United States
Department of
Agriculture

National
Agricultural
Statistics
Service

Ag Ch 1 (05)

Agricultural Chemical Usage Postharvest Applications - Oranges Summary

March 2005

Table of Contents

Page

Overview 1

Highlights 2

Chemical Applications Tables

Valencia Oranges: Percent Treated and Total Applied 4

Valencia Oranges: Chemical Application Rates and Total Applied 4

Early-Midseason-Navel Oranges: Percent Treated and Total Applied 6

Early-Midseason-Navel Oranges: Chemical Application Rates and Total Applied 6

Navel Oranges: Percent Treated and Total Applied 7

Navel Oranges: Chemical Application Rates and Total Applied 7

Postharvest Wax Applications 8

Postharvest Alkaline Cleaner Applications 9

Postharvest Color Additive Applications 10

Methods of Pesticide Application 11

Pest Management Practices - - - All Citrus

Percent of Operations Utilizing Practice, Total of Program States 12

Strategies Used in Determining Fumigation Schedule, Total of Program States 14

Survey Procedures 15

Estimation Procedures 15

Reliability 15

Terms and Definitions 16

Trade Names and Common Names 18

Survey Instruments

California 19

Florida 31

Report Features 43

Overview

The agricultural chemical use estimates in this report are based on data compiled from the 2004 Postharvest Chemical Use Survey. The Postharvest Survey was conducted for Valencia and Navel oranges marketed from November 2003 through December 2004 in California, and for Early-Midseason-Navels and Valencia oranges marketed from October 2003 through July 2004 in Florida. All results refer to pesticide applications made at off-farm facilities after the fruit was harvested. These applications were made at the orange packing or the processing facility. On-farm postharvest applications were beyond the scope of this survey.

It should be noted that Florida experienced four hurricanes during the data collection period. This weather anomaly caused difficulties in the enumeration of the survey in some areas of Florida.

In the two States surveyed, there were 83 Valencia orange facility reports summarized. In Florida, 55 facility reports contributed to the Early-Midseason-Navel summarized data, whereas reports from 44 Navel orange facilities in California were summarized. This information is included in the table below.

Agricultural Chemical Use Survey Coverage, 2003-2004 Marketing Year

State	Number of Reports Summarized		
	Valencia	Early-Midseason-Navels	Navels
California	42	n/a	44
Florida	41	55	n/a

n/a - not applicable, that is, this particular variety was not surveyed for this State

Oranges moving from a packinghouse operation to a processing operation will be duplicated in the reported total amount handled. The intent of the survey was to obtain the entire amount of chemicals applied to fresh and processed oranges; therefore, this duplication is necessary. All Navels, Valencia, and Early-Midseason-Navel oranges in the selected States in the survey were included; State or region of origin was not considered a factor.

Totals for the States surveyed as well as individual State totals are published for the percent of oranges treated, rate per application, rate per marketing year, and the total amount of active ingredient applied. Other tables included in this report detail total pesticide usage by class, methods of pesticide applications, and volume of fruit treated with wax, alkaline cleaners, and color additives.

Though commonly used as a carrier, the active ingredient petroleum distillate is classified by the Environmental Protection Agency (EPA) as a pesticide. Therefore, petroleum distillate is reported in the insecticide class of postharvest chemicals applied, based on the EPA classification.

Orange packing, processing, and storage operators were also asked a series of questions concerning their pest management practices related to all citrus fruit handled. Answers to these questions are summarized and included in this report. A copy of the survey instruments used to collect the data in each State are also included.

Highlights

2004 Valencia Orange Postharvest Agricultural Chemical Use: Valencia orange processors, packers, shippers, and storage facilities applied a total of 16,900 pounds of postharvest active ingredients classified as fungicides to Valencia oranges in Florida from October 2003 through July 2004, and from November 2003 through December 2004 in California. Operations handling Valencia oranges applied 173,700 pounds of active ingredients in the 'other' classification. Active ingredients classified as 'other' are not of the insecticide, fungicide, or herbicide nature, but include other types of postharvest chemicals such as antioxidants, waxes, defoamers, and fruit wash and/or cleaner treatments. On a State-by-State basis, an undisclosed amount of insecticide was used on the Valencia oranges as there was an insufficient number of reports to publish the insecticide data. The two States handled almost 7,392 million pounds of Valencia oranges.

Commonly Used Active Ingredients on Valencia Oranges: The active ingredient classified as fungicide most commonly used as a postharvest application to Valencia oranges based on total pounds applied in the States surveyed was sodium o-phenylphenate (SOPP), at 11,300 pounds, followed by imazalil, at 2,800 pounds, and thiabenzadole (TBZ), at 2,600 pounds. The 'other' active ingredients most commonly used included phosphoric acid, at 94,300 pounds, followed by dodecylbenzenesulfonic acid at 28,900 pounds, and sodium hypochlorite, at 21,900 pounds.

2004 Early-Midseason-Navel Orange Postharvest Agricultural Chemical Use: Processors, packers, shippers, and storage facilities handling Early-Midseason-Navel oranges in Florida applied a total of 8,400 pounds of fungicide postharvest active ingredients from October 2003 through July 2004. Operations handling Early-Midseason-Navel oranges applied 175,300 pounds of active ingredients in the 'other' classification. Active ingredients classified as 'other' are not of the insecticide, fungicide, or herbicide nature, but include other types of postharvest chemicals such as antioxidants, waxes, defoamers, and fruit wash and/or cleaner treatments. Florida handled over 6,024 million pounds of Early-Midseason-Navel oranges.

Commonly Used Active Ingredients on Early-Midseason-Navel Oranges: The active ingredient classified as a fungicide that was most commonly used as a postharvest application on Early-Midseason-Navel oranges based on total pounds applied in Florida was sodium o-phenylphenate (SOPP), at 6,600 pounds, followed by thiabenzadole (TBZ), at 1,500 pounds. The 'other' active ingredients most commonly used included phosphoric acid, at 106,800 pounds, followed by dodecylbenzenesulfonic acid at 36,900 pounds.

Highlights (continued)

2004 Navel Orange Postharvest Agricultural Chemical Use: Processors, packers, shippers, and storage facilities handling Navel oranges in California applied a total of 250,700 pounds of fungicide postharvest active ingredients from November 2003 through December 2004. Operations handling Navel oranges applied 195,400 pounds of active ingredients in the 'other' classification. Active ingredients classified as 'other' are not of the insecticide, fungicide, or herbicide nature, but include other types of postharvest chemicals such as antioxidants, waxes, defoamers, and fruit wash and/or cleaner treatments. On a State-by-State basis, an undisclosed amount of insecticide was used on the Navel oranges as there was an insufficient number of reports to publish the insecticide data. California handled just over 3,066 million pounds of Navel oranges.

Commonly Used Active Ingredients on Navel Oranges: The active ingredient most commonly used as a postharvest application to act as a fungicide on Navel oranges based on total pounds applied in California was imazalil at 208,500 pounds, followed by thiabendazole at 3,300 pounds and sodium o-phenylphenate (SOPP) at 2,600 pounds. The 'other' active ingredients most commonly used included phosphoric acid, at 63,600 pounds, followed by sodium hypochlorite, at 44,500 pounds.

Application Methods: Of the total chemical applications made to the 2003-2004 marketing year orange varieties surveyed in the two selected States, direct spray/foam was the most commonly used application method, followed by drip/brush on. Other application methods included drench, dip in fruit bath/wash, and gas/fog.

Pest Management Practices: The pest management practices section of the questionnaire asked for mechanical devices or cleaning practices used at the operations surveyed in the two States. This section asked about practices used on all citrus fruit in the operation, not just the specific varieties on which chemical usage data were collected.

In general, most of the operations used pest or rodent control measures and/or culled inferior fruit in the citrus facilities. The most commonly used cleaning activities included cleaning or sanitizing packing/processing facilities and equipment, picking up spilled fruit, and sweeping or vacuuming facility floors.

**Valencia Oranges: Postharvest Chemical Applications,
Percent Treated and Total Applied,
Program States and Total, 2003-04 Marketing Year**

State	Volume Handled	Percent Treated and Total Applied					
		Insecticide [1]		Fungicide		Other Chemical	
	Mil. lbs	*Percent*	*1,000 lbs*	*Percent*	*1,000 lbs*	*Percent*	*1,000 lbs*
CA	1,060.2			71.80	6.9	78.97	44.8
FL	6,331.6			2.95	10.0	98.92	128.9
Total	7,391.7			12.82	16.9	96.06	173.7

[1] Insufficient reports to publish data for this pesticide class.

**Valencia Oranges: Postharvest Chemical Applications,
Chemical Application Rates and Total Applied,
Total of Program States, 2003-04 Marketing Year [1] [2]**

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	*Number*	*Pounds per 1,000 lbs*	*Pounds per 1,000 lbs*	*1,000 lbs*
Fungicides:					
Imazalil	8.73	1.2	0.004	0.004	2.8
Sodium o-phenylphenate	4.05	1.0	0.04	0.04	11.3
Thiabendazole	7.40	1.0	0.005	0.005	2.6
Other:					
Chlorine	4.76	1.0	0.05	0.05	16.6
Citric acid	10.27	1.0	*	*	0.1
Dodecylbenzene sodium sulfonate	1.97	1.0	0.001	0.001	0.1
Dodecylbenzenesulfonic acid	49.46	1.0	0.01	0.01	28.9
Ethylene, compressed	1.55	1.0	0.04	0.04	4.2
Hydrogen chloride	1.61	1.0	0.004	0.004	0.5
Isopropyl alcohol	49.46	1.0	0.001	0.001	2.7
Phosphoric acid	75.13	1.0	0.02	0.02	94.3
Silicon emulsion	7.40	1.0	*	*	0.03
Sodium hypochlorite	7.84	1.0	0.04	0.04	21.9

* Rate applied is less than 0.0005 pounds per 1,000 pounds of Valencia oranges.

[1] Volume handled by Valencia packing/shipping facilities and processing in the two States surveyed was 7,391.7 million pounds. States included are CA and FL.

[2] Insufficient or limited reports to publish usage data for calcium hypochlorite, citric acid, dodecylbenzenesulfonic acid, gibberellic acid, hydrogen peroxide (dioxide), isopropyl ester, peroxyacetic (peracetic) acid, petroleum distillate, piperonyl butoxide, Pseudomonas syringae ESC-11, pyrethrins, silicon dioxide, sodium bicarbonate, and sulfur.

Valencia Oranges: Postharvest Chemical Applications, Chemical Application Rates and Total Applied, California, 2003-04 Marketing Year [1] [2]

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	*Number*	*Pounds per 1,000 lbs*	*Pounds per 1,000 lbs*	*1,000 lbs*
Fungicides:					
Imazalil	54.54	1.2	0.003	0.004	2.5
Sodium o-phenylphenate	12.73	1.0	0.02	0.02	3.1
Thiabendazole	41.12	1.0	0.003	0.003	1.2
Other:					
Chlorine	27.87	1.0	0.04	0.04	11.3
Dodecylbenzene sodium sulfonate	12.30	1.0	*	*	0.05
Ethylene, compressed	4.30	1.0	0.05	0.05	2.5
Phosphoric acid	11.41	1.2	0.05	0.05	6.5
Silicon emulsion	7.40	1.0	*	*	0.03
Sodium hypochlorite	49.14	1.0	0.04	0.04	20.8

* Rate applied is less than 0.0005 pounds per 1,000 pound of Valencia oranges.

[1] Volume handled by California Valencia orange packing/shipping facilities was 1,060.2 million pounds.

[2] Insufficient or limited reports to publish usage data for calcium hypochlorite, citric acid, dodecylbenzenesulfonic acid, gibberellic acid, hydrogen chloride, hydrogen peroxide (dioxide), isopropyl alcohol, isopropyl ester, peroxyacetic (peracetic) acid, petroleum distillate, piperonyl butoxide, Pseudomonas syringae ESC-11, pyrethrins, silicon dioxide, sodium bicarbonate, and sulfur.

Valencia Oranges: Postharvest Chemical Applications, Chemical Application Rates and Total Applied, Florida, 2003-04 Marketing Year [1] [2]

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	*Number*	*Pounds per 1,000 lbs*	*Pounds per 1,000 lbs*	*1,000 lbs*
Fungicides:					
Imazalil	1.06	1.1	0.004	0.005	0.3
Sodium o-phenylphenate	2.59	1.0	0.05	0.05	8.2
Thiabendazole	1.76	1.1	0.01	0.01	1.4
Other:					
Chlorine	0.89	1.0	0.10	0.10	5.4
Dodecylbenzene sodium sulfonate	0.24	1.0	0.004	0.004	0.1
Ethylene, compressed	1.09	1.0	0.03	0.03	1.7
Phosphoric acid	85.80	1.0	0.02	0.02	87.8
Sodium hypochlorite	0.92	1.0	0.02	0.02	1.1

[1] Volume handled by Florida orange processing was 6,331.6 million pounds.

[2] Insufficient or limited reports to publish usage data for chlorine dioxide, citric acid, dodecylbenzenesulfonic acid, hydrogen chloride, hydrogen peroxide (dioxide), isopropyl alcohol, and peroxyacetic (peracetic) acid.

Early-Midseason-Navel Oranges: Postharvest Chemical Applications, Percent Treated and Total Applied, Florida, 2003-04 Marketing Year

State	Volume Handled	Percent Treated and Total Applied			
		Fungicide		Other Chemical	
	Mil. lbs	*Percent*	*1,000 lbs*	*Percent*	*1,000 lbs*
FL	6,024.2	3.46	8.4	99.26	175.3

Early-Midseason-Navel Oranges: Postharvest Chemical Applications, Chemical Application Rates and Total Applied, Florida, 2003-04 Marketing Year [1] [2]

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	*Number*	*Pounds per 1,000 lbs*	*Pounds per 1,000 lbs*	*1,000 lbs*
Fungicides:					
Imazalil	1.64	1.2	0.003	0.003	0.3
Sodium o-phenylphenate	2.76	1.1	0.04	0.04	6.6
Thiabendazole	2.42	1.3	0.01	0.01	1.5
Other:					
Chlorine	5.67	1.0	0.02	0.02	7.6
Dodecylbenzene sodium sulfonate	0.28	1.0	0.005	0.005	0.1
Dodecylbenzenesulfonic acid	62.01	1.1	0.01	0.01	36.9
Ethylene, compressed	4.21	1.0	0.05	0.05	12.8
Hydrogen Chloride	3.61	1.0	0.001	0.001	0.1
Isopropyl alcohol	62.01	1.0	0.001	0.001	3.5
Phosphoric acid	83.13	1.0	0.02	0.02	106.8
Sodium hypochlorite	6.22	1.0	0.004	0.004	1.5

[1] Volume handled by Florida orange processing was 6,024.2 million pounds.
[2] Insufficient or limited reports to publish usage data for chlorine dioxide, citric acid, hydrogen peroxide (dioxide), and peroxyacetic (peracetic) acid.

Navel Oranges: Postharvest Chemical Applications,
Percent Treated and Total Applied,
California, 2003-04 Marketing Year

State	Volume Handled	Percent Treated and Total Applied			
		Fungicide		Other Chemical	
	Mil. lbs	*Percent*	*1,000 lbs*	*Percent*	*1,000 lbs*
CA	3,066.3	75.89	250.7	82.57	195.4

Navel Oranges: Postharvest Chemical Applications,
Chemical Application Rates and Total Applied,
California, 2003-04 Marketing Year [1] [2]

Agricultural Chemical	Volume Treated	Appli-cations	Rate per Application	Rate per Mkt. Year	Total Applied
	Percent	*Number*	*Pounds per 1,000 lbs*	*Pounds per 1,000 lbs*	*1,000 lbs*
Fungicides:					
Imazalil	65.64	1.2	0.09	0.10	208.5
Sodium o-phenylphenate	9.77	1.0	0.01	0.01	2.6
Thiabendazole	46.30	1.0	0.002	0.002	3.3
Other:					
Chlorine	35.49	1.0	0.03	0.03	33.5
Dodecylbenzene sodium sulfonate	11.55	1.0	*	*	0.1
Ethylene, compressed	7.82	1.0	0.10	0.10	24.7
Gibberellic acid	7.19	1.0	*	*	0.03
Phosphoric acid	25.21	1.2	0.07	0.08	63.6
Silicon emulsion	12.06	1.0	*	*	0.2
Sodium hypochlorite	39.24	1.0	0.04	0.04	44.5

* Rate applied is less than 0.0005 pounds of Navel oranges.

[1] Volume handled by California orange processing was 3,066.3 million pounds.

[2] Insufficient or limited reports to publish usage data for calcium hypochlorite, citric acid, dodecylbenzenesulfonic acid, hydrogen chloride, hydrogen peroxide (dioxide), isopropyl alcohol, isoproply ester, peroxyacetic (peracetic) acid, Pseudomonas syringae ESC-11, pyrethrins, silicon dioxide, sodium bicarbonate, and sulfur.

Valencia Oranges: Postharvest Wax Applications,
Percent Treated and Total Applied
Program States and Total, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
CA	64.34	1,060.2	113.6
FL	2.27	6,331.6	9.5
Total	11.17	7,391.7	123.1

Early-Midseason-Navel Oranges: Postharvest Wax Applications,
Percent Treated and Total Applied
Florida, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
FL	4.17	6,024.2	15.6

Navel Oranges: Postharvest Wax Applications,
Percent Treated with Wax, and Total Applied
California, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
CA	62.84	3,066.3	395.1

Valencia Oranges: Postharvest Alkaline Cleaner Applications,
Percent Treated and Total Applied
Program States and Total, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
CA	6.95	1,060.2	*
FL	0.16	6,331.6	*
Total	1.13	7,391.7	0.4

* Data not published due to disclosure restrictions.

Early-Midseason-Navel Oranges: Postharvest Alkaline Cleaner Applications,
Percent Treated and Total Applied
Florida, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
FL	0.64	6,024.2	0.3

Navel Oranges: Postharvest Alkaline Cleaner Applications,
Percent Treated with Wax, and Total Applied
California, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
CA	15.71	3,066.3	2.8

Valencia Oranges: Postharvest Color Additive Applications,
Percent Treated and Total Applied
Program States and Total, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
FL	1.45	6,331.6	0.3

Early-Midseason-Navel Oranges: Postharvest Color Additive Applications,
Percent Treated and Total Applied
Florida, 2003-04 Marketing Year

State	Percent of Volume Treated	Total Volume Handled	Total Applied
	Percent	*Million lbs*	*1,000 lbs*
FL	4.23	6,024.2	0.8

Valencia Oranges: Postharvest Chemical Use,
Application Methods Used,
Total of Program States, 2003-04 Marketing Year

Application Method	Total of States Surveyed
	Percent of Applications
Dip in Fruit Bath/Wash	11.9
Direct Spray/Foam	45.8
Drench	8.0
Drip/Brush-On	27.2
Gas/Fog	7.1

Early-Midseason-Navel Oranges: Postharvest Chemical Use,
Application Methods Used,
Total of Program States, 2003-04 Marketing Year

Application Method	Total of States Surveyed
	Percent of Applications
Dip in Fruit Bath/Wash	9.4
Direct Spray/Foam	35.0
Drench	11.3
Drip/Brush-On	35.0
Gas/Fog	9.4

Navel Oranges: Postharvest Chemical Use,
Application Methods Used,
Total of Program States, 2003-04 Marketing Year

Application Method	Total of States Surveyed
	Percent of Applications
Dip in Fruit Bath/Wash	13.1
Direct Spray/Foam	54.5
Drench	5.8
Drip/Brush-On	19.4
Gas/Fog	7.3

All Citrus: Pest Management Practices,
Percent of Operations Utilizing Practice,
Total of Program States, 2003-04 Marketing Year

Practice	Program States		
	CA	FL	ALL
	Percent of Operations	*Percent of Operations*	*Percent of Operations*
Mechanical Devices:			
Alkaline treatments (such as sodium or potassium biocarbonate) to control mold and/or rot	63	40	50
Cooling refrigeration rooms at 50 degrees Fahrenheit or lower	95	54	71
Controlled humidity and temperatures in degreening process	95	61	75
Culling mechanisms	88	79	83
Frequently changed fruit bath or process wash water	98	61	76
Ozonated water to reduce levels of fruit pathogens	12	12	12
Ozone gas in storage facilities	17	11	13
Pest or rodent control measures	100	89	94
Cleaning Activities:			
Clean or sanitize packing/processing facilities and equipment	100	100	100
Clean or santize structures in storage rooms	100	90	94
Control vegetation around stored cartons, bins, or boxes	95	86	90
Hose down, rinse, sweep, or vacuum empty bins/boxes	95	93	94
Pick up spilled fruit	100	98	99
Sweep or vacuum facility floors	100	98	99
Use Clean-in-Place (CIP), or any automated clean-up system	20	45	35

All Citrus: Pest Management Practices,
Percent of Operations Utilizing Practice,
Total of Program States, 2003-04 Marketing Year

Practice	Program States		
	CA	FL	ALL
	Percent of Operations	*Percent of Operations*	*Percent of Operations*
Measure Storage Facility Temperature:			
Cooling Room:			
Automatically monitored	44	12	25
Hourly	12	5	8
Daily	41	35	38
Twice a week		2	1
Weekly			
Other			
Do not monitor	2	5	4
Do not have this structure		40	24
Degreening Room:			
Automatically monitored	27	9	16
Hourly	15	21	18
Daily	44	32	37
Twice a week	2	2	2
Weekly			
Other			
Do not monitor	7	4	5
Do not have this structure	5	33	22
Other Structures:			
Automatically monitored	5	2	3
Hourly	5		2
Daily	37	12	22
Twice a week			
Weekly	5		2
Other			
Do not monitor	15	5	9
Do not have this structure	34	81	62

All Citrus: Pest Management Practices,
Strategies Used in Determining Fumigation Schedule
Program States and Total, 2003-04

Practice	States Surveyed		
	CA	FL	ALL
	Pct. of Operations	*Pct. of Operations*	*Pct. of Operations*
Bin Samples	80	39	57
Combined with other handling operations			
Marketing requirement	20	56	40
Preset Calendar Date		6	3
Other			

Survey Procedures

Operations chosen from the NASS List Sampling Frame were known to or expected to handle oranges. Generally, all operations known to engage in processing, packing, shipping, or holding Valencia and/or Navel oranges in California, or Early-Midseason-Navels and/or Valencia oranges in Florida were included in this survey. There were almost 200 operations selected to participate in the 2004 Orange Postharvest Chemical Use Survey, referencing the 2003-2004 orange crops in each State.

Estimation Procedures

The chemical applications data, reported by product name or trade name, were reviewed within State and across the two States for reasonableness and consistency. This review compared reported data with manufacturers' recommendations and with data from other operations using the same product. Following this review, product information was converted to active ingredient level. The chemical usage estimates in this publication are of those active ingredients.

Detailed data within a table may not multiply across or add down due to independent rounding of the published values.

Reliability

The probability nature of the survey provides for expansion of data so estimates are statistically representative of chemical use on the targeted commodities in the surveyed States. The reliability of these survey results is affected by sampling variability and non-sampling errors.

Sampling variability of the estimates differs by chemical and crop. In general, the more often the chemical was applied, the smaller the sampling variability. For example, estimates of use of a commonly used product, such as phosphoric acid on oranges, exhibit less variability than a rarely used product.

Non-sampling errors are errors that occur during a survey process and, unlike sampling variability, are difficult to measure. They may be caused by interviewers failing to follow instructions, poorly worded questions, non-response, problematic survey procedures, or data handling between collection and publication. In this survey, procedures and analyses were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

Variability for estimates of volume of the commodity handled will be higher than the variability for estimates of application rates. This is because application rates have a narrower range of responses and the manufacturers' recommended rates are generally followed.

Terms and Definitions

Active ingredient: The active ingredient is the specific chemical which kills or controls the target pests. Usage data are reported by pesticide product and are converted to an amount of active ingredient.

Agricultural chemicals: The phrase 'agricultural chemicals' refers to the active ingredients in pesticides.

Antioxidant: A substance that prevents or slows the breakdown of another substance by oxygen. Often, antioxidants are added to foods to prevent them from becoming rancid or from discoloring.

Application rates: The application rates refer to the average number of pounds of a pesticide active ingredient applied to a volume of product. Rate per application is the average number of pounds applied in one application. Rate per marketing year is the average number of pounds applied counting multiple applications. Number of applications is the average number of times a treated volume receives a specific agricultural chemical.

Common name: The common name is an officially recognized name for an active ingredient. This report shows active ingredient by common name.

Fumigant: A substance or mixture of substances which produce a gas vapor, fume, or smoke intended to destroy insects, rodents, or bacteria.

Marketing year: A marketing year refers to the period immediately following harvest of the crop through the marketing or disposition of the crop. For purposes of this survey, the California marketing year for the 2003-2004 orange crop was November 2003 through December 2004. In Florida, the marketing year for the 2003-2004 orange crop was October 2003 through July 2004.

Packers and Shippers: Packers and shippers generally prepare the commodity for fresh market distribution. They may have holding or storage facilities as well. Those elements of the commodity which do not meet the fresh market standards are often moved to processors.

Pesticides: As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), pesticides include any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Postharvest: After the commodity is harvested from the field, any subsequent activity is termed postharvest. Postharvest chemical usage refers to chemical applications after the commodity is taken from the field or orchard.

Terms and Definitions (continued)

Processor: Processors actually change the form of the commodity. These firms may have holding or storage facilities.

Total volume handled: The volume of a commodity handled by the market segment. For purposes of this release, total volume handled is the total amount of Valencia, Early-Midseaon-Navel or Navel oranges that passed through the operations summarized in a particular table

Trade name: A trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents. Some formulations as in the case of pre-mixes, can contain more than one active ingredient.

Volume treated: The amount that represents the percentage of volume handled receiving one or more applications of a specific agricultural chemical. This report does not contain total quantity treatments. However, total quantity treatments can be calculated by multiplying the total volume handled by the percent of volume treated and the average number of applications.

Trade Names, Common Names, and Classes

The following is a list of common name, associated class and trade name of active ingredients in this publication. The classes are fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing the data. Pre-mixes are not cataloged. The list may not be complete for all postharvest chemicals used on oranges. NASS does not mean to imply use of any specific trade name.

Class	Common Name	Trade Name
O	Alkaline cleaners	several
O	Calcium hypochlorite	Calcium hypochlorite
O	Chlorine	several
O	Citric acid	Citric acid
O	Dodecylbenzene sodium sulfonate	several soaps
O	Dodecylbenzenesulfonic acid	Fresh-Pak, CS-100, CS105
O	Ethylene, compressed	Ethylene, compressed
O	Fruit Waxes	several
O	Hydrogen chloride	Fresh-Pak, Tri-Circ
O	Hydrogen peroxide	StorOx, VigorOx
F	Imazalil	Deccozil EC-289, Freshgard 700, Fungaflor 500 EC
O	Isopropyl alcohol	CS-100, CS-105
O	Silicon emulsion	Anti-Foam, D-Foam
O	Phosphoric acid	Tri-Circ, CS-100, CS-105, Phosphoric Acid
O	Sodium hypochlorite	several
F	Sodium o-phenylphenate	Freshgard 5, SOPP, Fresh Foam
F	Thiabendazole (TBZ)	several

NATIONAL AGRICULTURAL STATISTICS SERVICE
U.S. Department of Agriculture
Rm 5829, South Building
1400 Independence Avenue, S.W.
Washington, D.C. 20250-2000
1-800-727-9540
Fax: 202-690-2090
E-mail: nass-dc@nass.usda.gov

2004 ORANGE POSTHARVEST CHEMICAL USE SURVEY CALIFORNIA

Form Approved
O.M.B. Number 0535-0218
Approval Expires 04/30/07
Project Code 143

VERSION	ID	SUBT.	T-TYPE	TABLE	LINE
2	_ _ _ _ _ _ _ _ _	_ _	0	000	00

CONTACT RECORD		
DATE	TIME	NOTES

RESPONSE CODES

3 - COMPLETE
4 - SCREENOUT
5 - NO ORANGES HANDLED/ RECEIVED
8 - REFUSAL
9 - INACCESSIBLE

OFFICE USE 910

OPTIONAL 002

INTRODUCTION
[*Introduce yourself, and ask for the operator. Rephrase in your own words.*]

We are collecting information on chemical use and need your help to make the information as accurate as possible. Authority for collection of information on the Orange Postharvest Chemical Use Survey is Title 7, Section 2204 of the U.S. Code. This information will be used for analysis and to compile and publish estimates for your state and the United States. Response to this survey is confidential and voluntary.

We encourage you to refer to your operation records during the interview.

BEGINNING TIME [*MILITARY*] . . . . . 004 _ _ _ _

Name _____

Address _____

_____

Phone (_____) _____

☐ [*Name, address and partners verified and updated if necessary.*]

1. Did this operation (*as listed on the label*) pack/ship, process, or hold any 2003-2004 Navel and/or Valencia oranges?
   [***Include*** *Navels and Valencias marketed from November 2003 through December 2004.*]

   ☐ **YES -** [*Go to page 3,* ***Screening.***]

   ☐ **NO -** [*Go to next page,* ***Change in Operation.***]

CHANGE IN OPERATION

- [*Complete this section only if item 1 on the front page is answered "No".*]

2. Has the operation named on the label been **sold, rented, or turned over** to someone else?

☐ **YES** - [*Continue.*] ☐ **NO** ⟶

3. Please provide the name and address of the operation that has taken over the business you formerly operated:

Operation Name: _____

Operator Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____

a. Will the operation handle or receive oranges or other crops at any of its facilities in 2004?

☐ **YES** ☐ **DON'T KNOW** ☐ **NO**

[***Regardless of answer above, write a note to explain the situation, then go to back page Conclusion.***]

_____

_____

_____

_____

NOTES and CALCULATIONS:

SCREENING

1. On this operation, were any 2003-2004 crop year oranges --

	VALENCIAS CODE	NAVELS CODE
a. sorted, graded, packaged, or shipped primarily for fresh market? ☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Continue.*]	106	116
b. changed to a processed product by pasteurizing, pressing, drying, freezing, or slicing? ☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Continue.*]	105	115
c. temporarily held in cold rooms or degreening rooms for later use to be shipped or processed? ☐ **YES** - [*Enter code 1 and go to Section A.*] ☐ **NO** - [*Go to Section A.*]	107	117

ENUMERATOR NOTE: *Verify that respondent is aware that for purposes of this survey, that postharvest is defined for packer/shipper as the period of time when the fruit is picked until it is shipped from this operation for fresh market or processing.*

For processors, postharvest is defined as the period of time when the whole fruit is received until right before the whole fruit is changed in form.

A QUANTITY HANDLED for VALENCIA ORANGES A

[ENUMERATOR NOTE: *If NO Valencia oranges, go to next page.*]

Now I would like to ask about the 2003-2004 crop year Valencia oranges packed/shipped, processed, or held in storage by this operation.

Please use your records to help us get an accurate record of your Valencia orange receipts.

1. What was the total quantity of the 2003-2004 crop year Valencia oranges packed/shipped, processed, or held in storage by this operation? . . . . . .

QUANTITY
200 ___,___,___.__

2 BOX (75 lbs.) 3 TON 4 CWT. (100 lbs.) 5 POUNDS (lbs.) 6 BIN 7 CARTON 8 OTHER UNIT	If unit equals "6", "7", or "8" enter POUNDS/UNIT
201	202 .__

a. Of the [*item 1*] oranges, how much **DID NOT** receive postharvest chemical applications? . . . . . .

[*Chemical applications include pesticides, waxes, soaps, bleach washes, drenches, and ethylene gas treatments.*]

QUANTITY
206 ___,___,___.__

OR

PERCENT OF TOTAL NOT TREATED
207

ENUMERATOR NOTE: [*Does item code 200 equal item code 206?*]
OR
[*Does item code 207 equal 100%?*]

☐ **YES -** Verify the operation did not apply any postharvest chemicals to Valencia oranges held in cold rooms or degreening rooms, on trucks, ships, rail cars, or air cargo containers from November 2003 through December 2004.

If no postharvest chemicals were applied go to next page.

If postharvest chemicals were applied, correct either item code 206 or item code 207 and go to next page.

☐ **NO -** Go to next page.

A QUANTITY HANDLED for NAVEL ORANGES A

[ENUMERATOR NOTE: *If NO Navel oranges, go to Section* **B.]**

Now I would like to ask about the 2003-2004 crop year Navel oranges packed/shipped, processed, or held in storage by this operation.

Please use your records to help us get an accurate record of your Navel orange receipts.

1. What was the total quantity of the 2003-2004 crop year Navel oranges packed/shipped, processed, or held in storage by this operation? . . . . . .

QUANTITY
210 ___,___,___.___

2 BOX (75lbs.) 3 TON 4 CWT. (100 lbs.) 5 POUNDS (lbs.) 6 BIN 7 CARTON 8 OTHER UNIT	If unit equals "6", "7", or "8" enter POUNDS/UNIT
211	212 .___

a. Of the [*item 1*] oranges, how much **DID NOT** receive postharvest chemical applications? . . . . . .

[*Chemical applications include pesticides, waxes, soaps, bleach washes, drenches, and ethylene gas treatments.*]

QUANTITY
216 ___,___,___.___

OR

PERCENT OF TOTAL NOT TREATED
217 .___

ENUMERATOR NOTE: [*Does item code 210 equal item code 216?*]
OR
[*Does item code 217 equal 100%?*]

☐ **YES -** Verify the operation did not apply any postharvest chemicals to Navel oranges held in cold rooms or degreening rooms, on trucks, ships, rail cars, or air cargo containers from November 2003 through December 2004.

If no postharvest chemicals were applied go to Section **C**, page 10.

If postharvest chemicals were applied, correct either item code 216 or item code 217 and go to Section **B**.

☐ **NO -** Go to Section **B**.

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

1. Now I have some questions about postharvest chemical use on 2003-2004 crop year **Valencia and Navel oranges** packed/shipped, processed, or held by your operation. I will be collecting chemical data for Valencia and Navel oranges only. I will need information for all products applied. Include waxes, bleach washes, and ethylene treatments. I will be asking for specific product and amount used, quantity of oranges treated, and timing and method of application. Please use your records to answer the questions as accurately as possible and to help make sure we do not miss any products used.

OFFICE USE LINES IN TABLE

T-TYPE	TABLE	LINE	399
3	001	99	

CROP CODES for COLUMN 1

157 **Valencias**

364 **Navels**

APPLICATION TIMING CODES for COLUMN 3

1 Prewash treatment
2 Pre-processing
3 On packing line
4 At process wash location
5 In degreening or cooling rooms
6 Drench application
7 Before or during regular storage/holding
8 After regular storage/holding

NOTES	LINE	1 [*Enter crop code from above.*] CODE	2 **What product was applied?** (*In Respondent Booklet*) a COMMON OR TRADE NAME	2 b PRODUCT CODE	3 **When was this product used?** [*Enter code from above.*]	4 **What was the total quantity of oranges treated with this chemical** (*in column 2*)?
	01	301		302	303	304 . ___
	02	301		302	303	304 . ___
	03	301		302	303	304 . ___
	04	301		302	303	304 . ___
	05	301		302	303	304 . ___
	06	301		302	303	304 . ___
	07	301		302	303	304 . ___
	08	301		302	303	304 . ___
	09	301		302	303	304 . ___
	10	301		302	303	304 . ___

[*For pesticides not listed in Respondent Booklet, specify--*]

LINE #	EPA #	Trade name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [*Ask only if EPA No. cannot be reported.*]	Target Pest

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

UNIT CODES for COLUMN 5

2 - BOX (*75 lbs.*)
3 - TON
4 - CWT. (*100lbs.*)
5 - POUNDS (*lbs.*)
6 - BIN
7 - CARTON
8 - OTHER

UNIT CODES for COLUMN 8

1 - POUNDS
12 - GALLONS
13 - QUARTS
14 - PINTS
15 - LIQUID OUNCES
28 - DRY OUNCES
30 - GRAMS
40 - KILOGRAMS
41 - LITERS
50 - OTHER (*Specify* _____)

APPLICATION CODES for COLUMN 9

1 - DRENCH
2 - DRIP/BRUSH ON
3 - DIRECT SPRAY/FOAM
4 - DIP in FRUIT BATH/WASH
6 - GAS/FOG
10 - OTHER (*Specify* _____)

LINE	5 [*Enter unit code from above.*] CODE	6. If column 5 unit equals "6", "7", or "8" enter pounds per unit.	7 What was the total amount of formulated product applied to the (*column 4*) amount of oranges?	8 [*Enter unit code from above.*] CODE	9 What was the method used to apply this product? CODE
01	305	306 .___	307 .___ ___	308	309
02	305	306 .___	307 .___ ___	308	309
03	305	306 .___	307 .___ ___	308	309
04	305	306 .___	307 .___ ___	308	309
05	305	306 .___	307 .___ ___	308	309
06	305	306 .___	307 .___ ___	308	309
07	305	306 .___	307 .___ ___	308	309
08	305	306 .___	307 .___ ___	308	309
09	305	306 .___	307 .___ ___	308	309
10	305	306 .___	307 .___ ___	308	309

Enumerator Notes:

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

CROP CODES for COLUMN 1

157	**Valencias**
364	**Navels**

APPLICATION TIMING CODES for COLUMN 3

1 Prewash treatment	5 In degreening or cooling rooms
2 Pre-processing	6 Drench application
3 On packing line	7 Before or during regular storage/holding
4 At process wash location	8 After regular storage/holding

NOTES	LINE	1 [*Enter crop code from above.*] CODE	2 What product was applied? (*In Respondent Booklet*) a COMMON OR TRADE NAME	2 b PRODUCT CODE	3 When was this product used? [*Enter code from above.*]	4 What was the total quantity of oranges treated with this chemical (*in column 2*)?
	11	301		302	303	304 . ___
	12	301		302	303	304 . ___
	13	301		302	303	304 . ___
	14	301		302	303	304 . ___
	15	301		302	303	304 . ___
	16	301		302	303	304 . ___
	17	301		302	303	304 . ___
	18	301		302	303	304 . ___
	19	301		302	303	304 . ___
	20	301		302	303	304 . ___

[*For pesticides not listed in Respondent Booklet, specify--*]

LINE #	EPA #	Trade name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [*Ask only if EPA No. cannot be reported.*]	Target Pest

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

UNIT CODES for COLUMN 5

2 - BOX (*75 lbs.*)
3 - TON
4 - CWT. (*100lbs.*)
5 - POUNDS (*lbs.*)
6 - BIN
7 - CARTON
8 - OTHER

UNIT CODES for COLUMN 8

1 - POUNDS
12 - GALLONS
13 - QUARTS
14 - PINTS
15 - LIQUID OUNCES
28 - DRY OUNCES
30 - GRAMS
40 - KILOGRAMS
41 - LITERS
50 - OTHER (*Specify* _____)

APPLICATION CODES for COLUMN 9

1 - DRENCH
2 - DRIP/BRUSH ON
3 - DIRECT SPRAY/FOAM
4 - DIP in FRUIT BATH/WASH
6 - GAS/FOG
10 - OTHER (*Specify* _____)

LINE	5 [*Enter unit code from above.*] CODE	6 If column 5 unit equals "6", "7", or "8" enter pounds per unit.	7 What was the total amount of formulated product applied to the (*column 4*) amount of oranges?	8 [*Enter unit code from above.*] CODE	9 What was the method used to apply this product? CODE
11	305	306 .___	307 .___ ___	308	309
12	305	306 .___	307 .___ ___	308	309
13	305	306 .___	307 .___ ___	308	309
14	305	306 .___	307 .___ ___	308	309
15	305	306 .___	307 .___ ___	308	309
16	305	306 .___	307 .___ ___	308	309
17	305	306 .___	307 .___ ___	308	309
18	305	306 .___	307 .___ ___	308	309
19	305	306 .___	307 .___ ___	308	309
20	305	306 .___	307 .___ ___	308	309

2. Have I recorded all fungicides, insecticides, antioxidants, and other postharvest chemicals applied to these oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** - [*Make additions to table in Section* **B**]

3. Have you included all soaps, waxes, bleach washes, and ethylene gas treatments used on the oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** -[*Make additions to table in Section* **B**]

4. Have you included all microbial agents and biological pesticides used on the oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** - [*Make additions to table in Section* **B**]

5. Have you included all drench applications used on the oranges at this facility?

   ☐ **YES** - [*Go to Section* **C**] ☐ **NO** - [*Make additions to table in Section* **B**]

C PEST MANAGEMENT PRACTICES C

T-TYPE	TABLE	LINE
0	000	00

Now I have some questions about pest management practices you may have used at your facilities during the 2003-2004 marketing year.

These next questions pertain to ALL CITRUS handled.

1. Do you use--

		CODE
a. ozone gas in storage facilities?	YES = 1	650
b. controlled humidity and temperatures in degreening process?	YES = 1	651
c. cooling refrigeration rooms at 50 degrees Farenheit or lower?	YES = 1	652
d. pest/rodent control measures?	YES = 1	653
e. frequently changed fruit bath or process wash water?	YES = 1	654
f. culling mechanisms?	YES = 1	655
g. alkaline treatments (*such as sodium or potassium biocarbonate*) to control mold and/or rot?	YES = 1	656
h. ozonated water to reduce levels of fruit pathogens?	YES = 1	657

2. Do you pack or process Certified Organic citrus fruits or juices? . . . . . YES = 1 | 658

3. How often do you measure temperature and/or humidity for citrus held or stored at this facility?

	FREQUENCY
Cooling Room. . . .	660
Degreening Room. . . .	661
Other Structures. . . .	662

1	AUTOMATICALLY MONITORED
2	HOURLY
3	DAILY
4	TWICE A WEEK
5	WEEKLY
6	OTHER - (*Specify* _____)
7	DO NOT MONITOR
8	DO NOT HAVE THIS STRUCTURE

COMPLETION CODE for CHEMICAL APPLICATIONS TABLE

1 - Incomplete / Refusal 3 - Valid Zero	300

COMPLETION CODE for PEST MANAGEMENT SECTION

1 - Incomplete/Refusal	500

C PEST MANAGEMENT PRACTICES C

4. Which cleaning practices do you use at this facility on ALL CITRUS handled?

Do you--

		CODE
a. hose down, rinse, sweep, or vacuum empty bins/boxes?	YES = 1	663
b. clean or sanitize packing/processing facilities and equipment?	YES = 1	664
c. pick up spilled fruit?	YES = 1	665
d. control vegetation around stored cartons, bins, or boxes?	YES = 1	666
e. sweep, vacuum, or wash facility floors?	YES = 1	667
f. clean or sanitize structures in storage rooms?	YES = 1	668
g. use Clean-in-Place (CIP), or any automated clean-up system?	YES = 1	669

5. Do you do any other cleaning activities at your facility besides the ones listed above?

☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Go to item 6.*] 670

a. What did you do? [*Record responses below.*]

OFFICE USE

_____ 671

_____ 672

_____ 673

_____ 674

6. Do you fumigate oranges or other citrus fruit?

☐ **YES** - [*Continue.*] ☐ **NO** - [*Go to Conclusion.*]

a. What strategy did you use to decide when to fumigate?

1	BASED ON MARKETING REQUIREMENT
2	PRESET CALENDAR DATE
3	BIN SAMPLES
4	COMBINED WITH OTHER HANDLING OPERATIONS
5	OTHER - (*Describe* _____)

ENTER ONE CODE 675

[ENUMERATOR NOTE - *If item 6 = YES, verify that a fumigation product was reported in Section* **B.]**

CONCLUSION

SURVEY PUBLICATIONS

That completes the survey. Would you like to receive a free copy of the results when they are published?

CODE 099

☐ **YES** - [*Enter code 1.*] ☐ **NO** . . . . . .

[*Thank the respondent then review this questionnaire.*]

RECORDS USE

Did respondent use operation records to report chemical data?

064

☐ **YES** - [*Enter code 1.*] ☐ **NO** . . . . . .

ENDING TIME [*MILITARY*] . . . . . 065 _ _ _ _

OFFICE USE - TIME IN HOURS 066

SUPPLEMENTS USED

Record the total number of Pesticide Supplements that were used to complete this interview. . . . . NUMBER 068

SERVICE REPORTS USED

Record the total number of Service Reports from chemical suppliers that were used to complete this interview. . . . . NUMBER 069

RESPONDENT

1	OPERATOR/MANAGER
2	SPOUSE
3	ACCOUNTANT/BOOKKEEPER
4	OTHER
8	OFFICE HOLD
9	PARTNER
10	CHEMICAL SUPPLY AGENT

. . . . . CODE 101

Respondent's name: _____

(*Phone*) _____

ENUMERATOR _____ . . . . . ENUMERATOR ID 098

DATE . . . . . MM DD YY 987 _ _ / _ _ / 04

OFFICE USE EVALUATION 100

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The time required to complete this information collection is estimated to average 30 minutes per response.

NATIONAL AGRICULTURAL STATISTICS SERVICE
U.S. Department of Agriculture
Rm 5829, South Building
1400 Independence Avenue, S.W.
Washington, D.C. 20250-2000
1-800-727-9540
Fax: 202-690-2090
E-mail: nass-dc@nass.usda.gov

2004 ORANGE POSTHARVEST CHEMICAL USE SURVEY FLORIDA

Form Approved
O.M.B. Number 0535-0218
Approval Expires 04/30/07
Project Code 143

VERSION	ID	SUBT.	T-TYPE	TABLE	LINE
1	_ _ _ _ _ _ _ _ _	_ _	0	000	00

CONTACT RECORD		
DATE	TIME	NOTES

RESPONSE CODES

3 - COMPLETE
4 - SCREENOUT
5 - NO ORANGES HANDLED/ RECEIVED
8 - REFUSAL
9 - INACCESSIBLE

OFFICE USE 910

OPTIONAL 002

INTRODUCTION
[*Introduce yourself, and ask for the operator. Rephrase in your own words.*]

We are collecting information on chemical use and need your help to make the information as accurate as possible. Authority for collection of information on the Orange Postharvest Chemical Use Survey is Title 7, Section 2204 of the U.S. Code. This information will be used for analysis and to compile and publish estimates for your state and the United States. Response to this survey is confidential and voluntary.

We encourage you to refer to your operation records during the interview.

BEGINNING TIME [*MILITARY*] . . . . . 004 _ _ _ _

Name _____

Address _____

_____

Phone (_____) _____

☐ [*Name, address and partners verified and updated if necessary.*]

1. Did this operation (*as listed on the label*) pack/ship, process, or hold any 2003-2004 Early-Midseason-Navel and/or Valencia oranges?
   [***Include** Early-Midseason-Navel and Valencias marketed from October 2003 through July 2004.*]

   ☐ **YES -** [*Go to page 3, **Screening**.*]

   ☐ **NO -** [*Go to next page, **Change in Operation**.*]

CHANGE IN OPERATION

- [*Complete this section only if item 1 on the front page is answered "No".*]

2. Has the operation named on the label been **sold, rented, or turned over** to someone else?

☐ **YES** - [*Continue.*] ☐ **NO** ⟶

3. Please provide the name and address of the operation that has taken over the business you formerly operated:

Operation Name: _____

Operator Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____

a. Will the operation handle or receive oranges or other crops at any of its facilities in 2004?

☐ **YES** ☐ **DON'T KNOW** ☐ **NO**

[***Regardless of answer above, write a note to explain the situation, then go to back page Conclusion.***]

_____

_____

_____

_____

NOTES and CALCULATIONS:

SCREENING

1. On this operation, were any 2003-2004 crop year oranges –

	VALENCIAS CODE	EARLY-MIDSEASON-NAVELS CODE
a. sorted, graded, packaged, or shipped primarily for fresh market? ☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Continue.*]	106	116
b. changed to a processed product by pasteurizing, pressing, drying, freezing, or slicing? ☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Continue.*]	105	115
c. temporarily held in cold rooms or degreening rooms for later use to be shipped or processed? ☐ **YES** - [*Enter code 1 and go to Section A.*] ☐ **NO** - [*Go to Section A.*]	107	117

ENUMERATOR NOTE: *Verify that respondent is aware that for purposes of this survey, that postharvest is defined for packer/shipper as the period of time when the fruit is picked until it is shipped from this operation for fresh market or processing.*

For processors, postharvest is defined as the period of time when the whole fruit is received until right before the whole fruit is changed in form.

A QUANTITY HANDLED for VALENCIA ORANGES A

[**ENUMERATOR NOTE:** *If NO Valencia oranges, go to next page.*]

Now I would like to ask about the 2003-2004 crop year Valencia oranges packed/shipped, processed, or held in storage by this operation.

Please use your records to help us get an accurate record of your Valencia orange receipts.

1. What was the total quantity of the 2003-2004 crop year Valencia oranges packed/shipped, processed, or held in storage by this operation? . . . . . .

QUANTITY
200 ___,___,___.__

2 BOX (90 lbs.) 3 TON 4 CWT. (100 lbs.) 5 POUNDS (lbs.) 6 BIN 7 CARTON 8 OTHER UNIT	If unit equals "6", "7", or "8" enter POUNDS/UNIT
201	202 .__

a. Of the [*item 1*] oranges, how much **DID NOT** receive postharvest chemical applications? . . . . . .

[*Chemical applications include pesticides, waxes, soaps, bleach washes, drenches, and ethylene gas treatments.*]

QUANTITY
206 ___,___,___.__

OR

PERCENT OF TOTAL NOT TREATED
207 ___.___

ENUMERATOR NOTE: [*Does item code 200 equal item code 206*?]
OR
[*Does item code 207 equal 100%*?]

☐ **YES -** Verify the operation did not apply any postharvest chemicals to Valencia oranges held in cold rooms or degreening rooms, on trucks, ships, rail cars, or air cargo containers from October 2003 through July 2004.

If no postharvest chemicals were applied go to next page.

If postharvest chemicals were applied, correct either item code 206 or item code 207 and go to next page.

☐ **NO -** Go to next page.

A QUANTITY HANDLED for EARLY-MIDSEASON-NAVEL ORANGES A

[ENUMERATOR NOTE: *If NO Early-Midseason-Navel oranges, go to Section* **B.]**

Now I would like to ask about the 2003-2004 crop year Early-Midseason-Navel oranges packed/shipped, processed, or held in storage by this operation.

Please use your records to help us get an accurate record of your Early-Midseason-Navel orange receipts.

1. What was the total quantity of the 2003-2004 crop year Early-Midseason-Navel oranges packed/shipped, processed, or held in storage by this operation? . . . . . .

QUANTITY
210 ___,___,___.___

2 BOX (90lbs.) 3 TON 4 CWT. (100 lbs.) 5 POUNDS (lbs.) 6 BIN 7 CARTON 8 OTHER UNIT	If unit equals "6", "7", or "8" enter POUNDS/UNIT
211	212 .___

a. Of the [*item 1*] oranges, how much **DID NOT** receive postharvest chemical applications? . . . . . .

[*Chemical applications include pesticides, waxes, soaps, bleach washes, drenches, and ethylene gas treatments.*]

QUANTITY
216 ___,___,___.___

PERCENT OF TOTAL NOT TREATED

OR 217 .___

ENUMERATOR NOTE: [*Does item code 210 equal item code 216?*]
OR
[*Does item code 217 equal 100%?*]

☐ **YES -** Verify the operation did not apply any postharvest chemicals to Early-Midseason-Navel oranges held in cold rooms or degreening rooms, on trucks, ships, rail cars, or air cargo containers from October 2003 through July 2004.

If no postharvest chemicals were applied go to Section **C**, page 10.

If postharvest chemicals were applied, correct either item code 216 or item code 217 and go to Section **B**.

☐ **NO -** Go to Section **B**.

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

1. Now I have some questions about postharvest chemical use on 2003-2004 crop year **Valencia and Early-Midseason-Navel oranges** packed/shipped, processed, or held by your operation. I will be collecting chemical data for Valencia and Early-Midseason-Navel oranges only. I will need information for all products applied. Include waxes, bleach washes, and ethylene treatments. I will be asking for specific product and amount used, quantity of oranges treated, and timing and method of application. Please use your records to answer the questions as accurately as possible and to help make sure we do not miss any products used.

OFFICE USE LINES IN TABLE

T-TYPE	TABLE	LINE	399
3	001	99	

CROP CODES for COLUMN 1

157 **Valencias**

362 **Early-Midseason-Navels**

APPLICATION TIMING CODES for COLUMN 3

1 Prewash treatment
2 Pre-processing
3 On packing line
4 At process wash location
5 In degreening or cooling rooms
6 Drench application
7 Before or during regular storage/holding
8 After regular storage/holding

NOTES	LINE	1 [*Enter crop code from above.*] CODE	2 **What product was applied?** (*In Respondent Booklet*) a COMMON OR TRADE NAME	2 b PRODUCT CODE	3 **When was this product used?** [*Enter code from above.*]	4 **What was the total quantity of oranges treated with this chemical** (*in column 2*)?
	01	301		302	303	304 . ___
	02	301		302	303	304 . ___
	03	301		302	303	304 . ___
	04	301		302	303	304 . ___
	05	301		302	303	304 . ___
	06	301		302	303	304 . ___
	07	301		302	303	304 . ___
	08	301		302	303	304 . ___
	09	301		302	303	304 . ___
	10	301		302	303	304 . ___

[*For pesticides not listed in Respondent Booklet, specify--*]

LINE #	EPA #	Trade name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [*Ask only if EPA No. cannot be reported.*]	Target Pest

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

UNIT CODES for COLUMN 5

2 - BOX (*90 lbs.*)
3 - TON
4 - CWT. (*100lbs.*)
5 - POUNDS (*lbs.*)
6 - BIN
7 - CARTON
8 - OTHER

UNIT CODES for COLUMN 8

1 - POUNDS
12 - GALLONS
13 - QUARTS
14 - PINTS
15 - LIQUID OUNCES
28 - DRY OUNCES
30 - GRAMS
40 - KILOGRAMS
41 - LITERS
50 - OTHER (*Specify* _____)

APPLICATION CODES for COLUMN 9

1 - DRENCH
2 - DRIP/BRUSH ON
3 - DIRECT SPRAY/FOAM
4 - DIP in FRUIT BATH/WASH
6 - GAS/FOG
10 - OTHER (*Specify* _____)

LINE	5 [*Enter unit code from above.*] CODE	6 If column 5 unit equals "6", "7", or "8" enter pounds per unit.	7 What was the total amount of formulated product applied to the (*column 4*) amount of oranges?	8 [*Enter unit code from above.*] CODE	9 What was the method used to apply this product? CODE
01	305	306 .___	307 .___ ___	308	309
02	305	306 .___	307 .___ ___	308	309
03	305	306 .___	307 .___ ___	308	309
04	305	306 .___	307 .___ ___	308	309
05	305	306 .___	307 .___ ___	308	309
06	305	306 .___	307 .___ ___	308	309
07	305	306 .___	307 .___ ___	308	309
08	305	306 .___	307 .___ ___	308	309
09	305	306 .___	307 .___ ___	308	309
10	305	306 .___	307 .___ ___	308	309

Enumerator Notes:

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

CROP CODES for COLUMN 1

157	**Valencias**
362	**Early-Midseason-Navels**

APPLICATION TIMING CODES for COLUMN 3

1 Prewash treatment	5 In degreening or cooling rooms
2 Pre-processing	6 Drench application
3 On packing line	7 Before or during regular storage/holding
4 At process wash location	8 After regular storage/holding

NOTES	LINE	1 [*Enter crop code from above.*] CODE	2 What product was applied? (*In Respondent Booklet*) a COMMON OR TRADE NAME	2 b PRODUCT CODE	3 When was this product used? [*Enter code from above.*]	4 What was the total quantity of oranges treated with this chemical (*in column 2*)?
	11	301		302	303	304 . ___
	12	301		302	303	304 . ___
	13	301		302	303	304 . ___
	14	301		302	303	304 . ___
	15	301		302	303	304 . ___
	16	301		302	303	304 . ___
	17	301		302	303	304 . ___
	18	301		302	303	304 . ___
	19	301		302	303	304 . ___
	20	301		302	303	304 . ___

[*For pesticides not listed in Respondent Booklet, specify--*]

LINE #	EPA #	Trade name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased [*Ask only if EPA No. cannot be reported.*]	Target Pest
___	___	___	___	___	___
___	___	___	___	___	___
___	___	___	___	___	___

B POSTHARVEST CHEMICAL TREATMENTS APPLIED B

UNIT CODES for COLUMN 5

2 - BOX (*90 lbs.*)
3 - TON
4 - CWT. (*100lbs.*)
5 - POUNDS (*lbs.*)
6 - BIN
7 - CARTON
8 - OTHER

UNIT CODES for COLUMN 8

1 - POUNDS
12 - GALLONS
13 - QUARTS
14 - PINTS
15 - LIQUID OUNCES
28 - DRY OUNCES
30 - GRAMS
40 - KILOGRAMS
41 - LITERS
50 - OTHER (*Specify* _____)

APPLICATION CODES for COLUMN 9

1 - DRENCH
2 - DRIP/BRUSH ON
3 - DIRECT SPRAY/FOAM
4 - DIP in FRUIT BATH/WASH
6 - GAS/FOG
10 - OTHER (*Specify* _____)

LINE	5 [*Enter unit code from above.*] CODE	6 If column 5 unit equals "6", "7", or "8" enter pounds per unit.	7 What was the total amount of formulated product applied to the (*column 4*) amount of oranges?	8 [*Enter unit code from above.*] CODE	9 What was the method used to apply this product? CODE
11	305	306 .___	307 .___ ___	308	309
12	305	306 .___	307 .___ ___	308	309
13	305	306 .___	307 .___ ___	308	309
14	305	306 .___	307 .___ ___	308	309
15	305	306 .___	307 .___ ___	308	309
16	305	306 .___	307 .___ ___	308	309
17	305	306 .___	307 .___ ___	308	309
18	305	306 .___	307 .___ ___	308	309
19	305	306 .___	307 .___ ___	308	309
20	305	306 .___	307 .___ ___	308	309

2. Have I recorded all fungicides, insecticides, antioxidants, and other postharvest chemicals applied to these oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** - [*Make additions to table in Section* **B**]

3. Have you included all soaps, waxes, bleach washes, and ethylene gas treatments used on the oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** -[*Make additions to table in Section* **B**]

4. Have you included microbial agents and biological pesticides used on the oranges at this facility?

   ☐ **YES** - [*Continue*] ☐ **NO** - [*Make additions to table in Section* **B**]

5. Have you included all drench applications used on the oranges at this facility?

   ☐ **YES** - [*Go to Section* **C**] ☐ **NO** - [*Make additions to table in Section* **B**]

C PEST MANAGEMENT PRACTICES C

T-TYPE	TABLE	LINE
0	000	00

Now I have some questions about pest management practices you may have used at your facilities during the 2003-2004 marketing year.

These next questions pertain to ALL CITRUS handled.

1. Do you use--

		CODE
a.	ozone gas in storage facilities? . . . . . YES = 1	650
b.	controlled humidity and temperatures in degreening process? . . . . . YES = 1	651
c.	cooling refrigeration rooms at 50 degrees Farenheit or lower? . . . . . YES = 1	652
d.	pest/rodent control measures? . . . . . YES = 1	653
e.	frequently changed fruit bath or process wash water? . . . . . YES = 1	654
f.	culling mechanisms? . . . . . YES = 1	655
g.	alkaline treatments (*such as sodium or potassium biocarbonate*) to control mold and/or rot? . . . . . YES = 1	656
h.	ozonated water to reduce levels of fruit pathogens? . . . . . YES = 1	657

2. Do you pack or process Certified Organic citrus fruits or juices? . . . . . YES = 1 | 658 |

3. How often do you measure temperature and/or humidity for citrus held or stored at this facility?

	FREQUENCY
Cooling Room. . . .	660
Degreening Room. . . .	661
Other Structures. . . .	662

1	AUTOMATICALLY MONITORED
2	HOURLY
3	DAILY
4	TWICE A WEEK
5	WEEKLY
6	OTHER - (*Specify* _____)
7	DO NOT MONITOR
8	DO NOT HAVE THIS STRUCTURE

COMPLETION CODE for CHEMICAL APPLICATIONS TABLE

1 - Incomplete / Refusal 3 - Valid Zero	300

COMPLETION CODE for PEST MANAGEMENT SECTION

1 - Incomplete/Refusal	500

C PEST MANAGEMENT PRACTICES C

4. Which cleaning practices do you use at this facility on ALL CITRUS handled?

Do you--

		CODE
a. hose down, rinse, sweep, or vacuum empty bins/boxes?	YES = 1	663
b. clean or sanitize packing/processing facilities and equipment?	YES = 1	664
c. pick up spilled fruit?	YES = 1	665
d. control vegetation around stored cartons, bins, or boxes?	YES = 1	666
e. sweep, vacuum, or wash facility floors?	YES = 1	667
f. clean or sanitize structures in storage rooms?	YES = 1	668
g. use Clean-in-Place (CIP), or any automated clean-up system?	YES = 1	669

5. Do you do any other cleaning activities at your facility besides the ones listed above?

☐ **YES** - [*Enter code 1 and continue.*] ☐ **NO** - [*Go to item 6.*] 670

a. What did you do? [*Record responses below.*]

OFFICE USE

_____ 671

_____ 672

_____ 673

_____ 674

6. Do you fumigate oranges or other citrus fruit?

☐ **YES** - [*Continue.*] ☐ **NO** - [*Go to Conclusion.*]

a. What strategy did you use to decide when to fumigate?

1	**BASED ON MARKETING REQUIREMENT**
2	**PRESET CALENDAR DATE**
3	**BIN SAMPLES**
4	**COMBINED WITH OTHER HANDLING OPERATIONS**
5	**OTHER - (*Describe* _____)**

. . . . . ENTER ONE CODE 675

[**ENUMERATOR NOTE** - *If item 6 = YES, verify that a fumigation product was reported in Section* **B.**]

CONCLUSION

SURVEY PUBLICATIONS

That completes the survey. Would you like to receive a free copy of the results when they are published?

CODE 099

☐ **YES** - [*Enter code 1.*] ☐ **NO** . . . . . .

[*Thank the respondent then review this questionnaire.*]

RECORDS USE

Did respondent use operation records to report chemical data?

064

☐ **YES** - [*Enter code 1.*] ☐ **NO** . . . . . .

ENDING TIME [*MILITARY*] . . . . . 065 _ _ _ _

OFFICE USE - TIME IN HOURS

066

SUPPLEMENTS USED

NUMBER

Record the total number of Pesticide Supplements that were used to complete this interview. 068

SERVICE REPORTS USED

NUMBER

Record the total number of Service Reports from chemical suppliers that were used to complete this interview. 069

RESPONDENT

1	OPERATOR/MANAGER
2	SPOUSE
3	ACCOUNTANT/BOOKKEEPER
4	OTHER
8	OFFICE HOLD
9	PARTNER
10	CHEMICAL SUPPLY AGENT

. . . . . CODE 101

Respondent's name: _____

(*Phone*) _____

ENUMERATOR _____ . . . . . ENUMERATOR ID 098

DATE . . . . . MM DD YY 987 _ _ / _ _ / 04

OFFICE USE EVALUATION

100

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The time required to complete this information collection is estimated to average 30 minutes per response.

Report Features

Released March 30, 2005, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. For information on "Agricultural Chemical Usage" call (202) 720-6146, office hours 7:30 a.m. to 4:00 p.m. E.T.

Listed below are persons within the National Agricultural Statistics Service to contact for additional information.

Michelle Radice, Environmental Statistician	(202) 690-2284
Sarah Hoffman, Head, Environmental and Demographics Section	(202) 720-0684
Linda Hutton, Chief, Environmental, Economics and Demographics Branch	(202) 720-6146

ACCESS TO REPORTS!!

For your convenience, there are several ways to obtain NASS reports, data products, and services:

INTERNET ACCESS

All NASS reports are available free of charge on the worldwide Internet. For access, connect to the Internet and go to the NASS Home Page at: **www.usda.gov/nass/**. Select "Today's Reports" or Publications and then Reports Calendar or Publications and then Search, by Title or Subject.

E-MAIL SUBSCRIPTION

All NASS reports are available by subscription free of charge direct to your e-mail address. Starting with the NASS Home Page at **www.usda.gov/nass/**, click on **Publications**, then click on the **Subscribe by E-mail** button which takes you to the page describing e-mail delivery of reports. Finally, click on **Go to the Subscription Page** and follow the instructions.

- -

PRINTED REPORTS OR DATA PRODUCTS

CALL OUR TOLL-FREE ORDER DESK: 800-999-6779 (U.S. and Canada)
Other areas, please call 703-605-6220 FAX: 703-605-6900
(Visa, MasterCard, check, or money order acceptable for payment.)

- -

ASSISTANCE

For **assistance** with general agricultural statistics or further information about NASS or its products or services, contact the **Agricultural Statistics Hotline** at **800-727-9540**, 7:30 a.m. to 4:00 p.m. ET, or e-mail: **nass@nass.usda.gov.**