Labeling Practices

Among Member Institutions
of the
American Public Gardens Association

Plant Nomenclature & Taxonomy Community 2019

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Introduction

Project Goals

In 2018, the Plant Nomenclature & Taxonomy community of the American Public Gardens Association (the Association) administered a survey to collect data on plant labeling practices among Association member institutions. This effort had three main goals, which were achieved:

1. Promote institutional information-sharing with respect to labeling practices
2. Identify existing practices that may serve as models for other gardens
3. Discover opportunities for improvement within the field

The initial intent for this project was to use survey results to establish a set of best practice standards to guide the industry. As we began to analyze survey data, however, we discovered a wide range of practices in use among respondent institutions. It became clear to us that because labeling decisions are being made on the basis of unique organizational missions and priorities, the resulting systems and practices will necessarily vary from one institution to another. Accordingly, this community of authors feels it is best to present the current report as a benchmarking resource, while leaving development of standards to the individual institution.

The member institutions of the Association are diverse in every facet of their operations. Therefore, we hope that the following information is used as an informative guide for those interested in implementing a labeling program, making changes to strengthen current practices, or learning how institutions across the continent are currently approaching their labeling practices.

Survey Deployment and Data Analysis

The survey was released electronically on January 8, 2018 to the American Public Gardens Association Plant Nomenclature & Taxonomy and Plant Collections Community online discussion boards, as well as to an older American Association of Botanic Gardens and Arboreta (AABGA) listserv that still receives some use. The survey was also forwarded by one company to its entire customer base, yielding 17 non-Association member responses that were removed from the data set. This event may have affected certain segments of data due to an increased response of clients that were Association members, notably the most commonly used vendors in the Purchased Display Labels segment of this report. In addition, two institutional duplicates were removed, while two partially completed surveys were used for the information that they provided. Respondent numbers to individual questions are reported throughout the document for purposes of clarity. The survey was launched and took place at the same time as the Association's major upgrade to their website, so the closing date was extended, and closed on February 9, 2018.

Data

Respondents Overview

Respondents

Seventy-nine institutions, representing 12.5% of all 2018 American Public Gardens Association member institutions, responded to the labeling practices survey.

Garden Size

When the survey was sent, the question about size of institution asked if the institution's operating budget was greater than or less than $1 million. Per a subsequent Association staff recommendation, respondent budget sizes were later recalibrated to reflect the operating budget size categories used in the Association's annual membership reporting from 2016, which was the most recent obtainable budget size data. The categories were: less than $150,000; $150,000-$399,999; $400,000-$999,999; $1,000,000-$2,999,999; $3,000,000-$9,999,999; and above $10,000,000[1].

Figure 1 shows the distribution of the responding institutions' operating budgets. Though the distribution of data appears balanced in representation, with the bulk of the responses coming from mid-sized institutions, after comparison of the number of institutions responding to this survey to the total number of member institutions in each institutional size category in Figure 2, there was a higher participation rate from institutions with the largest budgets. Seventy-seven percent of member institutions in the above $10,000,000 budget range responded to the survey, 40.5% of member institutions in the $3,000,000-$9,999,999 range, 20% of member institutions with $1,000,000-$2,999,999 operating budget, 14% from the $400,000-$999,999 range, 3.4% from the $150,000-$399,999 range, and 6.4% from the lowest operating budget category (less than $150,000 operating budget). It is therefore important to keep in mind that, while certain practices may appear to be prevalent across the entire industry, they may be common only among organizations with large budgets.

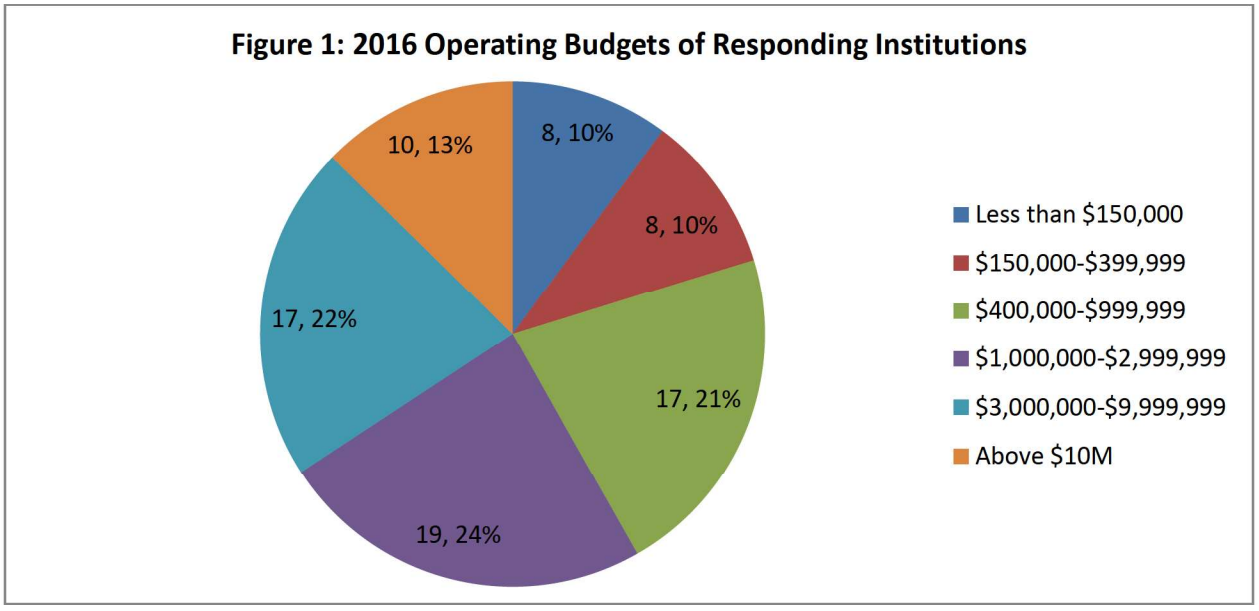


Figure 1: 2016 Operating Budgets of Responding Institutions

[1] Public Garden: The Journal of the American Public Gardens Association (2017). 2016 Institutional Members. American Public Gardens Association, 32(1). Most recently retrieved May 29, 2019 from https://publicgardens.org/sites/default/files/images/Magazine/2_2017_PG_Magazine.pdf

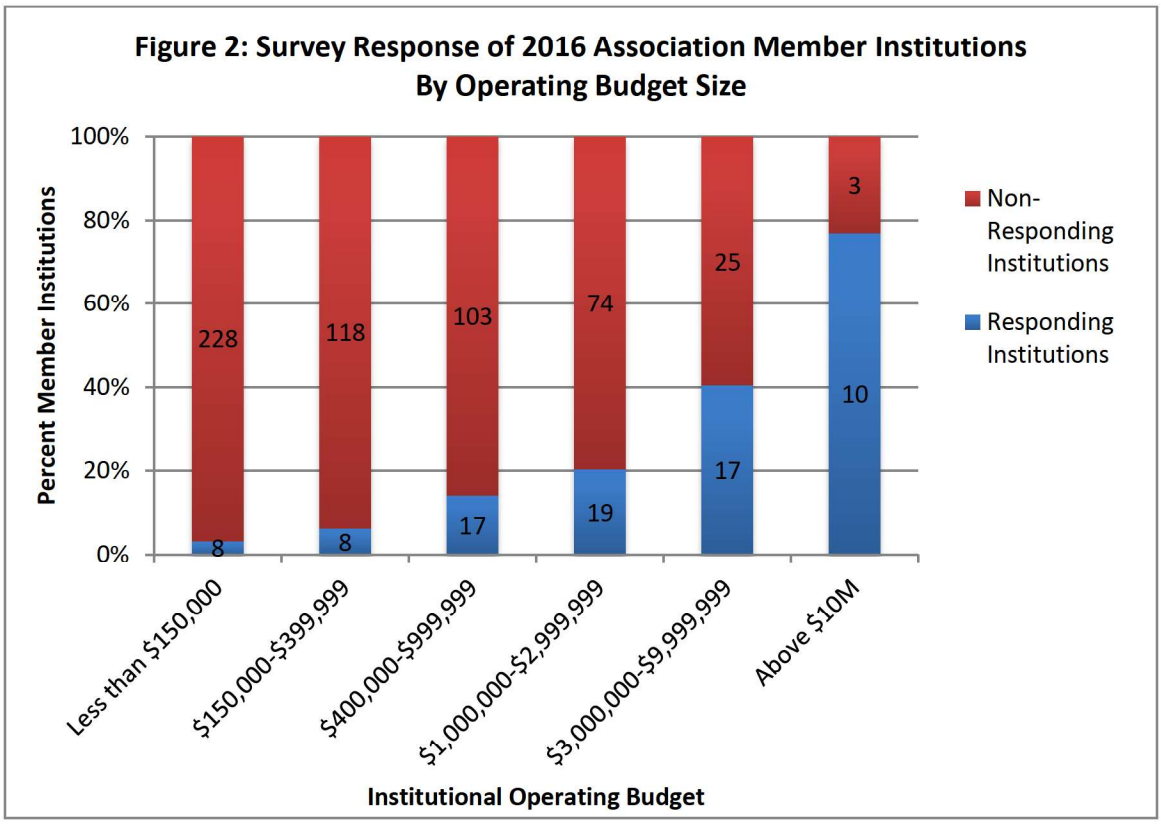


Figure 2: Survey Response of 2016 Association Member Institutions By Operating Budget Size

Geographic Distribution (79 responses)

The 79 responding institutions represent 36 states and provinces in the U.S. and Canada. Among these, California (12) and Pennsylvania (6) had the highest number of respondents with North Carolina and Ohio tied in the next tier with four responding institutions each. Washington, Washington D.C., Colorado, Illinois, New York, and Georgia each had 3 responding institutions. Eight states and 1 province had 2 responding institutions, and 14 states and 3 provinces had 1 responding institution. Figure 3 shows the geographic distribution of U.S. and Canada responses with the darkest areas having the most responses and white having none.

Figure 3: Geographic Distribution of Responding Institutions

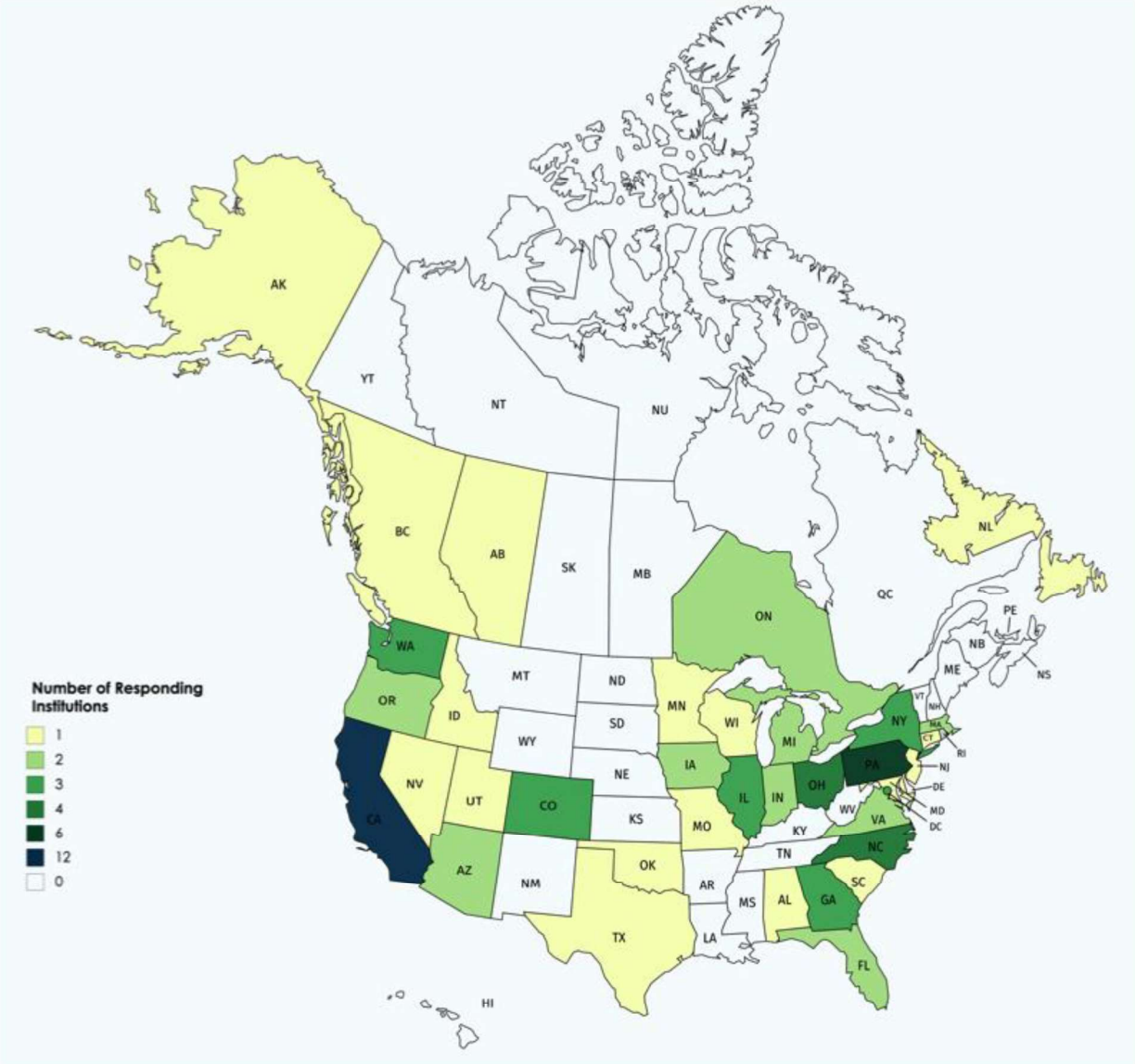


Figure 3: Geographic Distribution of Responding Institutions

Position Titles (79 responses)

As seen in Figure 4, the majority of respondents fall under the titles of curator (28%), plant records personnel (20%), and horticulture manager/supervisor (18%). Fewer Directors (14%) and Horticulturists/Gardeners (9%) responded to this survey. Others (11%) include Communications Manager, Sr. Admin Assistant, Botanist, Volunteer, Program Coordinator, and Education Director.

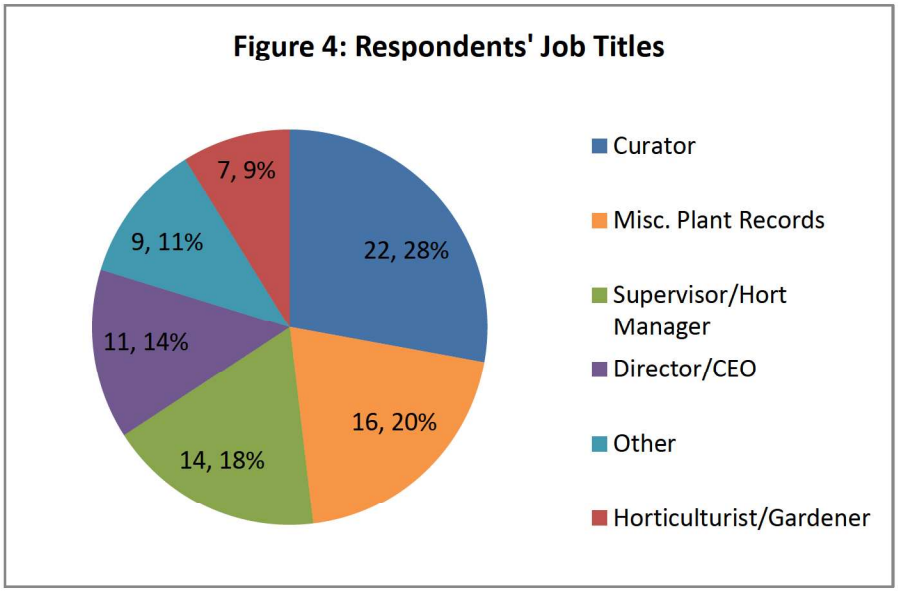


Figure 4: Respondents' Job Titles

Inclusion of Data and/or Images

When asked if they are willing to share data and/or images, 97% of respondents said they are willing. Twelve respondent gardens reached out further to offer assistance, support, or case studies for future development of this resource. Eighteen institutions sent images for possible inclusion in this document.

Staffing (79 responses)

Number of staff responsible for labeling plants

The majority (59%) of our respondents have a single staff person dedicated to the procurement of labels (see Figure 5). When compared to institution size, organizations with more than one person dedicated to the labeling process were in the four highest budget categories, with 70% of these in the above $10M size. In addition, institutions in the three largest budget categories dedicated more staff hours per week than did institutions with smaller budgets. See Figure 6.

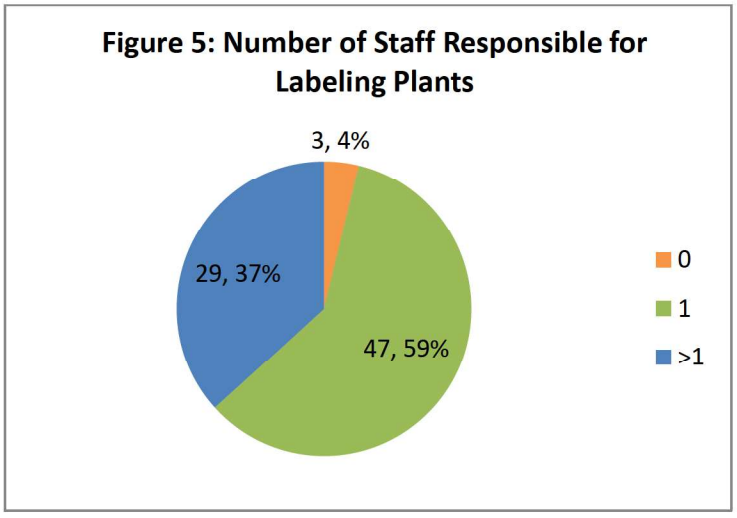


Figure 5: Number of Staff Responsible for Labeling Plants

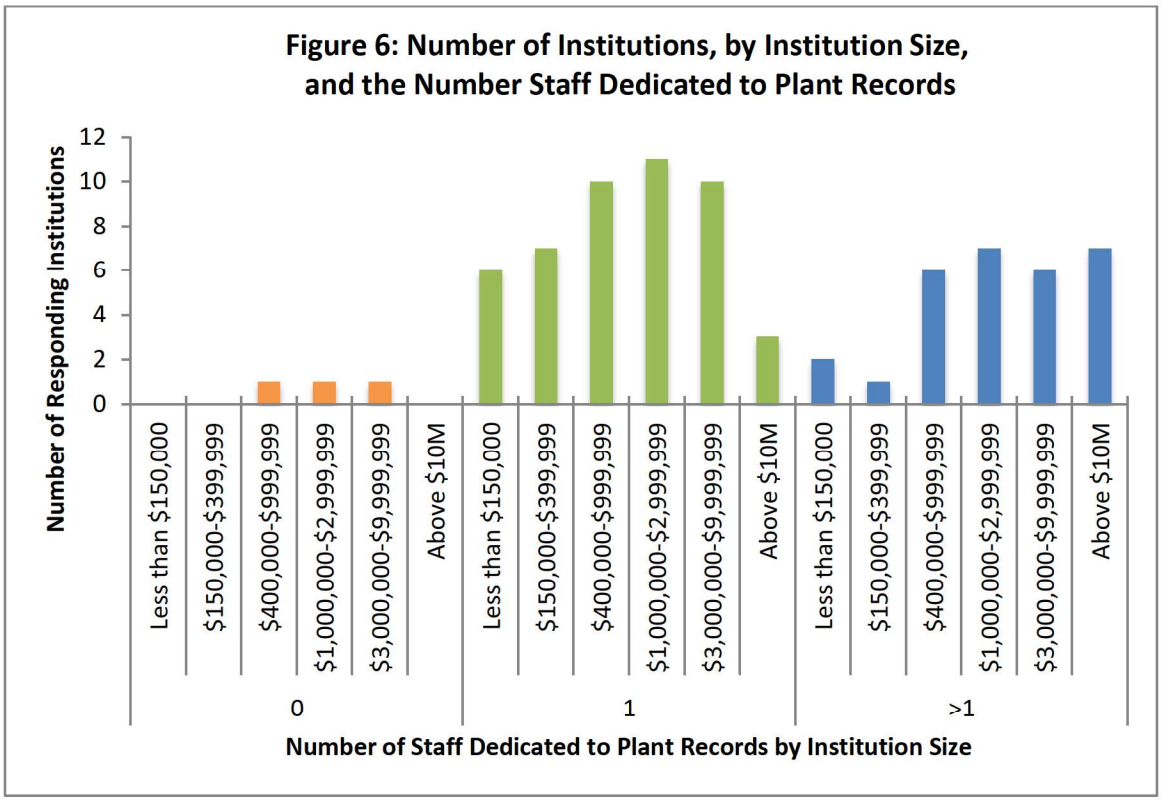


Figure 6: Number of Institutions, by Institution Size, and the Number Staff Dedicated to Plant Records

Staff hours dedicated to labels

The majority (86%) of responding institutions dedicate less than 20 staff hours per week to labeling plants (see Figure 7).

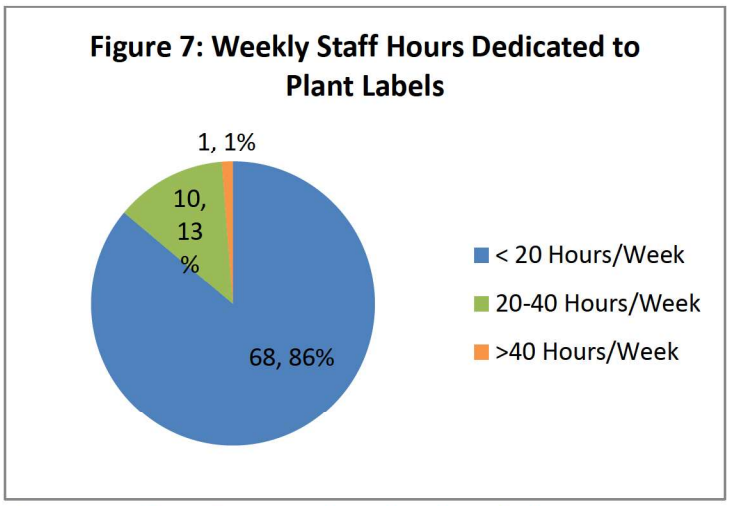


Figure 7: Weekly Staff Hours Dedicated to Plant Labels

Institutions with larger numbers of labeling-dedicated staff allocated a higher number of total hours to labeling per week.

Supplemental Help

Forty-eight percent of responding institutions use no supplemental help (students only, volunteers only, or both) in their labeling practices. Thirty-four percent use volunteers, and even fewer use students (12%) or both types of additional assistance (6%). See Figure 8.

There was little correlation between the use of supplemental help and institution size, staffing, or time dedicated to labeling. Use of supplemental help was most prevalent among institutions with the largest budget sizes (90% of respondents with institutional budget sizes of Greater than $10M used help), followed by those with the smallest budget sizes (75% of respondent institutions with budgets of ≤$150,000 used help).

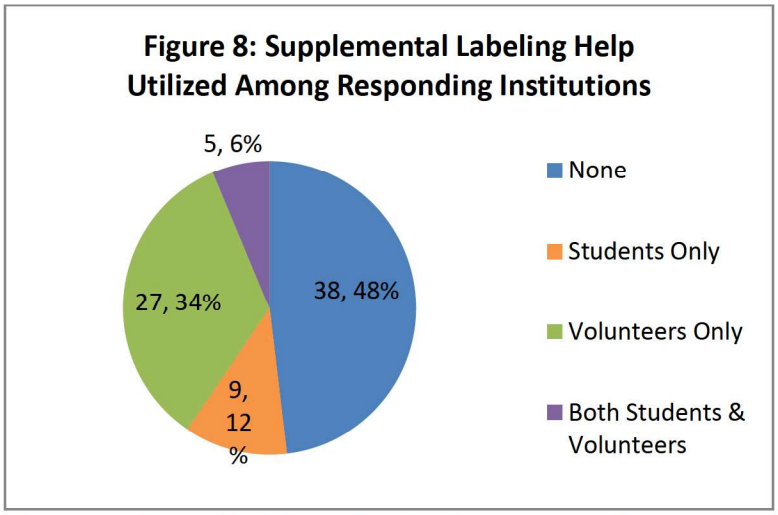


Figure 8: Supplemental Labeling Help Utilized Among Responding Institutions

Label Damage (79 responses)

Forty-one percent of responding institutions reported damage to their display labels.

Cause of Damage (34 responses – multiple responses accepted)

Squirrels were the most prevalent cause of label damage, with 21 institutions citing chewing as an issue (Figure 9). The other frequent culprits include people/vandalism (8) and mower/equipment (6).

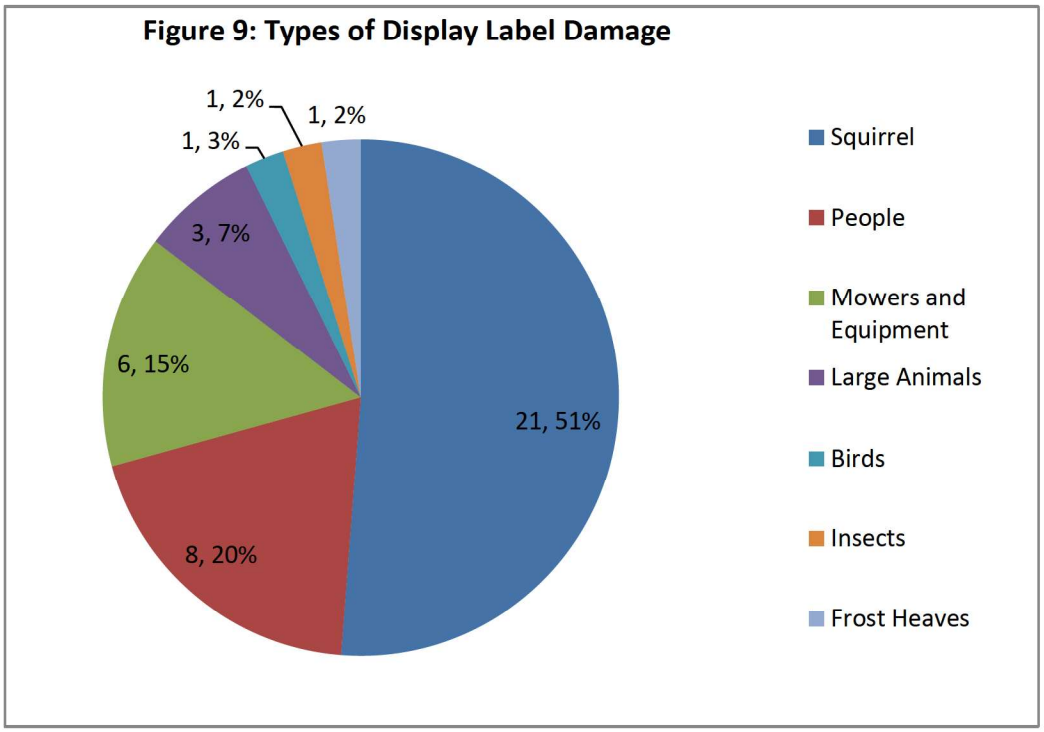


Figure 9: Types of Display Label Damage

When asked how they mitigate these damages, several institutions came forward with active solutions. Several respondents stated that they have a label replacement program that they follow, while one uses rivets to mount their labels and pushes the stakes deep into the ground to prevent large animal damage. Another institution uses stakes with garland on them to keep guests out of beds during their holiday light show, thereby avoiding label knockdown.

Other Methods of Providing Plant Information (73 responses – multiple responses accepted)

In addition to standard display and accession labels, respondent institutions used a number of other methods to convey plant-related information to the public (see Figure 10). The most common of these were interpretive panels installed in the landscape (28%; see Figure 11 for one example) and brochures or literature (26%). Plant lists (16%) and mobile applications or apps (13%) made up the next most commonly used means for sharing plant information. The "other" category made up 10% and includes docents/staffing (8), web-based plant information (5), QR codes (1), educational events (3), and temporary interpretive signage (2 responses; see Figure 10 for an example).

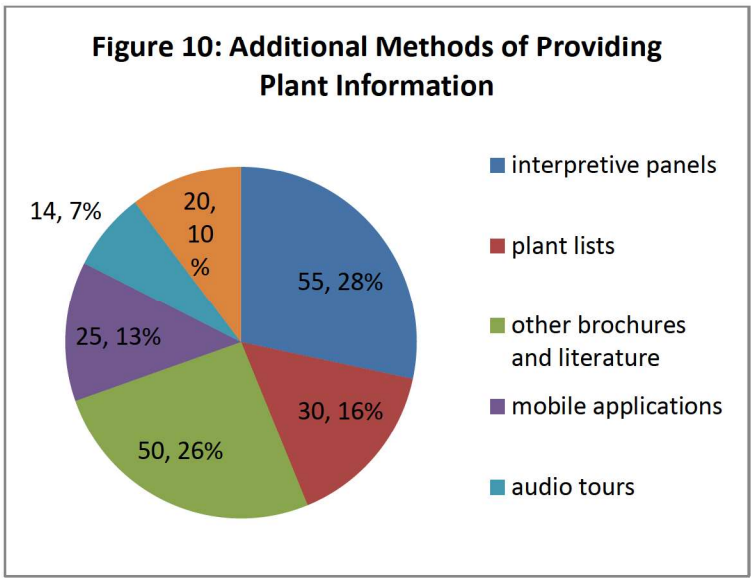


Figure 10: Additional Methods of Providing Plant Information

Figure 11: Example of Temporary Interpretive Signage

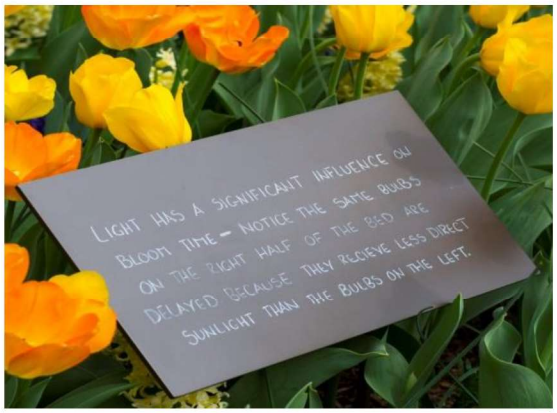


Figure 11: Example of Temporary Interpretive Signage

Label Changes (20 responses – multiple responses accepted)

Approximately 1/4 of respondents cited recent changes in their label program. Purchase of a new machine was the most common change (25%). Switching materials, new or improved implementation practices, and changes in production formats were each cited as changes by 17% of respondents. Personnel changes were also cited by three institutions (12%). All responses are shown in Figure 12.

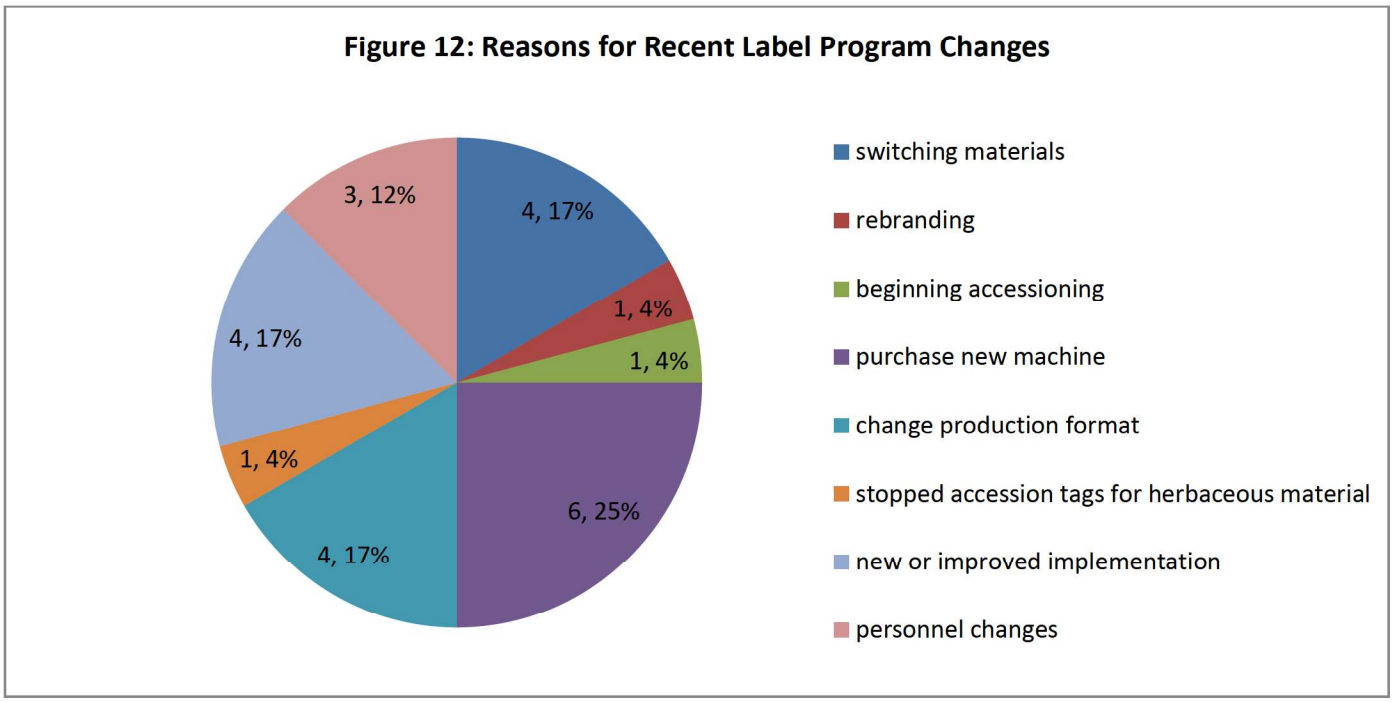


Figure 12: Reasons for Recent Label Program Changes

Additional Comments (26 responses)

Numerous institutions offered additional comments and information about their labeling programs. Comments included sharing public perception of their program, providing helpful tips, and revealing barriers to success (see Table 1). The most consistent messages included:

- the desire for more time and/or resources dedicated to labeling (6)
- that their program is a work in progress (6)
- there is a vested interest in this survey's results (4)

Table 1: Additional Comments about Labeling Programs	
Subject of Additional Comments	**Number of Related Comments**
Label program is a work in progress	6
Want more resources/time to dedicate to labeling	6
Looking forward to survey results	4
Need continuing education	1
Purchased label machine through grant	1
Frequent label changes call for in-house system	1
Interested to know more about audio device use	1
Helpful to have accession information in multiple places	1
Currently dormant labeling program	1
Testing new label materials	1
Interested in cost of engraving machine	1
Suggests using Living Collections Policy to avoid frequent label changes	1
Public is pleased with current labeling practices	1

Table 1: Additional Comments about Labeling Programs

Display Labels

For the purpose of the survey and this report, a **display label** is defined as a placard placed in front of a plant for public use and education, while an **accession label** is a tag with specific accession information for institutional staff use and plant tracking. The term "fabricated" or "fabrication" refers to labels made in-house at an institution while "manufactured" or "purchased" refers to labels acquired from an outside vendor. Within the context of the survey and this report, "make" is used as a general term, referring to both fabrication and purchase of labels.

Institutional Use of Display Labels (79 responses)

The overwhelming majority of participants (96%) use display labels in some capacity.

Quantity Made (76 responses)

Sixty-six percent of respondents stated that they fabricate or purchase fewer than 500 display labels per year, while 20% make 500-2,000 and 10% fabricate or purchase more than 2,000 annually. See Figure 13. Four percent of responses fell into the "Other" category, which included suspension of or inconsistent labeling program due to time or budget constraints. Among respondents that fabricate or purchase fewer than 500 display labels annually, institutions were split evenly between those that fabricate their labels and those that purchase them. Institutions making larger numbers of labels were more likely to fabricate them in-house.

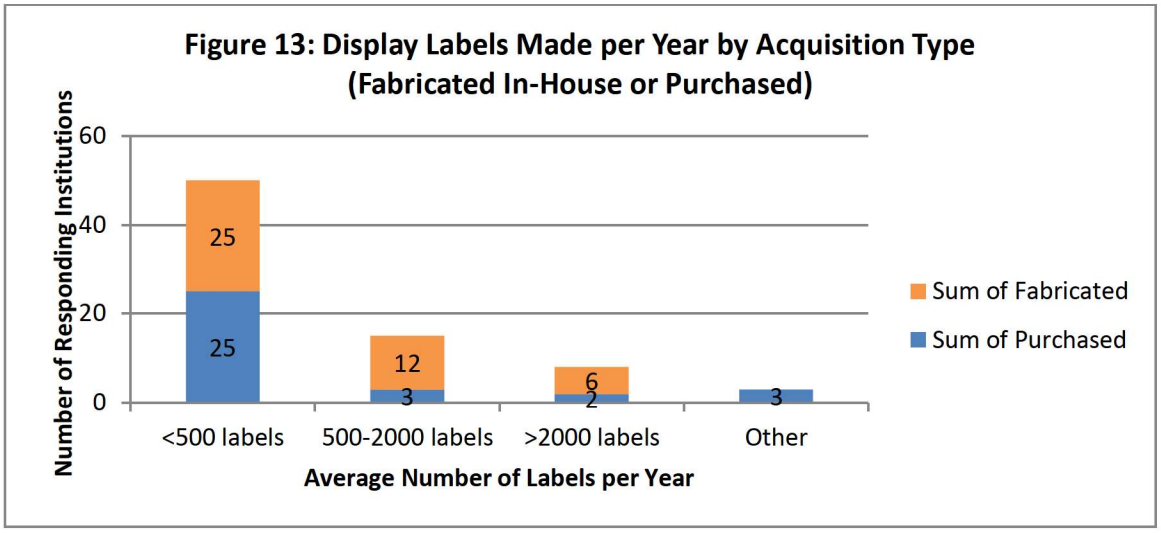


Figure 13: Display Labels Made per Year by Acquisition Type

Display label quantities were also correlated with institutional operating budget size. Sixty-two percent of institutions that fabricate or purchase more than 2,000 labels in a year had budgets in the above $10M category. Only 20% of that institutional budget size fabricate or purchase an average of less than 500 display labels in a year. Zero of the smallest institutions (budget size of less than $150,000) fabricate or purchase more than 500 display labels in a year, and only 29% of the $150,000-$399,999 budget group fell into the 500-2,000 label-per-year category.

Font Stylization

The following section highlights the font stylization findings of this survey. Appendix A of this report, Accessibility Considerations from Smithsonian Guidelines for Accessible Design, provides legibility and accessibility suggestions gathered by our museum interpretation peers.

Font Use (73 responses)

Forty percent of respondents are unsure of the font used on their display labels.

Sixty-five percent of those who know their fonts use sans serif, and 34% use serif. See Figure 14 for the sans serif fonts used by respondents and Figure 15 for the serif fonts.

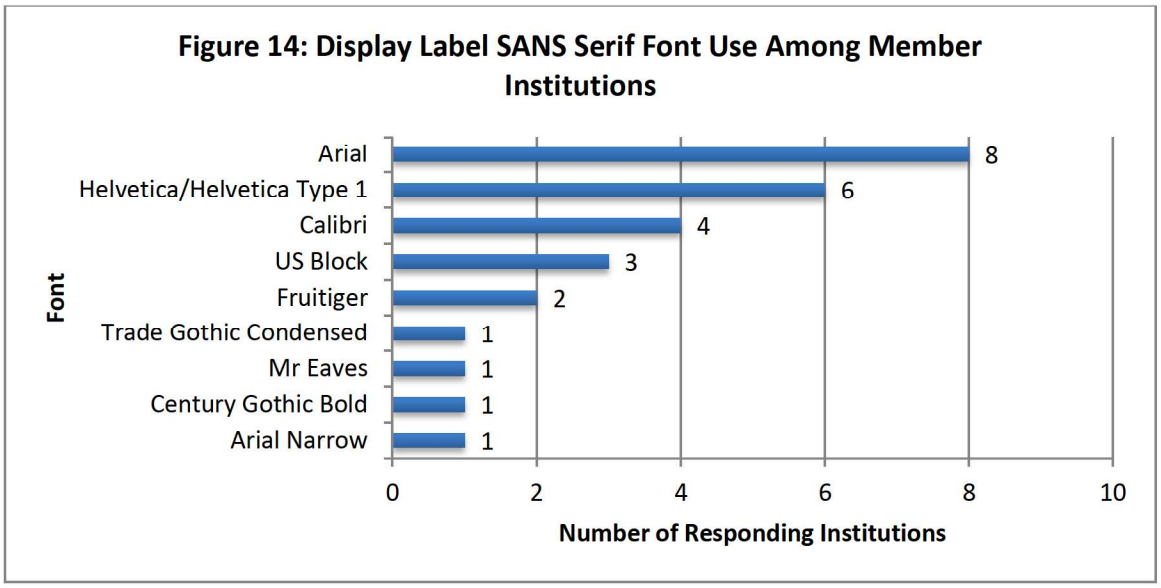


Figure 14: Display Label SANS Serif Font Use Among Member Institutions

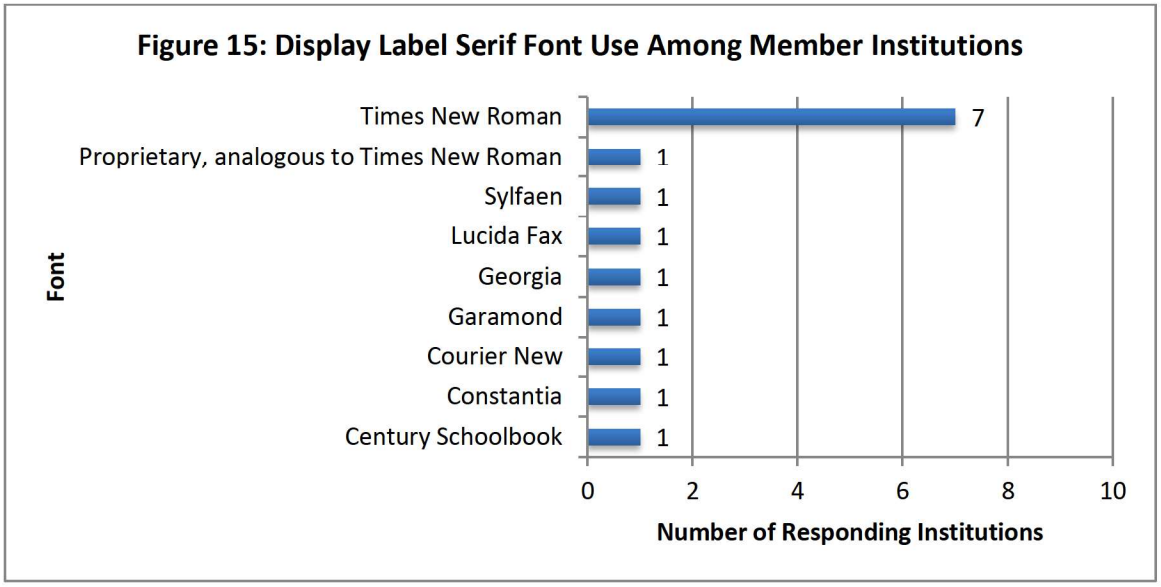


Figure 15: Display Label Serif Font Use Among Member Institutions

Italicization (75 responses)

Eighty percent of the respondents use italicization in their labels. Among the 15 institutions that do not italicize, six cited machine or process limitations while four cited legibility issues.

Font Sizes (55 responses - multiple responses accepted)

The twenty-seven different font sizes used on display labels vary from 7 point to 56 point. See Table 2 and Figure 16. Fifteen stated that their font sizes vary based on each text line of the label. Three respondents were unsure of what font sizes were being used on their labels. Twenty-one responses were given in inches instead of points, which vary from 0.15" to 0.75". See Figure 17.

Table 2: Example of font sizes used on display labels. Note that this example is in Arial (sans serif) and lowercase.	
smallest	7 point, for 3.5” x 2” label
largest	56 point, for 5” x 8” label viewed from long Unspecified distance

Table 2: Example of font sizes used on display labels

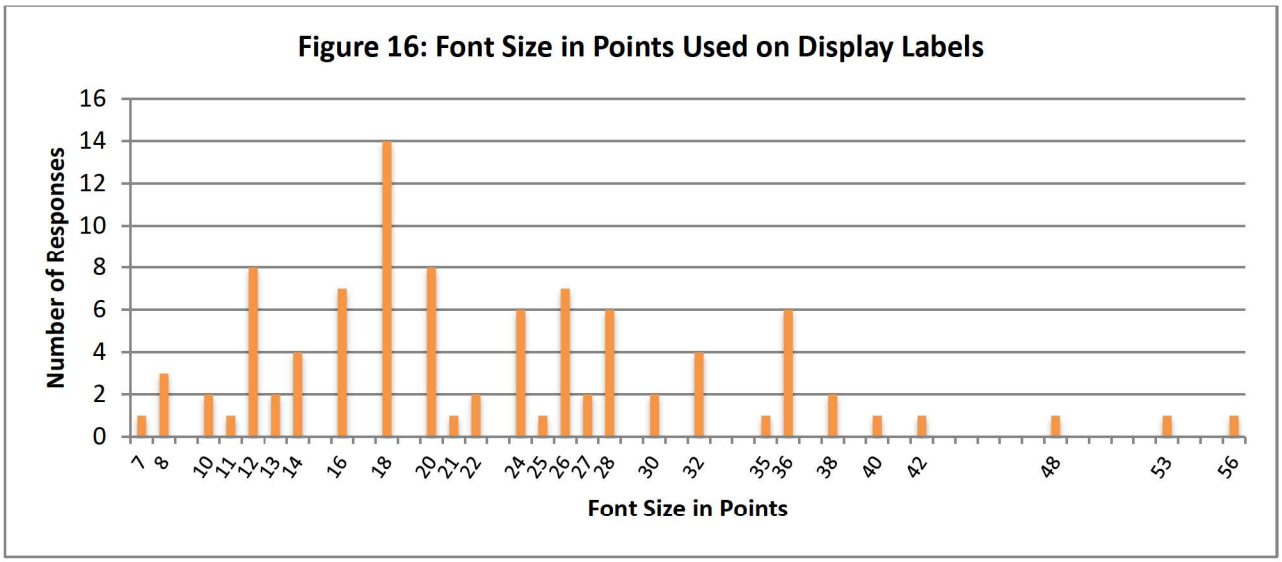


Figure 16: Font Size in Points Used on Display Labels

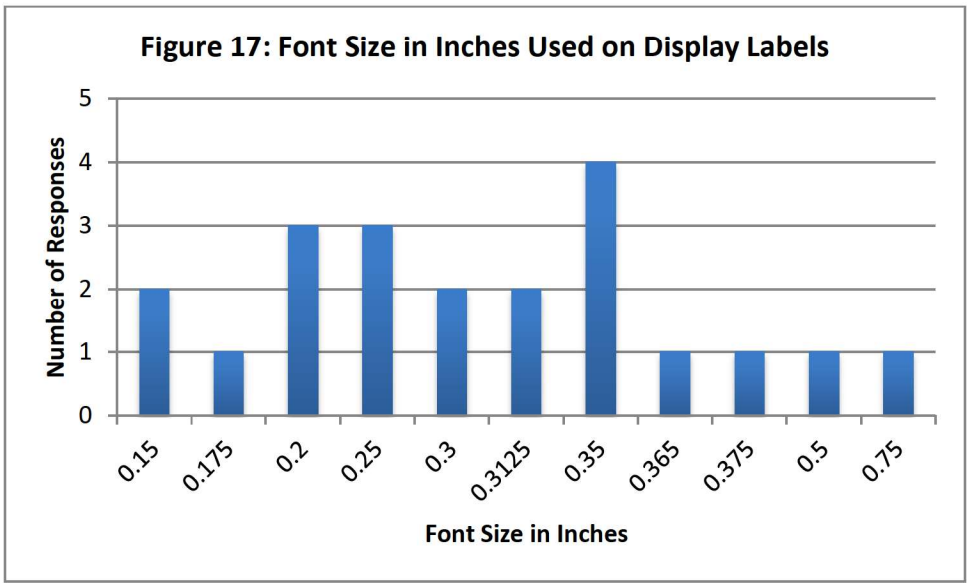


Figure 17: Font Size in Inches Used on Display Labels

Lines of Information Per Display Label (75 responses)

Forty percent of the respondents that answered the question use four lines of text on each display label (see Figure 18). The next most common answers were three lines of text (19%) and five lines of text (16%).

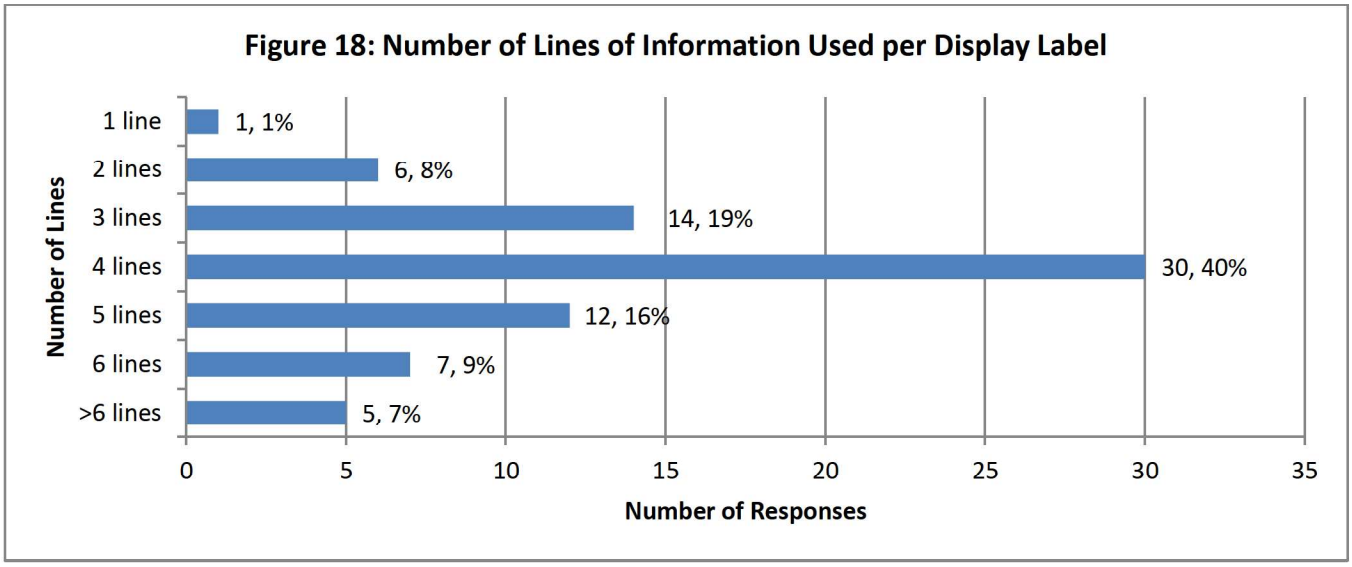


Figure 18: Number of Lines of Information Used per Display Label

Methods for Accommodating Long Text (71 responses – multiple responses accepted)

When text was too long to fit on one line in the respondent's typical display label format, two common strategies were employed: shrinking the font size (48) and adding a line (38). See Figure 19. Other frequently noted strategies included adjusting line spacing (12), adjusting wording (12), and abbreviating content (11).

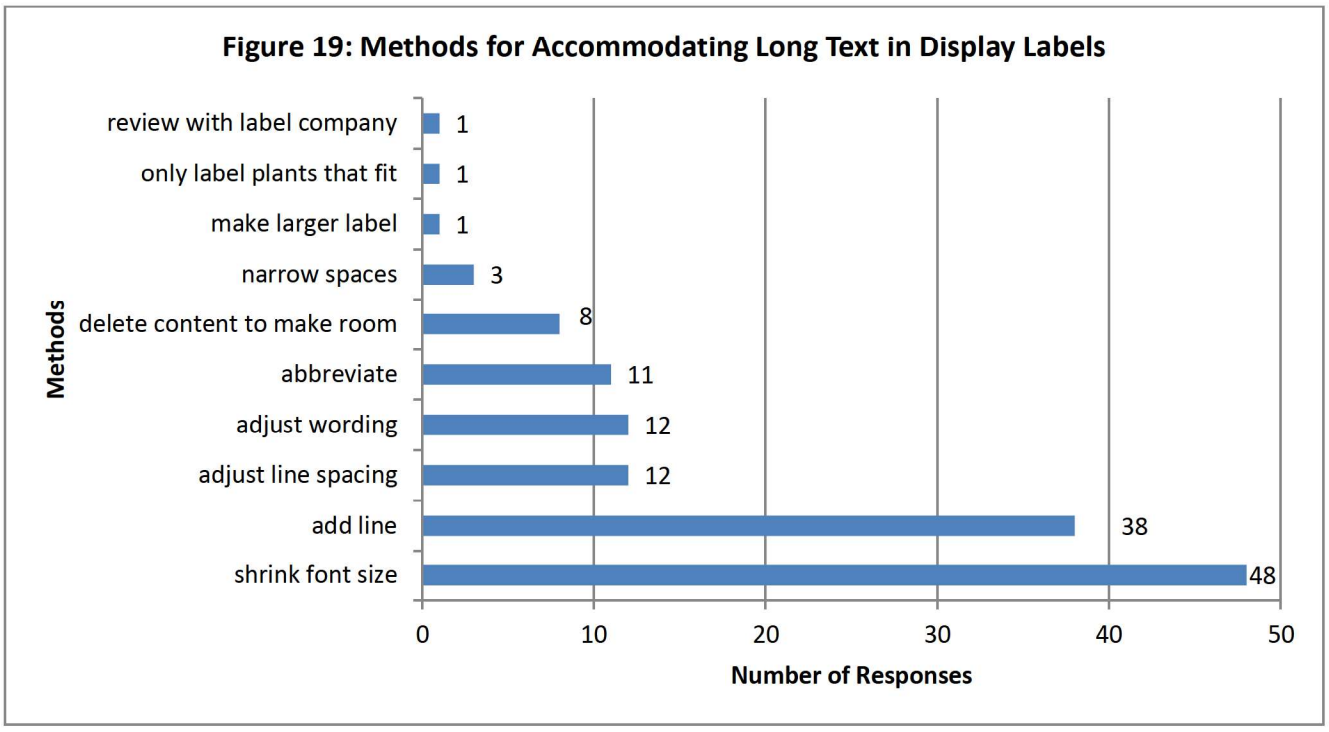


Figure 19: Methods for Accommodating Long Text in Display Labels

Information Included on Labels (76 responses – multiple responses accepted)

Of the 76 institutions that answered this question, 75 use both Latin name and common name on their display labels. The other most commonly used informational categories are family name (58) and native range (51). See Figure 20 for remaining information fields.

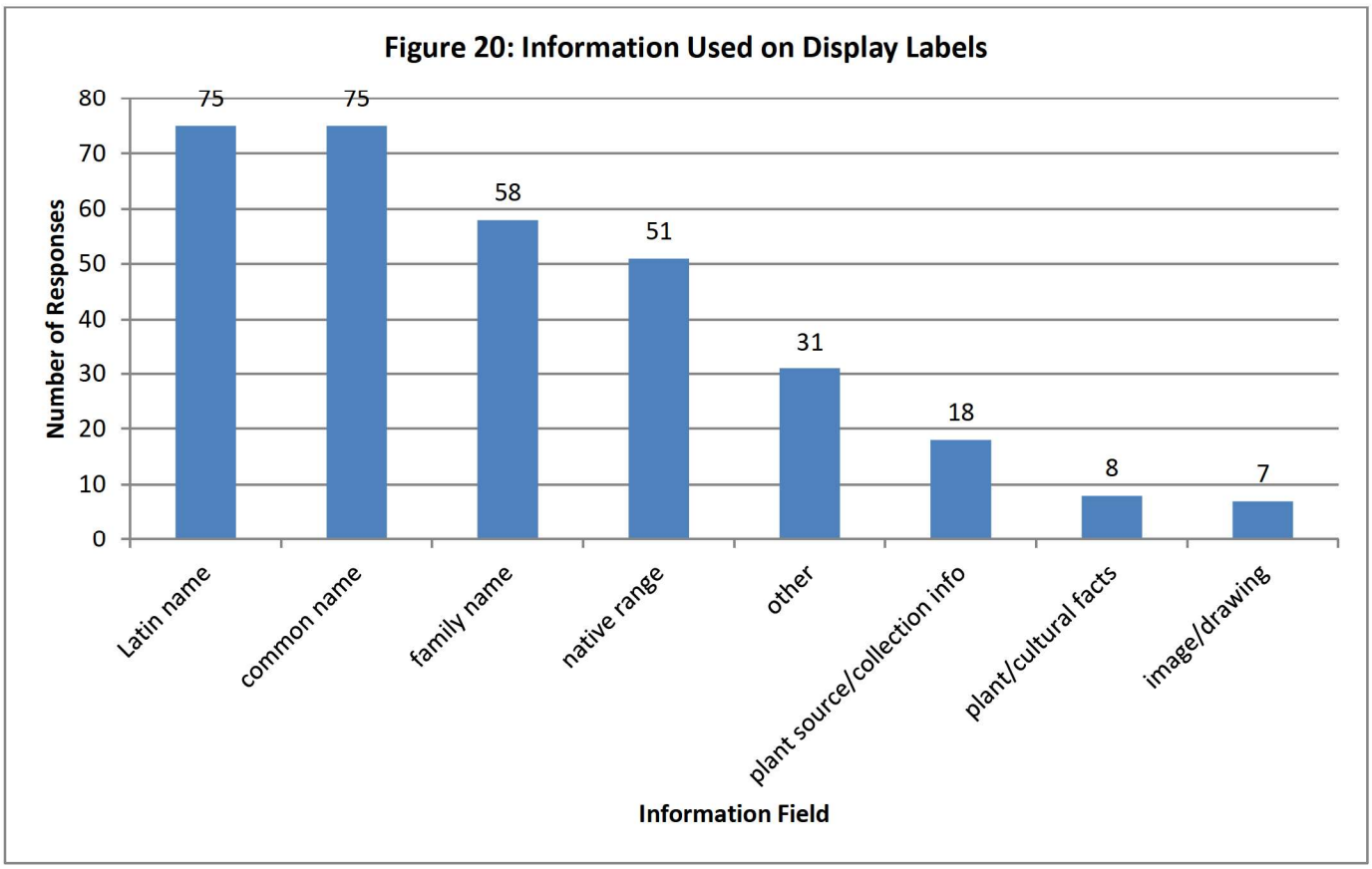


Figure 20: Information Used on Display Labels

The category of "other" had a high response rate of 31 instances and included family common name (6), institutional logo (5), introduction information (3), and conservation status (3). See Figure 21.

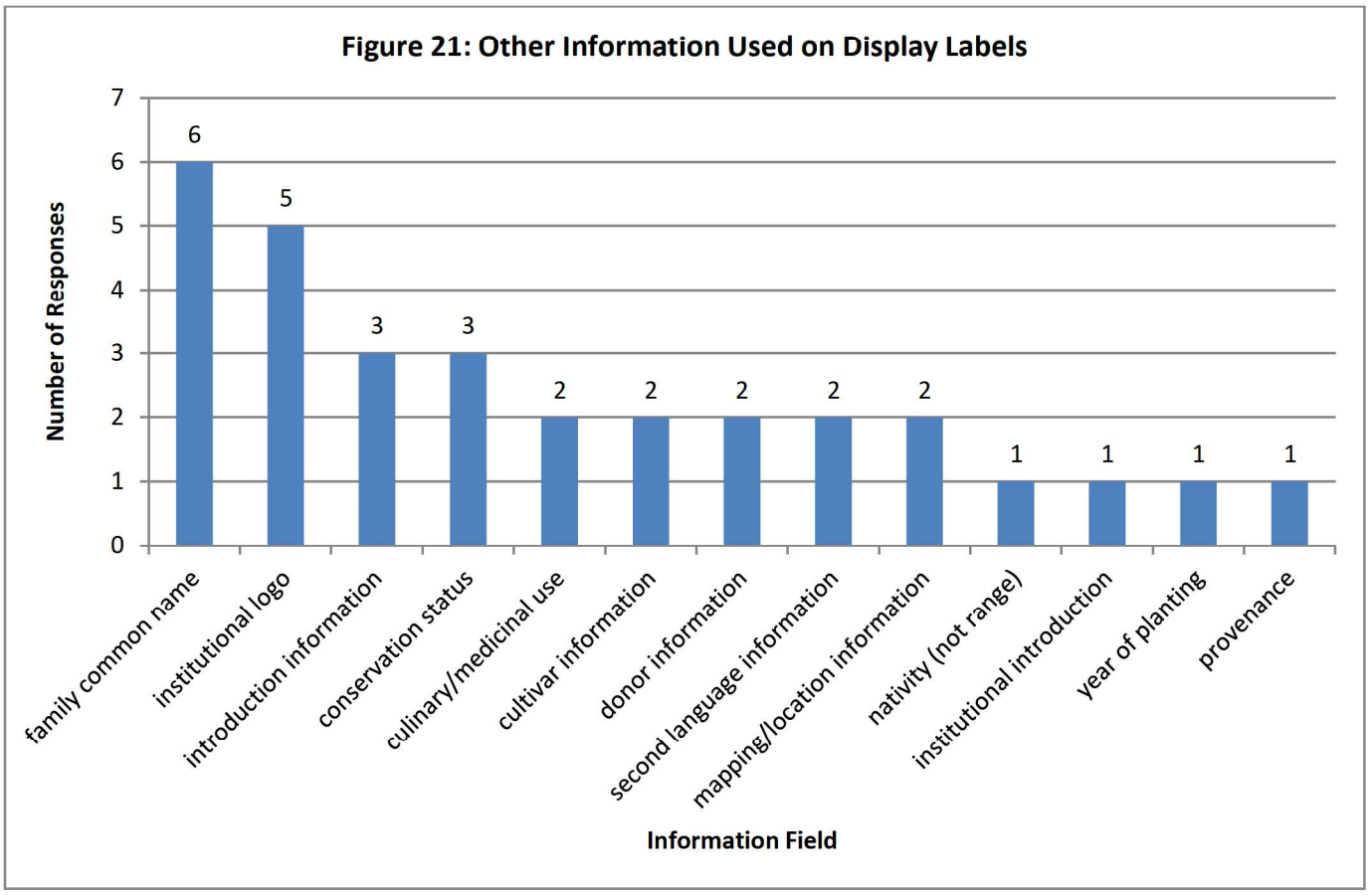


Figure 21: Other Information Used on Display Labels

Any open response "other" answers that clearly fell into a pre-established category were adjusted accordingly. For example, the answer "cultivar" was counted in conjunction with Latin name response.

Information Line Order (75 responses)

Common and Latin names were consistently used in the top two lines of the label.

- Common Name (74 responses) – 76% used common name in top two lines, while 45% used it as the first line
- Latin Name (75 responses) – 84% used Latin name in the top two lines, while 55% used it as the second line

Native range (62 responses) was most commonly used as the fourth line (40%), but also frequently used in third (13%) and fifth (18%) lines.

Family name (66 responses) was most often reported as used in the third line (45%). It was also heavily reported in the first line (17%) and fourth line (11%).

Accession number (45 responses), image/drawing (40 responses), and plant facts/cultural information (45 responses) were each used by 36% of respondents, and were cited to be used on any given line.

Other information (49 responses) was most often used in line five (20%) with less distribution in lines one through four and six (8%), (6%), (6%), (10%), and (6%) respectively. One respondent used other information in line seven.

Label Installation

Label Installation Methods (75 responses – multiple responses accepted)

The overwhelming majority of respondents (97%) use stakes of some kind to install their display labels. Fewer use wire (27%) or drill their display labels directly into plants (17%). Thirteen percent of respondents included additional installation methods as part of the "other" category. See Figure 22. These included wooden bases unattached to the plant, double-sided and dual-lock tapes, plastic spiral attachments, large rocks, and fences. See Figure 23 for all responses included in the "other" category. There is no apparent correlation between display label acquisition and installation methods.

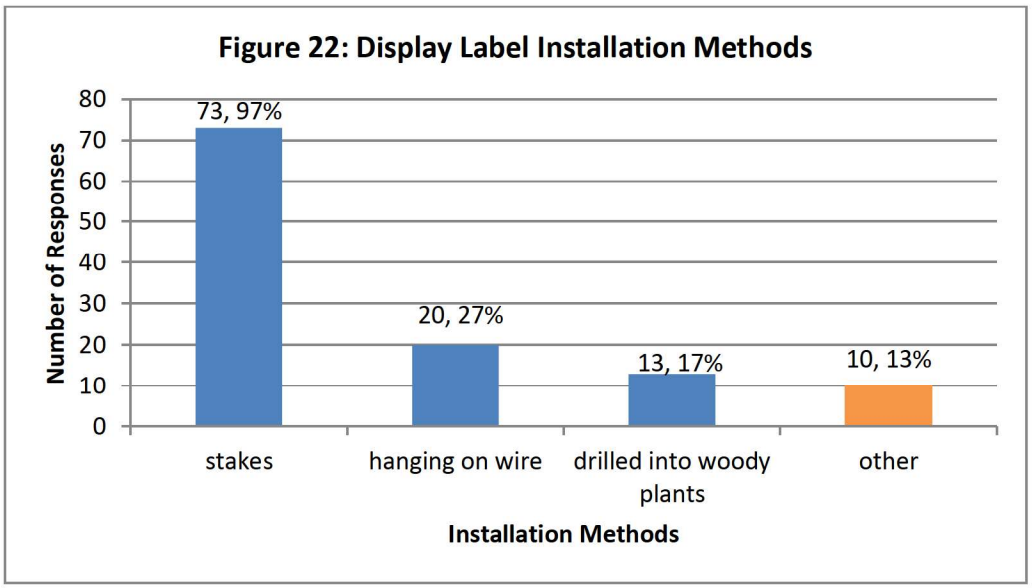


Figure 22: Display Label Installation Methods

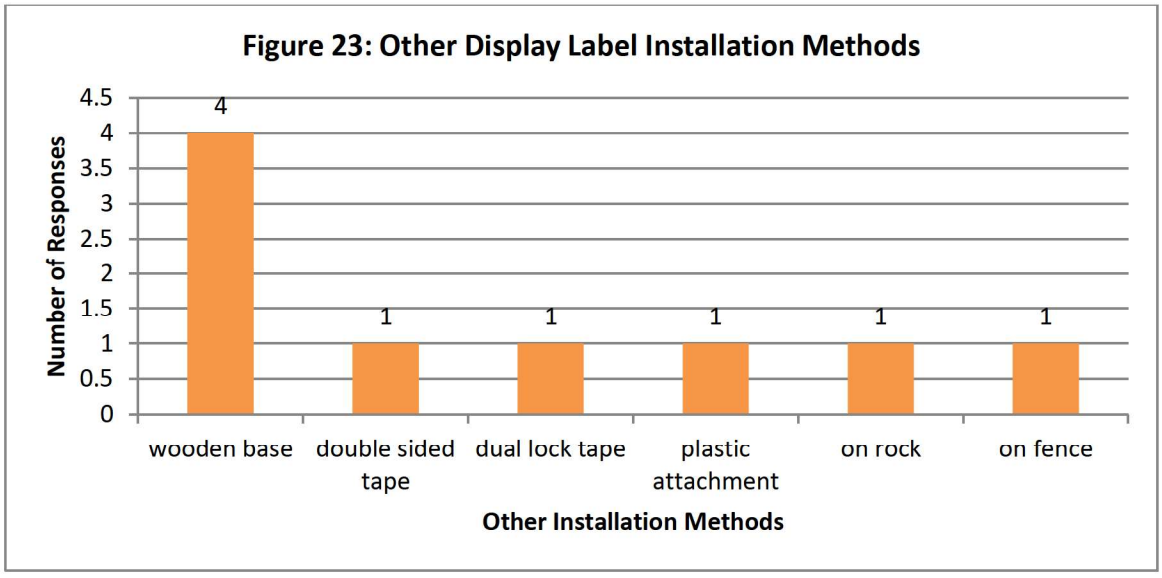


Figure 23: Other Display Label Installation Methods

Tree attachment hardware/methods (48 responses – multiple responses accepted)

Forty percent of responding institutions were clear that they do not fasten labels to trees. Among institutions that do fasten labels to trees, the most common tree attachment methods were stainless steel screws (9),

stainless steel nails (6), and coated wire (4). Seven institutions cited using stainless steel springs along with their other attachment methods to aid in stability while still allowing for tree growth (see Figure 24).

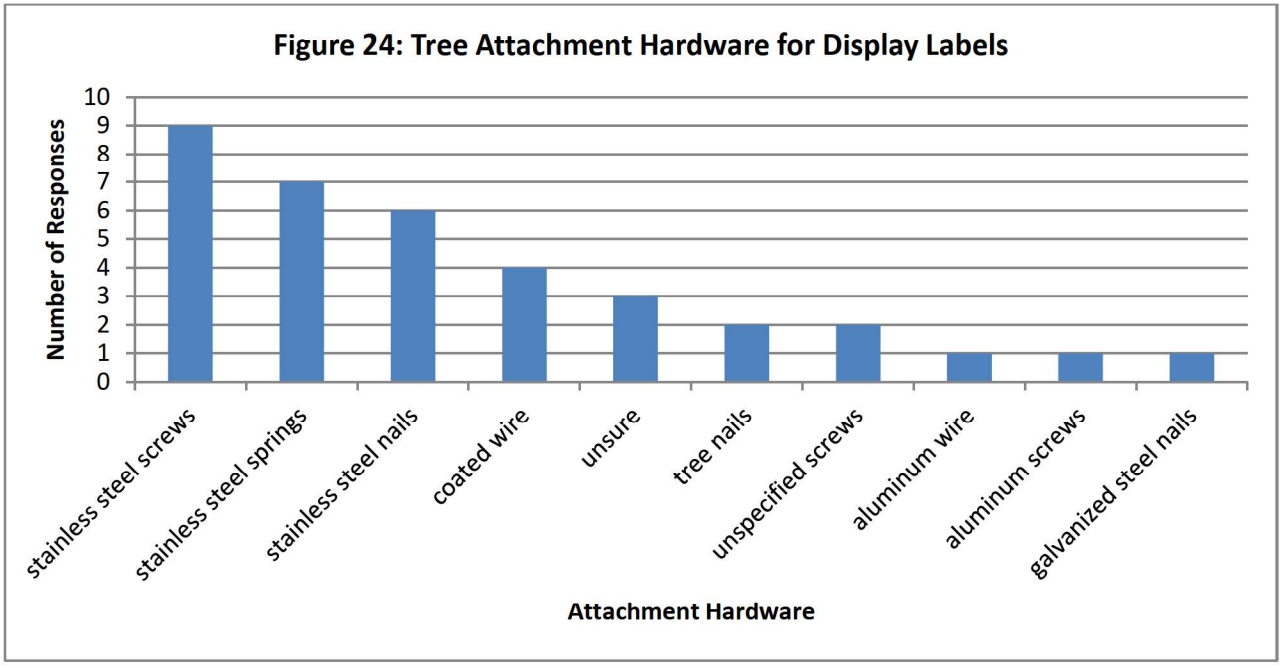


Figure 24: Tree Attachment Hardware for Display Labels

Corner Types (75 responses)

Fifty-three percent of respondents use labels with rounded corners, while 41% use square edges. The remaining 7% used "Other" corner types, including square edges that are filed to be round, or using a mix of corner types on different labels. One response in the "other" category noted that the square corners cut people. This was corroborated by respondents in the comments section, as well as through a photograph submitted by one institution (Figure 25).

Figure 25: Injury from squared-corner label (photo courtesy of Newfields)

Figure 25: Photo of Injury from Squared-Corner Label

Label Storage

Storage Practices (76 responses)

Fifty percent of responding institutions do not store their display labels in any capacity. Storage practices varied for labels used to identify plants in permanent institutional collections versus those used to identify annual plants, which are typically grown for only a portion of the year in changing garden displays. Twenty-five percent store a combination of collections and annual labels, 17% keep only annual labels in storage, and 8% store only collections labels. No institutions bring all of their labels into storage seasonally (Figure 26).

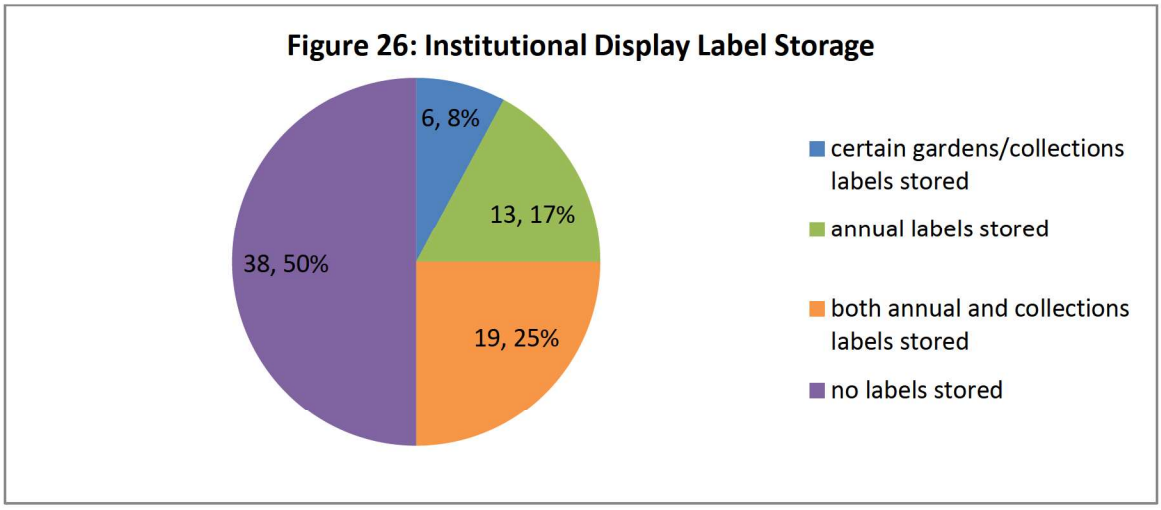


Figure 26: Institutional Display Label Storage

Storage Method (66 responses – multiple responses accepted)

Among institutions that store their display labels, 34% do so detached from stakes/brackets while 51% keep labels and mounts assembled during storage.

Storage Location (45 responses)

Work rooms and retired card catalog cabinets were the two most popular storage options (12) while buckets, boxes, and bins were the next most popular (7). See Figures 27 and 28 for examples of each type of storage location.

Figure 27: Display labels stored in a retired library card catalog at the Denver Botanic Gardens

Figure 27: Photo of Display labels stored in a retired library card catalog

Figure 28: Open bin storage at the Huntington Library, Art Collections, and Botanic Gardens.

Figure 28: Photo of Open Bin Storage of Display Labels

Life Expectancy & Maintenance

Display Label Life Expectancy (76 responses)

Of institutions responding to this question, 93% expected their display labels to last over 3 years. Additional comments included that MetalPhoto® labels last 20+ years, damage shortens the lifespan, sunlight can fade plastic and anodized aluminum labels, paper labels need to be reprinted every 3-5 years, and that many labels can last 6+ years.

Frequency of Maintenance (75 responses)

Of institutions that answered this question, 52% maintain their labels on an "as needed" basis while markedly fewer institutions (13%) do maintenance on a 2-5 year schedule. Nine percent tend to their labels semi-annually, another 9% do so weekly, and 8% do so annually. The least common maintenance intervals were monthly (5%) and daily (3%). See Figure 29.

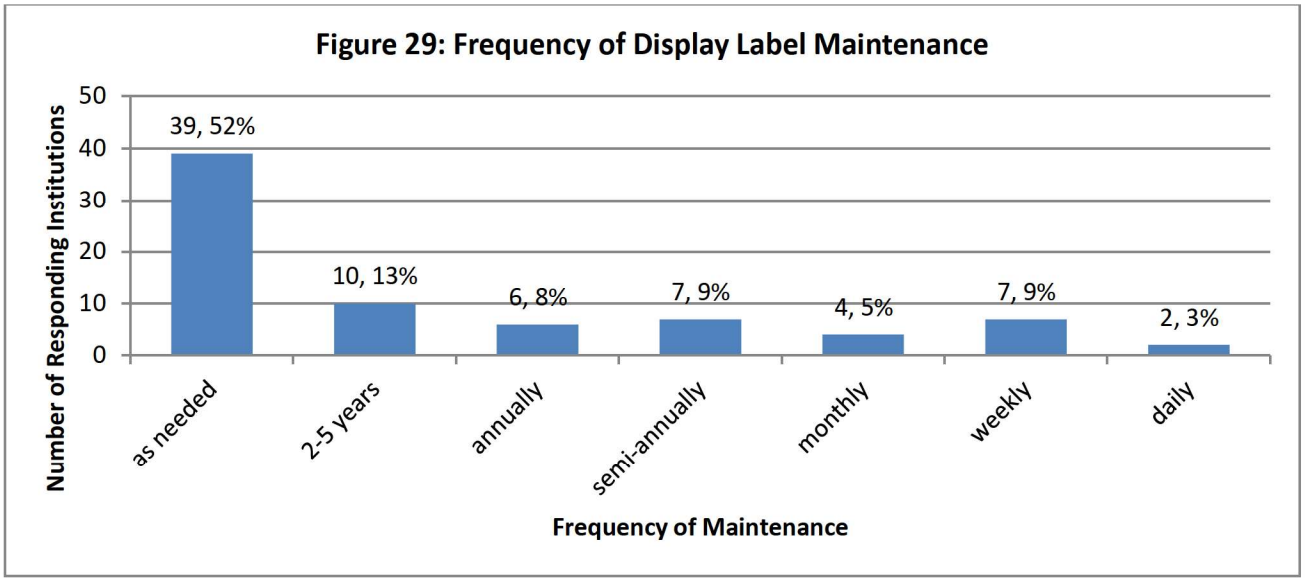


Figure 29: Frequency of Display Label Maintenance

Additional comments included that staff members maintain labels in their own garden areas, and that adjustments are made during garden work or as problems are seen. Some institutions use volunteers for their maintenance or check display labels during their collections inventory process.

Purchased versus In-House Fabrication

Display Label Acquisition (76 responses)

Of institutions that responded to this question, 56% fabricate their labels in-house while 44% purchase either the sign/plaque portion or the sign in addition to the mount, such as the stake. Of those institutions that purchase their labels, 64% purchase the sign plus the mount, while 36% purchase only the printed sign from an outside vendor (see Figure 30).

When comparing the label acquisition types to institution size there is a general trend that organizations within the higher operating budget categories, $1M and up, are more likely to fabricate their labels in-house, and organizations with operating budgets under $1M are more likely to purchase at least part of their labels (see Figure 31).

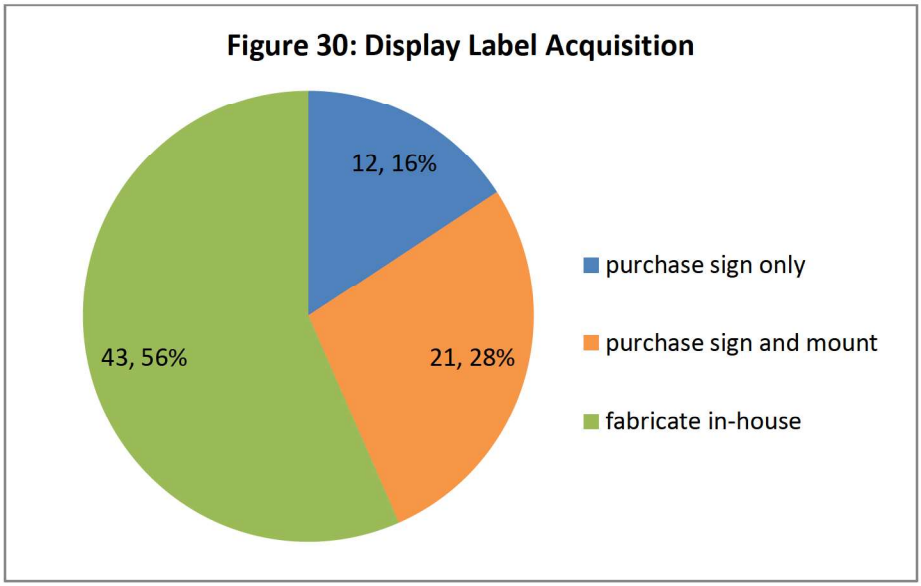


Figure 30: Display Label Acquisition

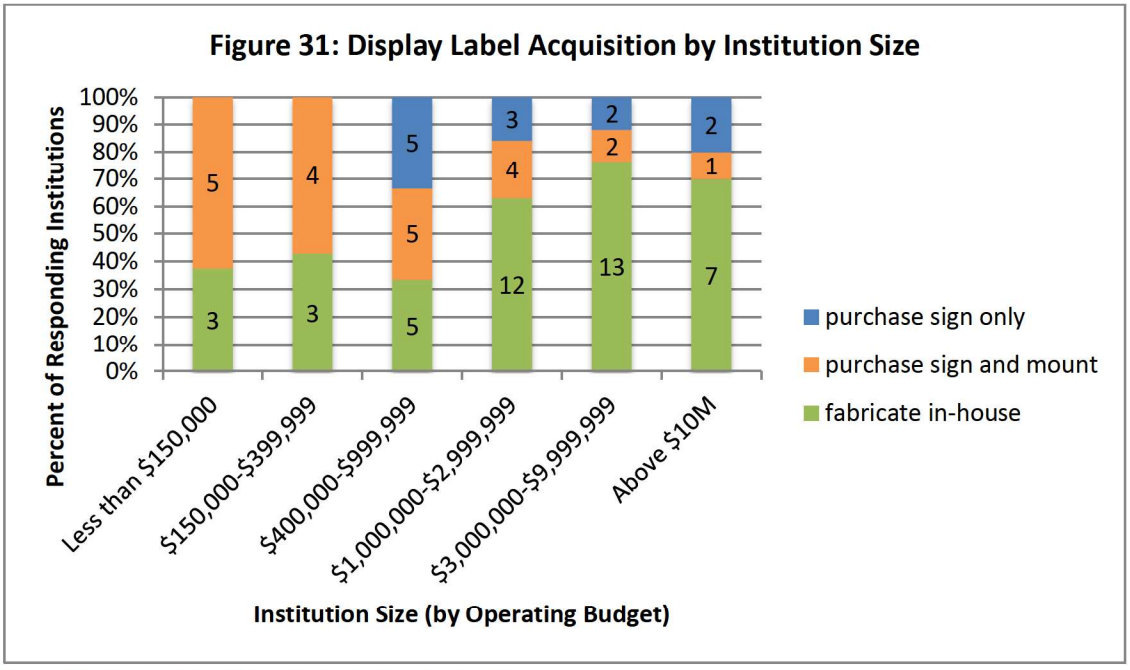


Figure 31: Display Label Acquisition by Institution Size

Display Label Size (100 responses -- multiple responses accepted)

Institutions that fabricate their labels in-house are more likely to use more than one size of label. Nearly 75% of institutions that make their own labels use more than one size, while just over 50% of those who purchase their labels use more than one size.

Label size data provided by respondents was organized into categories for ease of comparison (see Table 3).

Table 3: Smallest and largest display labels, categorized by purpose	
Label Type	**Dimensions (l x w)**
general smallest	1" x 3"
general largest	3.5" x 5.5"
herbaceous smallest	1.5" x4"
herbaceous largest	5.5" x 3"
long distance viewability/large plants smallest	3" x 4"
long distance viewability/large plants largest	5" x 8"
memorial smallest	4.25" x 4"
memorial largest	6" x 8"
miniature plants smallest	.75" x 2"
miniature plants largest	1.25" x 4"
woody plants smallest	2.5" x 5"
woody plants largest	4" x 6"
seasonal display smallest	1.5" x 2.5"
seasonal display largest	4" x 6"

Table 3: Smallest and Largest Display Labels Categorized by Purpose

Label Materials (88 responses)

The majority of responding institutions use aluminum (61%) or plastic (53%) for their labels, while some use both. Few institutions (10%) answered using the "other" category which included reverse engraved acrylic, paper, mixed materials, and Kynar®-coated aluminum. All "other" answers came from gardens that fabricate their own labels. Aluminum is the most popular material for purchased labels, while plastic is the preferred material of institutions that fabricate their own (see Figure 32).

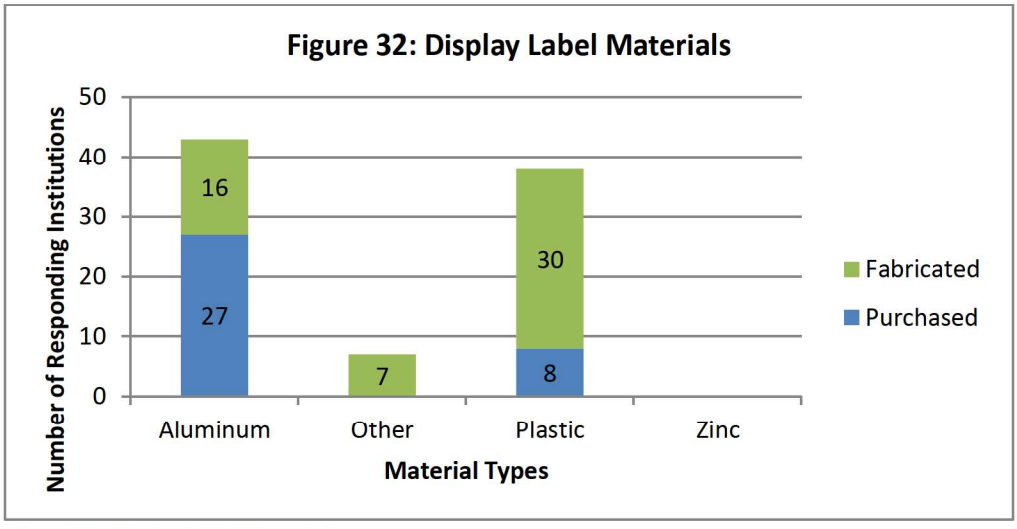


Figure 32: Display Label Materials

Cost Comparison (61 responses)

The survey asked respondents to include the label and all of the mounting material and fasteners in cost estimates. Staff time ordering label supplies, making the labels if applicable, placing the labels, and maintaining and organizing them was not factored into the cost of the labels.

There was not enough data to allow an accurate cost estimate for purchased plastic or paper labels. However, responses did show that, on average, fabricated aluminum labels are $0.50 cheaper per square inch of label surface area than purchased aluminum labels. Among the fabricated labels, aluminum was more expensive than plastic or paper. See Table 4. Table 5 shows the average, lowest and highest prices paid for display labels, regardless of label size.

Table 4: Average Cost of Fabricated and Purchased Display Labels per Square Inch by Material		
Material	**Fabricated**	**Purchased**
Aluminum	$0.60	$1.10
Plastic	$0.51	Insufficient data
Paper	$0.15	Insufficient data

Table 4: Average Cost of Fabricated and Purchased Display Labels per Square Inch by Material

Table 5: Average, Lowest, and Highest Prices Paid for Display Labels Fabricated In-House or Purchased		
Cost	**Fabricated (37 Responses)**	**Purchased (24 Responses)**
Average	$5.48 per all label sizes	$10.71 per all label sizes
Low	$0.42 for 2" x 4"	$0.70 for 2" x 3”
High	$16 for unspecified size	$35.00 for 6" x 8"

Table 5: Average, Lowest, and Highest Prices Paid for Display Labels Fabricated In-House or Purchased

Fabricated Label Systems

Machine Type (42 responses)

The most popular machines used for display label production among responding institutions are laser engravers (50%) and rotary engravers (38%). Photolabel (5%), and standard office printers (5%) and heat transfer (2%), are much less frequently used (see Figure 33).

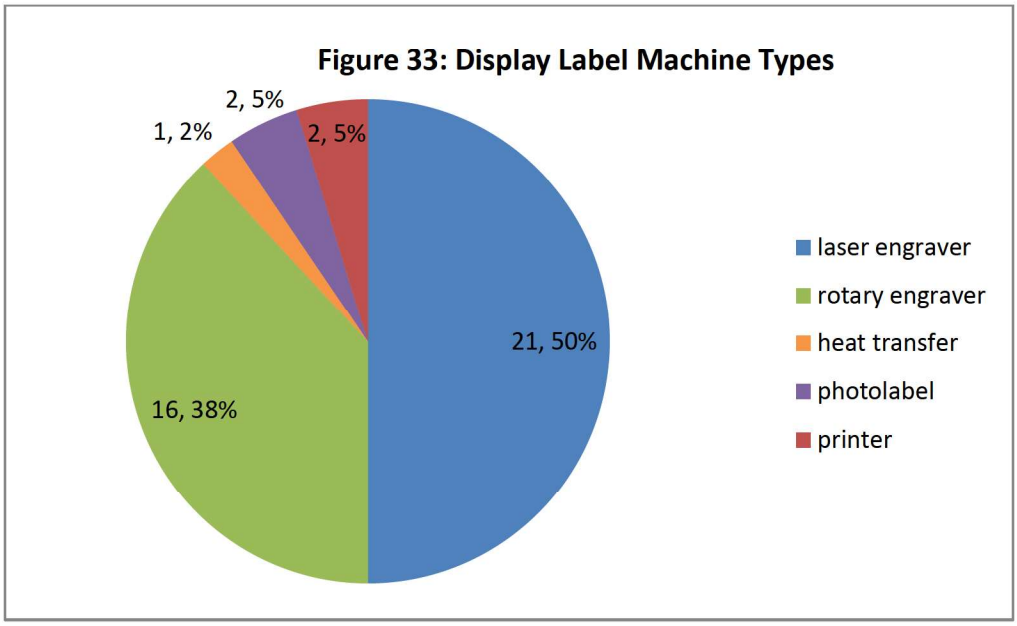


Figure 33: Display Label Machine Types

Machine Satisfaction Ratings (42 responses)

The overall average satisfaction score of all machines used by respondents for the in-house fabrication of display labels is a 4 out of 5. Heat transfer (1 response) had the highest satisfaction rate at 5.0, standard office printers (2) had the next highest average at 4.5 followed by laser engravers (21) at 4.4, photolabel (2) at 4.0 and rotary engravers (16) at the lowest end receiving a 3.6 satisfaction rating (see Figure 34).

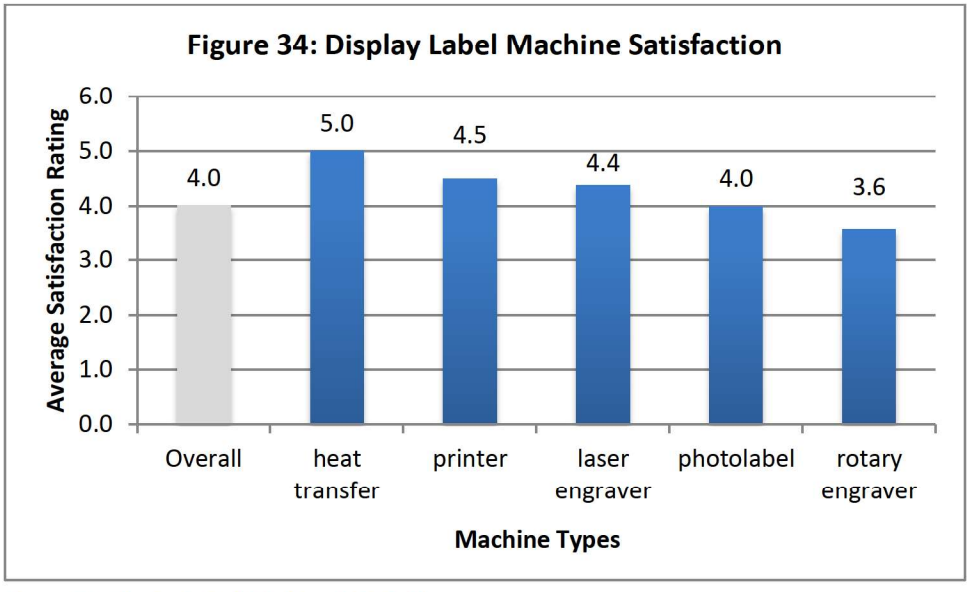


Figure 34: Display Label Machine Satisfaction

Machine Brands (39 responses)

This survey chose to focus on brand specifics for laser engravers and rotary engravers. As mentioned previously, there was more overall satisfaction with the laser engraver systems as compared to the rotary engraver systems. On average the rotary engraver systems are 4 years older than laser engraver systems. No rotary engravers were purchased by respondents in the year preceding this survey, 2017, but two laser engraver brands were.

Laser Engravers (20 responses)

The most commonly used laser engraver brands among respondents are Epilog and Universal Laser (both 35%), followed by Gravograph (20%). LaserPro (5%) and Xenetech (5%) were used by a smaller percentage of respondents (see Figure 35).

Of the three most common brands, Universal Laser had the highest satisfaction rating at 4.7 out of 5 followed by Epilog (4.4 out of 5) and Gravograph (4 out of 5) (see Figure 36).

As of this survey in 2018, the average length of time for laser engravers in use regardless of brand was 6.9 years. Gravograph (4 responses) machines were reported as the fewest average years of use at 4.5 years, with one machine reported in use since 2008. One response for LaserPro reported 6 years in use. Epilog (6.8 years of use average, 7 responses including 1 unknown year), and Universal Laser Systems (8 years of use average, 7 responses) each had one machine reported in use since 2002. Xenetech seems to have the average with most years in use (10 years) but the average was based on only 1 response. See Figure 37.

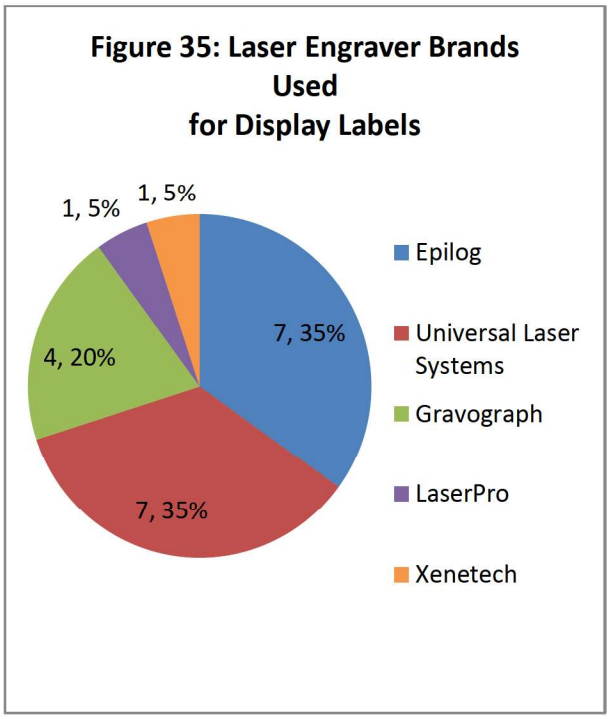


Figure 35: Laser Engraver Brands Used for Display Labels

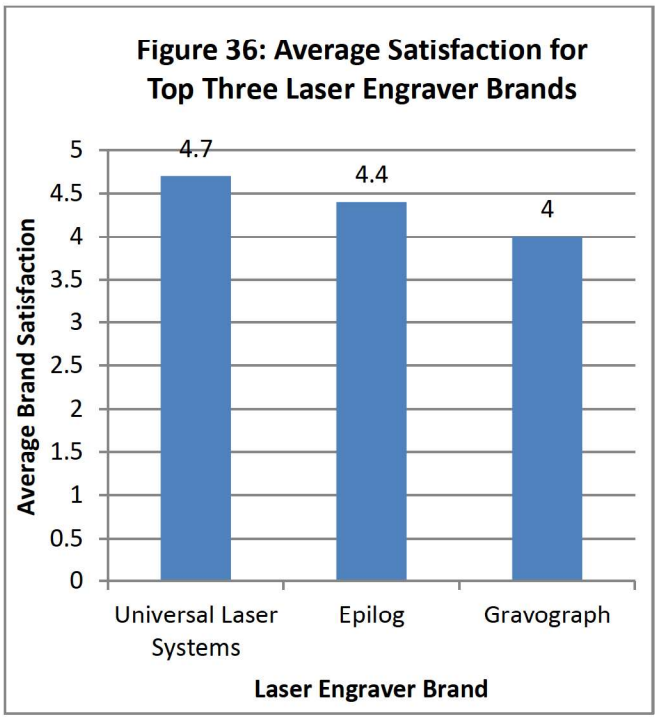


Figure 36: Average Satisfaction for Top Three Laser Engraver Brands

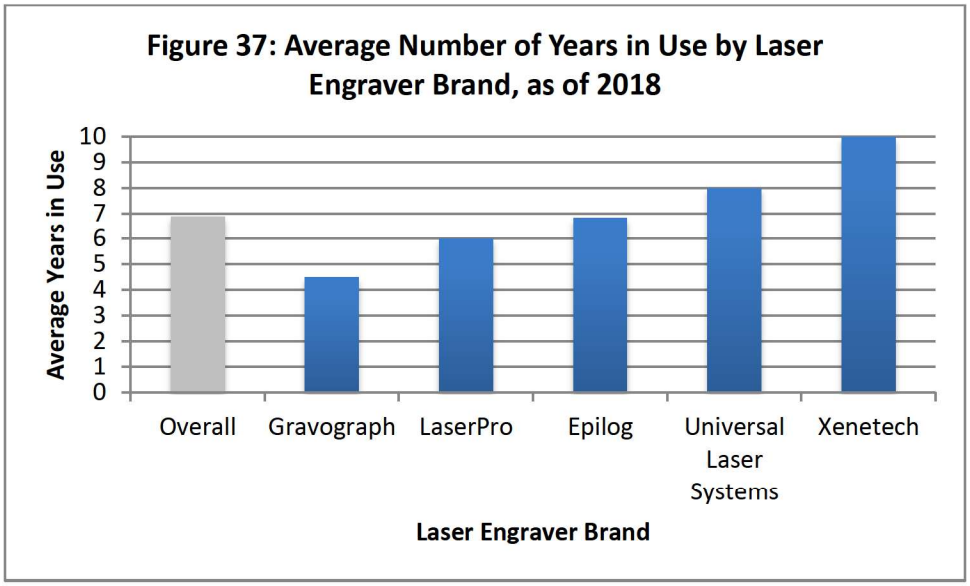


Figure 37: Average Number of Years in Use by Laser Engraver Brand, as of 2018

Rotary Engravers (16 responses)

The most commonly used rotary engraver brand among respondents is Vision (37%) followed by Gravograph (31%) and Dahlgren/Suregrave and Xenetech (both 13%). One institution's rotary engraver brand is unknown (see Figure 38).

Gravograph (6 responses), Vision (5 responses), and Xenetech (2 responses) rotary engravers each had an average satisfaction rating of 3.5, while Dahlgren/Suregrave (2 responses) and the unknown label printer had an average satisfaction of 3.0 (see Figure 39).

As of this survey in 2018, the average length of time for rotary engravers in use regardless of brand was 9.4 years. Vision machines, with 6 responses, were reported as the fewest average years of use at 7.5 years, followed by 1 institution that reported an unknown brand that was 8 years in use. Gravograph machines (5

responses) averaged at 9.4 years. Xenetech and Dahlgren/Suregrave both had 2 responses, with their machines' average years in use at 12.5 and 13 years respectively. See Figure 40.

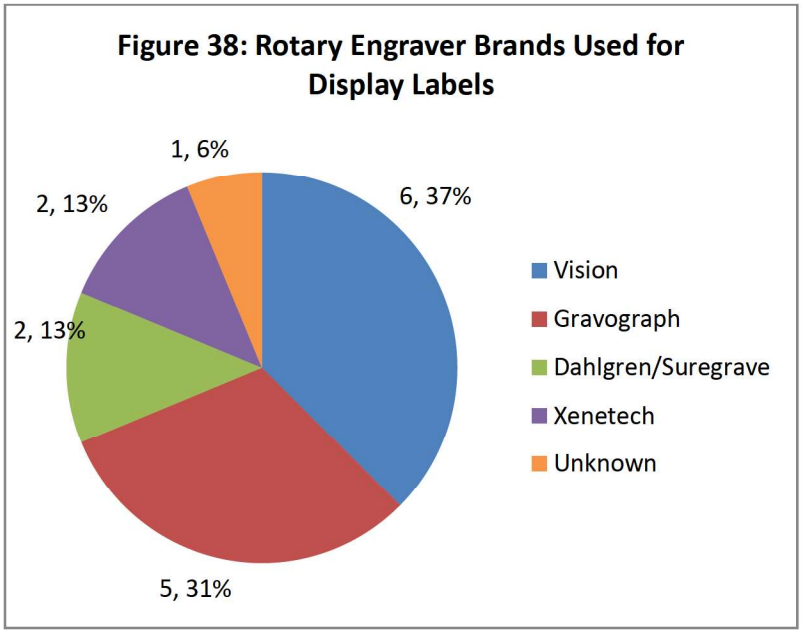


Figure 38: Rotary Engraver Brands Used for Display Labels

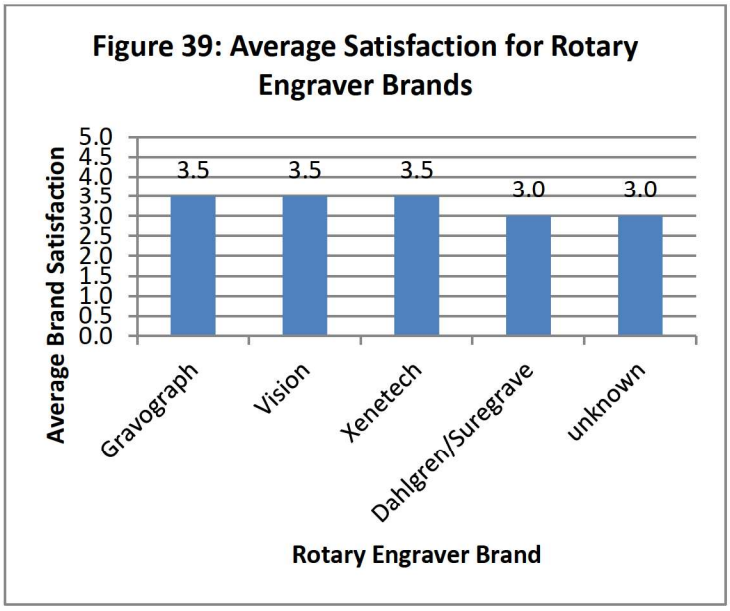


Figure 39: Average Satisfaction for Rotary Engraver Brands

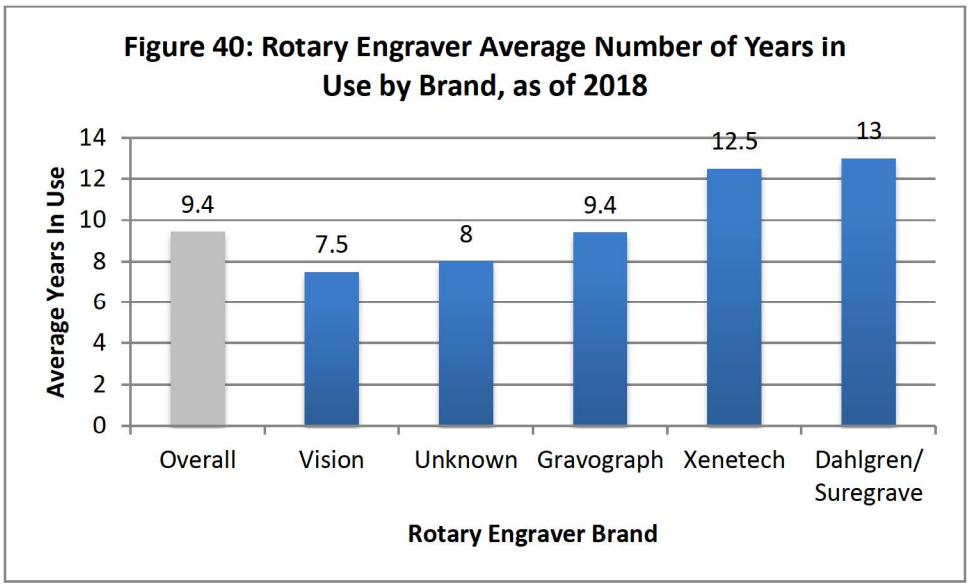


Figure 40: Rotary Engraver Average Number of Years in Use by Brand, as of 2018

Software (38 responses)

Table 6 shows the software types and number of responses for the in-house, fabricated labels. See Appendix C, Vendor And Software Information, for more detailed information.

Table 6: Software used by member institutions for their in-house, fabricated labels	
Software	**Number of Responses**
Corel	8
Gravostyle	8
Vision	6
Microsoft	4
Adobe	3
Xenetech	3
FileMaker Pro	2
EngraveLab	1
NiceLabel	1
SuperPro	1
unknown	1

Table 6: Software used by member institutions for their in-house, fabricated labels

Additional comments received in the in-house display label fabrication survey section:

- We have been looking for ways to attach labels to trees without nailing into the tree.
- We wish that we had a more environmentally friendly process to make durable outdoor labels in-house. We have not been able to determine the makeup of the plastic in our label templates, but we also know that MetalPhoto process is environmentally destructive as well as expensive. The plastic labels have numerous problems but do allow us to more freely design each label, and can be remade or replaced more easily when problems arise.

- We are beginning to use waterproof paper for annual and short-term labels as it lasts about one year and is much less expensive.
- Temporary display labels are used for newly planted plants. Permanent labels are made and installed after about a year.
- Our display labels are made in house, but by a different department.
- The base for our labels can be used over and over again as the labels can be pulled off clean. So we get many cycles out of them.
- Rivet gun, Gesipa AccuBird
- [In-house fabrication of display labels] is a time suck but drastically reduces the cost of signage. Training volunteers and students is proving very important to stay on top of the demand for signs.
- Try to limit the amount of display labels on wire as we don't have the staffing capacity to move labels as woody trees grow.
- We do buy the BLANK display and accession tags/signs, of course... didn't think you meant anyone would actually make the metal plates on site, but just confirming this.
- Maintenance of display signs is ongoing and very time consuming.
- For us the tall stakes are the expensive item. I reuse them as much as possible.
- We have a huge stock of springs and screws for trunk mounting so we haven't had to purchase any for decades.

Purchased Label Systems

Entire Product versus Label Only (33 responses)

Of label purchasers that responded to this question, 64% acquire the entire product from their vendor while 36% receive the label portion only.

Vendor Information for Purchased Display Labels (29 responses)

Of respondents that purchase display labels, 52% reported using Lark Label, 29% use Nameplate and Panel Technology, 9% use Precision Signs and Labels, and 5% purchase from Colmet Metal Sign and MetalPhoto of Cincinnati (see Figure 41). This data could potentially be skewed due to a miscommunication that led one vendor to share the survey with its client base. The authors were careful to only include responses from institutions that were American Public Gardens Association members at the time of the survey. All non-member responses were excluded.

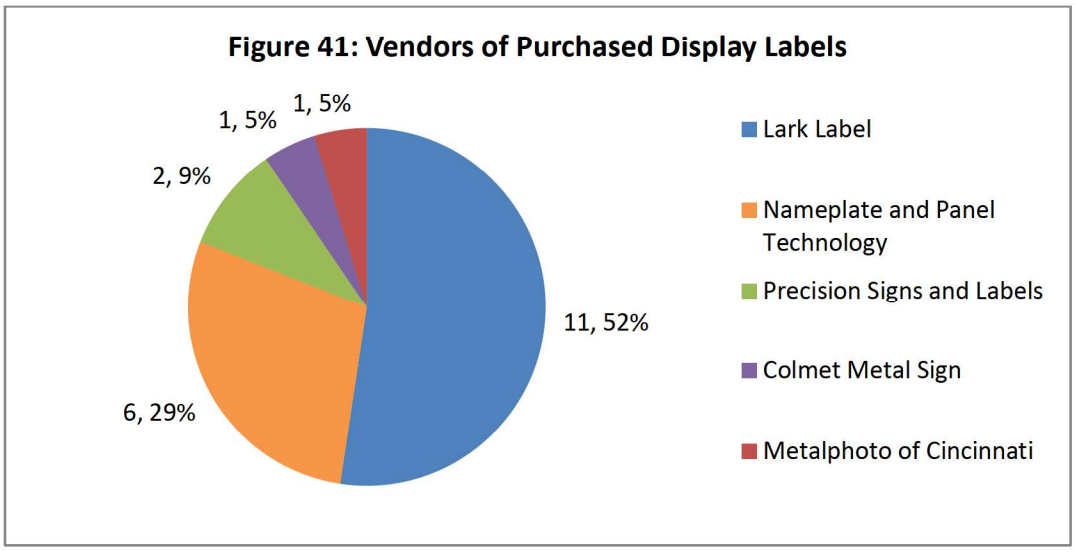


Figure 41: Vendors of Purchased Display Labels

Length of Time to Prepare Orders (28 responses)

There is a relatively even distribution of institutional time spent preparing a label order. Of responding institutions, 29% spend fewer than 4 labor hours preparing a label order, 39% spend 4 to 16 labor hours, and 32% spend more than 16 labor hours.

Length of Time to Receive Labels (28 responses)

The production time between when labels are ordered and when they arrive usually takes more than two weeks (57%) with fewer respondents receiving labels between one and two weeks after order submission (36%), and very few (7%) receiving labels in under one week (see Figure 42).

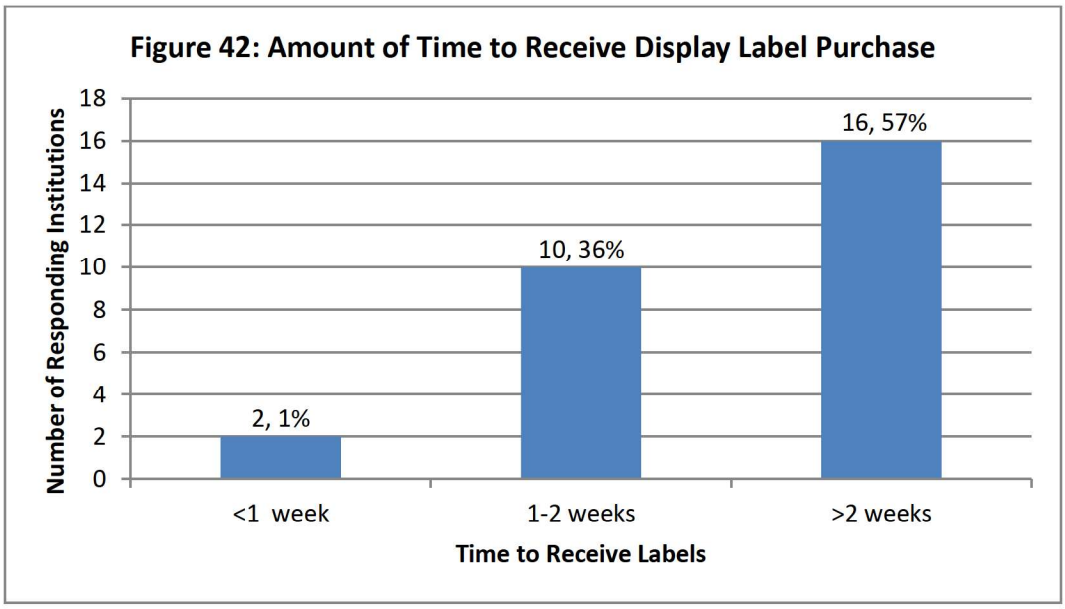


Figure 42: Amount of Time to Receive Display Label Purchase

Additional comments received in the purchased display label survey section:

- Colmet Galvanized Metal stakes disintegrate within five years due to soil chemistry interactions.
- One size display label fits all plants and plant groupings.
- Our process is in transition. With recent improvements to our bonsai and crevice gardens, we changed from engraved plastic to anodized aluminum in those areas. The aluminum product is pricier but we expect that it will look better for twice as long or more.
- Plastic paper temporary labels formatted and printed using ArcGIS software to duplicate background color and font of permanent labels. $5.15 - but cost is in the labor to hand cut them and mount with double sided tape.
- Researching native range is the most time consuming part of this process for us.
- Rivets improve life span of labels greatly.
- The process is inconsistent.
- We also have used Lark Label to produce some stakes that have just numbers on them that are cross referenced to a catalog of plants. This is used for plants in our Cactus and Succulent House display. We've also used MCG Biomarkers for temporary display labels, mostly on annuals or spring bulb displays.
- We are developing larger signage for perennial beds that would eliminate the need for many individual labels. During the winter some of our beds become a "label garden".
- We are in the process of changing the source/style and information about our display labels.
- We are investigating going away from having labels already attached to stakes and looking for another way to do this so that storage is easier.
- We create temporary labels using plastic paper for seasonal, short-term plantings.
- We have experimented with laser printed labels stuck onto obsolete metal display labels (that is, reusing old stakes and labels with new plant info affixed). It works well enough for short-term display labeling like annuals.
- We've not added any new labels since our initial order that was paid for by a Stanley Smith grant.

Accession Labels

For the purpose of this survey a **display label** is defined as a placard placed in front of a plant for public use and education, while an **accession label** is a tag with specific accession information for institutional staff use and plant tracking. The term "fabricated" or "fabrication" refers to labels made in-house at an institution while "manufactured" or "purchased" refers to labels acquired from an outside vendor. Within the context of this survey, "make" is used as a general term, referring to both fabrication and purchase of labels.

Accession Label Use (78 responses)

Seventy-nine percent of respondents use accession labels. Nine percent of respondents use a single label type to accomplish both display and accession functions, while 70% of respondents have unique accession labels.
Of the institutions that do not have unique accession labels, 71% have operating budgets under $1M.

Quantity Made (54 responses)

Of institutions responding to this question, 47% fabricate in-house or purchase fewer than 500 accession labels per year, while 33% fabricate or purchase between 500 and 2,000, and 20% fabricate or purchase more than 2,000 labels per year.
Of respondents that fabricate or purchase more than 2,000 labels per year, 90% belong to the two largest institutional budget sizes, $3M-$9.99M and above $10M (see Figure 43).

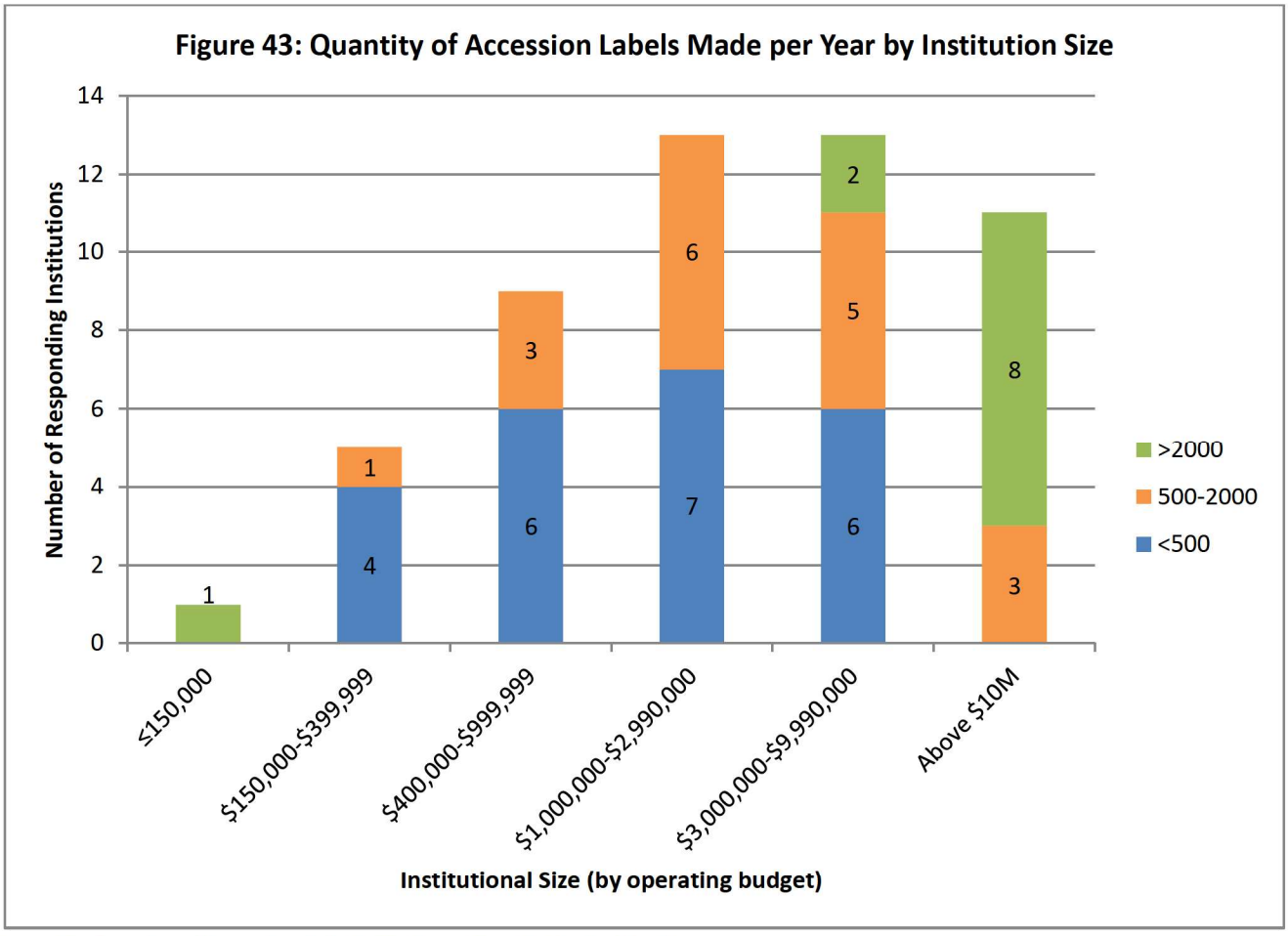


Figure 43: Quantity of Accession Labels Made per Year by Institution Size

Font Stylization

Font (54 responses)

The majority of institutions responding to this question were unsure what font was being used on their accession labels, or reported having no font choice due to machine limitations (69%).

Of the fonts that were individually cited, Arial, Courier (each 6%) and Helvetica (4%) were the most commonly used.

Italicization (54 responses)

A considerable majority of accession label users (85%) do not italicize Latin names.

When asked why they do not italicize (36 responses – multiple responses accepted), 81% responded that it was a limitation of the process or machine, while 11% cited legibility, and 8% mentioned the non-public nature of accession labels.

Font Sizes (41 responses - multiple responses accepted)

Of respondents to this question, 20% were unsure of the accession label font size they use, 2% use 0.12 inch font, and 2% use 0.25 inch font. Of font size measured in points, 37% use 12 point, 10% use 8 point, 5% use 20, 16, and 10 point font, and 2% use 4, 8.5, 9, 11, 14, and 18 point font. See Table 7 and Figure 44.

Table 7: Example of font sizes used on accession labels. Note that this example is in Arial (sans serif) and lowercase.	
smallest	8 point
largest	20 point

Table 7: Example of font sizes used on accession labels

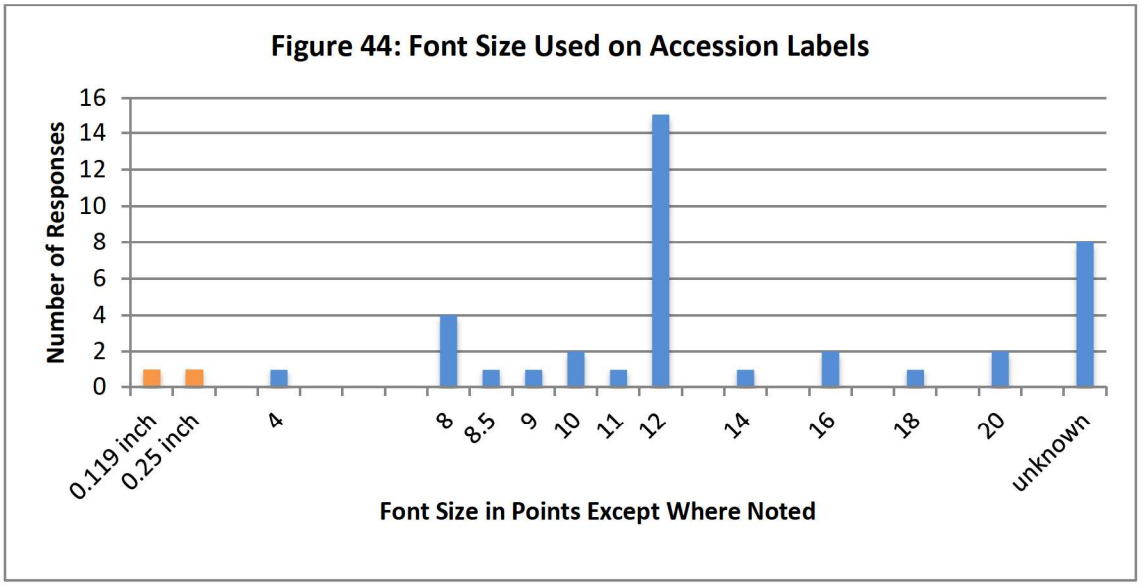


Figure 44: Font Size Used on Accession Labels

Label Sizes (52 responses - multiple responses accepted)

Regardless of whether fabricated in-house or purchased from a vendor, the mode (the value that occurred most often) for the height of the accession labels was 1" (16 responses), with 17 responses between 1.06" and 1.53", and 11 responses with height between 1.72" and 2.13". Five responses were between 3.38" and 4.5". The smallest height was 0.5" (2 responses) and the largest was 5" (1 response).

Four responses for width of accession labels were between 1" and 1.25". Ten responses were between 1.73" and 2.13". Fifteen institutions reported a width of 2.5" to 3.38", and the mode for the width was 3.5" (20 responses) and 1 institution reported a 4" width. The smallest width was 0.75" (1 response), and the largest was 5" (1 response).

When height and width are analyzed together as functions of each other as reported, the general trend for accession labels (21 responses) is in the range of 1" to 1.53" (height) x 3" to 3.5" (width), followed by 10 responses in the range of 1.72" to 2.13" (height) x 3.25" to 3.5" (width). Seven institutions reported a longer height (ranging from 2" to 5") than width (ranging from 1" to 3"). See Figure 45.

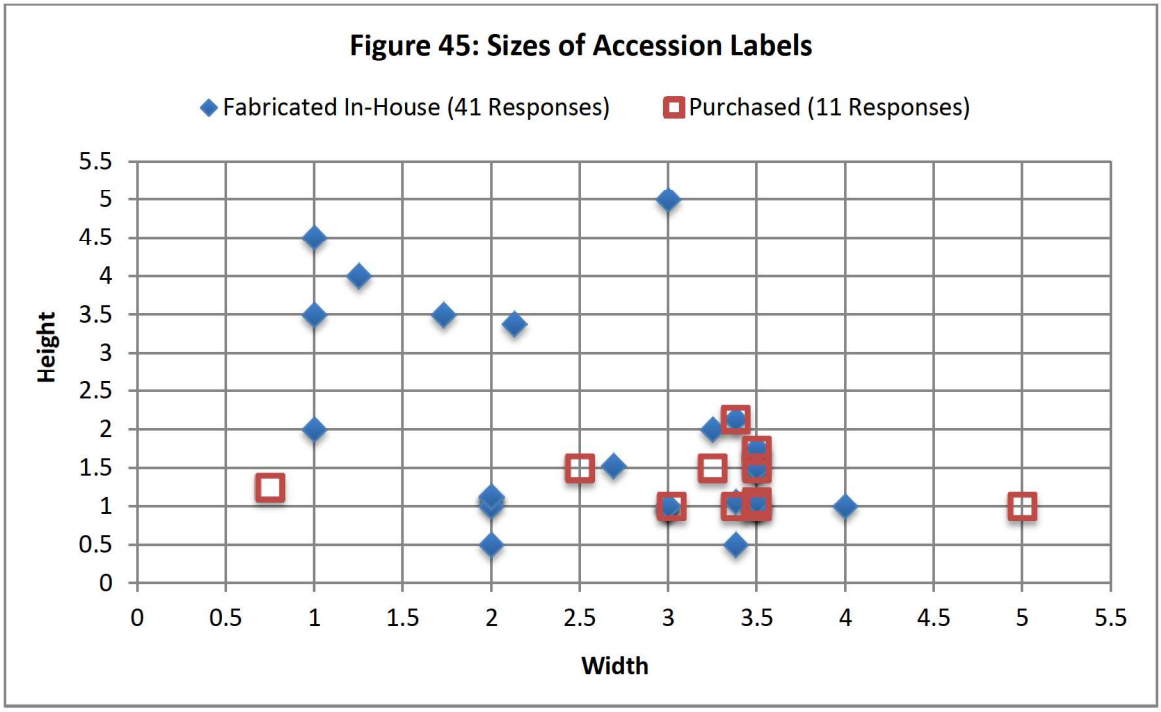


Figure 45: Sizes of Accession Labels

Lines of Information Per Label (55 responses)

The majority of accession label users include three (22%), four (22%), or five (24%) lines of information per accession label. Accession labels with six or more lines of text were used by 15% of respondents, while 18% of respondents produce labels with one or two lines of text (see Figure 46).

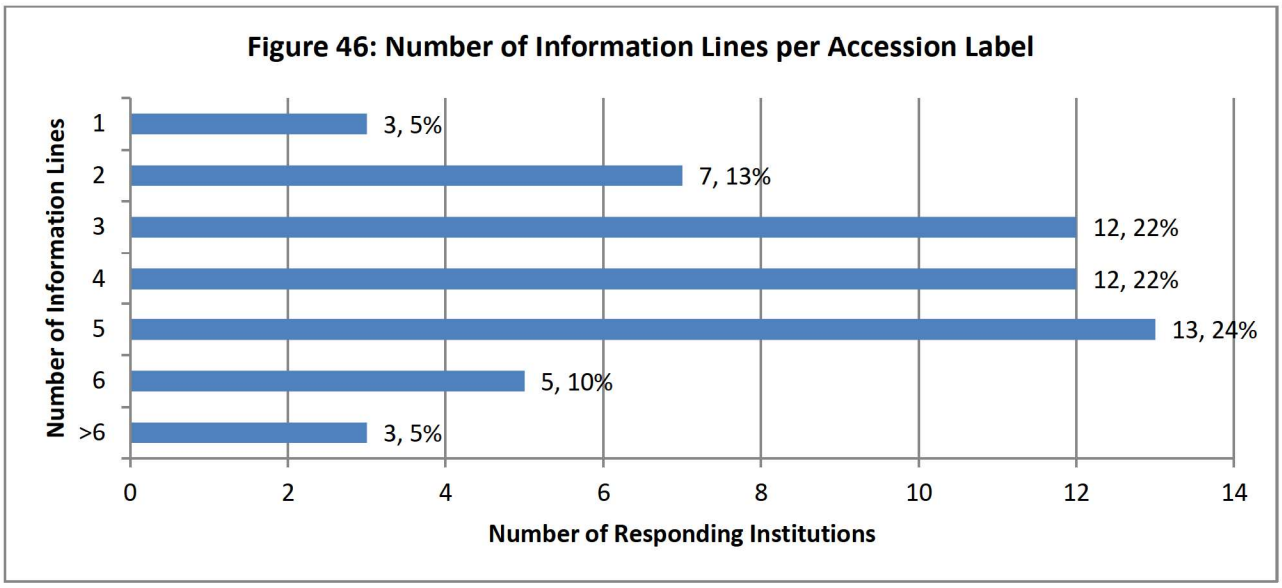


Figure 46: Number of Information Lines per Accession Label

Methods for Accommodating Long Text (48 responses)

Of respondents to this question, 50% add a line and wrap text if text is too long to fit on a single line. Fewer respondents choose to truncate information (12%), abbreviate information (19%), shrink font (17%), or change the label size (2%).

Information Included on Labels

Fields Used (54 responding institutions – multiple responses accepted)

Of respondents to this question, 98% include the accession number and 96% use the Latin name. Common name (36%), family name (35%), plant source/collection information (27%) and native range (20%) were also included by some respondents. Thirty-three percent of respondents cited "other" categories of data, including mapping information (13%), propagule/received as type information (7%), and parentage, planting date, patent information, quantities, staffing, lifespan, or special status (see Figure 47).

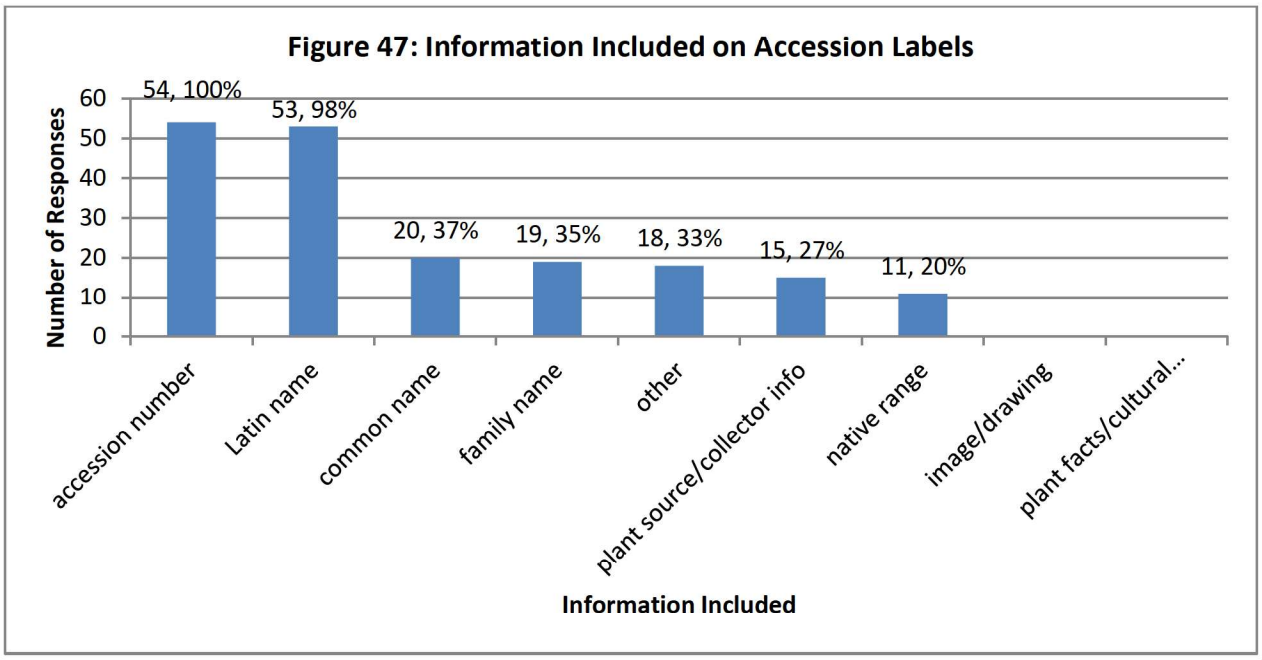


Figure 47: Information Included on Accession Labels

Label Installation

Accession Label Attachment (56 responding institutions – multiple responses accepted)

Of institutions responding to this question, 66% used thin, flexible wire to affix their accession labels to their plants, 41% used stakes, 34% used a thick or rigid wire driven into the ground, 27% drilled or nailed labels onto woody plants, and 16% used some other method (see Figure 48).

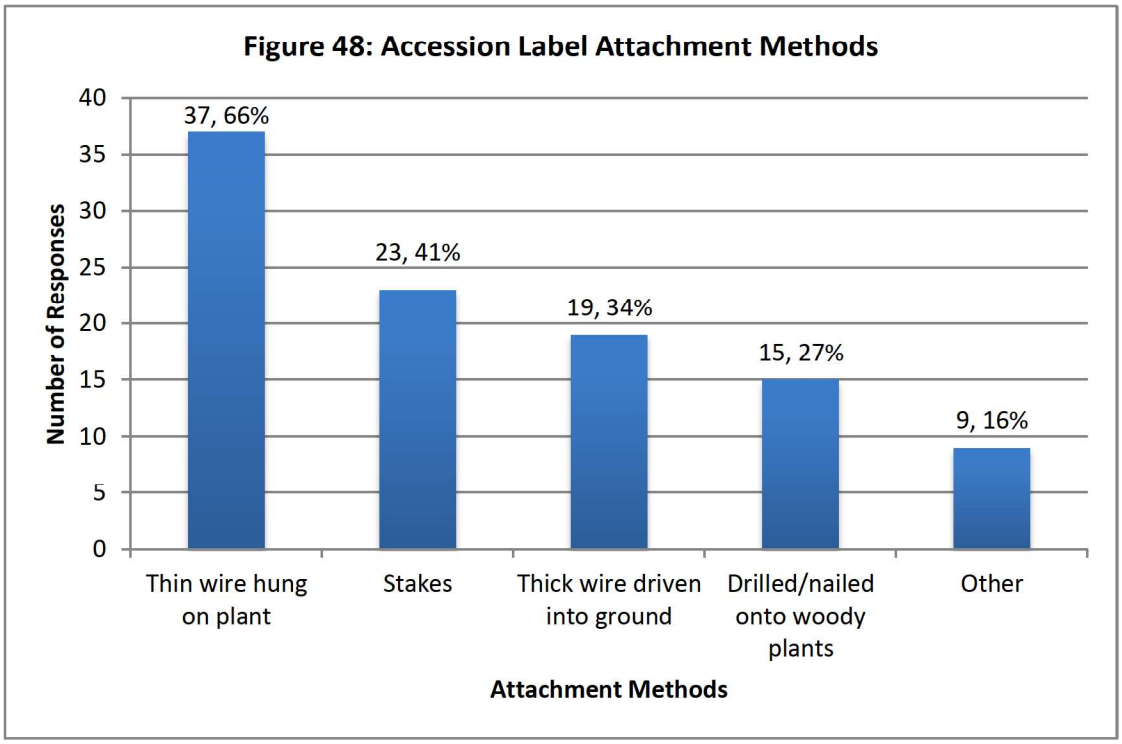


Figure 48: Accession Label Attachment Methods

Twenty institutions used one attachment method. Of these institutions, 9 used thin wire hung on plants only, 6 used stakes only, and 5 used thick wire driven into the ground. Thirty institutions used multiple methods of accession label attachment: 18 used two methods, 10 used three attachment methods, and 2 used all four methods.

Other accession label attachment methods not quantified in the previous section:

- attached with metal clamps for orchid collection items in terracotta pots, attached with hog rings for orchid pots in plastic pot
- Herbaceous perennials are tagged using bent stainless steel spring wire made in-house. Non-canopy woody plant material is tagged using exterior grade zip ties.
- I also use 'key rings' so accession labels can move as needed. These are attached to the loop made at top of stake.
- Landscape pins
- metal staples
- On electrical wire. Labels are affixed to a branch or to a display label stake.
- Pushed into containers
- small nail, wire or folded depending on best placement. These are not visible to the public.
- we use a metal stake that has been twisted into a pigtail and inserted to the north of the plant. For trees and shrubs we use the aluminium label attached to a piece of wire.

Accession Label Tree Attachment Hardware (43 responses - multiple responses accepted)

Many institutions use springs with their tree attachment methods. Slightly more institutions use screws of varying materials than nails (see Figure 49). It was common for institutions to not know what their nails or screws were made of. One institution cited purposely seeking out aluminum for the sake of chainsaw safety.

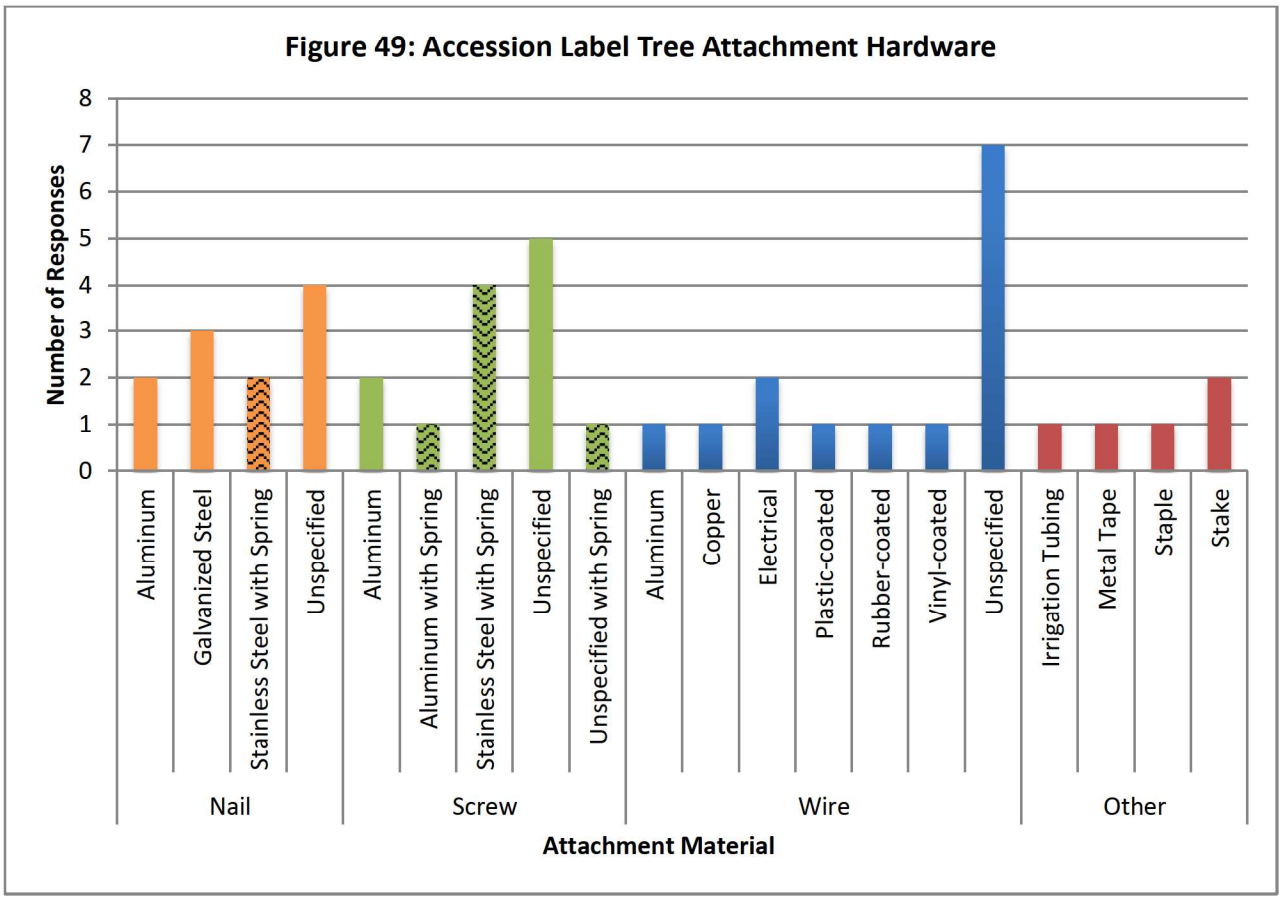


Figure 49: Accession Label Tree Attachment Hardware

Life Expectancy & Maintenance

Life Expectancy (55 responses)

One hundred percent of institutions responding to this question expected accession labels to last more than three years. Additional comments all mentioned long lifespans unless tampered with or failure of attachment method, with one respondent noting, “The wire to affix the label… will fail before the aluminum tag.”

Frequency of Maintenance (54 responses)

Thirty-three percent of question respondents maintain accession labels only as needed, while 39% are on a two- to five-year maintenance cycle. Seventeen percent adjust accession labels annually, and the remaining 11% do so more frequently - semi-annually, monthly, weekly, or daily (see Figure 50).

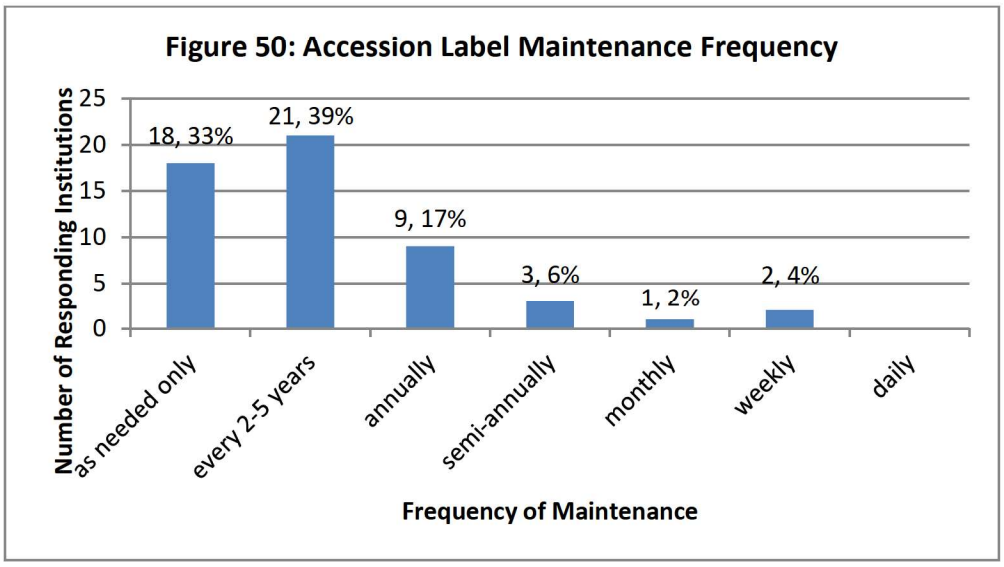


Figure 50: Accession Label Maintenance Frequency

Purchased versus Fabricated by Institution

Accession Label Acquisitions (55 responses)

Seventy-four percent of respondents fabricate and assemble their products in-house. Twenty-four percent purchase the label only, and 2% (1 responding institution) purchase fully printed and assembled products. Institutions in the lowest (less than $150,000) and mid-range operating budget categories ($400,000-$999,999 and $1,000,000-$2,999,999) are more likely to purchase accession labels (label only) when compared to institutions in other budget categories. Fifty percent, 44%, and 36% of respondents in each of those respective size categories purchase their labels. Among institutions with budgets of $150,000-$399,000 and above $10M, 20% purchased labels from vendors. Institutions with budgets of $3,000,000-$9,999,999 were least likely to purchase labels (7%) (see Figure 51).

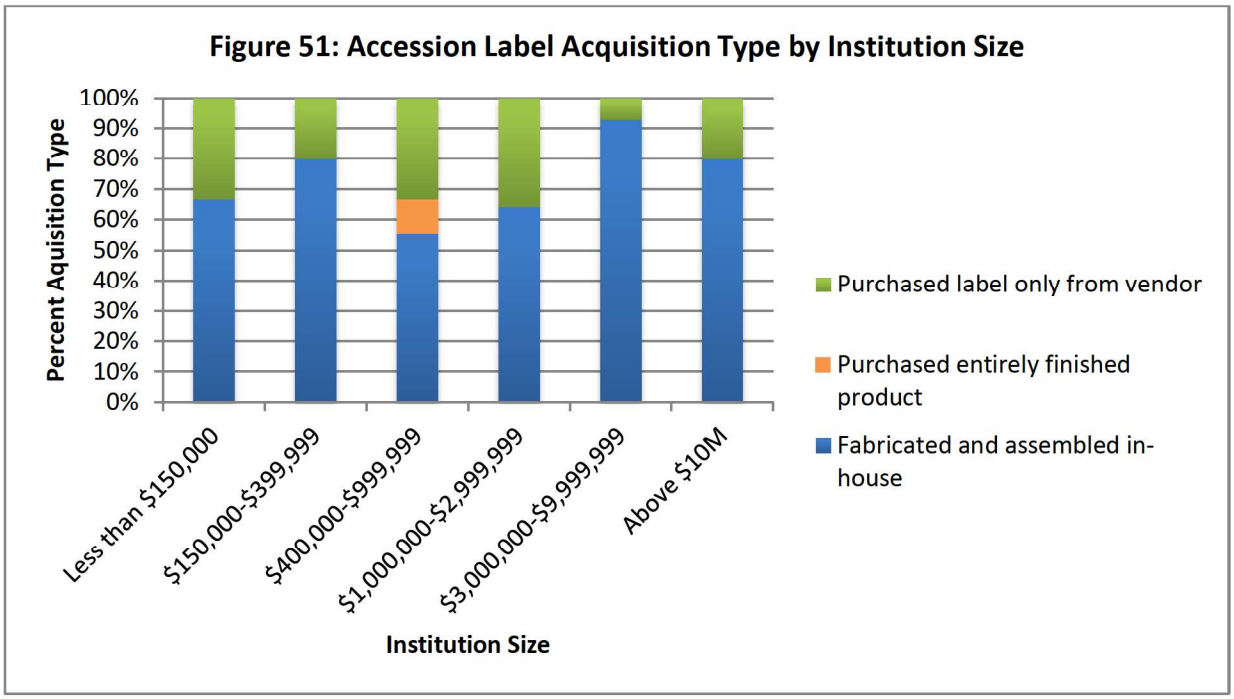


Figure 51: Accession Label Acquisition Type by Institution Size

Label Materials (55 responses – multiple responses accepted)

The majority (80%) of respondents use aluminum as their material of choice, irrespective of whether labels were being fabricated in-house or purchased from a vendor (see Figure 52).

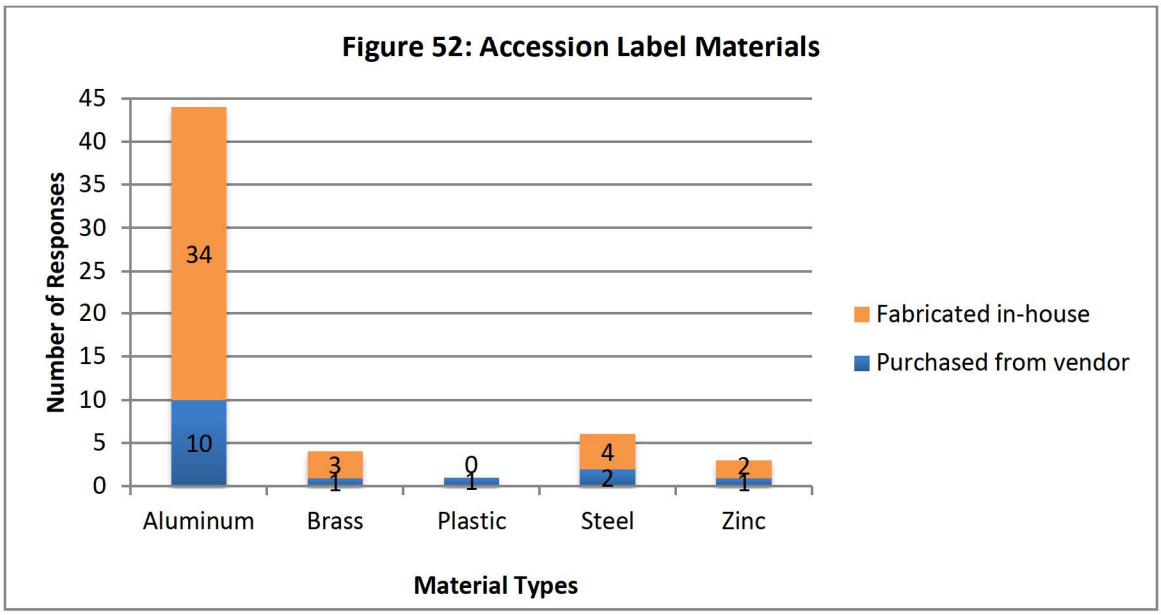


Figure 52: Accession Label Materials

Corner Types (54 responses)

Unlike in display labels, 86% of accession labels have rounded corners.

Cost Comparison (45 responses)

Staff time ordering label supplies, making the labels if applicable, placing the labels, and maintaining and organizing them was not factored into the cost of the labels. There was not enough data to compare the varying material type costs of accession labels. The average, low and high prices for labels purchased from a vendor are higher than those made in-house. See Table 8.

Table 8: Average, Lowest, and Highest Prices Paid for Accession Labels Fabricated In-House or Purchased		
Cost	**Fabricated (34 Responses)**	**Purchased (11 Responses)**
Average	$1.10 per all label sizes	$3.32 per all label sizes
Low	$0.11 for 3.38" x 2.2"	$0.20 for 1" x 2"
High	$4.00 for 4.5" x 1" and 2.13" x 3.38"	$13.00 for 5” x 3"

Table 8: Average, Lowest, and Highest Prices Paid for Accession Labels

Fabricated Label Systems

Machine Type (39 responses)

Of fabricated accession labels, 77% are made using an embosser machine, 15% are produced with laser engravers, and the remaining 8% are made with MetalPhoto, rotary engravers, or P-Touch® label machines (see Figure 53).

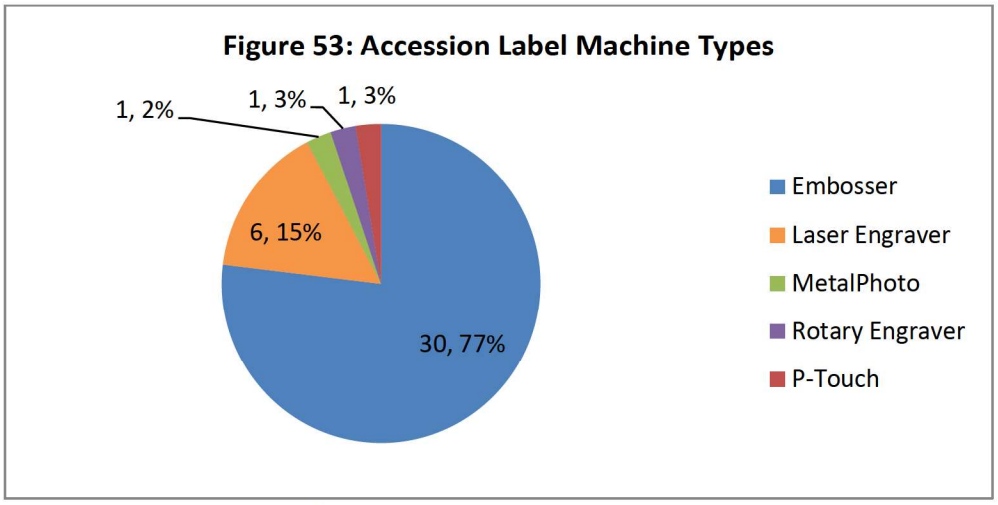


Figure 53: Accession Label Machine Types

Embosser Brands (28 responses)

Four embosser brands are the most common: CIM (36%), Datacard® (32%), NewBold Addressograph® (11%), and Matica (11%) (see Figure 54).

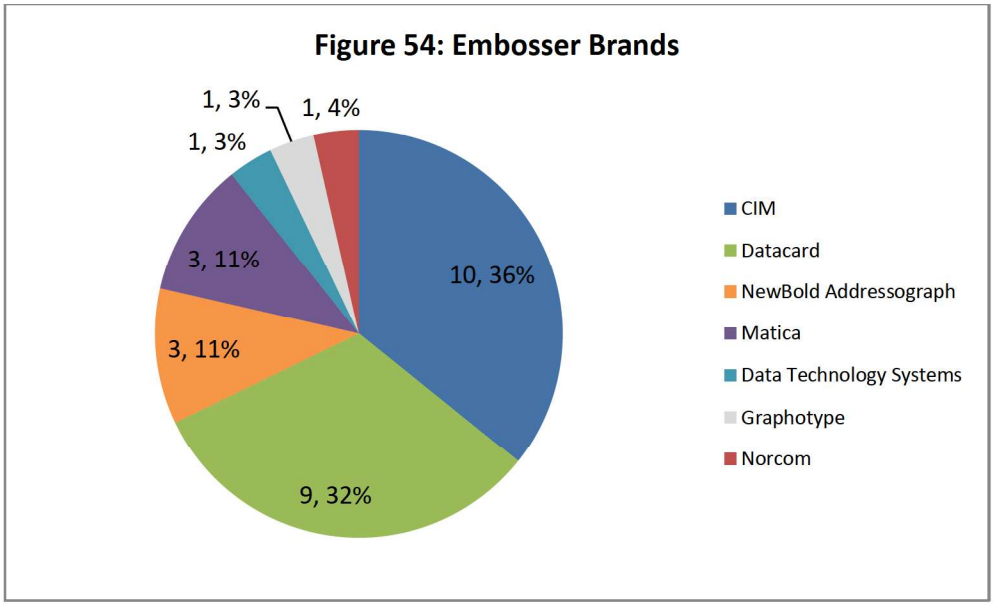


Figure 54: Embosser Brands

Embosser Brand Satisfaction (39 responses)

The average machine satisfaction rating was highest for the CIM machines with a 4.3 out of 5 rating. The other top brands were rated as follows: Matica (3.7/5), Datacard (3.5/5) and NewBold Addressograph (3.3/5) (see Figure 55).

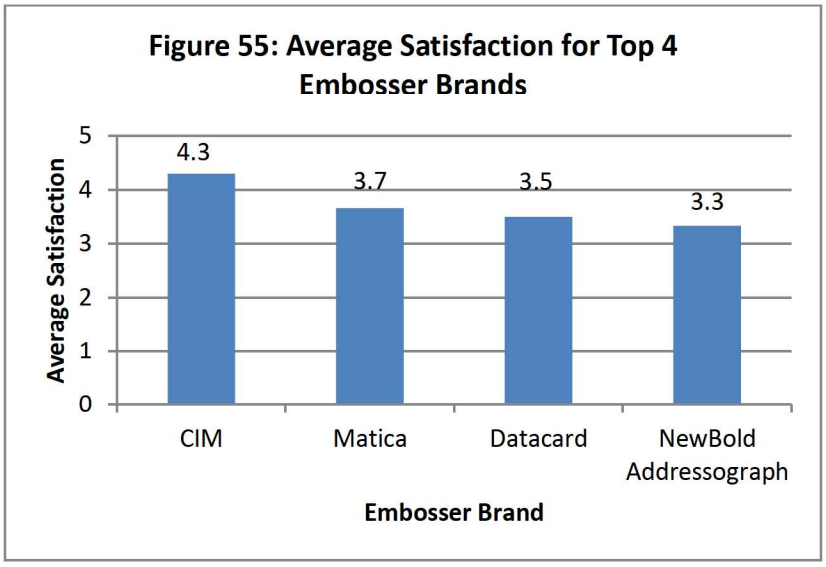


Figure 55: Average Satisfaction for Top 4 Embosser Brands

Age of Embosser Machines (25 responses)

As of this survey in 2018, the average length of time for embossers in use regardless of brand was 9.6 years. CIM machines, with 10 responses, were reported as the fewest average years of use at 8.4 years, followed by Matica (3 responses) averaging 8.7 years in use. Datacard machines (7 responses) averaged at 10.1 years. NewBold Addressograph had 3 responses, with the average years in use at 14.3 years. It is worth mentioning here that NewBold Addressograph had the largest spread in purchase years, 1978 through 2017 (see Figure 56).

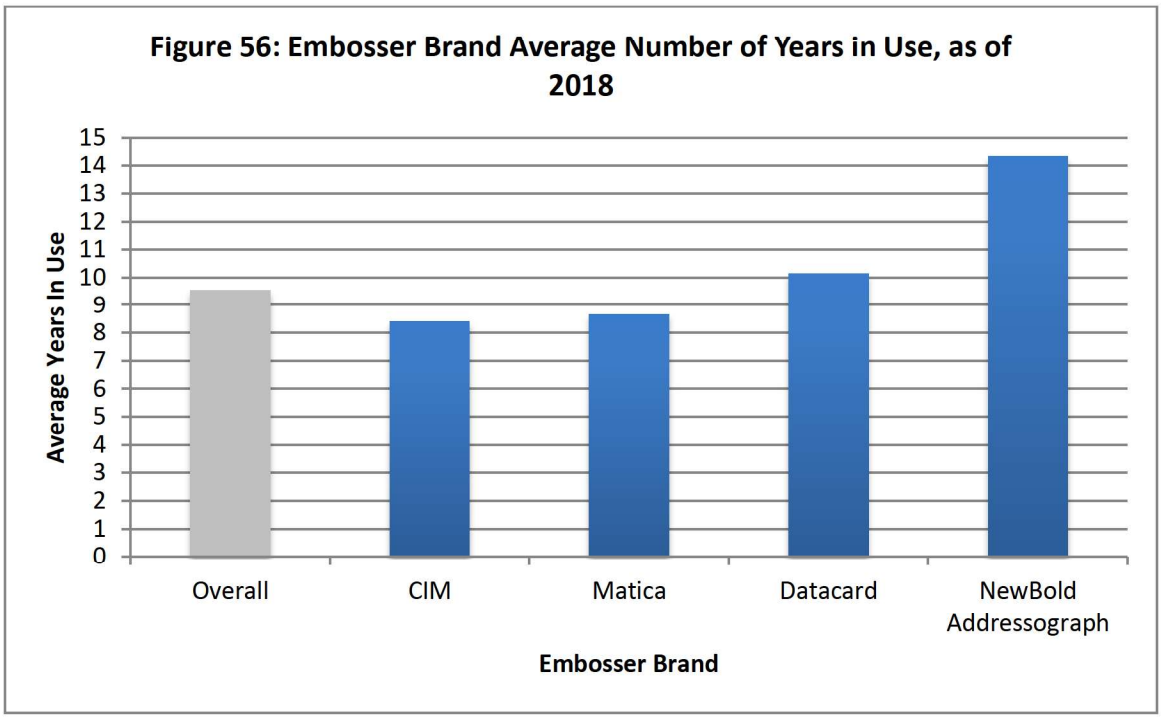


Figure 56: Embosser Brand Average Number of Years in Use, as of 2018

Additional Accession Label Fabrication Comments Received:

- Again, we "make" the label in that we engrave onto the purchased aluminum plates.
- Aluminum is anodized. We also emboss the tags with an accession number and qualifier as we are unsure of the lifespan of the laser etching. We will shortly be adding data-matrix 2D barcodes to nursery and accession tags to speed up inventorying.
- I buy the aluminum accession labels from CIM in bulk, usually 1,500 a year. They come as 2.125" x 3.375" labels that can break into two pieces so I end up with 3,000 actual accession labels from the order.
- I wish we had more space on our tags; I'm always running out of room to squeeze the information on.
- If/when our embosser breaks, we'll need to find a new solution. However, we intend to keep using it for the foreseeable future.
- Love our system. We make our own 14-gauge wire stakes, would like to find good sturdy pigtail to replace this, but otherwise this system works pretty well.
- Our accession labeling practice is still in its infancy. Not all plants get accession labels due to capacity but we have hopes to increase numbers made and used in future years.
- Our machine and process is old. Would like to update to quicker easier to use machine and smaller tags.
- Stakes are 1/8" diameter (17" long), come straight, must be bent by hand in-house to hang dog tag from.
- We are thinking of adding accession numbers to the back of display labels on our new laser engraver.
- We produce the accession labels on a tape.
- We twist the 9-gauge wire into loops at the top and insert the straight end of the wire into the ground. It is a rigid wire.
- We use military dog tags.

Purchased Label Systems

Entire Product Versus Label Only (14 responses)

Thirteen institutions (93%) purchase the accession label only, while one institution (7%) purchases the entire product, including fasteners.

Vendor Information for Purchased Display Labels (10 responses)

Of purchasing institutions that responded to the question, 40% buy their product from Damon Co. while 10% each purchase from Arkwood Products, Data Technology Systems, Denver Botanic Gardens, IdentiSys Inc., Lark Label, and Ofe International (see Figure 57).

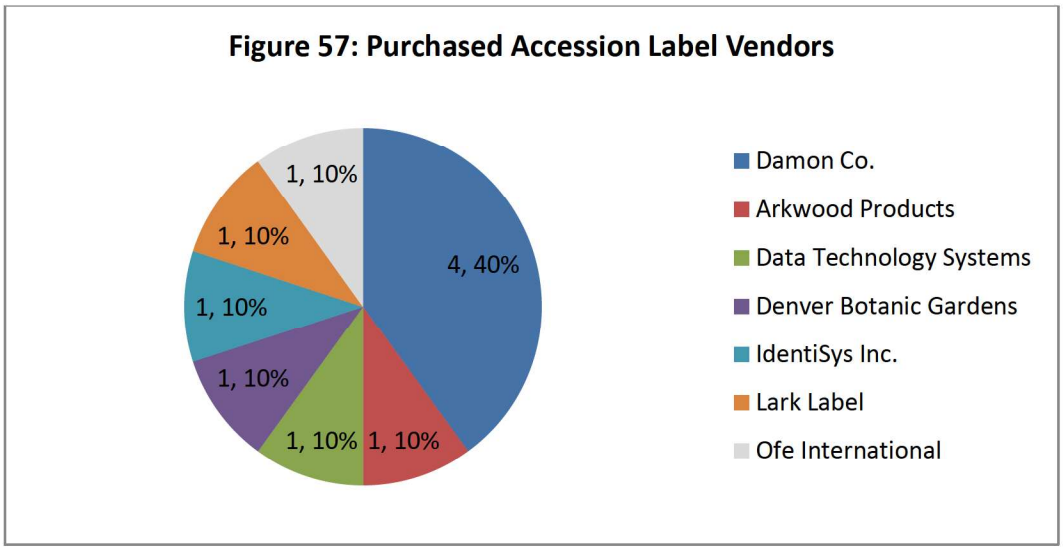


Figure 57: Purchased Accession Label Vendors

Length of Time to Prepare Orders (12 responses)

Of respondents to this question, 50% spend fewer than 4 labor hours preparing accession label orders, 27% take between four and 16 labor hours to complete and order, while 33% spend more than 16 labor hours.

Length of Time to Receive Labels (10 responses)

Overall, there is a quicker turnaround in accession labels than display labels. Of accession label purchasers, 70% receive their labels in 2 weeks or less with only 30% having to wait more than two weeks to receive their products.

Additional Purchasing Comments Include:

- [Another public garden] has a label maker and helps us print off the accession tags at cost of materials.
- We are looking to have labels produced and not already affixed to the stake. Storage concerns are driving this process. We have identified a way to affixed [sic] the label to the stake such that they can be readily removed and reattached -- plastic "Velcro®" product from 3M.

Conclusion

This report originated as a small project conceived while having some spirited conversations with like-minded plant records professionals. There had not, to our knowledge, been a public garden industry-wide survey focusing on display and accession label best practices since 1999, when Kathy Musial did a survey of display label information comprehension and layout preference at the American Public Gardens Association annual conference in Vancouver, and in the same year, Rhoda Maurer did an international survey for the Royal Horticultural Society[2] on gardens' practices regarding accession and display labels such as: information included on the labels, materials, and the labeling process. This survey was not compared to the 1999 surveys, since the Musial survey had different goals, and the majority of respondents to the Maurer survey were from institutions in countries outside of North America.

With the help of the American Public Gardens Association and specifically their Plant Nomenclature and Taxonomy Community and Plant Collections Community, we have assembled this wealth of label-related resources and data to share with our colleagues, though its full potential may not even be reached within this document. Our three main goals were to:

- promote institutional information sharing
- document excellent existing label practices
- discover what we need to improve upon as a professional community

The first goal, to promote institutional information sharing, was achieved. With 79 respondents who found the time in their busy work schedules to answer the many survey questions, this survey reached institutions with a range of budgets, staffing, missions, and practices from which to learn. In addition, many respondents were willing to share additional images or samples during follow-up communications. We received numerous unprompted, encouraging e-mails and notes from peers looking forward to seeing the data and expressing gratitude for tackling this project. This resource would not be as robust without the help of the gardens and colleagues that contributed images for inclusion in Appendix B: Institutional Examples. These institutions deserve special thanks, as do the many professionals who took time out of their busy work and home lives to pore over data, read drafts, and make suggestions for the current and future iterations of this project. Their contributions will ensure that this document serves as a useful tool for years to come.

Within the data some exemplary labeling practices were shared. Brackets, springs, and a number of useful tricks were revealed, mostly in the “additional comments” sections. The “other” and “comments” sections of this survey were so helpful that they were included in the reporting as much as possible. We were surprised to find so many patterns and similarities, across institutions big and small, in the content and layout of labels. Of institutions responding to the survey, 99% use both Latin and common name on their display labels, with over half also using family name or native range. These pieces of information have distinguished themselves as a de facto standard across the industry. Similarly, material usage has largely narrowed down to a few key products. Analysis of these trends will help gardens looking to make a change in their current practices or beginning the process of labeling their collections to make informed, educated decisions.

This survey was also meant to highlight the gaps in our industry, present frustrations, and identify areas for improvement. Several institutions mentioned that they do not, and implied that they would never, drill or nail anything directly into trees. Many responded that mowers and power tools chew up valuable label material, but this is a human error problem that could be improved upon with some thoughtful staff conversations and creative label placement. Prevention of squirrel damage may be a worthwhile topic for future inquiry, as there were several mentions of the damage but no suggestions as to how to deter squirrels from chewing the display labels. One additional frustration expressed throughout the survey was the lack of time and/or resources available for labeling, which was in turn due to

[2] Maurer, R. (1999). Labelling our collections: results of a survey. Botanic Garden Conservation International, 3(3). Retrieved May 28, 2019 from https://www.bgci.org/resources/article/0124/

insufficient staffing and funding. Finding effective ways to share the value our processes and make them more efficient, or perhaps drafting an open letter arguing for the importance and benefit of dedicating time to these tasks, are only a few suggestions for ways this survey could further spur action to benefit the Public Gardens community in North America and beyond.

We can certainly continue to learn. Future avenues for research include: where and how labeling fits into institutional living collections policies; where institutions receive their funding for equipment purchases (grants, donors, etc.). There will always be additional information to seek, and we hope the current report will provide a strong foundation for future endeavors.

Questions regarding this project should be addressed to Jaime Frye (jfrye@DiscoverNewfields.org) or Sara Helm-Wallace (sara.helm.wallace@gmail.com).

Appendices

Appendix A. Accessibility Considerations
from Smithsonian Guidelines for Accessible Exhibition Design

Below are some strategies pulled from the larger *Smithsonian Guidelines for Accessible Exhibition Design* report that may be important for consideration when designing and creating plant display labels[3].

Typeface, Fonts, and Structure

1. Sans-serif or simple serif fonts are the most legible.

Common Examples Include:

Arial
Calibri
Tahoma

2. Fonts that are too bold or narrow in proportion to height can be difficult to read.

Plant Label (regular)
Plant Label (too narrow)
Plant Label (too bold)

3. Not recommended:

condensed, extended, or light fonts
wide stroke width variation
Plant Label (David Regular)
narrow strokes that fade or break
Plant Label (Papyrus Regular)
letters and numbers with a close resemblance
a 2 d (Bernard MT Condensed)

4. Try to maintain 45-50 characters per line of text. [Statement excluding bracketed text is 50 characters]

5. Avoid using ALL CAPITAL LETTERS.

6. Avoid script or *italics* for essential information.

This may mean that as an industry we need to balance the scientific correctness of italicization and accessibility. How important is showing the scientifically accurate way to write a Latin name to your organization? Is it more important than a guest being able to read the Latin name at all? Is the Latin name key information or auxiliary information to the common name?

The answer to these questions may vary among institutions but they are important to discuss and consider.

7. Type size should be appropriate for its viewing distance.

[3] Smithsonian Guidelines for Exhibition Design. Most recently retrieved May 29, 2019 from https://www.si.edu/Accessibility/SGAED

The Smithsonian Guide for Accessible Exhibition Design suggests using 48 point font (3/4”) for anything meant to be read at a one-meter viewing distance. A few of the 2018 survey respondents noted different labels for close viewing and distance viewing.

Plant Label

8. Space between lines should be 20% larger than the surrounding font size.

9. Use fonts with consistent letter and word spacing.

10. Keep text left justified.

11. Print on solid, contrasting backgrounds.

    For outdoor use, light text on a dark background may help reduce glare.

Placement

12. Keep labels out of the way of swinging doors and with the reader’s proximity in mind.

    Try to avoid service areas or trip hazards. Keep from drawing guests off of paths or into service locations with label placement.

13. Some low-vision visitors need to be within three inches of text for best viewing.

    While the nature of plant labeling may not always allow for this to occur, it should be taken into consideration if determining which specimen of many to label. Try to mark a specimen in a good location that allows the guest to get as close as necessary without going into a planting bed or putting themselves or the plants in an unsafe situation.

14. Keep labeling consistent.

    Maintain a consistent labeling scheme throughout collection spaces. This allows guests to anticipate where to find information. Regardless of aesthetic style, avoid radically switching spacing, depth, or style.

Appendix B. Institutional Examples

A special thanks to our colleagues at the following institutions for providing images and additional information:

Arboretum at Penn State

Brenton Arboretum

Brooklyn Botanic Garden

Chicago Botanic Garden

Como Park Zoo & Conservatory

Denver Botanic Gardens

Green Bay Botanical Garden

The Huntington Library, Art Collections, and Botanical Gardens

Jensen-Olson Arboretum

Longwood Gardens

Missouri Botanical Garden

Morris County Park Commission

Morton Arboretum

Newfields

New York Botanical Garden

Rancho Santa Ana Botanic Garden

Royal Botanical Gardens, Ontario

Red Butte Garden

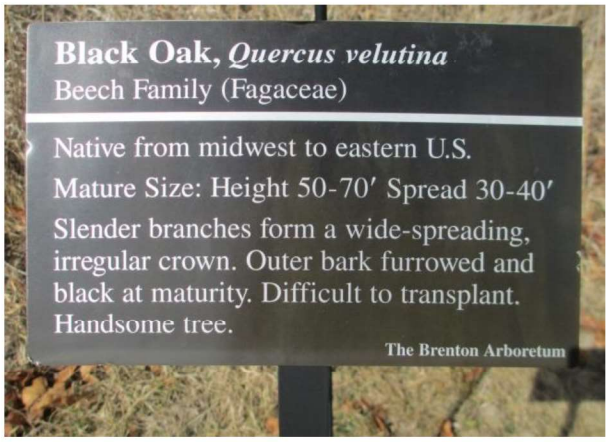
Arboretum at Penn State
Location: University Park, PA
Annual Operating Budget: $400,000 to $999,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Less than 500

Display Labels: 3" x 5" (all labeled plants except memorial)
Fields: Latin name, common name, family name, native range
Material: Plastic
Attachment: Stake with 3M Mounting Tape
Approximate Cost: $7
Label Material Vendor: Gravotech
Engraver: Gravograph rotary

Memorial Labels: 5” x 7”
Approximate Cost: $11
Additional Details: See Above

Accession Labels (2 Photos): 2.13" x 3.38" (all labeled plants)
Fields: Latin name, common name, accession number
Material: Aluminum
Attachment(s): Wire; stake with rivets
Approximate Cost: $4
Label Material Vendor: Damon Co.
Embosser: Datacard 195

Brenton Arboretum
Location: Dallas Center, IA
Annual Operating Budget: $150,000-$399,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Less than 500



Display Labels (3 Photos): 5” x 8” (woody plants, non-memorial)
Fields: Common name, Latin name, family, nativity, form, cultural
Material: Aluminum
Approximate Cost: $31
Finished Label Vendor: Lark Label

Accession Labels (2 Photos): 1.5” x 3” (all labeled plants)
Fields: Accession number, common name, Latin name
Material: Aluminum
Attachment: Thin wire on stake
Approximate Cost: $3.50
Label Material Vendor: Unknown
Finished Label Vendor or In-House Embosser/Printer: Unknown

Brooklyn Botanic Garden
Location: Brooklyn, NY
Annual Operating Budget: Above $10M
Display Labels Per Year: 500-2,000
Accession Labels Per Year: Greater than 2,000

Display Labels (2 Photos): 2.5” x 5.5” (annuals, shrubs, trees, etc.)
Fields: Common name, Latin name, family common name, family scientific name, nativity, accession number
Material: Plastic
Attachment: Custom-made stainless steel bracket with rubber hose
Approximate Cost: $10
Label Material Vendor: Rowmark via Johnson Plastics Plus
Engraver: Universal Laser System (ULS) VLS4.60 with UAC 2000 filtration unit

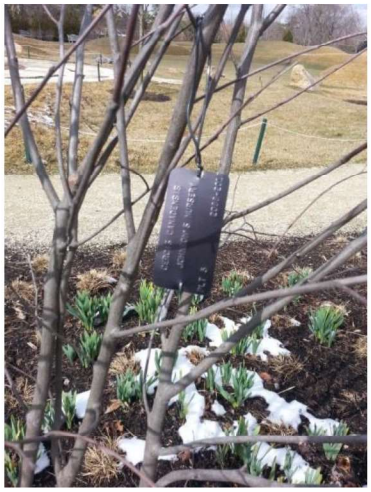
Display Labels: Custom size as needed (orchids)
Fields: Latin name, hybrid information, family, accession number
Additional Details: See Above

Accession Labels (2 photos): 1.06” x 3.5” (all labeled plants)
Fields: Accession number, institution, provenance, location, life form, reference number, common name, Latin name, family, nativity
Material: Anodized aluminum
Attachment: Wire; stainless steel screw with spring and washer
Approximate Cost: $0.36
Label Material Vendor: Data Technology Systems, Inc.
Engraver: ULS laser
Embosser: Addressograph

Chicago Botanic Garden
Location: Glencoe, IL
Annual Operating Budget: Above $10M
Display Labels Per Year: Greater than 2,000 (10,000)
Accession Labels Per Year: Greater than 2,000

Display Labels: 3” x 5” (plants at a distance)
Fields: Latin name, common name, family
Material: Aluminum
Attachment: Stake with rivets
Approximate Cost: $9.75
Finished Label Vendor: Photometals Inc.

Accession Labels (2 photos): 1.75” x 3.5” (woody plants and selected perennials)
Fields: Latin name, accession number, source, form in which plant material was received
Material: Aluminum
Attachment: Wire; thick wire driven into ground
Approximate Cost: $3.05
Label Material Vendor: Damon Co.
Embosser: Datacard 295



Como Park Zoo & Conservatory
Location: St. Paul, MN
Annual Operating Budget: $1,000,000-$2,999,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Unknown

Display Labels (3 photos): 2” x 3” (all labeled plants)
Fields: Latin name, common name, family, nativity
Material: Plastic
Attachment: Unknown on tree; brackets with thick wire driven into ground
Approximate Cost: $0.50
Label Material Vendor: Unknown
Engraver: Vision rotary

Denver Botanic Gardens
Location: Denver, CO
Annual Operating Budget: Above $10M
Display Labels Per Year: 500-2,000
Accession Labels Per Year: Greater than 2,000

Display Labels (2 photos): 3” x 5” (trees, shrubs, herbaceous perennials)
Fields: Latin name, common name, nativity, family (common and scientific)
Material: Aluminum
Attachment: Stake with rivet
Approximate Cost: $11.55
Finished Label Vendor: Nameplate & Panel Technology

Accession Labels: 1.06” x 3.5” (all labeled plants)
Fields: Latin name, accession num., provenance type
Material: Aluminum
Attachment: Thick wire driven into ground
Approximate Cost: $0.30
Label Material Vendor: Identisys
Embosser: CIM ME2000

Green Bay Botanical Garden
Location: Green Bay, WI
Annual Operating Budget: $1,000,000-$2,999,999
Display Labels Per Year: 500-2,000
Accession Labels Per Year: 500-2,000

Display Labels: 3” x 5” (perennials, trees, shrubs)
Fields: Latin name, common name, family, nativity, garden logo
Material: Plastic
Attachment: Stake with 3M tape
Approximate Cost: $5.30
Label Material Vendor: Johnson Plastics
Engraver: LaserPro C180

Accession Labels: 1.5” x 3.25” (perennials, trees, shrubs)
Fields: Latin name, family, accession number
Material: Brass
Attachment: Thick wire driven into ground
Approximate Cost: $2.12
Finished Label Vendor: Data Technology Systems

The Huntington Library, Art Collections, and Botanical Gardens
Location: San Marino, CA
Annual Operating Budget: Above $10M
Display Labels Per Year: Greater than 2,000
Accession Labels Per Year: Greater than 2,000

Display Labels (3 photos): 2.75” x 5.75” (most plants)
Fields: Latin name, common name, nativity, family name, accession number, other information pertinent to collection
Material: Plastic
Attachment: Stake with rivets
Approximate Cost: $10
Label Material Vendor: Gravograph
Engraver: Vanguard 9000 rotary

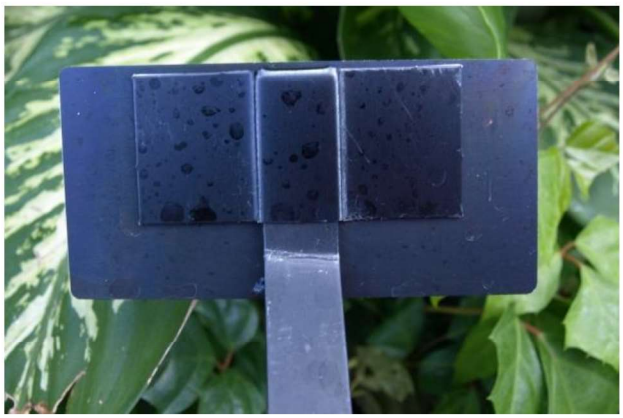
Accession Labels (2 photos): 1" x 2" (all labeled plants)
Fields: Latin name, accession number
Material: Stainless steel rolled edge dull dog-tags
Attachment: Thick wire driven into ground; plastic coated cable and nail
Approximate Cost: $2
Label Material Vendor: Damon Co.
Embosser: Norcom 1700

Jensen-Olson Arboretum
Location: Juneau, AK
Annual Operating Budget: $150,000-$399,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Less than 500

Display Labels (2 photos): 3” x 5” (trees, shrubs, perennials), 1” x 3” (Plant Collections Network Collection, rock garden)
Fields: Latin name, common name, family, nativity
Material: Aluminum
Attachment: Stake
Approximate Cost: $9/$6
Finished Label Vendor: Lark Label

Accession Labels: 0.5” x 2” (all labeled plants)
Fields: Latin name, accession number, source
Material: Zinc
Attachment: Thick wire driven into ground
Approximate Cost: $1.50
Label Material Vendor: Yucca Do Nursery
Embosser/Printer: Handwritten

Longwood Gardens
Location: Kennett Square, PA
Annual Operating Budget: Above $10M
Display Labels Per Year: Greater than 2,000
Accession Labels Per Year: Greater than 2,000



Display Labels (2 photos): 2” x 4” (plants 0'-3' from walkway)
Fields: Common name, Latin name, nativity, family
Material: Aluminum
Attachment: Bracket
Approximate Cost: $10
Finished Label Vendor: Nameplate and Panel Technology

Accession Labels (2 photos): 1.73” x 3.5” (trees, shrubs, most conservatory plants, all research plants)
Fields: Accession number, family, Latin name, common name, nativity
Material: Brass
Attachment: Stainless steel screw and spring; thick wire driven into ground; wire
Approximate Cost: $0.47
Label Material Vendor: Damon Co.
Embosser: CIM ME-2000

Missouri Botanical Garden
Location: St. Louis, MO
Annual Operating Budget: Above $10M
Display Labels Per Year: Greater than 2,000
Accession Labels Per Year: Greater than 2,000

Display Labels: 4” x 6” (trees and plants far from path)
Fields: Common name, Latin name, family, nativity garden logo
Material: Plastic
Attachment: Stake with tape
Approximate Cost: $1.40
Label Material Vendor: Johnson Plastics
Engraver: Epilog laser Helix 50 watt

Accession Labels (2 photos): 1.06” x 3.5” (all labeled plants)
Fields: Accession number, Latin name, source
Material: Aluminum
Attachment: Wire; thick wire driven into ground
Approximate Cost: $0.33/$1
Label Material Vendor: Elliot Data Systems
Embosser: CIM ME-2000

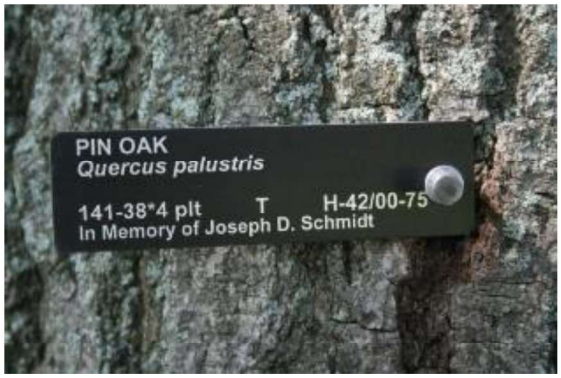
Morris County Park Commission
Location: Morristown, NJ
Annual Operating Budget: $3,000,000-$9,999,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Less than 500

Display Labels: 5.25” x 2” (all labeled plants)
Fields: Latin name, common name, nativity, family
Material: Plastic
Attachment: Wire
Approximate Cost: Unknown
Label Material Vendor: Gravograph
Engraver: Gravograph IS700 rotary

Accession Labels: 1.75” x 3.5” (all labeled plants)
Fields: Latin name, family, nativity, common name, source, accession number
Material: Aluminum
Attachment: Wire
Approximate Cost: Unknown
Label Material Vendor: Data Technology Systems
Embosser: Datacard 295

Morton Arboretum
Location: Lisle, IL
Annual Operating Budget: Above $10M
Display Labels Per Year: Less than 500
Accession Labels Per Year: 500-2,000

Display Labels (2 photos): 2.13” x 4.5” (all labeled plants)
Fields: Common name, Latin name
Material: Aluminum
Attachment: Stake, stainless steel nail and spring
Approximate Cost: $10
Finished Label Vendor: MetalPhoto



Accession Labels (2 photos): 4” x 1.25” (all labeled plants)
Fields: Common name, Latin name, accession num., type, annotation, location, memorial information
Material: Aluminum
Attachment: Stainless steel nail and spring; stake
Approximate Cost: $1
Finished Label Vendor: MetalPhoto

Newfields
Location: Indianapolis, IN
Annual Operating Budget: $3,000,000-$9,999,999
Display Labels Per Year: 500-2,000
Accession Labels Per Year: Less than 500

Display Labels: 2” x 4” (annuals, perennials, woody plants)
Fields: Common name, Latin name, family, nativity
Material: Anodized aluminum
Attachment: Stake with 3M tape
Approximate Cost: $4
Label Material Vendor: Signature Plates
Engraver: Epilog Mini laser

Display Labels: 3” x 5” (seasonal containers)
Fields: common name, Latin name
Material: never-tear paper
Attachment: bracket stake with 3M tape
Approximate Cost: $1
Label Material Vendor: Amazon
Printer: Office Printer

Accession Labels: 1” x 3” (all labeled plants)
Fields: Latin name, accession number, source
Material: Anodized aluminum
Attachment: Wire; thick wire driven into ground
Approximate Cost: $2
Label Material Vendor: Signature Plates
Engraver: Epilog Mini laser

New York Botanical Garden
Location: Bronx, NY
Annual Operating Budget: Above $10M
Display Labels Per Year: Greater than 2,000
Accession Labels Per Year: Greater than 2,000

Display Labels: 3” x 5” (woody plants)
Fields: Common name, Latin name, family, nativity. Accession number included for woody plants
Material: Plastic
Attachment: Stake with 3M tape
Approximate Cost: $3.50
Label Material Vendor: B.F. Plastics
Engraver: Epilog Mini 18x12 laser

Accession Labels (2 photos): 1” x 3.5” (all labeled plants)
Fields: Accession number, family, Latin name, received as, lineage, source
Material: Aluminum
Attachment: Wire; aluminum screw and spring
Approximate Cost: $1
Label Material Vendor: Damon Co.
Embosser: Datacard 295

Rancho Santa Ana Botanic Garden
Location: Claremont, CA
Annual Operating Budget: $3,000,000-$9,999,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: 500-2,000

Display Labels (2 photos): 3.25” x 4.75” (all labeled plants)
Fields: Latin name, common name, family, family common name
Material: Plastic
Attachment: Stake with rubber cement
Approximate Cost: $15
Label Material Vendor: Ability Plastics
Engraver: Xenetech Viper XOT Star 912 rotary

Accession Labels (2 photos): 1.12” x 2” (all labeled plants)
Fields: Latin name, accession number, propagule information
Material: Stainless steel
Attachment: Wire; thick wire driven into ground
Approximate Cost: $0.25
Label Material Vendor: Damon Co.
Embosser: CIM AES 1700A

Royal Botanical Gardens, Ontario
Location: Hamilton, ON
Annual Operating Budget: $3,000,000-$9,999,999
Display Labels Per Year: 500-2,000
Accession Labels Per Year: 500-2,000

Display Labels (2 photos): 3” x 5” (perennials, woody plants)
Fields: Common name, French common name, Latin name, nativity, family, accession number
Material: Aluminum
Attachment: Stakes with 3M tape
Approximate Cost: $8
Label Material Vendor: Navitage Solutions
Engraver: Gravograph LS100ex laser

Memorial Label
See Details Above

Accession Labels: 4.5” x 1” (all labeled plants)
Fields: Accession number, Latin name, garden location
Material: Aluminum
Attachment: Wire
Approximate Cost: $4
Label Material Vendor: Navitage Solutions
Engraver: Gravograph LS100ex laser

Red Butte Garden
Location: Salt Lake City, UT
Annual Operating Budget: $3,000,000-$9,999,999
Display Labels Per Year: Less than 500
Accession Labels Per Year: Unknown

Display Labels (2 photos): 3.5” x 5.5” (perennials, shrubs, trees close to path)
Fields: Common name, Latin name, family, nativity, cultural, informational symbols
Material: Plastic
Attachment: Plastic stake with acrylic glue
Approximate Cost: $13.50
Label Material Vendor: Plastic Fabricating
Engraver: Phoenix 1212 rotary

Accession Labels (2 photos): 1” x 3” (all labeled plants)
Fields: Latin name, accession number
Material: Brass
Attachment: Thick wire driven into ground
Approximate Cost: $0.75
Label Material Vendor: Delvies Plastics
Engraver: Phoenix 1212 rotary

Appendix C. Vendor and Software Information

Finished Labels

Colmet Metal Sign
https://www.colmet.com/
972-494-3900
Garland, TX

Lark Label
http://larklabel.com/
316-682-5275
Wichita, KS

MetalPhoto of Cincinnati
https://www.mpofcinci.com/
513-772-8281
Cincinnati, OH

Nameplate and Panel Technology
http://www.nptec.com/
630-690-9360
Carol Stream, IL

Precision Signs and Labels
https://precisionsignsandlabels.com/
877-444-0856
Rochester, NY

Plates

Ability Plastics
http://www.abilityplastics.com/
800-323-2722
Justice, IL

Able Engraving
https://www.able-engravers.com/
800-383-5185
Skokie, IL

B.F. Plastics
http://www.bfplasticsinc.com/
800-866-7121
Lawrence, OH

Chewbarkas
https://www.chewbarka.com/
401-565-9911
Colmet Metal Sign
https://www.colmet.com/
972-494-3900
Garland, TX

Engraving Express
http://www.engravexp.com/
309-963-3970

Plates, Continued

Gravograph
https://www.gravograph.com/
+33 4-78-55-85-50
France

GS Direct
https://www.gsdirect.net/
800-234-3729
Eden Prairie, MN

Horizons Imaging Systems
https://horizonsisg.com/
800-482-7758
Cleveland, OH

Johnson Plastics Plus
https://www.johnsonplastics.com/
800-869-7800
Multiple Locations

Lark Label
http://larklabel.com/
316-682-5275
Wichita, KS

Marco Awards Group
https://marcoawardsgroup.com/
800-229-6592
Multiple Locations

Metal Marker
https://www.metalmarkermfg.com/
800-428-0095
North Ridgeville, OH

MetalPhoto
https://metalphoto.com/
800-482-7758
Cleveland, OH

Mitch Art Inc.
http://www.mitchartinc.com/
989-835-3964
Midland, MI

Nameplate & Panel Technology
http://www.nptec.com/
630-690-9360
Carol Stream, IL

Nash Industries
http://nashind.com/
856-456-5656
Gloucester City, NJ

Plates, Continued

Navitage Solutions
http://navitage.com/
855-828-4300
Mississauga, ON

Panterials, Inc.
http://panterials.com/
800-231-4644
Northridge, CA

Photometals Inc.
http://photometals.com/
877-897-7575
Phoenix, AZ

Plastic Fabricating & Distributing
https://www.plasticsfab.com/
574-233-7527
South Bend, IN

Precision Signs and Labels
https://precisionsignsandlabels.com/
877-444-0856
Rochester, NY

Signature Plates
http://signatureplates.com/
866-273-6182

The Essential Company UK
https://www.theessentialscompany.co.uk/
01-953-797-227
Norfolk, UK

Tyrelltech
https://www.tyrrelltech.com/
888-865-0300
Laurel, MD

Adhesives

3M Canada Inc.
https://www.3mcanada.ca/3M/en_CA/company-ca/
London, ON

B.F. Plastics
http://www.bfplasticsinc.com/
800-866-7121
Lawrence, OH

Bron Tape
https://brontapes.com/
888-877-2766
Multiple Locations

Adhesives, Continued

Hyatt's
http://www.hyatts.com/
800-234-9288
Buffalo, NY

Johnson Plastics Plus
https://www.johnsonplastics.com/
800-869-7800
Multiple Locations

Lark Label
http://larklabel.com/
316-682-5275
Wichita, KS

McMaster Carr
https://www.mcmaster.com/
630-833-0300
Elmhurst, IL

Menards
https://www.menards.com
Multiple Locations

MSC Industrial Direct
https://www.mscdirect.com/
800-645-7270
Melville, NY

R.S. Hughes
https://www.rshughes.com/
877-774-8443
Multiple Locations

Paper

Avery
https://www.avery.com/
800-462-8379

GS Direct
https://www.gsdirect.net/
800-234-3729
Eden Prairie, MN

Michaels
https://www.michaels.com/
800-642-4235
Multiple Locations

Onlinelabels.com
https://www.onlinelabels.com/
888-575-2235

Springs

Associated Spring Raymond
https://www.asraymond.com/
800-872-7732
Maumee, OH

Century Spring Corp.
https://www.centuryspring.com/
800-237-5225
Commerce, CA

DP Industries
https://www.dpind.com

Paragon Spring Co.
http://www.paragonspring.com/
773-489-6300
Chicago, IL

Nails and Screws

DP Industries
https://www.dpind.com

Grainger
https://www.grainger.com/
800-472-4643

Hi-Tech Fasteners
http://www.hitechfasteners.com
800-466-1940

Home Depot
https://www.homedepot.com/
800-466-3337
Multiple Locations

Jameston Distributers
https://www.jamestowndistributors.com
800-497-0010
Bristol, RI

McFeely's
https://www.mcfeelys.com/
800-443-7937
Harrison, OH

McMaster Carr
https://www.mcmaster.com/
630-833-0300
Elmhurst, IL

Menards
https://www.menards.com
Multiple Locations

Mutual Screw & Supply
https://www.mutualscrew.com/
201-351-3420

Nails and Screws, Continued

Nameplate and Panel Technology
http://www.nptec.com/
630-690-9360
Carol Stream, IL

Brackets

Fastenal
https://www.fastenal.com/
877-507-7555
Winona, MN

Pro-Type Industries
http://www.pro-type.com/
703-450-5200
Sterling, VA

Wire

Ace Hardware
https://www.acehardware.com/
888-827-4223
Multiple Locations

Alpha Wire
http://www.alphawire.com/
908-925-8000
Elizabeth, NJ

Bulk Wire
https://bulkwire.com/
714-674-4900
Yorba Linda, CA

Colonial Electric Supply
https://www.colonialelectricsupply.com/
610-312-8100
Multiple Locations

Fastenal
https://www.fastenal.com/
877-507-7555
Winona, MN

Lowes
https://www.lowes.com/
800-445-6937
Multiple Location

McMaster Carr
https://www.mcmaster.com/
630-833-0300
Elmhurst, IL

Wire, Continued

MSC Industrial Direct
https://www.mscdirect.com/
800-645-7270
Melville, NY

Newark Element 14
https://www.newark.com/
800-463-9275
Chicago, IL

Tobram Electric Supply
https://www.torbramelectric.com/
844-837-7377
Caledon, ON

Vetco Electronics, Inc.
https://vetco.net/
425-641-7275
Bellevue, WA

Western Steel & Wire, Inc.
http://westernsteelwire.com/
415-822-5490

Stakes

AAA Metal
http://www.aaa-metals.com/
800-531-9500
Hanson, MA

All Metal Manufacturing
https://www.allmetalrc.com/
605-787-4677
Rapid City, SD

Col-met
https://www.colmet.com/
972-494-3900
Garland, TX

DCM Fabrication Inc.
http://www.dcmfabricationinc.com/
409-330-4923
Orange, TX

DP Industries
https://www.dpind.com

Garden Marker
https://www.gardenmarker.com/
928-852-4763
Sedona, AZ

Stakes, Continued

Gemplers
https://www.gemplers.com/
800-382-8473
Janesville, WI

GTS Drywall Supply
https://gtsinteriorsupply.com/
Multiple Locations

Harris Sheet Metal Co.
http://www.harrissheetmetal.com/
989-496-3080
Midland Township, MI

Industrial Metal Supply
https://www.industrialmetalsupply.com/

Lark Label
http://larklabel.com/
316-682-5275
Wichita, KS

Metalphoto of Cincinnati
https://www.mpofcinci.com/
513-772-8281
Cincinnati, OH

Nameplate and Panel Technology
http://www.nptec.com/
630-690-9360
Carol Stream, IL

Navitage Solutions
http://navitage.com/
855-828-4300
Mississauga, ON

Paragon Spring Co.
http://www.paragonspring.com/
773-489-6300
Chicago, IL

Plastic Fabricating & Distributing
https://www.plasticsfab.com/
574-233-7527
South Bend, IN

Precision Signs and Labels
https://precisionsignsandlabels.com/
877-444-0856
Rochester, NY

Stakes, Continued

Ryerson Steel

https://www.ryerson.com/

855-793-7766

Multiple Locations

Tee-N-Jay MFG, Inc.

https://tee-n-jay.com/

818-504-2961

Sun Valley, CA

The Essential Company UK

https://www.theessentialscompany.co.uk/

01-953-797-227

Norfolk, UK

Wirecraft Manufacturing

http://wirecraftco.com/

314-868-9911

St. Louis, MO

Rivets

Red Hill General Store

http://www.redhillgeneralstore.com/

800-251-8824

Multiple Locations

Laser Engravers and Their Software

- Epilog
  - CorelDraw
  - Microsoft Access
  - Microsoft Word
  - Nicelabel
- Gravograph
  - Gravostyle
- Universal Laser Systems
  - CorelDraw
  - FilemakerPro
  - Microsoft Word
- Xenetech
  - Xenetech Software

Rotary Engravers and Their Software

- Gravograph
  - Gravostyle
- Suregrave
  - SuperPRo
- Vision
  - Vision Software
- Dahlgren Wizzard
  - EngraveLab
- Xenetech
  - Xenetech Software