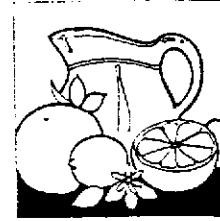


# FLORIDA AGRICULTURAL STATISTICS



## Citrus Maturity and Yield Tests

FLORIDA DEPARTMENT OF AGRICULTURE  
AND CONSUMER SERVICES  
DOYLE CONNER, COMMISSIONER  
TALLAHASSEE, FLORIDA

FLORIDA AGRICULTURAL  
STATISTICS SERVICE

DIVISION OF MARKETING

Robert L. Freie, State Statistician  
Orlando, Florida

H. Vance Young, Jr., Ph.D., Director  
Tallahassee, Florida

Cooperating with

U.S. Department of Agriculture  
Agricultural Marketing Service  
and  
National Agricultural Statistics Service

University of Florida  
Institute of Food & Agricultural Sciences  
Agricultural Experiment Stations  
Department of Food & Resource Economics

### ACKNOWLEDGMENT

The Citrus Maturity Testing Program historic series contained in this publication was prepared by the Florida Agricultural Statistics Service from tests made at the Maturity Test Laboratory, located at the Orange County Agricultural Center.

We offer our sincere thanks to the many growers who allow picking of fruit samples from their groves, the Orange County Commissioners who maintain our test facilities, and citrus organizations who voluntarily cooperate in this program.

The report was assembled under the direction of Robert R. Terry and Harry M. Whittaker of the Florida Agricultural Statistics Service.

For information call: (407) 648-6018

## CONTENTS

	Page
Introduction . . . . .	1
History of Citrus Maturity Testing Program . . . . .	1
Sampling . . . . .	2
Testing . . . . .	2
Comparisons of Fruit Test Results . . . . .	3
Forecasts of Yield of FCOJ . . . . .	3
The 1980-81 Season . . . . .	3
The 1981-82 Season . . . . .	4
The 1982-83 Season . . . . .	4
The 1983-84 Season . . . . .	4
The 1984-85 Season . . . . .	4
The 1985-86 Season . . . . .	5
The 1986-87 Season . . . . .	5
The 1987-88 Season . . . . .	5
The 1988-89 Season . . . . .	5
 Unadjusted Averages	
Early Oranges . . . . .	6-7
Midseason Oranges . . . . .	8-9
Late Oranges . . . . .	10-13
 Unadjusted Matched Averages from Identical Sample Trees, Within Season	
Early Oranges . . . . .	14-16
Midseason Oranges . . . . .	17-19
Late Oranges . . . . .	20-22
 Unadjusted Matched Averages from Identical Sample Trees, Yearly Comparisons	
Early Oranges . . . . .	23-24
Midseason Oranges . . . . .	25-26
Late Oranges . . . . .	27-28
 Unadjusted Averages	
White Seedless Grapefruit . . . . .	29-30
Colored Seedless Grapefruit . . . . .	31-32

This publication was produced at an annual cost of \$1,896.21 or \$2.53 per copy to inform citrus industry officials and other users of the historic trends involved in citrus maturity testing. M89T27

## CITRUS MATURITY TESTING PROGRAM

### INTRODUCTION

Since the processing industry began to utilize the large majority of the orange crop in Florida, the concept of production estimates and forecasts only in terms of boxes of a given weight no longer fully reflects the statistical needs of the citrus industry. To be more meaningful, forecasts and estimates of production need to be expressed in terms of total pounds of solids as well as in terms of boxes. This publication provides a summary of results from randomly sampled fruit collected and tested by the Florida Agricultural Statistics Service for recent years.

### HISTORY

In the late 1950's the Service began to collect fruit samples of oranges monthly to determine if maturity and yield factors could be projected in advance of harvest. For several years fieldmen picked a single fruit from each grove they entered to make monthly counts and size measurements in their regular drop and growth surveys. These fruit were combined into a single sample for each type of orange--early, midseason, and late--and juice was extracted with the aid of an electrically operated reamer. The necessary weights and test results were accumulated. Within a few seasons, it was determined that declines in acid, increases in soluble solids and solids-to-acid ratios and, later in the season, decreases in juice and gains in pounds solids followed predictable patterns. It appeared from these data that changes in these elements could be predicted over time if sufficient observations were available to provide a valid statistical base. None of the results of these tests were published. The yields of pounds solids shown in these tests appeared to be correlated with changes in yield levels of fruit received at the processing plants.

In early 1963, following the disastrous freeze of December 1962, the industry was very concerned over the level of pounds-solids yield that would be obtained from Valencia oranges which had been damaged severely. In response to recommendations by the Citrus Crop Estimates Advisory Committee and requests from others in the citrus industry, the Florida Agricultural Statistics Service conducted a series of tests using fruit from randomly selected sample groves. Three successive tests were made at two week intervals. These tests indicated rather accurately the abnormally low levels of juice and pounds of solids in Valencias that spring.

This pilot project provided experience for developing regular survey procedures which would yield statistically reliable results. Sufficient funds were available to finance the work and a regular program of monthly surveys began on October 1, 1963. The sample size selected in these first surveys provided for 50 groves each for early, midseason, and late oranges. Reports were issued individually on early and midseason oranges on the first of each month from October through January in the 1963-64 season, and from October 1 through February 1 in the 1964-65 and 1965-66 seasons. Valencia orange test results were reported on October 1 through April 1 in the 1963-64 season, and through May 1 in the 1964-65 season. In the 1965-66 season, Valencias were tested at the first of each month from October through February and, beginning in February, a midmonth report was added, continuing through April of that season. In the 1966-67 season, testing began September 1 and midmonth tests were added to the previous monthly programs.

In 1967, following a statistical evaluation of the preceding four years' results, the Service responded to industry requests for area data from the maturity and yield tests, and expanded sample sizes. In that year, the number of early orange groves was established at 73, midseasons at 55, and Valencias at 100. September 1 continued as the first test date and the schedule of midmonth tests was retained.

In the 1964-65 season, seedless grapefruit tests were added to the program with a separate series for white and colored varieties. A series for seedy grapefruit was added in the 1965-66 season and retained through the 1983 season, but has been discontinued because of steadily declining production.

## SAMPLING

The Florida Agricultural Statistics Service collects fruit samples starting the first of October, and monthly thereafter. Each sample consists of 15 oranges or 5 grapefruit. The samples are picked from preselected groves and predetermined sample trees. During the 1983-89 season the number of sample groves were: early orange, 90; midseason orange, 65; late (Valencia) orange, 120; white seedless grapefruit, 63; and colored seedless, 53.

Sample groves and trees remain relatively constant from year to year in order to assure the greatest continuity of data. Each sample is picked from a randomly selected cluster of five trees, a central (pivot) tree and four adjacent trees. Sample fruit are selected from the pivot tree's side nearest the road of travel and from the sides of the other four sample trees nearest the pivot tree. This procedure insures that fruit from all exposures are included in the samples.

## TESTING

Early and midseason oranges are now tested on the first of each month beginning October 1 and continuing through February 1. Late oranges are tested on the first of each month beginning October 1 and ending June 1. Grapefruit tests are run the first of each month from October through December.

All maturity tests are conducted at a testing facility located at the Orange County Agricultural Center at 2350 E. Michigan Avenue in Orlando. The testing laboratory was built with funds and labor donated by Florida Citrus Mutual, the Florida Citrus Processors Association, the Florida Citrus Packers and the Orange County Commissioners.

All samples are run through an FMC 091 test extractor using mechanical pressure only. This machine utilizes a .040 short strainer and standard 5/8 inch orifice tube. The beam setting is 1/6 inch and no restrictors are used. Only the 3 inch cup is used for oranges, and only the 5 inch cup for grapefruit. The extractor and specifications correspond to those used for official State tests when the program began. State tests are now run on the FMC 091 B utilizing air pressure.

## COMPARISONS OF FRUIT TEST RESULTS

These Maturity Test Results are not directly comparable with the results of tests being taken by the Division of Fruit and Vegetable Inspection (DFVI) for each load of fruit delivered for processing. The Maturity Tests are from a sample of all fruit remaining on trees at the time of sampling, whereas the DFVI tests are of fruit currently being delivered. Secondly, the Maturity Test Results are based on an extraction procedure which has not varied or changed over the entire history of the tests, and the resulting measures of acids, solids and juice are unadjusted, whereas the DFVI tests are made primarily to establish a basis for payment of fruit, in accord with industry regulations. Thus, the Maturity Test Results are stated for unfinished juice, and the DFVI tests are made, then adjusted to calculate finished juice based on current factoring.

The finished juice from test results entered on DFVI inspection certificates will always be less than the unfinished juice extracted by the inspector and the amount of unfinished juice reported in Maturity Test Results for the corresponding date.

## FORECASTS OF YIELD OF FCOJ

Yield forecasts per 90 pound box equivalents are based on historic relationships, adjusted to reflect the effects of changing regulations on allowable extraction rates and current Brix standards. The forecast is made and measured against the history of actual final yields reported by the Florida Citrus Processors Association. Variables used in the forecasts include Maturity Test Results, and the forecasts properly take into account the actual cumulative yield to date as reported by the Florida Citrus Processors Association.

Starting in the 1965-66 season the standard for Florida orange juice was increased to 45.0° Brix, from the previous standard of 42.0°. This standard was changed to 43.4° with the 1980-81 season, then to 42.0° Brix, the U.S. standard, in 1981-82 and subsequently.

## THE 1980-81 SEASON (THE FIRST SEASON AT 43.4° BRIX)

The all orange FCOJ yield projection on October 1 was 1.37 gallons of 43.4° Brix equivalent and was continued through January. On the mornings of January 13 and 14, the northern one-half of the citrus belt saw the most severe freeze since 1962. Temperatures were in the high teens and low 20's for long durations in most citrus producing counties except the lower East Coast which escaped with little damage. The all orange FCOJ projection for February 1 was lowered to 1.19 gallons per box. This level was continued until May 1 when the yield was raised to 1.20 gallons. The final early and midseason orange yield was 1.21081 with the late yield at 1.20688 gallons. The final all orange FCOJ yield was 1.20935 gallons per box.

#### THE 1981-82 SEASON (THE FIRST SEASON RETURNING TO 42.0° BRIX)

The first FCOJ yield projection for the 1981-82 season on October 1 was 1.42 gallons at 42.0° Brix. This projection was carried until January 1 when the yield was lowered to 1.41 due to slightly lower yield tests. This was the second consecutive year with a severe January freeze. On the morning of January 12, temperatures dropped into the teens in most citrus growing areas, causing considerable damage to both trees and fruit. The February 1 all orange FCOJ projection was lowered to 1.28 gallons per box. The yield was raised to 1.29 gallons per box on March 1, but lowered again to 1.28 gallons on April 1, with the final yield for all oranges at 1.27730. The final early and midseason yield was 1.31576 and the late orange yield was 1.21496 gallons.

#### THE 1982-83 SEASON (42.0° BRIX)

The October 1 all orange FCOJ yield projection was 1.37 gallons per box of 42.0° Brix concentrate. The January 1 yield projection was raised to 1.42 gallons per box. Near perfect growing conditions and excellent soil moisture prevailed throughout the winter which helped the all orange yield finally to attain its level of 1.48305 gallons, the highest in many years. The early and midseason orange yield was 1.41625 and the late orange yield was 1.55933 gallons per box.

#### THE 1983-84 SEASON

The all orange October projection for FCOJ was 1.43 gallons of 42.0° Brix. This yield was continued through December but was lowered in January to 1.23 due to the December 25-26 freeze. The February projection was 1.21. The March yield was increased to 1.25 gallons per box. By May forecast time, the all orange yield projection was 1.28 with the final of 1.28931 gallons per box. The early and midseason final was 1.23692 and the Valencia final was 1.39011 gallons per box.

#### THE 1984-85 SEASON

The first all orange FCOJ yield projection for the 1984-85 season in October was 1.46 gallons of 42.0° Brix. This projection was continued until the February forecast when the yield expectations were lowered to 1.33 due to the January 21-23 freeze which, like the December 1983 freeze, was most severe in the upper portions of the citrus belt. The March 1 all orange yield was raised to 1.36 and was maintained until June when it was increased to 1.38 gallons per box. The final all orange FCOJ was 1.37582 gallons. The final early and midseason yield was 1.39083 and the Valencia final was 1.35988 gallons.

### THE 1985-86 SEASON

The initial FCOJ yield forecast issued October 1 for all oranges was projected to be 1.42 gallons of 42.0° Brix. This yield forecast was maintained until January when it was reduced to 1.40 gallons due to freezing conditions on December 26-27, 1985. The February indications were further lowered to 1.38 gallons per box for all oranges, following the second freeze of the season on January 28-29, 1986. Early and midseason oranges were final at 1.35822 gallons. Late oranges averaged 1.40629 while the all orange yield was final at 1.37834 gallons per box.

### THE 1986-87 SEASON

The all orange FCOJ yield projection on October 1, 1986 was 1.44 gallons of 42.0° Brix. This all orange yield forecast was continued until January when the yield was increased to 1.46 gallons per box. Near ideal weather continued throughout the winter with absence of freezing temperatures. Yield forecasts were further increased in March and again in April to 1.50 gallons per box for all oranges. The early and midseason orange yield was final at 1.44643 gallons per box. Continued excellent growing conditions prevailed and Valencias reached 1.59621 gallons per box. The final all orange FCOJ yield was 1.50827 gallons.

### THE 1987-88 SEASON (RECORD-SEASON)

The October 1, 1987 all orange FCOJ yield projection was 1.46 gallons per box of 42.0° Brix concentrate. This projection was held until January when the forecast was increased to 1.48 gallons per box. There was almost ideal growing weather with good moisture through the winter. The yield projection was increased to 1.51 gallons the first of February and again to 1.53 in March. The spring months had adequate rainfall and no damaging cold weather. The early and midseason orange yield was final at 1.48982 gallons per box. The late type (Valencia) oranges set an all time record high yield at 1.64573. The all orange yield was also at a record level 1.55342 gallons per box.

### THE 1988-89 SEASON

The October 1 all orange FCOJ yield projection was 1.52 gallons of 42.0° Brix concentrate. This level was maintained until January when the unseasonably warm weather and lack of rain had depressed juice levels and the all orange FCOJ projection was lowered to 1.50 gallons per box. Improvements in weather and the Valencia orange crop returned the all orange projection to 1.52 for the February forecast. Continuing improvements in the late oranges supported an increase in all oranges the first of April to 1.53 gallons per box. The early and midseasons were final at 1.47532 gallons of FCOJ per box. The all orange yield projection remained at 1.53. The late type Valencia oranges were final at 1.62816 gallons per box. The all orange yield was final at 1.53442 gallons per box which was second only to the record 1987-88 season yield of 1.55342.

EARLY ORANGES

Maturity and yield test results  
unadjusted averages for regular bloom fruit  
from sample groves  
1980-81 through 1988-89

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
		Number	Percent	Pounds		
October 1						
1980-81	80	1.34	9.67	7.38	47.95	4.63
1981-82	80	1.32	9.53	7.44	48.75	4.65
1982-83	78	1.04	9.15	9.07	49.38	4.53
1983-84	79	1.46	8.89	6.16	47.46	4.22
1984-85	80	1.16	9.60	8.49	49.14	4.72
1985-86	80	1.08	9.34	8.82	49.30	4.61
1986-87	90	1.30	9.53	7.49	49.07	4.67
1987-88	90	1.47	9.79	6.80	47.58	4.65
1988-89	90	1.43	9.54	6.76	48.22	4.59
November 1						
1980-81	79	1.13	10.40	9.45	50.57	5.26
1981-82	80	1.06	10.34	9.89	50.56	5.23
1982-83	77	0.86	9.79	11.57	50.97	5.00
1983-84	79	1.03	9.89	9.72	51.29	5.07
1984-85	79	0.88	10.43	12.17	50.88	5.31
1985-86	78	0.86	9.99	11.85	51.88	5.18
1986-87	90	1.04	10.18	9.99	51.69	5.25
1987-88	90	1.17	10.23	8.85	50.60	5.17
1988-89	89	1.12	10.46	9.49	51.01	5.33
December 1						
1980-81	73	0.97	11.34	11.90	50.91	5.77
1981-82	78	0.98	11.20	11.64	51.45	5.76
1982-83	70	0.77	11.88	14.41	50.13	5.47
1983-84	79	0.98	10.65	11.06	51.67	5.50
1984-85	72	0.84	10.95	13.25	51.32	5.62
1985-86	76	0.77	10.62	13.98	52.73	5.60
1986-87	81	0.79	10.95	14.28	52.80	5.77
1987-88	84	0.95	11.31	12.13	52.11	5.88
1988-89	84	0.99	11.23	11.53	51.77	5.81

Continued



EARLY ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89 (continued)

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
December 15						
1980-81	64	0.99	11.86	12.21	50.96	6.04
1981-82	72	0.98	11.56	12.02	51.30	5.93
1982-83	56	0.72	11.24	15.96	50.70	5.71
1983-84	74	0.95	11.19	11.97	51.53	5.76
1984-85	1/					
January 1						
1980-81	52	0.99	12.11	12.45	49.51	6.00
1981-82	57	0.95	11.76	12.61	49.70	5.85
1982-83	39	0.76	11.50	15.45	50.59	5.85
1983-84	62	0.82	11.13	13.89	45.41	5.06
1984-85	51	0.83	11.90	14.64	50.64	6.03
1985-86	56	0.77	11.48	15.04	50.19	5.77
1986-87	45	0.81	11.86	14.99	52.97	6.28
1987-88	57	0.87	12.22	14.21	52.01	6.35
1988-89	50	0.87	12.26	14.21	51.46	6.31
February 1						
1980-81	23	0.75	12.28	16.96	41.23	5.07
1981-82	19	0.81	12.79	16.47	46.41	5.96
1982-83	2/					
1983-84	2/					
1984-85	18	0.73	12.43	17.33	45.41	5.69
1985-86	29	0.74	12.16	16.64	49.22	5.99
1986-87	13	0.83	12.97	15.72	50.52	6.54
1987-88	29	0.86	13.12	15.46	51.06	6.70
1988-89	19	0.82	13.23	16.32	51.10	6.76

1/ December 15 test discontinued.  
 2/ Too few samples to test.

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent	Percent		Pounds	Pounds
October 1						
1980-81	60	1.54	9.43	6.22	49.68	4.69
1981-82	60	1.44	9.31	6.63	50.51	4.70
1982-83	60	1.19	9.13	8.03	51.71	4.75
1983-84	60	1.61	8.76	5.53	49.13	4.31
1984-85	60	1.30	9.21	7.27	50.79	4.68
1985-86	60	1.18	9.19	8.01	49.79	4.58
1986-87	65	1.49	9.37	6.47	51.17	4.79
1987-88	65	1.65	9.41	5.79	48.39	4.55
1988-89	65	1.53	9.16	6.08	49.62	4.54
November 1						
1980-81	59	1.27	10.39	8.40	52.21	5.42
1981-82	60	1.20	10.36	8.77	51.74	5.35
1982-83	60	1.01	10.04	10.32	53.15	5.34
1983-84	60	1.13	9.89	8.97	53.36	5.28
1984-85	60	1.00	10.19	10.59	53.11	5.41
1985-86	60	0.94	9.94	10.74	52.75	5.25
1986-87	65	1.20	10.05	8.62	53.46	5.37
1987-88	65	1.36	10.12	7.55	51.93	5.25
1988-89	65	1.32	10.10	7.83	52.61	5.31
December 1						
1980-81	59	1.10	11.44	10.72	50.27	5.74
1981-82	59	1.08	11.33	10.75	53.64	6.07
1982-83	59	0.91	11.14	12.76	53.16	5.93
1983-84	59	1.02	10.91	10.92	53.70	5.86
1984-85	60	0.96	10.93	11.71	52.87	5.78
1985-86	59	0.86	10.63	12.60	53.32	5.67
1986-87	63	0.93	11.13	12.27	55.46	6.17
1987-88	65	1.10	11.16	10.33	53.83	6.00
1988-89	65	1.06	11.10	10.71	52.89	5.86

Continued

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89 (continued)

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
December 15						
1980-81	56	1.13	11.84	10.63	52.26	6.19
1981-82	57	1.08	11.76	11.01	52.71	6.20
1982-83	54	0.82	11.54	14.58	52.87	6.11
1983-84	57	1.05	11.39	11.08	53.47	6.09
1984-85	1/					
January 1						
1980-81	52	1.12	12.15	11.07	50.93	6.19
1981-82	52	1.01	11.79	11.88	51.83	6.11
1982-83	42	0.89	12.03	13.95	52.94	6.39
1983-84	55	0.89	11.31	13.14	48.75	5.52
1984-85	53	0.89	11.70	13.47	51.82	6.06
1985-86	50	0.84	11.39	13.75	51.33	5.85
1986-87	54	0.89	12.10	13.91	54.48	6.59
1987-88	63	1.00	12.04	12.15	53.19	6.40
1988-89	60	0.98	11.93	12.35	52.99	6.33
February 1						
1980-81	32	0.89	12.51	14.64	43.94	5.51
1981-82	31	0.86	12.52	14.84	48.66	6.13
1982-83	12	0.82	12.32	15.59	50.24	6.23
1983-84	2/					
1984-85	16	0.79	12.18	15.89	47.70	5.82
1985-86	23	0.84	12.30	15.09	50.08	6.17
1986-87	23	0.90	12.55	14.41	53.69	6.74
1987-88	40	1.00	12.68	12.86	52.39	6.64
1988-89	32	0.96	13.37	14.14	50.69	6.77

1/ December 15 test discontinued.  
 2/ Too few samples to test.

LATE ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
October 1						
1980-81	110	2.77	9.01	3.28	46.80	4.22
1981-82	110	2.56	8.63	3.41	47.37	4.09
1982-83	110	2.22	8.42	3.86	48.68	4.10
1983-84	110	2.79	8.38	3.03	44.53	3.73
1984-85	110	2.37	8.76	3.75	47.75	4.19
1985-86	110	2.40	8.63	3.65	48.83	4.21
1986-87	120	2.70	8.79	3.28	46.96	4.13
1987-88	120	2.86	8.86	3.13	46.36	4.11
1988-89	120	2.80	8.64	3.12	46.15	3.98
November 1						
1980-81	110	2.37	9.66	4.11	50.20	4.85
1981-82	110	2.10	9.20	4.44	50.15	4.62
1982-83	110	1.85	8.74	4.91	51.58	4.62
1983-84	110	2.03	8.84	4.39	49.88	4.41
1984-85	110	1.86	9.33	5.09	52.14	4.86
1985-86	110	1.84	8.93	4.94	52.05	4.65
1986-87	120	2.18	9.27	4.28	51.14	4.74
1987-88	120	2.34	9.12	3.95	49.47	4.51
1988-89	120	2.40	9.30	3.91	50.10	4.66
December 1						
1980-81	110	1.87	10.29	5.57	52.08	5.36
1981-82	110	1.79	9.97	5.67	54.00	5.39
1982-83	110	1.48	9.90	6.84	54.23	5.38
1983-84	110	1.76	9.71	5.58	51.63	5.02
1984-85	110	1.63	9.90	6.15	53.40	5.29
1985-86	109	1.55	9.40	6.16	54.03	5.08
1986-87	120	1.61	9.97	6.28	53.61	5.35
1987-88	120	1.85	9.94	5.42	53.93	5.36
1988-89	120	1.84	10.07	5.54	52.96	5.33

Continued

LATE ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89 (continued)

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
January 1						
1980-81	110	1.76	10.94	6.35	53.33	5.83
1981-82	110	1.63	10.53	6.54	53.57	5.65
1982-83	110	1.35	10.75	8.09	55.54	5.98
1983-84	110	1.46	10.38	7.22	50.31	5.23
1984-85	110	1.45	10.57	7.40	54.13	5.72
1985-86	109	1.34	10.13	7.69	54.73	5.55
1985-87	120	1.42	10.71	7.66	55.49	5.94
1987-88	120	1.61	10.86	6.82	55.20	5.99
1988-89	120	1.62	10.79	6.74	54.26	5.85
February 1						
1980-81	110	1.57	11.40	7.39	50.81	5.80
1981-82	110	1.38	10.97	8.07	51.70	5.69
1982-83	109	1.20	11.25	9.51	54.98	6.19
1983-84	91	1.19	10.86	9.24	45.82	5.01
1984-85	108	1.29	11.04	8.67	52.03	5.76
1985-86	108	1.22	10.60	8.78	53.99	5.73
1986-87	120	1.30	11.29	8.81	55.94	6.32
1987-88	120	1.45	11.54	8.04	55.56	6.41
1988-89	120	1.39	11.63	8.47	55.24	6.43
March 1						
1980-81	107	1.38	11.91	8.78	47.22	5.63
1981-82	102	1.18	11.28	9.67	49.32	5.59
1982-83	108	1.15	11.93	10.57	54.00	6.46
1983-84	59	1.17	11.79	10.18	50.79	6.00
1984-85	73	1.16	11.84	10.40	51.72	6.14
1985-86	103	1.12	11.24	10.16	53.33	6.00
1986-87	113	1.20	11.89	10.02	55.07	6.55
1987-88	120	1.31	12.17	9.35	55.93	6.81
1988-89	120	1.27	12.20	9.67	55.17	6.73

Continued

LATE ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89 (continued)

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
April 1						
1980-81	82	1.21	12.07	10.19	47.26	5.71
1981-82	76	1.03	11.33	11.16	50.28	5.71
1982-83	98	1.05	12.21	11.74	53.92	6.60
1983-84	48	1.03	12.14	11.93	52.17	6.35
1984-85	49	1.03	12.27	12.17	51.84	6.37
1985-86	92	0.98	11.60	12.08	53.39	6.21
1986-87	113	1.09	12.50	11.60	54.97	6.87
1987-88	116	1.16	12.60	11.02	56.01	7.06
1988-89	110	1.09	12.73	11.83	56.02	7.13
April 15						
1980-81	65	1.11	12.26	11.16	48.03	5.89
1981-82	68	0.99	11.54	11.84	50.16	5.82
1982-83	91	0.96	12.34	13.01	53.95	6.67
1983-84	42	0.99	12.46	12.70	52.57	6.57
1984-85	1/					
May 1						
1980-81	43	1.05	12.45	11.99	49.75	6.18
1981-82	51	0.89	11.43	13.02	49.21	5.65
1982-83	66	0.95	12.38	13.15	53.79	6.67
1983-84	30	0.95	12.82	13.61	51.61	6.64
1984-85	30	0.86	12.05	14.25	51.68	6.23
1985-86	47	0.85	11.77	14.10	52.40	6.19
1986-87	71	0.99	12.67	12.94	56.52	7.16
1987-88	79	1.01	12.89	12.86	56.02	7.23
1988-89	71	0.97	13.00	13.55	55.42	7.21

1/ April 15 test discontinued.

Continued

LATE ORANGES

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89 (continued)

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
	Number	Percent			Pounds	
June 1						
1980-81	15	0.92	12.78	14.18	51.94	6.61
1981-82	9	0.82	11.74	14.47	47.44	5.55
1982-83	15	0.87	13.15	15.31	52.02	6.84
1983-84	1/					
1984-85	1/					
1985-86	21	0.79	12.13	15.44	52.76	6.42
1986-87	17	0.78	12.27	15.85	55.42	6.81
1987-88	26	0.88	13.08	14.97	55.75	7.30
1988-89	27	0.81	13.17	16.53	56.00	7.39

1/ Too few samples to test.

EARLY ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

Season and date	Acid	Soluble solids	Ratio	Juice per box	Solids per box
Number	Percent			Pounds	
1980-81 (52 groves)					
Sep 1	2.16	9.65	4.50	39.60	3.82
Oct 1	1.36	9.72	7.26	48.06	4.67
Nov 1	1.16	10.49	9.27	51.14	5.36
Dec 1	0.99	11.40	11.73	51.43	5.86
Dec 15	1.01	11.89	11.97	50.74	6.03
Jan 1	0.99	12.11	12.45	49.51	6.00
1981-82 (57 groves)					
Sep 1	1.94	9.39	4.91	42.81	4.01
Oct 1	1.36	9.57	7.21	48.57	4.65
Nov 1	1.09	10.36	9.65	50.80	5.26
Dec 1	1.01	11.27	11.38	51.34	5.78
Dec 15	1.00	11.66	11.86	51.39	6.00
Jan 1	0.95	11.76	12.61	49.70	5.85
1982-83 (39 groves)					
Oct 1	1.06	9.11	8.84	49.62	4.53
Nov 1	0.87	9.78	11.48	51.28	5.02
Dec 1	0.78	10.80	14.13	50.39	5.45
Dec 15	0.70	11.13	16.12	50.01	5.58
Jan 1	0.76	11.50	15.45	50.59	5.85

Continued



EARLY ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date	: :	Acid	: :	Soluble solids	: :	Ratio	: :	Juice per box	: :	Solids per box
Number		Percent						Pounds		
1983-84 (62 groves)										
Oct	1	1.47		8.84		6.09		47.73		4.22
Nov	1	1.03		9.81		9.59		51.38		5.03
Dec	1	0.98		10.58		10.94		51.84		5.48
Dec	15	0.94		11.15		11.97		51.59		5.75
Jan	1	0.82		11.13		13.89		45.41		5.06
1984-85 (51 groves)										
Oct	1	1.20		9.74		8.31		48.70		4.74
Nov	1	0.90		10.63		12.12		51.18		5.44
Dec	1	0.84		11.13		13.40		51.31		5.71
Dec	15 1/									
Jan	1	0.83		11.90		14.64		50.64		6.03
1985-86 (56 groves)										
Oct	1	1.09		9.30		8.69		48.95		4.55
Nov	1	0.87		10.06		11.78		51.92		5.23
Dec	1	0.79		10.68		13.72		52.76		5.64
Jan	1	0.77		11.48		15.04		50.19		5.77

1/ December 15 test discontinued.

Continued

EARLY ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date	Number	Acid	Soluble solids	Ratio	Juice per box	Solids per box
		Percent			Pounds	
1986-87 (45 groves)						
Oct	1	1.34	9.59	7.34	49.13	4.70
Nov	1	1.07	10.25	9.82	51.84	5.31
Dec	1	0.81	11.02	13.98	53.46	5.88
Jan	1	0.81	11.86	14.99	52.97	6.28
1987-88 (57 groves)						
Oct	1	1.50	9.86	6.69	47.49	4.67
Nov	1	1.21	10.31	8.62	50.60	5.21
Dec	1	0.98	11.39	11.78	51.85	5.89
Jan	1	0.87	12.22	14.21	52.01	6.35
1988-89 (50 groves)						
Oct	1	1.48	9.56	6.53	48.04	4.59
Nov	1	1.13	10.51	9.39	50.69	5.32
Dec	1	1.01	11.35	11.39	51.87	5.88
Jan	1	0.87	12.26	14.21	51.46	6.31

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

Season and date	: : Acid	: : Soluble solids	: : Ratio	: : Juice per box	: : Solids per box
-----					
	Number	Percent			Pounds
1980-81 (32 groves)					
Sep 1	1	2.34	9.38	4.05	41.91
Oct 1	1	1.58	9.41	6.01	49.49
Nov 1	1	1.33	10.38	8.06	52.21
Dec 1	1	1.15	11.45	10.22	50.29
Dec 15	15	1.17	11.84	10.25	51.88
Jan 1	1	1.14	12.10	10.83	50.86
Feb 1	1	0.89	12.51	14.64	43.94
1981-82 (31 groves)					
Sep 1	1	2.14	9.28	4.40	45.52
Oct 1	1	1.52	9.44	6.33	50.72
Nov 1	1	1.25	10.51	8.57	52.09
Dec 1	1	1.10	11.48	10.64	53.79
Dec 15	15	1.10	11.92	10.98	53.13
Jan 1	1	1.04	11.88	11.65	52.16
Feb 1	1	0.86	12.52	14.84	48.66
1982-83 (12 groves)					
Oct 1	1	1.18	9.21	8.27	52.77
Nov 1	1	1.02	10.00	10.27	52.80
Dec 1	1	0.90	11.10	13.00	53.35
Dec 15	15	0.80	11.32	14.78	52.67
Jan 1	1	0.89	12.00	13.90	52.31
Feb 1	1	0.82	12.32	15.59	50.24

-----  
 Continued

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date	: :	Acid	: :	Soluble solids	: :	Ratio	: :	Juice per box	: :	Solids per box
Number		Percent						Pounds		
1983-84 (55 groves)										
Oct	1	1.62		8.77		5.50		49.23		4.32
Nov	1	1.14		9.90		8.91		53.50		5.29
Dec	1	1.03		10.90		10.84		54.02		5.89
Dec	15	1.05		11.39		11.03		53.49		6.09
Jan	1	0.89		11.31		13.14		48.75		5.52
1984-85 (53 groves)										
Oct	1	1.30		9.21		7.25		50.88		4.69
Nov	1	1.01		10.22		10.48		53.23		5.44
Dec	1	0.97		11.00		11.65		53.14		5.85
Dec	15 1/									
Jan	1	0.89		11.70		13.47		51.82		6.06
1985-86 (50 groves)										
Oct	1	1.19		9.18		7.88		49.78		4.57
Nov	1	0.95		9.95		10.68		52.94		5.27
Dec	1	0.87		10.63		12.49		53.21		5.66
Jan	1	0.84		11.39		13.75		51.33		5.85

1/ December 15 test discontinued.

Continued

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date	Acid	Soluble solids	Ratio	Juice per box	Solids per box	
-----						
	Number	Percent			Pounds	
1986-87 (54 groves)						
Oct 1	1	1.51	9.37	6.40	51.17	4.79
Nov 1	1	1.21	10.05	8.56	53.28	5.35
Dec 1	1	0.94	11.14	12.19	55.40	6.17
Jan 1	1	0.89	12.10	13.91	54.48	6.59
1987-88 (63 groves)						
Oct 1	1	1.66	9.41	5.76	48.40	4.55
Nov 1	1	1.37	10.12	7.52	51.96	5.26
Dec 1	1	1.10	11.16	10.30	54.03	6.03
Jan 1	1	1.00	12.04	12.15	53.19	6.40
1988-89 (60 groves)						
Oct 1	1	1.55	9.13	6.01	49.87	4.55
Nov 1	1	1.33	10.06	7.73	52.83	5.31
Dec 1	1	1.06	11.09	10.67	53.12	5.89
Jan 1	1	0.98	11.93	12.35	52.99	6.33
-----						

LATE ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

Season and date	Number	Acid	Soluble solids	Ratio	Juice per box	Solids per box
1980-81 (43 groves)						
Oct	1	2.78	8.93	3.24	46.53	4.16
Nov	1	2.41	9.72	4.06	50.14	4.88
Dec	1	1.93	10.41	5.47	51.81	5.39
Jan	1	1.82	11.04	6.18	53.11	5.86
Feb	1	1.65	11.61	7.12	52.54	6.10
Mar	1	1.44	12.12	8.52	49.49	6.00
Apr	1	1.24	12.24	10.06	49.31	6.04
Apr	15	1.13	12.33	11.09	49.15	6.06
May	1	1.05	12.45	11.99	49.75	6.18
1981-82 (51 groves)						
Oct	1	2.63	8.72	3.35	47.52	4.14
Nov	1	2.16	9.33	4.36	50.75	4.73
Dec	1	1.86	10.11	5.51	54.53	5.51
Jan	1	1.71	10.70	6.31	53.90	5.77
Feb	1	1.45	11.14	7.80	52.92	5.90
Mar	1	1.25	11.39	9.23	51.02	5.83
Apr	1	1.04	11.42	11.03	51.10	5.84
Apr	15	1.00	11.57	11.78	50.63	5.89
May	1	0.89	11.43	13.02	49.21	5.65
1982-83 (66 groves)						
Oct	1	2.25	8.40	3.78	48.45	4.07
Nov	1	1.87	8.89	4.83	51.59	4.60
Dec	1	1.50	9.83	6.64	54.42	5.35
Jan	1	1.39	10.76	7.85	55.50	5.98
Feb	1	1.21	11.20	9.35	54.88	6.16
Mar	1	1.15	11.84	10.43	54.03	6.42
Apr	1	1.06	12.12	11.57	53.74	6.53
Apr	15	0.97	12.36	12.83	53.96	6.68
May	1	0.95	12.38	13.15	53.79	6.67

Continued

LATE ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date	Acid	Soluble solids	Ratio	Juice per box	Solids per box
Number	Percent			Pounds	
1983-84 (30 groves)					
Oct 1	2.83	8.45	3.01	44.56	3.77
Nov 1	2.08	8.87	4.31	50.07	4.45
Dec 1	1.79	9.81	5.55	52.08	5.11
Jan 1	1.55	10.60	6.89	54.05	5.73
Feb 1	1.30	11.33	8.77	52.73	5.97
Mar 1	1.21	12.02	9.98	52.41	6.31
Apr 1	1.06	12.26	11.72	52.27	6.42
Apr 15	1.01	12.59	12.59	52.22	6.59
May 1	0.95	12.82	13.61	51.61	6.64
1984-85 (30 groves)					
Oct 1	2.41	8.85	3.71	47.68	4.22
Nov 1	1.90	9.47	5.05	51.58	4.88
Dec 1	1.72	10.07	5.96	53.34	5.37
Jan 1	1.49	10.78	7.30	53.81	5.80
Feb 1	1.37	11.30	8.37	54.45	6.15
Mar 1	1.19	12.01	10.15	54.04	6.50
Apr 1	1.04	12.25	12.03	52.03	6.38
Apr 15 1/					
May 1	0.86	12.05	14.25	51.68	6.23
1985-86 (47 groves)					
Oct 1	2.42	8.60	3.62	48.67	4.19
Nov 1	1.88	8.83	4.79	51.71	4.57
Dec 1	1.58	9.36	6.03	53.90	5.05
Jan 1	1.36	10.09	7.53	54.69	5.52
Feb 1	1.23	10.54	8.70	54.22	5.72
Mar 1	1.14	11.24	9.96	53.24	5.99
Apr 1	0.99	11.54	11.88	53.06	6.13
May 1	0.85	11.77	14.10	52.40	6.19

1/ April 15 test discontinued.

Continued

LATE ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89 (continued)

Season and date		: Acid	: Soluble solids	: Ratio	: Juice per box	: Solids per box
Number		Percent			Pounds	
1986-87 (71 groves)						
Oct	1	2.78	8.81	3.20	46.89	4.13
Nov	1	2.24	9.24	4.16	51.09	4.72
Dec	1	1.64	9.98	6.16	53.67	5.36
Jan	1	1.47	10.74	7.41	55.84	6.00
Feb	1	1.32	11.30	8.63	55.73	6.30
Mar	1	1.25	11.93	9.69	54.99	6.56
Apr	1	1.12	12.58	11.35	54.80	6.90
May	1	0.99	12.67	12.94	56.52	7.16
1987-88 (79 groves)						
Oct	1	2.90	8.87	3.09	46.33	4.11
Nov	1	2.35	9.10	3.91	49.35	4.49
Dec	1	1.87	9.95	5.36	54.27	5.40
Jan	1	1.62	10.87	6.77	55.52	6.03
Feb	1	1.47	11.53	7.92	55.69	6.43
Mar	1	1.34	12.23	9.19	56.18	6.88
Apr	1	1.18	12.66	10.83	56.01	7.09
May	1	1.01	12.89	12.86	56.02	7.23
1988-89 (71 groves)						
Oct	1	2.85	8.65	3.06	46.24	3.99
Nov	1	2.41	9.32	3.89	49.81	4.64
Dec	1	1.86	10.09	5.45	53.27	5.37
Jan	1	1.63	10.79	6.69	54.37	5.86
Feb	1	1.39	11.68	8.46	55.34	6.47
Mar	1	1.29	12.27	9.58	54.84	6.73
Apr	1	1.08	12.70	11.86	56.00	7.11
May	1	0.97	13.00	13.55	55.42	7.21



EARLY ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Percent acid

Sep 1	2.16	1.94	1/	1/	1/	1/	1/	1/	1/
Oct 1	1.36	1.36	1.06	1.47	1.20	1.09	1.34	1.50	1.48
Nov 1	1.16	1.09	0.87	1.03	0.90	0.87	1.07	1.21	1.13
Dec 1	0.99	1.01	0.78	0.98	0.84	0.79	0.81	0.98	1.01
Dec 15	1.01	1.00	0.70	0.94	1/	1/	1/	1/	1/
Jan 1	0.99	0.95	0.76	0.82	0.83	0.77	0.81	0.87	0.87

Percent soluble solids

Sep 1	9.65	9.39	1/	1/	1/	1/	1/	1/	1/
Oct 1	9.72	9.57	9.11	8.84	9.74	9.30	9.59	9.86	9.56
Nov 1	10.49	10.36	9.78	9.81	10.63	10.06	10.25	10.31	10.51
Dec 1	11.40	11.27	10.80	10.58	11.13	10.68	11.02	11.39	11.35
Dec 15	11.89	11.66	11.13	11.15	1/	1/	1/	1/	1/
Jan 1	12.11	11.76	11.50	11.13	11.90	11.48	11.86	12.22	12.36

Ratio

Sep 1	4.50	4.91	1/	1/	1/	1/	1/	1/	1/
Oct 1	7.26	7.21	8.84	6.09	8.31	8.69	7.34	6.69	6.53
Nov 1	9.27	9.65	11.48	9.59	12.12	11.78	9.82	8.62	9.39
Dec 1	11.73	11.38	14.13	10.94	13.40	13.72	13.98	11.78	11.39
Dec 15	11.97	11.86	16.12	11.97	1/	1/	1/	1/	1/
Jan 1	12.45	12.61	15.45	13.89	14.64	15.04	14.99	14.21	14.21

-----  
 1/ Test discontinued.

EARLY ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Pounds juice per box

Sep 1	39.60	42.81	1/	1/	1/	1/	1/	1/	1/
Oct 1	48.06	48.57	49.62	47.73	48.70	48.95	49.13	47.49	48.04
Nov 1	51.14	50.80	51.28	51.38	51.18	51.92	51.84	50.60	50.69
Dec 1	51.43	51.34	50.39	51.84	51.31	52.76	53.46	51.85	51.87
Dec 15	50.74	51.39	50.01	51.59	1/	1/	1/	1/	1/
Jan 1	49.51	49.70	50.59	45.41	50.64	50.19	52.97	52.01	51.46

Pounds solids per box

Sep 1	3.82	4.01	1/	1/	1/	1/	1/	1/	1/
Oct 1	4.67	4.65	4.53	4.22	4.74	4.55	4.70	4.67	4.59
Nov 1	5.36	5.26	5.02	5.03	5.44	5.23	5.31	5.21	5.32
Dec 1	5.86	5.78	5.45	5.48	5.71	5.64	5.88	5.89	5.88
Dec 15	6.03	6.00	5.58	5.75	1/	1/	1/	1/	1/
Jan 1	6.00	5.85	5.85	5.06	6.03	5.77	6.28	6.35	6.31

-----  
 1/ Test discontinued.

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

Date : 1980-81: 1981-82: 1982-83: 1983-84: 1984-85: 1985-86: 1986-87: 1987-88: 1988-89

Percent acid

Sep 1	2.34	2.14	1/	1/	1/	1/	1/	1/	1/
Oct 1	1.58	1.52	1.18	1.62	1.30	1.06	1.52	1.65	1.63
Nov 1	1.33	1.25	1.02	1.14	1.01	0.86	1.25	1.38	1.41
Dec 1	1.15	1.10	0.90	1.03	0.97	0.79	0.96	1.13	1.11
Dec 15	1.17	1.10	0.80	1.05	1/	1/	1/	1/	1/
Jan 1	1.14	1.04	0.89	0.89	0.89	0.76	0.89	1.02	1.02
Feb 1	0.39	0.86	0.82	2/	2/	0.84	0.90	1.00	0.96

Percent soluble solids

Sep 1	9.38	9.28	1/	1/	1/	1/	1/	1/	1/
Oct 1	9.41	9.44	9.21	8.77	9.21	9.33	9.27	9.36	9.30
Nov 1	10.38	10.51	10.00	9.90	10.22	10.10	10.02	10.08	10.18
Dec 1	11.45	11.48	11.10	10.90	11.00	10.69	11.10	11.12	11.30
Dec 15	11.84	11.92	11.32	11.39	1/	1/	1/	1/	1/
Jan 1	12.10	11.88	12.00	11.31	11.70	11.50	11.82	11.97	12.20
Feb 1	12.51	12.52	12.32	2/	2/	12.30	12.55	12.68	13.37

Ratio

Sep 1	4.05	4.40	1/	1/	1/	1/	1/	1/	1/
Oct 1	6.01	6.33	8.27	5.50	7.25	8.95	6.33	5.73	5.81
Nov 1	8.06	8.57	10.27	8.91	10.48	11.81	8.26	7.39	7.36
Dec 1	10.22	10.64	13.00	10.84	11.65	13.76	11.88	9.97	10.37
Dec 15	10.25	10.98	14.78	11.03	1/	1/	1/	1/	1/
Jan 1	10.83	11.65	13.90	13.14	13.47	15.40	13.76	11.91	12.12
Feb 1	14.64	14.84	15.59	2/	2/	15.09	14.41	12.86	14.14

1/ Test discontinued.

2/ Too few samples to test.

MIDSEASON ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Pounds juice per box

Sep 1	41.91	45.52	1/	1/	1/	1/	1/	1/	1/
Oct 1	49.49	50.72	52.77	49.23	48.70	49.86	52.22	48.78	49.11
Nov 1	52.21	52.09	52.30	53.50	51.18	52.50	53.29	52.24	52.32
Dec 1	50.29	53.79	53.35	54.02	51.31	52.78	54.24	54.22	52.76
Dec 15	51.88	53.13	52.67	53.49	1/	1/	1/	1/	1/
Jan 1	50.86	52.16	52.31	48.75	50.64	50.98	54.50	53.23	52.90
Feb 1	43.94	48.66	50.24	2/	2/	50.08	53.69	52.39	50.69

Pounds solids per box

Sep 1	3.93	4.22	1/	1/	1/	1/	1/	1/	1/
Oct 1	4.65	4.78	4.87	4.32	4.69	4.65	4.84	4.56	4.56
Nov 1	5.42	5.46	5.29	5.29	5.44	5.31	5.34	5.26	5.32
Dec 1	5.75	6.16	5.93	5.89	5.85	5.65	6.03	6.03	5.95
Dec 15	6.14	6.33	5.98	6.09	1/	1/	1/	1/	1/
Jan 1	6.15	6.20	6.29	5.52	6.06	5.87	6.45	6.37	6.45
Feb 1	5.51	6.13	6.23	2/	2/	6.17	6.74	6.64	6.77

-----  
 1/ Test discontinued.

2/ Too few samples to test.

LATE ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Percent acid

Oct 1	2.78	2.63	2.25	2.83	2.41	2.42	2.78	2.90	2.85
Nov 1	2.41	2.16	1.87	2.08	1.90	1.88	2.24	2.35	2.41
Dec 1	1.93	1.86	1.50	1.79	1.72	1.58	1.64	1.87	1.86
Jan 1	1.82	1.71	1.39	1.55	1.49	1.36	1.47	1.62	1.63
Feb 1	1.65	1.45	1.21	1.30	1.37	1.23	1.32	1.47	1.39
Mar 1	1.44	1.25	1.15	1.21	1.19	1.14	1.25	1.34	1.29
Apr 1	1.24	1.04	1.06	1.06	1.04	0.99	1.12	1.18	1.08
Apr 15	1.13	1.00	0.97	1.01	1/	1/	1/	1/	1/
May 1	1.05	0.89	0.95	0.95	0.86	0.85	0.99	1.01	0.97

Percent soluble solids

Oct 1	8.93	8.72	8.40	8.45	8.85	8.60	8.81	8.87	8.65
Nov 1	9.72	9.33	8.89	8.87	9.47	8.83	9.24	9.10	9.32
Dec 1	10.41	10.11	9.83	9.81	10.07	9.36	9.98	9.95	10.09
Jan 1	11.04	10.70	10.76	10.60	10.78	10.09	10.74	10.87	10.79
Feb 1	11.61	11.14	11.20	11.33	11.30	10.54	11.30	11.53	11.68
Mar 1	12.12	11.39	11.84	12.02	12.01	11.24	11.93	12.23	12.27
Apr 1	12.24	11.42	12.12	12.26	12.25	11.54	12.58	12.66	12.70
Apr 15	12.33	11.57	12.36	12.59	1/	1/	1/	1/	1/
May 1	12.45	11.43	12.38	12.82	12.05	11.77	12.67	12.89	13.00

Ratio

Oct 1	3.24	3.35	3.78	3.01	3.71	3.62	3.20	3.09	3.06
Nov 1	4.06	4.36	4.83	4.31	5.05	4.79	4.16	3.91	3.89
Dec 1	5.47	5.51	6.64	5.55	5.96	6.03	6.16	5.36	5.45
Jan 1	6.18	6.31	7.85	6.89	7.30	7.53	7.41	6.77	6.69
Feb 1	7.12	7.80	9.35	8.77	8.37	8.70	8.63	7.92	8.46
Mar 1	8.52	9.23	10.43	9.98	10.15	9.96	9.69	9.19	9.58
Apr 1	10.06	11.03	11.57	11.72	12.03	11.88	11.35	10.83	11.86
Apr 15	11.09	11.78	12.83	12.59	1/	1/	1/	1/	1/
May 1	11.99	13.02	13.15	13.61	14.25	14.10	12.94	12.86	13.55

-----  
 1/ April 15 test discontinued.

LATE ORANGES

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

Date	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
Pounds juice per box									
Oct 1	46.53	47.52	48.45	44.56	47.68	48.67	46.89	46.33	46.24
Nov 1	50.14	50.75	51.59	50.07	51.58	51.71	51.09	49.35	49.81
Dec 1	51.81	54.53	54.42	52.08	53.34	53.90	53.67	54.27	53.27
Jan 1	53.11	53.90	55.50	54.05	53.81	54.69	55.84	55.52	54.37
Feb 1	52.54	52.92	54.88	52.73	54.45	54.22	55.73	55.69	55.34
Mar 1	49.49	51.02	54.03	52.41	54.04	53.24	54.99	56.18	54.84
Apr 1	49.31	51.10	53.74	52.27	52.03	53.06	54.80	56.01	56.00
Apr 15	49.15	50.63	53.96	52.22	1/	1/	1/	1/	1/
May 1	49.75	49.21	53.79	51.61	51.68	52.40	56.52	56.02	55.42
Pounds solids per box									
Oct 1	4.16	4.14	4.07	3.77	4.22	4.19	4.13	4.11	3.99
Nov 1	4.88	4.73	4.60	4.45	4.88	4.57	4.72	4.49	4.64
Dec 1	5.39	5.51	5.35	5.11	5.37	5.05	5.36	5.40	5.37
Jan 1	5.86	5.77	5.98	5.73	5.80	5.52	6.00	6.03	5.86
Feb 1	6.10	5.90	6.16	5.97	6.15	5.72	6.30	6.43	6.47
Mar 1	6.00	5.83	6.42	6.31	6.50	5.99	6.56	6.88	6.73
Apr 1	6.04	5.84	6.53	6.42	6.38	6.13	6.90	7.09	7.11
Apr 15	6.06	5.89	6.68	6.59	1/	1/	1/	1/	1/
May 1	6.18	5.65	6.67	6.64	6.23	6.19	7.16	7.23	7.21

1/ April 15 test discontinued.

WHITE SEEDLESS GRAPEFRUIT

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
Number		Percent			Pounds	
October 1						
1980-81	62	1.55	9.99	6.49	34.04	3.39
1981-82	62	1.48	9.73	6.62	41.67	4.05
1982-83	62	1.29	9.09	7.10	39.04	3.55
1983-84	62	1.59	9.36	5.92	34.64	3.24
1984-85	61	1.51	9.80	6.53	37.97	3.71
1985-86	61	1.38	9.24	6.73	38.64	3.57
1986-87	63	1.57	9.78	6.29	38.99	3.81
1987-88	63	1.65	10.11	6.14	37.08	3.74
1988-89	63	1.61	9.86	6.18	37.94	3.74
November 1						
1980-81	59	1.44	10.29	7.20	42.02	4.32
1981-82	62	1.41	10.09	7.19	45.24	4.56
1982-83	59	1.22	9.11	7.49	38.66	3.52
1983-84	62	1.37	9.46	6.96	42.31	4.00
1984-85	55	1.37	9.88	7.26	42.68	4.21
1985-86	58	1.22	9.30	7.69	43.10	4.01
1986-87	61	1.46	10.06	6.95	42.16	4.24
1987-88	62	1.55	10.14	6.59	40.43	4.10
1988-89	63	1.59	10.22	6.49	41.03	4.19
December 1						
1980-81	53	1.40	10.53	7.59	39.92	4.20
1981-82	59	1.40	10.08	7.27	46.40	4.67
1982-83	51	1.11	9.20	8.30	44.05	4.06
1983-84	59	1.37	9.78	7.18	42.71	4.18
1984-85	54	1.37	9.99	7.33	44.53	4.45
1985-86	53	1.15	9.50	8.28	44.28	4.21
1986-87	55	1.26	9.95	7.98	43.83	4.35
1987-88	58	1.38	9.98	7.29	44.14	4.40
1988-89	62	1.45	10.31	7.17	39.05	4.01

WHITE SEEDLESS GRAPEFRUIT

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Percent acid

Sep 1	1.84	1.71	1/	1/	1/	1/	1/	1/	1/
Oct 1	1.57	1.48	1.30	1.60	1.53	1.39	1.60	1.66	1.61
Nov 1	1.45	1.41	1.23	1.37	1.36	1.23	1.48	1.54	1.59
Dec 1	1.40	1.40	1.11	1.37	1.37	1.15	1.26	1.38	1.45

Percent soluble solids

Sep 1	10.22	9.96	1/	1/	1/	1/	1/	1/	1/
Oct 1	10.08	9.77	9.18	9.36	9.86	9.23	9.82	10.14	9.88
Nov 1	10.35	10.14	9.21	9.47	9.86	9.36	10.07	10.13	10.24
Dec 1	10.53	10.08	9.20	9.78	9.99	9.50	9.95	9.98	10.31

Ratio

Sep 1	5.57	5.85	1/	1/	1/	1/	1/	1/	1/
Oct 1	6.44	6.64	7.09	5.89	6.48	6.66	6.19	6.14	6.19
Nov 1	7.20	7.22	7.52	6.94	7.27	7.68	6.87	6.61	6.50
Dec 1	7.59	7.27	8.30	7.18	7.33	8.28	7.98	7.29	7.17

Pounds juice per box

Sep 1	31.78	36.58	1/	1/	1/	1/	1/	1/	1/
Oct 1	34.17	41.66	39.00	34.58	38.07	38.53	39.16	36.98	38.00
Nov 1	41.96	45.37	38.49	42.31	42.75	43.12	42.14	40.46	41.06
Dec 1	39.92	46.40	44.05	42.71	44.53	44.28	43.83	44.14	39.05

Pounds solids per box

Sep 1	3.24	3.63	1/	1/	1/	1/	1/	1/	1/
Oct 1	3.43	4.07	3.58	3.24	3.74	3.56	3.84	3.74	3.75
Nov 1	4.34	4.59	3.54	4.00	4.21	4.04	4.24	4.10	4.20
Dec 1	4.20	4.67	4.06	4.18	4.45	4.21	4.35	4.40	4.01

-----  
 1/ September tests discontinued.



COLORED SEEDLESS GRAPEFRUIT

Maturity and yield test results  
 unadjusted averages for regular bloom fruit  
 from sample groves  
 1980-81 through 1988-89

Crop year	Sample groves	Acid	Soluble solids	Ratio	Juice per box	Solids per box
		Percent	Pounds			
October 1						
1980-81	51	1.59	10.15	6.43	34.30	3.48
1981-82	50	1.53	9.92	6.54	41.24	4.09
1982-83	51	1.26	9.18	7.30	40.33	3.71
1983-84	52	1.63	9.65	5.95	37.18	3.58
1984-85	51	1.51	10.02	6.65	37.79	3.79
1985-86	51	1.37	9.36	6.86	40.02	3.75
1986-87	53	1.53	9.86	6.47	38.63	3.81
1987-88	53	1.64	10.32	6.31	37.08	3.83
1988-89	53	1.62	9.88	6.12	38.99	3.85
November 1						
1980-81	45	1.44	10.40	7.30	42.80	4.45
1981-82	49	1.50	10.29	6.93	44.52	4.57
1982-83	45	1.19	9.31	7.86	40.11	3.73
1983-84	49	1.40	9.91	7.12	42.25	4.18
1984-85	49	1.39	10.16	7.32	42.79	4.34
1985-86	47	1.19	9.57	8.13	44.86	4.29
1986-87	53	1.38	10.10	7.35	42.75	4.32
1987-88	49	1.53	10.30	6.77	40.37	4.16
1988-89	50	1.57	10.40	6.64	42.09	4.38
December 1						
1980-81	37	1.41	10.73	7.70	40.03	4.29
1981-82	47	1.41	10.50	7.52	47.62	5.01
1982-83	34	1.06	9.53	9.01	45.56	4.44
1983-84	43	1.37	10.27	7.52	43.63	4.48
1984-85	42	1.38	10.35	7.56	44.18	4.58
1985-86	41	1.11	9.63	8.72	46.61	4.49
1986-87	48	1.17	10.05	8.71	46.38	4.66
1987-88	47	1.36	10.25	7.54	43.93	4.50
1988-89	45	1.45	10.61	7.34	40.16	4.26

COLORED SEEDLESS GRAPEFRUIT

Maturity and yield test results  
 unadjusted matched averages for regular bloom fruit  
 from identical sample trees  
 1980-81 through 1988-89

-----  
 Date : 1980-81:1981-82:1982-83:1983-84:1984-85:1985-86:1986-87:1987-88:1988-89  
 -----

Percent acid

Sep 1	1.90	1.76	1/	1/	1/	1/	1/	1/	1/
Oct 1	1.62	1.53	1.28	1.64	1.54	1.38	1.53	1.65	1.63
Nov 1	1.44	1.51	1.21	1.41	1.41	1.19	1.38	1.52	1.58
Dec 1	1.41	1.41	1.06	1.37	1.38	1.11	1.17	1.36	1.45

Percent soluble solids

Sep 1	10.33	10.09	1/	1/	1/	1/	1/	1/	1/
Oct 1	10.23	9.93	9.31	9.70	10.13	9.42	9.85	10.39	9.98
Nov 1	10.46	10.30	9.37	9.93	10.23	9.55	10.09	10.31	10.47
Dec 1	10.73	10.50	9.53	10.27	10.35	9.63	10.05	10.25	10.61

Ratio

Sep 1	5.45	5.75	1/	1/	1/	1/	1/	1/	1/
Oct 1	6.35	6.53	7.30	5.94	6.61	6.85	6.47	6.31	6.13
Nov 1	7.31	6.90	7.79	7.11	7.28	8.12	7.36	6.80	6.68
Dec 1	7.70	7.52	9.01	7.52	7.56	8.72	8.71	7.54	7.34

Pounds juice per box

Sep 1	31.31	36.01	1/	1/	1/	1/	1/	1/	1/
Oct 1	34.32	41.39	40.58	37.26	37.42	40.44	38.50	37.18	39.02
Nov 1	43.29	44.45	40.28	41.88	42.47	45.24	42.58	40.43	42.16
Dec 1	40.03	47.62	46.56	43.63	44.18	46.61	46.38	43.93	40.16

Pounds solids per box

Sep 1	3.22	3.62	1/	1/	1/	1/	1/	1/	1/
Oct 1	3.50	4.10	3.78	3.60	3.79	3.81	3.79	3.86	3.89
Nov 1	4.52	4.57	3.78	4.15	4.34	4.32	4.30	4.17	4.41
Dec 1	4.29	5.01	4.44	4.48	4.58	4.49	4.66	4.50	4.26

-----  
 1/ September test discontinued.