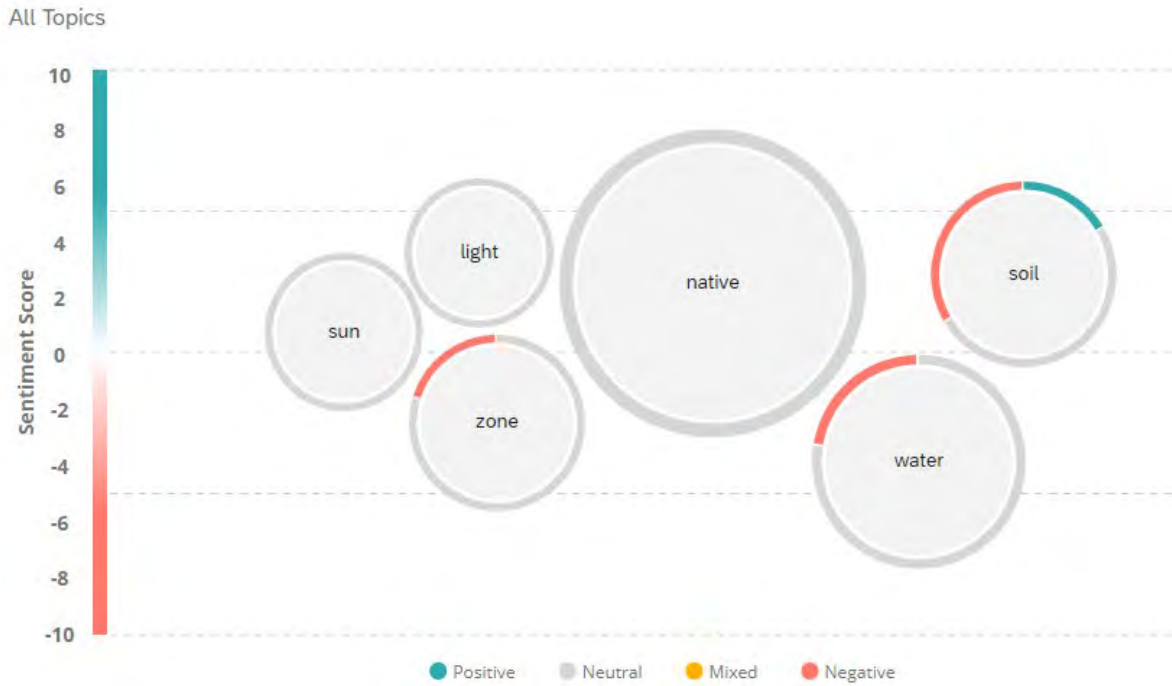


Figure 8.31. *Keyword bubble diagram for blue rug juniper*



Figure 8.32. *Keyword cloud for blue rug juniper*

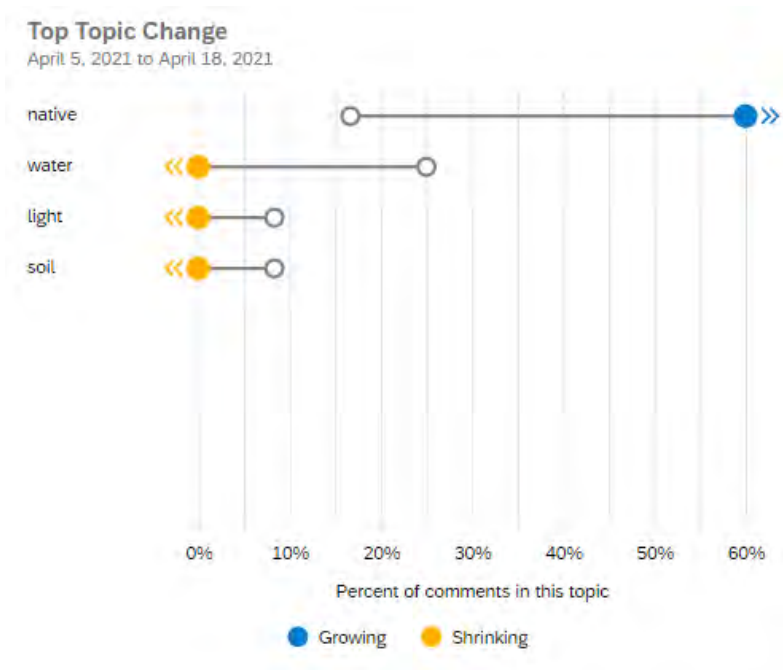


Figure 8.33 Keyword changes for blue rug juniper

Table 8.7 Keyword percentages for blue rug juniper

All topics	53	Percentage
native	19	35.85%
water	9	16.98%
soil	6	11.32%
zone	5	9.43%
light	2	3.77%
sun	3	5.66%

Table 8.8 Total keyword percentages for blue rug juniper

Q33 - Topics

Page Options ▾

#	Field	Choice Count
Unknown	Unknown	32.31% 21
native	native	29.23% 19
water	water	13.85% 9
soil	soil	9.23% 6
zone	zone	7.69% 5
sun	sun	4.62% 3
light	light	3.08% 2
		65

The total number of unique comments was 53. The chart above shows the total number of keywords as 65, since 32 comments included multiple keywords. Keywords that appeared multiple times included native, soil, sun, zone, water, light and size. These keywords appeared 44 times in total. A total of 21 comments contained other keywords, including hill, erosion, and invasion.

Further Improvements of the New Labels



Figure 8.34. *Rain gardens offer solution to storm water pollution* (edited by author)

Many consumers asked about the soil for sideoats grama grass. They also asked about the plant's wet-dry tolerance, mature size (height and width) and spacing between grasses.

The following information aimed at addressing these questions.

1. Space the grasses 2' apart. Although they do not reach 2' when people plant them initially, it will be necessary to plant them 2' feet apart to give them enough space to thrive when mature. (The grass's mature height and width are 2 feet).
2. Dig a hole that is around 6" deep (no deeper than the root ball) and 1.5 or 2 times wider than the root ball to give them enough space.
3. Sideoats grama grass can survive in plenty of soil types, including sand, loam, and clay. The best thing is that it can grow in Georgia red clay, so consumers do not need to buy new soil for this plant. The only thing they need to do is to reduce the compaction of the soil within the hole area and make it loose enough for the plant root to thrive.
4. This sideoats grama grass likes dry and well-drained soil. Therefore, the soil in the above section is dry.



Figure 8.35. *Final label for sideoats grama grass*

Pictured in Figure 8.35, the final label for sideoats grama grass includes information on soil, sun requirements, and the spacing between grasses. This label will give consumers enough information for them to develop a thorough understanding of the grass.



Figure 8.36. *Indigo bush in dry red clay soil*



Figure 8.37. *Indigo bush in wet red clay soil*

Consumers also asked about the soil and moisture preferences of the indigo bush. The above graphics (Figures 8.36 and 8.37) attempt to address these questions.

1. Dig a hole that is as deep as the root ball (6 inches for a two-year-old indigo bush) and twice its width.
2. The indigo bush can adapt to any soil type, including Georgia red clay.
3. The indigo bush can tolerant both dry and wet moisture conditions.



Figure 8.38 *Final label for indigo bush*

The ideal label layout puts the section that shows the soil and water information beside the main graphic, enabling consumers to relate these two aspects.



Figure 8.39 *Blue rug juniper with blue evergreen foliage - The Home Depot* (edited by author)

People also wanted to know the soil and moisture preferences of the blue rug juniper. The label section illustrated in Figure 8.39 aims to show the soil and moisture levels preferred by blue rug juniper prefers:

1. The blue rug juniper prefers sandy soil but can tolerate Georgia red clay soil.
2. The blue rug juniper likes dry and well-drained soil. The graphics above show dry soil.

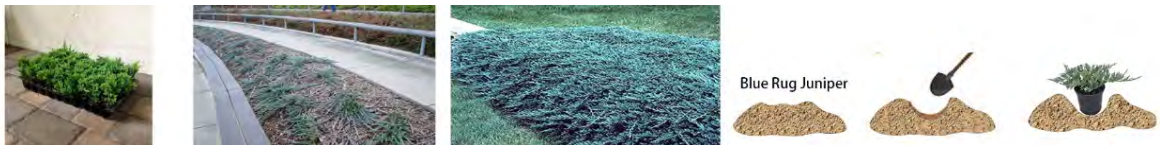


Figure 8.40 *Final label for blue rug juniper*

The ideal graphic places the installation section alongside the label, enabling consumers to connect these two aspects of the plant. It is helpful to write “Blue Rug Juniper” on the label so that consumers understand that this a native plant.



Figure 8.41 *Degroot's spire arborvitae in soil*

For the juniper, instead of common juniper or eastern red cedar, it is better to choose a juniper that does not grow more than 12 feet tall to address consumer concerns about the size of this plant. Thus, the Degroot's spire arborvitae is the best choice. This arborvitae can adapt to all soil types, including sand, loam and clay, and can grow in Georgia red clay.



Figure 8.42 *Final label for Degroot's spire arborvitae*

The label in Figure 8.42 shows that it is best to plant this arborvitae 6 feet apart since it will reach 3 to 5 feet wide when it matures. In addition, its mature height will be 12 feet. The label will show the plant name as “American Arborvitae,” which is the common name of this juniper. The reason to show the common name instead of the scientific name is that when consumers see “American,” they will immediately know that this plant is native.

CHAPTER NINE

CONCLUSION

Low sales exist among hibernating and immature native plants. These native plants are difficult to market since they sometimes have unappealing appearances. Consumers have misperceptions about these plants, and current labels on the market do not provide enough information to help correct those misunderstandings. For instance, consumers do not think hibernating and immature plants are alive and can survive, and current labels only show flowers and fruits. In addition, the difference between the current plant and the plant on the label is too dramatic, so people cannot believe in the current labels. Thus, at least, the information about the plants' natural life cycle is needed on plant labels to help consumers visualize the plant's growth and believe that the plants will have a good future before they make a purchase. Research into consumer preferences using market research provided the basis for new ideas in designing new labels for the green industry.

This research designs a new labeling system to communicate information on aesthetic aspects of native plants that may currently be overlooked, such as their strong roots, growth over time, and appearance across seasons. Brochure design has also been developed to communicate these plants' ecological and functional benefits. The new labels help address and combat consumer misunderstandings, thereby increasing interest levels and sales. To some extent, the new labels have changed consumers' stereotypical assumption that hibernating plants are dead in fall and winter. Moreover, the new labels help provide consumers with knowledge they previously lacked, such as how a plant survives and how large it will grow.

There are also low sales of immature evergreen plants among native plants. ELA found that problem that homeowners usually did not like these plants with unattractive appearances, so ELA advocated homeowners using these evergreens functionally instead of decoratively. The green industry found that labels can help to educate consumers about native plants. These ideas were in the right direction, but none of them deeply investigated how to label immature evergreens efficiently. Thus, this research labeled immature evergreens functionally and used the survey to test how well the labels increase consumers' interest and sales.

The new labels were effective in increasing consumers' interest in plants that they recognize as native species. However, the new labels were not significantly effective in increasing interest in plants that consumers recognize as nonnative species. For example, since consumers often do not know that plants such as junipers can be native to many areas, they often assume that native junipers are nonnative species. Thus, an improved version of the new labels will inform consumers that a plant can be native to several areas. Moreover, the basic information about plants soil, sun, water, and light requirements should be included on the label. Alternatively, if new expanded label costs become too high, research could look at the use of QR codes for consumers to access information or certain types of information via smart device.

In addition, there are three important suggestions to propose. First, Bringing new concepts and definitions of beauty, such as health beauty forward is a good way to propose aiming future market research to focus on finding and discovering beauty. The second suggestion is that consumers' preferences should be further explored through market research since there are gaps between consumers' preferences and current label designs. The third suggestion is to advocate that landscape architects who specialize in planting design to label native plants.

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APPENDIX A
IRB APPROVAL LETTER



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Human Research Protection Program

NOT HUMAN RESEARCH DETERMINATION

March 15, 2021

Dear [Brad Davis](#):

On 3/15/2021, the Human Subjects Office reviewed the following submission:

Title of Study:	Native Plant Marketing
Investigator:	Brad Davis
Co-Investigator:	Dingning Yu
IRB ID:	PROJECT00003770

We have determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations. Information of interest is about plants. No individual or private information is collected about survey respondents.

University of Georgia (UGA) IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human subjects, please submit a new request to the IRB for a determination.

Sincerely,

Katherine Bright, Sr. Compliance Officer
Human Subjects Office, University of Georgia