Growers' and Consumers' Knowledge, Attitudes and Opinions Regarding Roses Available for Purchase

T.M. Waliczek
Department of Agriculture
Texas State University
San Marcos, TX
USA

D.H. Byrne
Department of Horticultural Sciences
Texas A&M University
College Station
USA

D.J. Holeman
Rose Hybridizer Association
Enfield, CT
USA

Abstract

 Rose breeders historically have bred plants based on what they personally have deemed important, or instead on variables growers have noted as important for the success in growing the crop. End-user opinions have not been formally considered. The purpose of this study was to investigate the growers' and the consumers' knowledge, attitudes, needs and opinions of roses available on the market and their experiences in growing them in the nursery and home landscape. A survey tool was developed to measure what attributes consumers were looking for in purchasing and growing rose plants, their knowledge of diseases and pests and their hopes for new plants coming to market. The survey was developed using Limesurvey web-based survey design tool. A link was sent to horticultural group mailing lists including the Rose Hybridizer Association, the American Rose Society, the Texas Landscape and Nursery Association, Master Gardeners among others as well as distributed through personal email lists, Facebook, and a news release from Texas A&M University. The survey was posted for 10 weeks. It included approximately 66 questions and took 30 min or more to complete. Over 1800 responses were received from rose growers and consumers worldwide. Data were automatically downloaded into Microsoft Excel. Data formatting was conducted in Excel and transferred to PASW/SPSS. Results of the survey found that respondents preferred roses that were disease resistant, with fragrant, abundant, red and recurrent blooming flowers. The ideal height of the rose shrubs is waist to shoulder-height. Therefore, roses should be bred to include these attributes.

INTRODUCTION

 Roses are members of the *Rosaceae*, the most important horticultural family in the world. Cultivated roses (*Rosa* L.) are the world's most popular garden and cut-flower producing plants. Roses are grown in greenhouses for the florist industry to produce both cut flowers and potted specimens. Garden roses exist in many forms including hybrid teas, shrubs, and polyanthas, displaying a wide range of flower colors and forms and thus serve a multitude of landscape uses. A recent study has estimated the annual value of landscape roses in North America to be about $ US 1,000,000,000 (Vineland Research and Innovation Centre, 2013). Unfortunately, the sales of garden roses has decreased over the last 20 years by about 30% (Byrne et al., 2010; Hutton, 2012). This spurred the question of why this has happened and developed into a survey to determine what consumers and those in the horticultural business want in new rose cultivars.

 The purpose of this study was to investigate the growers' and the consumers' knowledge, attitudes, needs and opinions of roses available on the market and their experiences in growing them in the nursery and home landscape to guide future rose

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breeding endeavors and in hopes of developing strategies to increase rose use. Specific objectives included observing attributes consumers and growers were looking for in purchasing and growing rose plants, measuring consumers' and growers' knowledge of diseases and pests of roses and garnering ideas for the direction of future breeding projects to develop cultivars that meet the needs of consumers and growers.

MATERIALS AND METHODS

Survey Instrument

A survey tool was developed using other similar industry-related instruments and was tested for validity by rose specialists and nursery professionals. The survey included 66 questions/statements in multiple sections and took respondents approximately 30-40 min to complete.

Five questions were included to gather information on respondents' role in the horticultural supply chain. Thirteen questions were included to garner information on the respondents' demographic and rose growing history. Eight questions asked respondents to rank physical traits of roses such as flower size, flower color, number or size of prickles and disease resistance. Seven questions including some with photographs asked respondents to identify common diseases in roses and rank those that they felt were the most problematic in their gardens. Seven questions were asked concerning marketing roses such as common garden store outlets where plants are purchased and prices considered reasonable. Nine questions asked respondents about their opinions on the supply chain and availability of plants. Most questions were answered using 5-point Likert scales that ranged from "Strongly Disagree" to "Strongly Agree," or from "Not important" to "Most Important." Some questions included multiple choice answers, or required respondents to rank answers. Four questions were left open-ended and allowed the respondent to answer in their own words as to the biggest improvement that breeders could make to roses, the biggest problems they have in growing roses and the plants they feel are good alternatives to roses.

In order to post the survey online, it was developed using Limesurvey web-based survey design tool. It was posted from October, 2012 through early January, 2013. A Cronbach's alpha reliability analysis determined instrument reliability to vary amongst sections from $\alpha=0.13$ to 0.73 indicating that some sections of the instrument needed improvement.

Sampling and Data Analysis

A link was sent to horticultural group mailing lists including the American Rose Society, the Rose Hybridizers Association, the Texas Landscape and Nursery Association, the Master Gardeners, as well as distributed through personal email lists, Facebook, and a news release from Texas A&M University. No incentive was given for participation.

Data were automatically downloaded into Microsoft Excel. Data formatting was conducted in Excel and transferred to PASW/SPSS. Descriptive statistics determined trends among overall growers and consumers. Comparisons of growers versus consumers, as well as demographic groups were made using ANOVA tests.

RESULTS

Demographic Characteristics

A total of 1813 responses were received from rose growers and consumers worldwide. Demographic information showed that 94% of respondents were United States residents and 89% of respondents grew roses. Most respondents were 55-69 years old (49%) or over 70 years old (23%). Most respondents classified themselves as teachers (36%), professionals (10%) or as retired (32%). When asked their role in the horticultural supply chain, 84% responded that they considered themselves recreational gardeners,

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23% classified themselves as plant propagators and 19% considered themselves to be rose marketers.

Important Plant Attributes
Respondents were asked to rank factors important in choosing rose plants on a Likert scale that ranged from "Not Important" (1) to "Most Important" (5). Characteristics included disease resistance, flower color, flower number, flower size, foliage color, foliage glossiness, fragrance, mature bush size, petal number, prickle number and prickle size. Disease resistance (87%), fragrance (62%) and flower color (60%) were ranked as being the most important characteristics influencing respondents' choice of rose plants with prickle number (17%) and prickle size (16%) being less influential in choice of plants (Table 1).

Plant Characteristics
Respondents were asked how much they agreed or disagreed with various statements regarding rose plant characteristics and cultural requirements necessary to maintain plants. Statements were listed and respondents answered using a Likert scale that ranged from Disagree (1), Somewhat Disagree (2), Neutral (3), Agree (4) and Strongly Agree (5).
Results verified previous findings in many instances. When respondents read the statement, "I prefer roses that bloom throughout the season rather than just once per year," 89% of respondents agreed or strongly agreed. Respondents felt neutral (43%) regarding the importance of the size of the blooms in selecting rose plants indicating that small or large blooms are both very pleasing and marketable. Most respondents preferred a rose plant that grew to waist height (48%), or to shoulder height (38%). Seven color samples were shown to respondents including blue, lavender, pink, red, red-orange, orange and yellow. Most respondents (30%) preferred red roses, with pink (15%) and purple (18%) being the next favorite color choices. Most respondents could identify common rose diseases including black spot (82%), powdery mildew (82%) and rust (93%) and most felt black spot was the most threatening disease to roses (41%) in their gardens.
When ranking statements regarding the value of roses to the landscape, most (64%) of respondents strongly agreed or agreed that roses were the most valuable plants in their garden and most (53%) agreed or strongly agreed that they would be willing to pay more for rose plants in their garden compared to what they would pay for other landscaping plants.
Respondents were posed statements regarding cultural requirements needed to maintain plants. Most (62%) respondents strongly agreed or agreed that roses grew easily in their climate, and most (62%) disagreed that roses were difficult to grow. Furthermore, most (48%) disagreed that the best way to keep plants healthy was to spray them with chemicals. However, most of the respondents were those that were familiar with growing roses given the high number of responses gathered from those with membership in organizations related to growing roses.

ANOVA Comparisons
No differences were found in comparisons of those factors considered important in choosing rose plants of those respondents who were members of the American Rose Society versus those who were not members indicating that respondents who, perhaps, had more experience growing roses did not necessarily value different characteristics in roses.

CONCLUSIONS
Results of the survey found that respondents preferred roses that were disease resistant, with fragrant, abundant, red and everblooming flowers. The ideal height of the rose shrubs is waist to shoulder-height. Therefore, roses should be bred to include these

attributes. Preferences, perceptions and marketing may vary with different demographic backgrounds, different levels of experience in growing rose plants and with those involved in various capacities of the horticultural supply chain. Therefore, further research will explore these differences, as well as aim to gather responses from those who are currently not considering roses for purchase in their gardens. Future studies will also strive to improve the reliability of the survey. Future studies could also explore buying habits of markets in other countries because a large portion of this sample was from the North America and the United States.

Literature Cited

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Tables

Table 1. Percentage of respondents ranking the importance of various factors in their choice of roses on Likert scales ranging from "not important" to "most important" in the study of consumer and rose growers' perceptions of roses available for purchase.

Item	Not impt. (%)	Not very impt. (%)	Impt. (%)	Very impt. (%)	Most impt. (%)
Flower size	2.4	13.5	34.7	21.4	4.2
Flower color	1.7	7.1	30.9	43.8	16.5
Petal number	6.0	28.6	35.7	24.2	5.5
Flower number	1.2	6.5	39.5	41.0	11.8
Fragrance	2.6	11.2	24.1	33.4	28.7
Mature plant size	1.7	13.5	42.1	32.8	9.9
Foliage color	5.6	31.7	39.7	19.0	3.9
Foliage glossiness	8.7	38.7	34.9	14.1	3.5
Prickle size	13.8	45.8	24.6	12.5	3.2
Number of prickles	14.3	44.3	24.4	13.1	3.9
Disease resistance	0.3	1.6	11.0	32.3	54.7

Table 2. Percentage of respondents rating their agreement or disagreement with statements on a Likert scale ranging from "strongly disagree" to "strongly agree" in the study of consumer and rose growers' perceptions of roses available for purchase.

Item	Strongly disagree (%)	Somewhat disagree (%)	Neither agree nor disagree (%)	Somewhat agree (%)	Strongly agree (%)
I prefer to grow roses that bloom throughout the season rather than just once per year.	2.6	2.2	5.8	18.4	70.9
The best way to keep my rose bushes healthy is to spray them.	29.7	17.8	17.0	20.6	14.8
Roses are the most valuable plants in my garden.	4.3	9.0	23.1	24.5	39.0
I prefer roses that have fewer big blooms rather than many small blooms.	6.9	17.5	43.1	21.7	10.9
Roses are difficult to grow.	32.7	29.3	18.1	16.6	3.3
I would pay more for a rose bush than I would for most other landscaping plants.	6.1	16.1	25.0	33.2	19.6
Roses grow easily in my climate.	4.9	15.5	18.1	37.2	24.3

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