this geographic region. Nectarines will be a new orchard product that should not compete with local peaches, but rather will add a new dimension in fruit production and sales. The nonmelting flesh nectarines now emerging from breeding programs will, with a little consumer education, become a demand specialty item. The Pick Your Own type of operation provides the personal contact between grower and consumer to accomplish this necessary education toward a new taste in fruit.

Thus, while prospects for continued and sustained production in the Midwest and Central South are good, the future ultimately becomes a responsibility of the fruit breeder. Cultivar development lies in their hands. In assessing the requirements of new cultivars to meet the needs of the area, certain priorities in breeding may be established. An ordering of these on the basis of current need would produce the following list compiled from suggestions received from participants in the survey: 1) increased bacterial leaf spot resistance, 2) greater winter hardiness, 3) more frost resistance in bloom, 4) expanded rootstock capability, 5) improved handling and holding characteristics in fruit, and 6) emphasis on mid and late season maturity dates. Quality, of course is an implied prerequisite, but acceptable quality and appearance are generally found in today's cultivars, whereas the above-mentioned characteristics are presently marginal. In view of the importance of peach breeding to the future welfare of the peach industry, it is alarming that many peach breeding programs in the nation are being discontinued. If we are to retain a strong peach industry, it is imperative that existing peach breeding programs be continued and well supported.

The authors gratefully acknowledge the cooperation of research and extension personnel who have supplied data and opinions on peach production in their states.

Peach and Nectarine Cultivars of the West Coast

David W. Ramming[1]

The last 25 years have seen the introduction of many new peach and nectarine cultivars. Both public and private breeders have played major roles in developing these cultivars along with the discovery of many mutations. However, some peach cultivars over 50 years old are still important. The production and acreage for California, Oregon, Washington and British Columbia will be outlined and the major cultivars and trends of the peach and nectarine industry will be discussed.

Production and Acreage

Peach acreage in British Columbia has been increasing at a rate of about 10% a year for the last five years and is expected to continue to increase at the rate of about 5% for the next five years. In 1976, approximately 2,350 acres of peaches, of which 80% were bearing, produced about 15,500 tons.

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Nectarine interest is increasing and approximately 100 tons were produced in 1976 (7).

The peach acreage in Washington has been decreasing for the past 15 years, but is now fairly stable at about 3-4,000 acres, of which 75% are bearing. Production has ranged from a high of 21,500 tons to a low of 13,650 tons since 1973. The average production is about 15,500 tons. Much interest in nectarines has resulted in the planting of 3-400 acres (5).

Oregon produces the smallest amount of peaches of the states on the west coast. It averages approximately 5-6,000 tons per year (6). The acreage of peaches probably amounts to about 1,000 acres although no reliable figures are available. Most orchards are about 10-20 acres in size and all the fruit is consumed locally.

California produces more peaches than all the other states combined. In 1976, California produced 980,000 tons of peaches, representing approximately 67% of the U.S. peach crop. Approximately 76% of California's peach crop was cling peach cultivars, of which 594,000 tons were processed (1, 4). A total of 131,000 tons of freestone peaches was shipped to the fresh market, and the remaining 101,000 tons of freestones were processed (Table 1).

Over the past 15 years, the total peach acreage in California has been declining; in 1977, only 68,550 acres remained in production, of which 32% (22,230 acres) were freestone cultivars. Just this winter, an additional 5,220 acres of clings were pulled, leaving a total of 41,100 acres of clings. The freestone peach acreage declined until eight years ago, but it has held fairly steady since. Before 1976, the amount of freestones shipped averaged about 100,000 tons, but increased to 131,000 and 134,000 tons in 1976 and 1977, respectively (4). The amount of freestones dried has greatly decreased, while the amount frozen has increased. The tonage of freestones canned increased until 1965 and has decreased thereafter.

Table 1. California peach and nectarine acreage and production, 1976.

	Bearing acreage		Production (tons)
PEACH	72,720		980,000
Cling	51,160		748,000
		processed	594,000
		fresh	2,000
		culls and	152,000
Freestone	21,560		232,000
		processed	101,000
		fresh	131,000
NECTARINE	13,250		128,000

In the past 30 years the nectarine industry in California has come of age and now produces over 98% of the U.S. crop. In 1977, 150,000 tons of nectarines were shipped. The number of nectarines shipped has exceeded the number of fresh peaches shipped since 1972, except for 1976. The nectarine acreage has increased, especially over the last five years, and in 1976 amounted to approximately 13,250 bearing acres and 6,370 nonbearing acres.

Cultivars

The Pacific Northwest area of British Columbia, Washington and Oregon grows a number of the same cultivars of peaches. The major cultivars grown in British Columbia are Redhaven (970 acres); the Vee cultivars, consisting of Valiant, Veteran, and Vedette (433 acres); Fairhaven (250 acres); and Elberta (433 acres) (7). Some of the less important cultivars grown are Spotlight, Sunhaven, J. H. Hale, Redglobe, Triogem and Early

Table 2. The ten major peach cultivars shipped from California in 1977.

Cultivar	Production (1,000 packages)
Fay Elberta ↓*	1,114
Springcrest ↑	932
Redtop	918
Suncrest	787
O'Henry ↑	509
Fayette ↑	469
Carnival ↑	374
Angelus	366
June Lady ↑	359
Fortyniner	356

*The direction of the arrow following the cultivar indicates the recent trend in production.

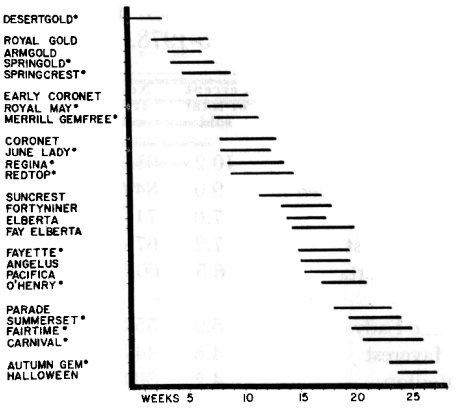

Fig. 1. The 26 principal shipping peach cultivars grown in California and their approximate ripening period. (*Over 10,000 trees sold during 1975-1978 season).

Redhaven. The peach industry in British Columbia is currently interested in cultivars that ripen earlier than Redhaven and cultivars that ripen in late August. The cultivars presently being planted in descending order of quantity are: Redhaven, Fairhaven, Early Redhaven, Vee cultivars, Glohaven, and Canadian Harmony. Over 50% of the trees planted are Redhaven and it is now considered to be over-planted. The nectarine cultivars currently recommended for trial and roadside markets are Crimson Gold, NJN21, Earliblaze, Ruby Gold, Early Sungrand and Stark Redgold.

The major peach cultivars grown in Washington are: Dixired, Redhaven, Redglobe, Yakima Hale, Elberta and J. H. Hale. Redhaven is still being planted (5). Minor cultivars grown are Early Redhaven, Golden Jubilee, Suncrest, Early Elberta, Earlihale and Rio Oso Gem. Of these, Early Redhaven and Suncrest are being planted. Currently, the greatest interest is in early-maturing peach cultivars. Nectarines are also of interest in Washington and plantings are expected to increase. Currently, cultivars being planted are Flavortop, Stark Sunglo and Stark Redgold.

Many peach cultivars are being tried in Oregon, especially by farmers with roadside markets. The major cultivar grown is Veteran because of its ability to set well under Oregon's adverse weather conditions. The second major cultivar is probably Redhaven.

The Pacific Northwest needs peach cultivars that color well and have more hardiness than those from the eastern and southern states. Nectarine cultivars that are hardy, produce well and have a minimum of insect and disease problems are also needed.

The major cling peach cultivars grown in California, in order of maturity, are Loadel (10%), Carson (5%), Andross (7%), Carolyn (12%), Halford (18%) and Starn (6%). Some of the minor cultivars, in order of maturity, are Fortuna, Sweeney, Tufts, Bowen, Peak, Palora, Andora, Gaume, Carolyn R, Everts, Wiser, Sullivan 4 and Corona (3). Most of the crop matures during August, causing a handling problem for the canners although part of the problem is relieved due to the different districts' maturity times. There will probably be little change in the cling cultivars during the next five years, although some of

Table 3. Freestone peach tree sales by cultivar for 1975-1978.

Cultivar	Percent of total sold	No. of trees sold	Maturity season*
Springcrest	10.2	95,981	early
Merrill Gemfree	9.0	84,699	early
O'Henry	7.6	71,303	late
Flavorcrest	7.2	67,403	early
Fay Elberta	6.5	60,660	mid
June Lady	5.9	55,522	early
Maycrest	4.8	44,819	early
Redtop	4.2	39,863	early
Flamecrest	3.6	33,852	mid
Royal Crest	3.4	31,958	early
Fairtime	3.0	28,039	late
Desertgold	2.9	27,077	early
Carnival	2.9	26,894	late
Autumn Gem	2.3	21,314	late
Fayette	2.2	20,852	mid
Royal May	1.7	15,508	early
Sparkle	1.7	15,507	mid
Regina	1.6	15,231	early
First Lady	1.4	13,100	mid
Windsor	1.3	11,946	late
Summerset	1.1	10,242	late
Springold	1.1	10,132	early
Rio Oso Gem	1.1	10,071	mid
Others	13.3	126,426	
TOTAL		938,399	
Early cultivars	57%	536,693	
Mid-season cultivars	21%	200,671	
Late-season cultivars	22%	201,035	

*Early cultivars = those maturing earlier than, or at the same time as, July Elberta.
Mid-season cultivars = those maturing later than July Elberta, but earlier than, or at the same time as Rio Oso Gem.
Late cultivars = those maturing later than Rio Oso Gem.

the old minor cultivars will be discarded if the acreage continues to decline. By that time, it is hoped that the large carry-over of canned peaches will have been reduced and the demand for cling peaches will have increases. The cling season needs to be extended with cultivars that are productive and have high quality, firm, uniform fruit.

Freestone peach production and shipments in California extend from the last week of April to the middle of October. The production starts in the Coachella Valley with the cultivar Desertgold. A need exists to develop improved cultivars to fill the gaps in the season and to replace old cultivars. One hundred twenty-nine freestone cultivars were reported by the California Tree Fruit Agreement for 1977 and many new cultivars are being introduced every year. Eighty-eight of the cultivars reported produced over 5,000 packages each.

The ten major peach cultivars shipped in 1977 are shown in Table 2. Of the ten major cultivars in 1971, only four are still among the top ten in 1977. These cultivars are Fay Elberta, Redtop, Suncrest, and Forty-niner. The 26 principal peach cultivars that ripen throughout the season with their approximate shipping times are shown in Figure 1. These cultivars make up the major portion of freestone peaches shipped. To give you an indication of the cultivars that will be producing in the next five years, a list of the cultivars for which over 10,000 trees were sold in the last three seasons is included in Table 3 (2). Other cultivars of interest are two recently named by Burchell Nursery. They are Golden Lady (early) and Elegant Lady (mid-season) from Merrill's seedlings. Of the four cultivars recently released by Dr. C. O. Hesse, University of California, Cal Red and Fire Red show the most promise.

Over the past five years, there has been a lot of interest in early-ripening cultivars, as shown by the tree sales (Table 3). As a result, Springcrest is currently overplanted. There has also

Table 4. The eleven major nectarine cultivars shipped from California in 1977.

Cultivar	Production (1,000 packages)
Fantasia ↑*	1,161
Early Sungrand ↓	1,151
May Grand ↑	1,150
Sun Grand	929
Flamekist ↑	890
Armking ↑	754
Late Le Grand ↓	749
Independence	687
Flavortop ↑	685
Autumn Grand	665
Red Grand	630

*The direction of the arrow following the cultivar indicates the recent trend in production.

been an increased interest in late-season cultivars. As these early and late season cultivars become over-planted, there will be an increased demand for mid-season cultivars. Currently, there is need for improved cultivars during Early Coronet season and between Fayette and Fairtime. There is continued need for improvement of shipping quality and fruit quality of the existing cultivars.

The nectarine season is not as long as the peach season, but it lasts from the last week in May to the middle of September. Seventy-six nectarine cultivars are listed by the California Tree Fruit Agreement for 1977 (4). Of these 51 cultivars produced over 5,000 packages each. Again, many gaps exist during the season which need to be filled and the season needs to be extended with improved cultivars. Fifteen years ago, six major cultivars produced 78% of the crop for a total of over 3.33 million packages. Of these six cultivars, four are still ranked in the eleven highest-producing cultivars for 1977. They are Early Sungrand, Sun Grand, Late LeGrand and Red Grand. In 1977, 73% or 9.5 million packages were produced by eleven cultivars (Table 4).

Table 5. Nectarine tree sales by cultivars for 1975-78.

Cultivar	Percent of total sold	No. of trees sold	Maturity season*
	14.7	128,361	early
	12.3	107,129	mid
	10.2	88,793	late
	6.7	58,405	late
	6.2	53,965	mid
	5.6	48,781	early
	5.4	47,314	early
	5.4	45,260	late
	4.4	38,569	early
	4.4	38,529	early
	3.2	28,206	mid
	3.2	28,059	early
	3.1	26,667	late
	2.5	21,382	early
	1.4	12,456	late
	1.4	12,425	early
	10.1	88,023	——
TOTAL		872,324	
Early	33%	284,851	
Mid-season	38%	331,390	
Late	29%	256,083	

*Early cultivars = those maturing earlier than, or at the same time as, Star Grand.
Mid-season cultivars = those maturing later than Star Grand, but earlier than, or at the same time as, Le Grand.
Late cultivars = those maturing later than Le Grand.

A list of the 18 major nectarine cultivars that ripen throughout the season is given in Figure 2. These cultivars make up the major portion of nectarines shipped in 1977. An indication of the cultivars that will be producing within five years can be anticipated by observing the tree sales for the past three seasons. The cultivars for which over 10,000 trees were sold since 1975 are shown in Table 5 (2). Two new cultivars, not mentioned above, that appear promising are Spring Red and Summer Beaut. Both

are early nectarines which ripen just before Early Sungrand.

The last ten years have seen the filling of the season with nectarine cultivars around the six old major cultivars. A number of nectarines with high finish and good size have been developed during this time. There has always been an interest in early cultivars, but recently the need for late-maturing nectarines that do not develop internal breakdown during storage has become a major objective for the nectarine industry. The nectarines still need to be improved before they reach the excellence of our peach cultivars. Improvements needed are: increased size early in the season, more color and freestones during the late season. Fruit breeders are coming closer to these objectives every year.

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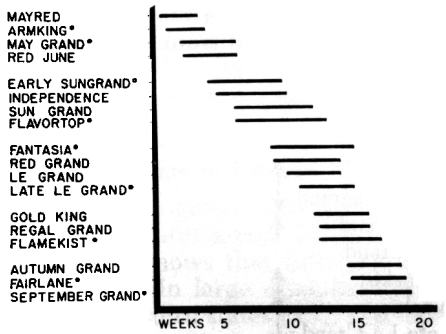

Fig. 2. The 18 principal nectarine cultivars grown in California and their approximate ripening period. (*Over 10,000 trees sold during 1975-1978 season).

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American Pomological Society
93rd Annual Meeting, July 18, 1978

Boston, Massachusetts

Present—H. Daubeny (Presiding), P. O. Domoto, F. Hough, N. Niles, G. Kessler, J. Cummins, K. Hanson, D. Cain, D. Ourecky, R. Joseph, R. Way, D. Meador, B. Parliman, J. Mortensen, B. Storey, R. Simons, D. Hemphill, M. Ishiyama, G. McEachen, J. Moore, R. Andersen, C. Smith, M. Smith, R. O'Barr, J. Parker, C. Rayzea, J. Johnson, C. Hearn, C. Bailey, K. Hanson, C. Bittner, M. Westwood, G. Greene, M. Kolbe, H. Brooks, D. Lockwood, G. Galletta, M. Austin, A. Draper, R. Bringhurst, L. Tukey, J. Overcash, and R. Rom.

Minutes—of the last meeting October 12, 1977, were approved as read and published.

Treasurer's Report—

The report of the treasurer and the audit for 1977 were accepted and approved as presented.

Secretary's Report—

The secretary briefly reported on his duties and submitted suggestions for involving the Executive Board and the Advisory Board to a greater degree in the business of the society.