Literature Cited

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Developing a Dual Purpose Peach in Louisiana

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Abstract

Over a two year period, 24 peach clones were evaluated for canning suitability. Five clones produced acceptable products. Of these, 4 were yellow-fleshed and 1 was white-fleshed. Only 1 yellow-fleshed peach was a genetic clingstone with non-melting flesh. All others were freestone types. The canned peaches were compared to 2 commercial clingstone packs. The 4 yellow-fleshed clones produced canned products similar to the commercial packs. The white peach yielded a bright, firm canned product.

Introduction

Traditionally, the genetic clingstone, non-melting flesh, peach is preferred for commercial canning while the genetic freestone, melting flesh, is normally grown for fresh market. Many of the characteristics which are desirable in a fresh market peach become liabilities in processing. High pH is dangerous with conventional boiling water processing because of the possibility of botulism. A peach with melting flesh will usually not maintain acceptable texture during heat treatment. Irregular flesh pigmentation which may be ignored in a fresh market peach often produces darkening in a canned product. Consumers of canned peaches prefer firm texture with moderate acidity and medium orange to yellow flesh with little or no red coloration. Developing a peach suitable for both fresh and processed markets would be economically attractive to growers. The purpose of this research was to evaluate current clonal selections of the fresh market breeding program for such potential.

During the 1983 and 1984 seasons, 24 peach clones were evaluated for canning suitability. The peaches included genetic clingstones and freestones. The freestone types included the range from physiological clings through true freestones. Flesh colors of the fresh material ranged from white with red mottling to yellow-orange with and without red coloration. Red pigmentation in some clones extended from pit to skin throughout the flesh.

Procedures

All clones were harvested at approximately the same maturity stage and processed immediately. The peaches were washed, sorted, halved, pitted and peeled by hand. Peach halves were then placed into enamel-lined 303 x 406 cans, weighed, and covered with hot (88-93°C) 40 degree Brix sucrose syrup. Six cans of each clone were steam exhausted 5 minutes, sealed, and processed in boiling water for 20 minutes.

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Fresh and canned samples (after 30 days storage) were prepared for analysis by passing the rinsed and drained slices through a manual juicer. Immediately after juicing each sample was evaluated for color (L.a.b.), pH, titratable acidity, and soluble solids (°Brix). The instruments used were a Gardner Instruments XL-23 Colorimeter (standardized with a white tile, L = 92.94, a = -0.89, b = 1.06), a Beckman Zeromatic IV pH meter, and a Bellingham and Stanley RFM-80 refractometer. Acidity was determined using 0.1 N NaOH titrating to an endpoint pH of 8.1 and reported as percent malic acid.

Canned peach halves (intact) also were evaluated for shear texture, loss of drained weight and subjective overall appearance when compared to a commercial pack. The subjective appearance evaluation used a 10 point scale with 1 being poor and 10 being excellent. This number represents a composite score of flesh color, intensity, uniformity, and overall eye appeal evaluations by 5 panelists. Two different brands of commercial clingstone canned peaches were used for comparison and were assumed to represent a score of 10. Shear texture was determined using a Food Technology Corporation TPI Texturepress with a CS-1 standard shear-compression cell and 300 pound ring. The change in drained weight is the difference between rinsed slices before and after canning and is reported as percent loss of initial weight. This is an indicator of leaching or sloughing in the canned product.

Results and Discussion

Five clones were found to have insufficient acid (pH greater than 4.6) when canned and could not withstand processing as a non-acid food (temperatures greater than 100°C). Thus, they were eliminated from consideration as a canned product. Fourteen other peach clones became unacceptably brown or soft as a result of processing. Only 5 clones were found suitable as a processed product. Four yellow-fleshed peaches which processed well are: 'La Pecher'; 'Idlewild'; 71-A73-34., and 9-A47-33. The first 3 are freestone type, while 9-A47-33 is a true clingstone with nonmelting flesh. A white-fleshed selection, 9-A54-13, a freestone type, also has good canning qualities.

Quality evaluation results of fresh material of the 5 peaches are shown in Table 1. The data represents the average of 12 canned samples, 6 replications for each of the 2 years. 'La Pecher' and 71-A73-34 were similar in nearly all categories. 'Idlewild' exhibited the lowest pH, highest titratable acidity, and lowest solids-acid ratio. The genetic clingstone, 9-A47-33, had the least acidity of the 4 yellow-fleshed peaches. The Hunter color "a" values for these yellow-fleshed peaches were low indicating a predominance of true yellow with little "redness" influence. The white-fleshed 9-A54-13 is a low acid, sweet peach with a high solids-acid ratio.

Results of tests performed on the peaches after processing are shown in Table 2. Because sugar has been added to the canned product, the soluble solids, referred to as Cut-out Brix, varies with the weight and sugar content of the fruit and syrup placed into the can. The 5 peaches listed had a Cut-out Brix ranging from 19° to 21° using 40° syrup. The most desirable product in past consumer preference surveys had Cut-out Brix values of 22° to 23°. Recent trends have been toward reduced sugar as seen in the 2 commercial non-melting clingstones which have been included for comparison in Table 2.

The 4 yellow-fleshed peaches, especially 9-A47-33, had pH values and titratable acidities similar to the commercial packs. Both 'Idlewild' and 71-A73-34 had a slight increase in pH following processing. The 4 also had good color after processing changing slightly toward orange (more redness;

Table 1. Quality parameters of fresh peach puree.

Clones	pH	Soluble solids (°Brix)	Titratable acidity (% malic)	Solids/acid ratio	Color values L	a	b
YELLOW-FLESH							
La Pecher	3.55 ab*	7.75 bc	0.62 bc	12.5 ab	42.37 a	0.95 b	21.90 b
Idlewild	3.36 a	7.10 a	0.78 c	9.1 a	43.38 a	1.12 b	21.85 b
71-A73-34	3.40 a	6.90 a	0.64 bc	10.8 ab	43.13 a	0.47 b	21.50 b
9-A47-33	3.64 b	7.35 ab	0.49 b	15.0 b	42.86 a	-0.89 ab	20.90 b
WHITE-FLESH							
9-A54-13	4.10 c	8.20 c	0.24 a	34.2 c	38.63 a	-2.78 a	8.14 a

*Means in a column followed by the same letter are not significantly different at the 5% level (Duncan's multiple range test).

higher "a" value) though not as orange as the commercial packs. It is interesting to note that although these clones had slight red mottling of the flesh when fresh, the red coloration disappeared on processing. The fruit appeared bright uniform yellow and the syrup did not appear to darken appreciably. This is contrary to the other red mottled clones tested which produced brown flesh and dark syrup on processing. None (of the 4) were found to be appreciably different in subjective appearance from the commercial products.

The pH of the white fleshed peach, 9-A54-13, increased slightly during processing but not dangerously so. Unlike all other white-fleshed clones tested, it did not discolor in processing.

When fresh, 9-A54-13 has white flesh with scattered red mottling; when processed, this clone produces a uniformly bright white product.

The processed textures of the 4 yellow-fleshed peaches closely matched those of the non-melting commercial products when measured on a shear press. The true non-melting clingstone, 9-A47-33, was identical to both commercial products. The texture value of the white variety 9-A54-13 was considerably firmer than all other peaches tested. Considering that this clone is a freestone type, it is unusual that such a firm texture was maintained after heat processing.

In terms of change in drained weight, the three yellow, freestone type peaches all lost about the same

Table 2. Quality parameters of canned peaches.

Cultivar or Selection	pH[x]	Cut-out Brix[x]	Titratable acidity[x] (% malic)	Color value[x] L	a	b	Subjective appearance rating[y] (10 = excellent)	Shear texture[y] (pounds)	Loss drained weight[y] (%)
YELLOW-FLESH									
71-A72-23	3.48a*	19.4cd	0.39b	50.76a	5.92b	29.05b	10a	28b	23.2b
71-A73-30	3.48a	20.0cd	0.53c	51.32a	5.44b	28.78b	10a	24a	21.2b
71-A73-34	3.60ab	19.0c	0.41b	51.48a	6.00b	29.28b	10a	27ab	22.9b
9-A47-33	3.65ab	19.8cd	0.32b	47.97a	1.225a	26.38b	10a	30b	7.8a
WHITE-FLESH									
9-A54-13	4.30c	21.1d	0.14a	47.44a	-2.32a	12.22a	z	100c	8.3a
COMMERCIAL									
Brand A	3.65ab	16.4b	0.37b	49.21bc	8.75bc	29.21b	10a	30b	—
Brand B	3.80b	14.2a	0.31b	48.61c	13.30c	30.19b	10a	30b	—

*Means in a column followed by the same letter are not significantly different at the 5% level (Duncan's multiple range test).
[x]Peach puree.
[y]Intact peach halves.
[z]No direct comparison with commercial packs.

percentage. The yellow, non-melting flesh, clingstone, 9-A47-33, had the lowest drained weight loss of any peach tested, maintaining its integrity well under heat processing. The white-fleshed selection, although a freestone type, exhibited a drain weight loss similar to the genetic clingstone.

Conclusions

Any one of the 4 yellow-fleshed peaches would make an acceptable canned product in addition to serving the fresh market. Of the 4, the genetic clingstone, 9-A47-33, was most like the commercial packs in terms of pH, titratable acidity, color, texture, and subjective appearance. This clone could easily serve the dual functions of fresh eating and processing, both at home and commercially. The white-fleshed peach, 9-A54-13 has a unique processing potential. The bright white firm textured flesh is attractive, albeit unusual. The relatively high pH may pose a problem in home canning, but would not be a concern for commercial processors.

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APS

ANNUAL MEETING

THURSDAY, AUGUST 14, 1986

7:00 P.M. WILLMAN ROOM 119

Cover Subjects

If you have an idea for a cover subject, please contact the editor. Fresh material is needed for the drawings thus we need to work nearly a year ahead. There are many varieties that have had significant impact on our fruit industry and deserve to be documented and featured. The present goal is to feature a different fruit on the cover of each issue with a brief article describing the importance and history of the variety. We need a sample of the fruit for the drawing and a person willing to write the article.