Table 4. Accumulation of elements in plant organs at end of harvest season (2 season data except for Mn).

Plant organs	Element accumulation (kg/ha)					Element accumulation (g/ha)			
	N	P	K	Ca	Mg	Fe	Zn	Mn	B
Roots & crown	5.2	0.8	3.4	5.7	1.2	164	29	27	9
Petioles	2.5	0.6	7.1	3.0	0.7	17	6	6	4
Leaves	14.4	1.5	8.7	9.2	1.8	69	12	43	11
Flower & stalk	0.8	0.2	1.0	0.4	0.1	5	1	3	1
Fruit[z]	1.7	0.4	2.1	0.7	0.2	7	2	3	1
Dead foliage	5.1	0.8	2.0	9.6	1.1	132	8	36	11

[z]All unharvested fruit.

concentrations of K. P concentrations did not vary consistently among plant organs during the 2 seasons.

The amount of each element accumulated in each plant organ (excluding harvested fruit) is given in Table 4. The amount is the product of the elemental concentration and the dry matter content. At the end of the season, the dry matter content of the various plant organs as a percent of the total dry matter content of the plant was: leaves 31, dead material 24, roots and crown 23, petioles 13, immature fruit 6, and flower and flower stalks 3. Leaves accumulated the greatest amounts of N, P, K, Mg, and Mn; the roots and crown accumulated the most Fe and Zn while Ca was accumulated in greatest amounts by the dead material.

Variation in either the plant size or the fruit yield will alter the total elemental accumulation but should not appreciatively change the pattern of nutrient accumulation. The data indicate that most of the elemental accumulation occurs during the fruit harvest, and most of the N, P, K, Mg, Zn, and B accumulated during that time were in the fruit. For maximum fruit yield, these elements must be available in greatest amounts during fruiting. Strawberries are generally grown on coarse-textured soils and fertilizer leaching can be serious even under full-bed mulch (1). To reduce the leaching problem, controlled-release fertilizer is applied in Florida and elsewhere. However, the release characteristics of these fertilizers vary greatly (6) and should be carefully evaluated so that the nutrients are released to meet the needs of the plant without being subject to excessive leaching. The amount of fertilizer to apply will vary with the fruit yields and the soil. Only small amounts are needed to replace that contained in the harvested fruit. Amounts applied in excess of this either buildup the soil fertility or are lost by leaching and volatization. Since strawberries are generally grown on porous soils, leaching is probably the ultimate fate of the excess fertilizer.

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Factors Affecting the Marketability of Roses[1]

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Abstract. **Marketability of arrangements of rose (*Rosa hybrida* L.) was evaluated on the basis of unit size, stem length, cultivar, flower condition including openness, bentneck and discoloration, and price using conjoint analysis. Long stemmed, 12 unit red hybrid tea roses lost competitive position in favor of shorter 9 and 5 unit rose arrangements. Price was the major determinant for the favorable consumer acceptance of the smaller sized, short stemmed roses in arrangements. The cultivar of rose marketed and the degree of flower openness were important factors influencing the consumer's purchase decision. Low priced short stemmed roses (40 cm) in a tight bud-stage were the most highly valued, however, 'Sonia' roses evoked strong consumer appeal regardless of price or stage of bud openness.**

Roses are the major cut flower crop in the U.S., representing about 39% of the wholesale value of cut flower production (1). However, market growth has been slowed due to seasonal supply and demand imbalances (10). Market expansion could be enhanced if roses were merchandised in mixed bouquets and arrangements rather than exclusively on a homogeneous basis (6).

Another factor affecting market growth has been consumer price resistance to the 12 units in which roses are commonly merchandised (10). Recently high prices have represented a barrier to consumer spending. Efforts by the industry to eliminate the 12 unit package have met with resistance due to a

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fear that metric packaging would result in different grading procedures for quality, flower openness and stem length and variation in these factors by cultivar. Also, the consumers' response to different unit sizes and prices has remained the most critical question in changing rose packaging.

This research was designed to analyze the consumer response to roses by varying the number of units, stem length, and price. A secondary consideration of the research was to determine the most important rose product characteristics such as openness and the presence of product defects, which influence the marketability of roses.

Materials and Methods

Rose purchasing information was collected from 99 Columbus, Ohio, residents on May 16, 1979. The site for this study (Columbus, Ohio) was chosen since it had frequently been used in the past for test marketing of many consumer products (8). All experiments were conducted with the underlying assumption that this study could be extrapolated to the general U.S. population.

A Columbus-based market research consulting firm randomly screened and hired people used in the study. The screening process provided a representative sample of the potential population likely to be flower purchasers. These consumers had annual family incomes over $10,000. The actual consumer sample was comprised of a total of 50 females and 49 males.

Four experiments were designed using conjoint analysis (3, 4, 7, 9) to evaluate the relative importance of a product's multidimensional attributes and their relative single attribute (5). While conjoint analysis only required rank-ordered input data, it yielded interval-scaled output data (2). This methodology has been used in previously published horticultural research (6).

The 4 separate experiments were conducted concurrently with about 10 people at a time. Each experiment involved the study of 3 factors. These factors were identical for experiments 1 and 2, but varied for experiments 3 and 4. Rose arrangements were systematically prepared on the basis of 3 levels for each of the 3 factors, resulting in a 3 way design (3 × 3 × 3) of 27 product combinations. Participants were asked to rank 9 of the 27 alternative products using fractional factorial design. There was a 7-position rating scale on which the participants indicated their rankings from "the most to the least desirable product offering." Ties were allowed except in the first and last positions. The interval-scaled output resulted from conjoint analysis of the rank-ordered input data using a multiple regression model.

In the first 2 experiments, the 3 factors studied included unit size, stem length, and price. Unit size was defined as the number of roses within each arrangement. The 3 specific unit sizes included 12, 9, and 5 roses each arranged in a 28 cm crystal glass vase. Style of the arrangements was identical. These experiments utilized 'Forever Yours' and 'Samantha' roses, in a uniform bud stage, respectively.

Stem length was the second factor studied in both experiments. The 3 stem lengths were short (40 cm), medium (56 cm), and long (66 cm).

In both experiments, 3 price levels: low, average, and high, were defined as $5.00, $6.00, and $7.00, respectively, for the 5-unit size arrangement; and $9.00, $11.00, and $13.00, respectively, for the 9-unit size arrangement; and $12.50, $15.00, and $17.50, respectively, for the 12-unit size arrangement.

In the third study, the 3 factors evaluated were openness, cultivar, and price. Openness was defined as the degree of flower opening including tight bug-stage, average or half-open bud stage, and fully open. Openness was uniform throughout each level.

Cultivar was the second factor studied. Three cultivars, a pink sweetheart rose, 'Junior Bridesmaid'; a pink-salmon floribunda rose, 'Sonia' and a red hybrid tea rose 'Forever Yours' were used in this experiment.

Price was the third factor studied. Sweetheart, floribunda, and hybrid tea roses in units of 12 were priced at 3 levels: low, $10.00; average, $15.00; and high, $17.50. All of the roses were arranged in crystal glass vases and the style of the arrangements was identical.

A fourth experiment focused on openness, bentnecks and discoloration of red 'Forever Yours' hybrid tea roses. Openness, as defined in experiment 3, comprised 3 levels: tight bud, average open bud, and fully open flower.

The degree of rose bentnecks was divided into 3 levels: no bending, slight bending, and extreme bending. Slight bentneck was defined as roses with a bentneck of from 5^{o} to 45^{o}.

To achieve these specific levels of bentneck roses, the rose stems were artificially bent at the flower head with wire several hours prior to consumer testing. The wires, removed prior to the consumer testing, caused only slight variation in the specified degree of bending. Discoloration was defined as blueing, fading, or any other color change in the rose petals. The experiment was designed for 3 levels of petal discoloration: no discoloration, slight discoloration, and extensive discoloration. Slight discoloration was defined as 5% to 20% of the rose petal area showing discoloration while extensive discoloration was defined as greater than 20% of the rose petal area showing discoloration. To achieve these specific levels of discoloration, the roses were placed in floral preservatives known to cause color change in rose petals. However, due to physiological factors, discoloration was much less visible in the tight bud and half-opened roses than it was in the full-opened and exposed petals.

The conjoint rank data were analyzed for segmentation groups including age, income, sex, flower budget and flower purchase frequency. The average ranked conjoint data for each segmentation group were entered into a separate regression program which yielded a set of utility values for all levels of each factor studied.

The algorithms provided "numerical" representations for the utilities by which they were able to indicate each factor's relative importance. These numerical representations were termed relative utility scores. These scores were relative, not absolute, because they were significant only within the context of the specific experiment's product alternatives. The term "utility" referred to value or satisfaction gained by a consumer through a purchase choice. Since all utility scores were expressed in the common unit with a zero base, it was possible to compare utility ranges from different factors to determine each factor's relative importance (3). As with previous uses of conjoint analysis, interactions between factors studied were assumed to be controllable.

Results and Discussion

The 5 and 9-unit sized arrangements evaluated in experiments 1 and 2 showed varying degrees of positive consumer acceptability. In experiment 1, the 9-unit 'Forever Yours' rose product produced greater consumer value than either the 12-unit product or the 5-unit product (Table 1). In experiment 2 (the 9-unit arrangement), using 'Samantha' roses again maintained its competitive position by showing greater consumer value than either the 12- or 5-unit product (Table 2). However, the 5-unit 'Samantha' product showed a much stronger consumer acceptability than the 5-unit 'Forever Yours' arrangement of Experiment 1. Possibly the slightly smaller flower size of 'Samantha' enhanced the appeal of the 5-unit product compared to the 'Forever Yours' product.

Short-stemmed roses were more valuable to consumers than the medium or long-stem roses. Females and consumers under 35 years old expressed stronger appeal for the short

Table 1. Relative utility scores for unit size, stem length, and price for 'Forever Yours' roses, Experiment 1.

Consumer groups	Utility index[z]								
	Unit size of flowers			Stem length[y]			Price[x]		
	12	9	5	Short	Medium	Long	Low	Avg	High
Sex									
Males	0.39	0.71	0	0.86	0.07	0	1.36	0.73	0
Females	0.35	0.57	0	0.92	0.59	0	1.17	0.77	0
Age									
<35 years	1.41	1.33	0	0.79	0.35	0	1.42	1.42	0
>35 years	0.79	0.69	0	0.51	0	0.10	1.06	0.66	0
Income									
<$25,000	0.35	0.63	0	0.90	0.30	0	1.21	0.62	0
>$25,000	0.61	0.80	0	0.92	0.36	0	1.39	0.99	0
Flower budget									
<$25,00/yr	0	0.29	0.34	0.48	0.44	0	1.43	0.86	0
$25.00-$75.00/yr	0.43	0.70	0	1.33	0.64	0	1.42	0.84	0
>$75.00/yr	0.98	0.27	0	0.73	0	0.46	0.63	0.37	0
Frequency of flower buying (times/year)									
Low (0-2)	0.72	0.87	0	1.14	0.63	0	1.24	0.73	0
Avg (3-6)	0.52	0.38	0	0.57	0.04	0	1.10	0.79	0
High (>6)	0	1.03	1.03	1.03	0	0.60	2.14	0.68	0
All groups	0.37	0.63	0	0.89	0.34	0	1.26	0.75	0

[z]Utility index represents a relative utility score for purchasing components where the lowest component value was set at a base value of 0.

[y]Stem lengths are: Short (40 cm), Medium (56 cm) and Long (66 cm).

[x]Prices were $5.00, $6.00 and $7.00 for the 5-unit size arrangements; $9.00, $11.00, and $13.00 for the 9-unit size arrangements, and $12.50, $15.00 and $17.50 for the 12-unit size arrangements.

Table 2. Relative utility scores for unit size, stem length, and price for 'Samantha' roses, Experiment 2.

Consumer groups	Utility index[z]								
	Unit size of flowers			Stem length[y]			Price[x]		
	12	9	5	Short	Medium	Long	Low	Avg	High
Sex									
Males	0	0.67	0.52	0.80	0.56	0	1.27	0.82	0
Females	0	0.99	0.06	1.47	1.35	0	0.94	0.34	0
Age									
<35 years	0	1.07	0.49	1.07	0.82	0	1.20	0.96	0
>35 years	0.23	0.86	0	0.54	0.68	0	1.02	0.57	0
Income									
<$25,000	0	0.86	0.50	1.11	1.04	0	1.11	0.58	0
>$25,000	0.07	0.94	0	1.21	0.84	0	1.07	0.49	0
Flower budget									
<$25.00/yr	0	0.61	0.42	0.95	0.82	0	1.13	0.66	0
$25.00-$75.00/yr	0	1.09	0.44	1.44	1.24	0	1.22	0.57	0
>$75.00/yr	0.36	0.74	0	0.70	0.50	0	0.57	0.44	0
Frequency of flower buying (times/yr)									
Low (0-2)	0.25	0.77	0	1.25	1.05	0	1.02	0.59	0
Avg (3-6)	0	1.31	0.78	0.99	0.86	0	1.15	0.51	0
High (>6)	0	1.08	1.98	1.24	1.02	0	1.43	0.68	0
All groups	0	0.83	0.27	1.16	0.98	0	1.09	0.57	0

[z]Utility index represents a relative utility score for purchasing components where the lowest component value was set at a base value of 0.

[y]Stem lengths are: Short (40 cm), Medium (56 cm) and Long (66 cm).

[x]Prices were $5.00, $6.00 and $7.00 for the 5-unit size arrangements; $9.00, $11.00, and $13.00 for the 9-unit size arrangements, and $12.50, $15.00, and $17.50 for the 12-unit size arrangements.

Table 3. Relative utility scores for openness, cultivar, and price, Experiment 3.

Consumer groups	Utility index[z]								
	Flower openness			Cultivar[y]			Price[x]		
	Tight	Slight	Full	J.Br.	Sonia	F.Y.	Low	Avg.	High
Sex									
Males	0.41	0.29	0	0	1.65	0.61	1.21	0.17	0
Females	1.46	0.96	0	0.72	2.38	0	1.22	0	0.09
Age									
<35 yrs	0.36	0.12	0	0.57	2.18	0	1.37	0.43	0
>35 yrs	1.08	0.52	0	0.36	1.71	0	0.97	0	0
Income									
<$25,000	0.66	0.51	0	0	1.71	0.04	1.40	0.25	0
>$25,000	1.62	0.90	0	0.37	1.89	0	1.14	0	0.34
Flower budget									
<$25/yr	0.84	0.48	0	0.75	2.24	0	1.91	0.40	0
$25-$75/yr	1.12	0.64	0	0	1.67	0	1.01	0	0
>$75/yr	0.54	0.65	0	0	1.79	0.30	1.19	0	0.19
Flower buying frequency (times/yr)									
Low (0-2)	0.74	0.51	0	0.08	1.64	0	1.24	0.08	0
Avg (3-6)	1.44	0.85	0	0.29	1.91	0	1.09	0	0.15
High (>6)	0.48	0.62	0	0	2.52	0.71	1.67	0.43	0
All groups	0.96	0.64	0	0.09	1.75	0	1.17	0.03	0

[z]Utility index represents a relative utility score for purchasing components where the lowest component value was set at a base value of 0.

[y]J.Br. represents 'Junior Bridesmaid'; Sonia represents 'Sonia'; F.Y. represents 'Forever Yours'.

[x]Prices were low $10.00; average $15.00; and high $17.50.

Table 4. Relative utility scores for openness, bentnecks, and discoloration, Experiment 4.

Consumer groups	Utility index[z]								
	Flower openness			Bentnecks[y]			Discoloration[x]		
	Tight	Slight	Full	None	Slight	Extreme	None	Slight	Extreme
Sex									
Males	0.80	1.10	0	0.33	0.25	0	0.42	0.46	0
Females	3.38	2.42	0	0.79	0.38	0	0.75	0.23	0
Age									
<35 yrs	2.09	1.56	0	0.53	0.24	0	0.58	0.40	0
>35 yrs	2.17	1.74	0	0.56	0.32	0	0.68	0.13	0
Income									
<$25,000	1.76	1.51	0	0.68	0.29	0	0.51	0.39	0
>$25,000	2.81	2.18	0	0.46	0.39	0	0.79	0.33	0
Flower budget									
<$25/yr	2.54	1.74	0	0.74	0.39	0	0.68	0.54	0
$25-$75/yr	2.04	1.94	0	0.66	0.33	0	0.47	0.29	0
>$75/yr	2.00	1.46	0	0.22	0.24	0	0.81	0.32	0
Flower buying frequency (times/yr)									
Low (0-2)	2.07	1.72	0	0.52	0.30	0	0.66	0.46	0
Avg (3-6)	2.68	2.16	0	0.65	0.38	0	0.61	0.16	0
High (>6)	0.46	0.76	0	0.68	0.30	0	0	0.32	0
All groups	2.16	1.80	0	0.58	0.32	0	0.60	0.34	0

[z]Utility index represents a relative utility score for purchasing components where the lowest component value was set at a base value of 0.

[y]"None means straight stems <5° bending, "Slight" means 5° to 45° bending, "Extreme" means >45° bending.

[x]"None means >5% petal discoloration, "Slight" means 5%-20% petal discoloration, "Extreme" means >20% petal discoloration.

Table 5. Relative importance of purchasing components for rose floral products, Experiments 1, 2, 3 and 4.

Consumer groups	Relative importance (%)											
	Experiment 1			Experiment 2			Experiment 3			Experiment 4		
	Unit size	Stem length	Price	Unit size	Stem length	Price	Openness	Cultivar	Price	Openness	Bentnecks	Discoloration
Sex												
Males	24.2	29.4	46.4	24.5	29.2	46.4	12.5	50.5	37.0	58.2	17.5	24.3
Females	21.4	34.6	44.0	29.1	43.2	27.6	28.9	47.0	24.1	68.7	16.1	15.2
Age												
<35 yrs old	40.0	21.8	39.2	32.0	32.0	35.9	9.2	55.8	35.0	65.3	16.6	18.1
>35 yrs old	33.5	21.6	44.9	33.6	26.6	39.8	28.7	45.5	25.8	63.6	16.4	19.9
Income												
<$25,000	23.0	32.8	44.2	27.9	36.0	36.0	17.5	45.4	37.1	59.7	23.1	17.3
>$25,000	25.7	29.6	44.7	29.2	37.6	33.2	34.8	40.6	24.5	69.2	11.3	19.5
Flower budget												
<$25/yr	15.1	21.3	63.6	22.7	35.3	42.0	16.8	44.9	38.3	64.1	18.7	17.2
$25-$75/yr	20.3	38.6	41.2	29.1	38.4	32.5	29.5	43.9	26.6	64.4	20.8	14.8
>$75/yr	41.9	31.2	26.9	36.8	34.8	28.4	17.9	49.3	32.8	65.6	7.9	26.6
Flower buying frequency (times/yr)												
Low (0-2)	26.8	35.1	38.2	25.3	41.1	33.6	20.4	45.3	34.3	63.7	16.0	20.3
Avg (3-6)	23.7	26.0	50.2	38.0	28.7	33.3	32.4	43.0	24.5	68.0	16.5	15.5
High (>6)	24.5	24.5	51.0	42.6	26.7	30.8	12.9	52.4	34.7	43.2	38.6	18.2
All groups	22.7	32.0	45.3	28.6	27.6	43.8	24.7	45.1	30.2	64.7	17.4	18.0

roses particularly 'Samantha'. The long 56 cm roses scored lowest for all consumer groups (Table 2).

Longer-stemmed roses also evoked a greater price sensitivity than their shorter counterparts. The low priced rose products evoked a greater price consumer response than did both the average and high priced roses. Younger consumers, males and high income consumers displayed stronger appeal for the lower priced products (Tables 1 and 2).

Persons with the greatest flower purchasing frequency and persons with the lowest flower budgets displayed stronger appeal for the 5-unit arrangements, while consumers with the lowest purchase frequency and those with the highest flower budgets had stronger appeal for the 12-unit arrangements (Table 1 and 2). Possibly the more frequent flower purchasers are more price sensitive and make smaller unit-size purchases.

The ideal product offering was the 9-unit short-stemmed roses at prices less than $13.00. Consumers displayed interest in trading smaller unit size and stem length in order to purchase at lower prices (Table 5). Also, the short stem 'Samantha' rose in units of 5 priced at $5.00 was a very attractive product offering in terms of consumer acceptability.

In experiment 3, the consumer response to cultivar, openness and price was examined. The rose cultivar used in the arrangements was the most important floral product characteristic influencing the consumers' purchasing decision (Table 3). 'Sonia' roses had the greatest utility scores with an index value of 1.75, whereas 'Junior Bridesmaid' and 'Forever Yours' had values of 0.09 and 0, respectively. This finding was consistent with an earlier study which found that 'Sonia' roses had greater consumer appeal than 'Junior Bridesmaid' and 'Forever Yours' roses (6). Persons purchasing more frequently and persons with the lowest flower budgets had a particularly strong appeal for 'Sonia' roses. Price and degree of flower openness followed the cultivar characteristic with lesser importance as shown by their percentage of relative importance (Table 5).

The tight rose products in experiment 3 were the most desirable, especially among females, persons over 35 years of age and higher income consumers. The fully-open roses scored lowest. The three highest rated rose arrangements were the low priced 'Sonia' in the tight, average and open stages of openness. In contrast to the other roses, it appears 'Sonia' roses remained competitively strong in consumer value even in the open bud stages. Also, 'Sonia's high utility scoring even at high price levels possibly reveals the low price sensitivity towards this rose (Table 3).

In experiment 4, the tight roses scored a utility value of 2.16 followed closely by the slightly open roses at 1.80 (Table 4), while the fully open roses were not judged attractive. Females were more perceptive to flower openness and judged it to be more important. The male segment was the only one to judge the slightly open rose more ideal than the tight rose. The degree of openness accounted for almost 65% of the purchase choice (Table 5).

Discoloration of petals and stem bending were of about equal disutility to consumers (Table 5). Generally, females and persons over 35 years of age had a more negative response to stem bending and flower discoloration. Males were generally more concerned with discoloration while females were more concerned with stem bending.

In summary, roses were found to have a strong, positive appeal when they were merchandised in units less than a dozen, particularly in units of 9. Price was a major motivation for purchasing roses in small units and with shorter stem lengths. This evidence supports the merchandising of roses in units of less than 12. The degree of openness affected consumer utility extensively, but this varied substantially by cultivar. In the open stage, the 'Sonia' rose had more appeal than the 'Forever Yours' rose in the tight bud stage. Openness was the most negative factor in consumer choice of roses compared to bentneck and discoloration.

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Horticultural Characteristics of Native *Vaccinium darrowi, V. elliottii, V. fuscatum,* and *V. myrsinites* in Alachua County, Florida[1]

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Abstract. **Date of 50% anthesis, date of 50% fruit ripening, length of fruit development period, fruit size, flavor, scar and color were determined for random samples of *V. darrowi* Camp, *V. elliottii* (Chapm.) Small, *V. fuscatum* Ait., and *V. myrsinites* Lam. growing in their native habitats in Alachua County, Florida. Mean berry weight ranged from 25.1 cg for *V. fuscatum* to 17.8 cg for *V. myrsinites. V. elliottii* flowered and ripened early, with only 60 days from flowering to ripening for 5 plants. *V. myrsinites* and *V. darrowi* flowered late, about 1 to 2 weeks after commercial *V. ashei* Reade, but ripened with *V. ashei.* Fruit ranged from shiny black to moderately glaucous for *V. elliottii* and *V. darrowi* but was black for *V. fuscatum* and *V. myrsinites.* Variance analysis suggested that selecting the best clone within a species is almost as important as selecting the best species in breeding most traits.**

Although blueberries are often considered a high-latitude crop, about 10 *Vaccinium* species are native in Florida (2, 8) the exact number varying with the philosophy of the taxonomist. One Florida species, *V. ashei,* has been domesticated as the "rabbiteye blueberry." The vigor and productivity of this species promise to make it an important component of the blueberry industry in future years. The diploid species, *V. darrowi,* produces some viable *2n* or diploid gametes (1, 3) and has been hybridized with highbush blueberry cultivars from the northern United States to produce tetraploid cultivars adapted to southern conditions. The other Florida species have been used little in breeding, although Florida's *V. fuscatum* is similar to *V. australe,* which has been used in breeding blueberries for North Carolina, New Jersey, and Michigan.

This study compares horticultural characteristics of 4 blueberry species in their native habitats in Alachua County Florida and assesses the potential usefulness of each species in breeding blueberry cultivars.

Materials and Methods

Plants of *V. fuscatum, V. myrsinites, V. elliottii* and *V. darrowi* were tagged in December 1977. *V. fuscatum* and *V. myrsinites* were in a moist pine flatwoods 13 km northwest of Gainesville, *V. elliottii* in a sandy, well-drained soil along the Santa Fe River 24 km northeast of Gainesville, and *V. darrowi* in a dry, sandy, pine-oak forest 29 km southwest of Gainesville. Thirty plants of *V. fuscatum* and 15 or more plants each of *V. elliottii, V. darrowi,* and *V. myrsinites* were observed between Feb. 18 and July 20, 1978 at intervals ranging from 1 to 2 weeks. Percent of flowers at or past anthesis and percent of ripe fruit were recorded for all plants that flowered and fruited. In some cases, particularly for *V. myrsinites,* some plants that flowered did not mature any fruit. To maintain a reasonable sample size for fruiting characteristics, fruiting data were collected for some additional plants randomly selected after anthesis. Data were used to estimate for each plant the dates of 50% anthesis, dates of 10%, 50% and 90% fruit ripening and the fruit development period (days between 50% anthesis and 50% fruit ripening). Five samples of 10 fruit each were weighed for each plant that matured 50 fruit. Fruit flavor, stem scar and color were scored for each plant on a 1 to 10 scale (5). Flowering and fruiting dates were compared with those for highbush and rabbiteye cultivars at the University of Florida's blueberry breeding farm 15 km northwest of Gainesville.

Within each of the 4 species, variance in 10 – berry samples was partitioned into among – plant and within – plant components to determine whether berry weight varied significantly among plants within species. Mean fruit weights were compared for the 4 species using a modification of Duncan's test proposed by Kramer (6).

V. myrsinites, V. darrowi, and *V. elliottii* presented no taxonomic problems in selecting plants for observation. Typical populations as described by Camp (2) and Ward (8) were located for each. *V. fuscatum,* on the other hand, is a heterogeneous assemblage which Camp and Ward thought might contain both diploid and tetraploid components (8). Chromosome counts for 16 plants were used in conjunction with a study of leaf types to separate the *V. fuscatum* complex in the observation area into diploid and tetraploid components. Data

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