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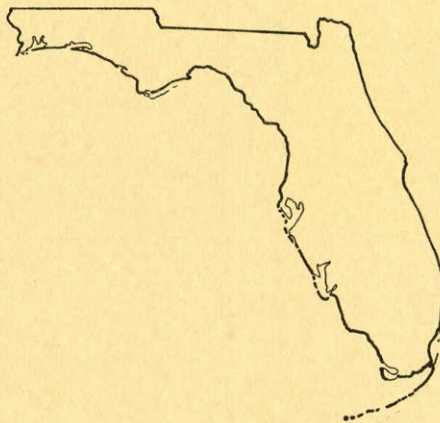
Richard L. Kilmer

Economic Information
Report 167

Grower's Returns and Marketing Costs for Florida Citrus

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ABSTRACT

Changes in costs associated with each level in the fresh and processed citrus marketing channel are examined. The results indicate that nearly 61 percent of the retail food dollar spent on fresh grapefruit is associated with activities that occur after the fruit leaves fresh fruit packinghouses. For frozen concentrated orange juice and canned single-strength grapefruit juice the F.O.B.-retail margin was estimated to be 27 and 26 percent, respectively, of the consumers' expenditures.

Key words: citrus marketing, marketing margins, cost trends, citrus acreage, citrus production, on-tree revenue, on-tree returns.

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GROWERS' RETURNS AND MARKETING COSTS
FOR FLORIDA CITRUS

Richard L. Kilmer

INTRODUCTION

The United States Department of Agriculture has published the farmer's share of the consumer's food dollar on commodities for many years. The increase in food prices has stimulated an interest in cost of marketing functions performed between the producer and consumer. The purpose of this update of a previous report [12] is to look at the costs associated with each level in the fresh and processed citrus marketing channel. In this paper (1) value of production and on tree prices, (2) picking and hauling costs, (3) fresh citrus packing and selling costs, (4) citrus processing, warehousing, and selling costs, and (5) the wholesaling and retailing stage in the citrus production/marketing process are examined.

TRENDS IN PRODUCTION, VALUE OF PRODUCTION,
AND ON-TREE PRICES

Total citrus bearing acreage in Florida declined from 1970-71 through 1978-79 and then increased (Table 1). The increase came from increases in orange bearing acreage which were complemented by increases in grapefruit bearing acreage which has continued since 1963-64. Specialty fruit acreage has declined since 1970-71 but was offset by the increases in orange and grapefruit bearing acreage. Prior to 1970-71, orange and specialty fruit bearing acreage had increased rapidly while grapefruit bearing acreage had remained relatively stable. In 1980-81, orange, grapefruit,

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Table 1. Florida citrus bearing acres by type of fruit, 1959-60 through 1980-81 seasons.

| Season | <u>All round oranges</u> | | <u>All grapefruit</u> | | <u>Specialty fruit^a</u> | | <u>All citrus</u> | |
|---------|--------------------------|--------------------------|------------------------|--------------------------|------------------------------------|--------------------------|------------------------|--------------------------|
| | <u>Bearing Acreage</u> | <u>Index^b</u> | <u>Bearing Acreage</u> | <u>Index^b</u> | <u>Bearing Acreage</u> | <u>Index^b</u> | <u>Bearing Acreage</u> | <u>Index^b</u> |
| | <u>1000 acres</u> | <u>Percent</u> | <u>1000 acres</u> | <u>Percent</u> | <u>1000 acres</u> | <u>Percent</u> | <u>1000 acres</u> | <u>Percent</u> |
| 1959-60 | 370.0 | 97 | 92.3 | 103 | 45.9 | 104 | 508.2 | 98 |
| 1960-61 | 374.1 | 98 | 92.5 | 103 | 48.3 | 109 | 514.9 | 100 |
| 1961-62 | 408.7 | 107 | 94.0 | 104 | 46.8 | 106 | 549.5 | 106 |
| 1962-63 | 370.0 | 97 | 88.0 | 98 | 41.3 | 93 | 499.3 | 97 |
| 1963-64 | 388.0 | 102 | 83.0 | 92 | 39.1 | 88 | 510.1 | 99 |
| 1964-65 | 435.0 | 114 | 84.0 | 93 | 42.3 | 96 | 561.3 | 109 |
| 1965-66 | 472.0 | 124 | 85.8 | 95 | 45.3 | 102 | 603.1 | 117 |
| 1966-67 | 522.0 | 137 | 87.0 | 97 | 49.7 | 112 | 658.7 | 128 |
| 1967-68 | 557.6 | 146 | 87.5 | 97 | 54.6 | 123 | 699.7 | 135 |
| 1968-69 | 595.6 | 156 | 90.3 | 100 | 60.9 | 138 | 746.8 | 145 |
| 1969-70 | 636.1 | 166 | 98.7 | 110 | 71.6 | 162 | 806.4 | 156 |
| 1970-71 | 660.5 | 173 | 107.2 | 119 | 78.8 | 178 | 846.5 | 164 |
| 1971-72 | 624.2 | 163 | 112.6 | 125 | 75.6 | 171 | 812.4 | 157 |
| 1972-73 | 619.6 | 162 | 114.6 | 127 | 74.9 | 169 | 809.1 | 157 |
| 1973-74 | 614.6 | 161 | 115.8 | 129 | 73.4 | 166 | 803.8 | 156 |
| 1974-75 | 610.4 | 160 | 115.4 | 128 | 73.7 | 166 | 799.5 | 155 |
| 1975-76 | 596.4 | 156 | 117.9 | 131 | 70.2 | 159 | 784.5 | 152 |
| 1976-77 | 594.3 | 156 | 119.3 | 133 | 69.6 | 157 | 783.2 | 152 |
| 1977-78 | 579.0 | 152 | 120.3 | 134 | 65.5 | 148 | 764.8 | 148 |
| 1978-79 | 571.5 | 150 | 124.6 | 139 | 63.4 | 143 | 759.5 | 147 |
| 1979-80 | 576.6 | 151 | 126.4 | 141 | 63.6 | 144 | 766.6 | 148 |
| 1980-81 | 573.4 | 150 | 125.6 | 140 | 63.0 | 142 | 762.0 | 148 |
| Index | 382.16 | | 89.6 | | 44.28 | | 516.4 | |

Source: [1]

^aIncludes Temples, tangelos, tangerines, honey tangerines and limes.

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

and specialty fruit accounted for 75, 17, and 8 percent of total citrus bearing acreage.

Even though total citrus bearing acreage has stabilized during the last four years instead of declining, total citrus production has declined except for 1979-80 (Table 2). This is due to the freeze in 1976-77 which had carry over effects into the next two years and to a second freeze in 1980-81. This decline in production is atypical when compared to the 1970-71 through 1976-77 period when total citrus acreage decreased while total production increased.

The total nominal on-tree value of the citrus crop more than doubled from 1975-76 to the 1978-79 season (Table 3). Oranges showed the largest increase with specialty fruit second. By the 1980-81 season, however, grapefruit value had increased more than 300 percentage points.

Between 1976-77 and 1980-81, per acre nominal returns more than doubled for the total citrus crop and oranges and grapefruit in particular (Table 4). This was also the case for on-tree nominal returns per box (Table 5).

HARVESTING AND HAULING COSTS

Harvesting and hauling represent the first process in the marketing channel from grove to consumer. Harvesting also represents the least mechanized and most labor intensive operation in the marketing channel. Recent increases in harvesting and hauling costs--especially labor costs--have been of great concern to the industry. While mechanical harvesting may, in the future, work to deter the rapidly increasing harvesting costs, mechanical harvesting adoption has been slow. Harvesting and hauling costs remain a major concern.

Table 2. Florida citrus production by type of fruit, 1959-60 through 1980-81 seasons.

| Season | <u>All round oranges</u> | | <u>All grapefruit</u> | | <u>Specialty fruit^a</u> | | <u>All citrus</u> | |
|---------|--------------------------|--------------------|-----------------------|--------------------|------------------------------------|--------------------|---------------------|--------------------|
| | Production | Index ^b | Production | Index ^b | Production | Index ^b | Production | Index ^b |
| | 1000 1-3/5 boxes | Percent | 1000 1-3/5 boxes | Percent | 1000 1-3/5 boxes | Percent | 1000 1-3/5 boxes | Percent |
| 1959-60 | 87,600 | 108 | 30,500 | 100 | 7,470 | 90 | 125,570 | 104 |
| 1960-61 | 82,700 | 102 | 31,600 | 103 | 9,980 | 120 | 124,280 | 103 |
| 1961-62 | 108,800 | 134 | 34,800 | 114 | 10,210 | 123 | 153,810 | 128 |
| 1962-63 | 72,500 | 89 | 30,000 | 98 | 5,250 | 63 | 107,750 | 90 |
| 1963-64 | 54,900 | 68 | 26,300 | 86 | 8,620 | 104 | 89,820 | 75 |
| 1964-65 | 82,400 | 101 | 31,900 | 104 | 9,350 | 113 | 123,650 | 103 |
| 1965-66 | 95,900 | 118 | 34,900 | 114 | 10,190 | 123 | 140,990 | 117 |
| 1966-67 | 139,500 | 172 | 43,600 | 142 | 11,895 | 143 | 194,995 | 162 |
| 1967-68 | 100,500 | 124 | 32,900 | 107 | 10,270 | 124 | 143,670 | 119 |
| 1968-69 | 129,700 | 160 | 39,900 | 130 | 11,500 | 138 | 181,100 | 151 |
| 1969-70 | 137,700 | 169 | 37,400 | 122 | 12,405 | 149 | 187,505 | 156 |
| 1970-71 | 142,300 | 175 | 42,900 | 140 | 13,250 | 160 | 198,450 | 165 |
| 1971-72 | 137,000 | 169 | 47,000 | 153 | 14,800 | 178 | 198,800 | 165 |
| 1972-73 | 169,700 | 209 | 45,400 | 148 | 13,200 | 159 | 228,300 | 190 |
| 1973-74 | 165,800 | 204 | 48,100 | 157 | 14,350 | 173 | 228,250 | 190 |
| 1974-75 | 173,300 | 213 | 44,600 | 146 | 15,850 | 191 | 233,750 | 194 |
| 1975-76 | 181,200 | 223 | 49,100 | 160 | 17,530 | 211 | 247,830 | 206 |
| 1976-77 | 186,800 | 230 | 51,500 | 168 | 14,250 | 172 | 252,550 | 210 |
| 1977-78 | 167,800 | 206 | 51,400 | 168 | 12,450 | 150 | 231,650 | 193 |
| 1978-79 | 164,000 | 202 | 50,000 | 163 | 14,890 | 179 | 228,890 | 190 |
| 1979-80 | 206,700 | 254 | 54,800 | 179 | 20,200 | 243 | 281,700 | 234 |
| 1980-81 | 172,400 | 212 | 50,300 | 164 | 13,800 | 166 | 236,500 | 197 |
| Index | 81,300 | | 30,640 | | 8,306 | | 120,246 | |

Source: [1]

^aIncludes Temples, tangelos, tangerines, honey tangerines and limes.

^bPercentage of average value for 1959-60 through 1964-64 seasons (Index).

Table 3. On-tree value of Florida citrus production by type of fruit, 1959-60 through 1980-81 seasons.

| Season | All round oranges | | All grapefruit | | Specialty fruit ^a | | All citrus ^b | |
|---------|-------------------|--------------------|----------------|--------------------|------------------------------|--------------------|-------------------------|--------------------|
| | Value | Index ^c | Value | Index ^c | Value | Index ^c | Value | Index ^c |
| | Thousand \$ | Percent | Thousand \$ | Percent | Thousand \$ | Percent | Thousand \$ | Percent |
| 1959-60 | 170,057 | 80 | 32,043 | 88 | 19,635 | 82 | 221,735 | 82 |
| 1960-61 | 244,376 | 116 | 30,138 | 83 | 25,348 | 106 | 299,862 | 110 |
| 1961-62 | 203,255 | 96 | 23,498 | 65 | 23,506 | 98 | 250,259 | 92 |
| 1962-63 | 196,116 | 93 | 37,146 | 102 | 17,421 | 73 | 250,683 | 92 |
| 1963-64 | 243,935 | 115 | 59,147 | 163 | 34,005 | 142 | 337,087 | 124 |
| 1964-65 | 200,276 | 95 | 46,892 | 129 | 27,308 | 114 | 274,476 | 101 |
| 1965-66 | 155,625 | 74 | 47,471 | 130 | 22,312 | 93 | 225,408 | 83 |
| 1966-67 | 130,526 | 62 | 32,393 | 89 | 15,156 | 63 | 178,075 | 65 |
| 1967-68 | 207,432 | 98 | 66,317 | 182 | 34,321 | 143 | 308,070 | 113 |
| 1968-69 | 218,660 | 103 | 39,011 | 107 | 27,723 | 116 | 285,394 | 105 |
| 1969-70 | 156,876 | 74 | 63,526 | 175 | 22,055 | 92 | 242,457 | 89 |
| 1970-71 | 208,146 | 98 | 81,514 | 224 | 24,228 | 101 | 313,888 | 115 |
| 1971-72 | 280,317 | 133 | 108,991 | 299 | 33,991 | 142 | 423,299 | 156 |
| 1972-73 | 265,361 | 125 | 94,635 | 260 | 29,434 | 123 | 389,430 | 143 |
| 1973-74 | 244,691 | 116 | 79,879 | 219 | 30,692 | 128 | 355,262 | 131 |
| 1974-75 | 280,350 | 133 | 76,367 | 210 | 36,498 | 152 | 393,215 | 145 |
| 1975-76 | 321,449 | 152 | 72,155 | 198 | 42,552 | 177 | 436,156 | 160 |
| 1976-77 | 405,982 | 192 | 81,116 | 223 | 38,810 | 162 | 525,908 | 193 |
| 1977-78 | 693,677 | 328 | 84,438 | 232 | 68,219 | 284 | 846,334 | 311 |
| 1978-79 | 764,961 | 362 | 120,128 | 330 | 77,481 | 323 | 962,570 | 354 |
| 1979-80 | 768,877 | 363 | 181,208 | 498 | 76,639 | 320 | 1,026,724 | 378 |
| 1980-81 | 770,109 | 364 | 183,376 | 504 | 57,891 | 241 | 1,011,376 | 372 |
| Index | 211,548 | | 36,395 | | 23,983 | | 271,925 | |

Source: [1]

^aIncludes temples, tangelos, tangerines, honey tangerines and limes.

^bIncludes all round oranges, all grapefruit, and specialty fruit.

^cPercentage of average values for 1959-60 through 1963-64 seasons (Index).

Table 4. Average value of citrus production per acre of citrus by type of fruit, 1959-60 through 1980-81 seasons.

| Season | All round oranges | | All grapefruit | | Speciality fruit ^a | | All citrus | |
|---------|-------------------|--------------------|----------------|--------------------|-------------------------------|--------------------|------------|--------------------|
| | Value | Index ^b | Value | Index ^b | Value | Index ^b | Value | Index ^b |
| | \$/acre | Percent | \$/acre | Percent | \$/acre | Percent | \$/acre | Percent |
| 1959-60 | 459.62 | 83 | 347.16 | 84 | 427.78 | 78 | 436.31 | 83 |
| 1960-61 | 653.24 | 118 | 325.82 | 79 | 524.80 | 96 | 582.37 | 110 |
| 1961-62 | 497.32 | 90 | 249.98 | 61 | 500.13 | 91 | 455.43 | 86 |
| 1962-63 | 530.04 | 96 | 422.11 | 103 | 421.82 | 77 | 502.07 | 95 |
| 1963-64 | 628.70 | 114 | 712.61 | 173 | 869.69 | 158 | 660.83 | 125 |
| 1964-65 | 460.40 | 83 | 558.24 | 136 | 645.58 | 118 | 489.00 | 93 |
| 1965-66 | 329.71 | 60 | 553.28 | 134 | 492.54 | 90 | 373.75 | 71 |
| 1966-67 | 250.05 | 45 | 372.33 | 90 | 304.95 | 56 | 270.34 | 51 |
| 1967-68 | 372.01 | 67 | 757.91 | 184 | 628.59 | 115 | 440.29 | 83 |
| 1968-69 | 367.13 | 66 | 432.02 | 105 | 455.22 | 83 | 382.16 | 72 |
| 1969-70 | 246.62 | 45 | 643.63 | 156 | 308.03 | 56 | 300.67 | 57 |
| 1970-71 | 315.13 | 57 | 760.39 | 185 | 307.46 | 56 | 370.81 | 70 |
| 1971-72 | 449.08 | 81 | 967.95 | 235 | 449.62 | 82 | 521.05 | 99 |
| 1972-73 | 428.28 | 77 | 825.79 | 201 | 392.98 | 72 | 481.31 | 91 |
| 1973-74 | 398.13 | 72 | 689.80 | 168 | 418.15 | 76 | 441.98 | 84 |
| 1974-75 | 459.29 | 83 | 661.76 | 161 | 495.22 | 90 | 491.83 | 93 |
| 1975-76 | 538.98 | 97 | 612.00 | 149 | 606.15 | 110 | 555.97 | 105 |
| 1976-77 | 683.13 | 123 | 679.93 | 165 | 557.61 | 102 | 671.49 | 127 |
| 1977-78 | 1,198.06 | 216 | 701.90 | 171 | 1,041.51 | 190 | 1,106.61 | 210 |
| 1978-79 | 1,338.51 | 242 | 964.11 | 234 | 1,222.10 | 223 | 1,267.37 | 240 |
| 1979-80 | 1,333.47 | 241 | 1,433.61 | 348 | 1,205.02 | 220 | 1,339.32 | 254 |
| 1980-81 | 1,343.06 | 243 | 1,460.00 | 355 | 918.90 | 167 | 1,327.27 | 252 |
| Index | 553.78 | | 411.54 | | 548.84 | | 527.40 | |

Source: [1]

^aIncludes Temples, tangelos, tangerines, honey tangerines and limes.

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

Table 5. On-tree price per box of Florida citrus by type of fruit, 1959-60 through 1980-81 seasons.

| Season | All round oranges | | All grapefruit | | Specialty fruit ^a | | All citrus | |
|---------|-------------------|--------------------|----------------|--------------------|------------------------------|--------------------|------------|--------------------|
| | Price | Index ^b | Price | Index ^b | Price | Index ^b | Price | Index ^b |
| | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent |
| 1959-60 | 1.96 | 70 | 1.05 | 122 | 2.62 | 89 | 1.76 | 74 |
| 1960-61 | 2.98 | 107 | .96 | 78 | 2.53 | 86 | 2.41 | 101 |
| 1961-62 | 1.88 | 67 | .67 | 54 | 2.30 | 78 | 1.63 | 68 |
| 1962-63 | 2.71 | 97 | 1.24 | 101 | 3.32 | 113 | 2.33 | 98 |
| 1963-64 | 4.44 | 159 | 2.24 | 182 | 3.94 | 134 | 3.75 | 158 |
| 1964-65 | 2.43 | 87 | 1.47 | 120 | 2.92 | 99 | 2.22 | 93 |
| 1965-66 | 1.62 | 58 | 1.36 | 111 | 2.19 | 74 | 1.60 | 67 |
| 1966-67 | .94 | 34 | .74 | 60 | 1.27 | 43 | .91 | 38 |
| 1967-68 | 2.07 | 74 | 2.01 | 163 | 3.34 | 114 | 2.14 | 90 |
| 1968-69 | 1.68 | 60 | .98 | 80 | 2.41 | 82 | 1.58 | 66 |
| 1969-70 | 1.14 | 41 | 1.70 | 138 | 1.78 | 61 | 1.29 | 54 |
| 1970-71 | 1.46 | 52 | 1.91 | 155 | 1.83 | 62 | 1.58 | 66 |
| 1971-72 | 2.04 | 73 | 2.32 | 189 | 2.30 | 78 | 2.13 | 89 |
| 1972-73 | 1.56 | 56 | 2.08 | 169 | 2.23 | 76 | 1.71 | 72 |
| 1973-74 | 1.47 | 53 | 1.66 | 135 | 2.14 | 73 | 1.56 | 66 |
| 1974-75 | 1.62 | 58 | 1.72 | 140 | 2.30 | 78 | 1.68 | 71 |
| 1975-76 | 1.77 | 63 | 1.47 | 120 | 2.43 | 83 | 1.76 | 74 |
| 1976-77 | 2.17 | 78 | 1.58 | 128 | 2.72 | 93 | 2.08 | 87 |
| 1977-78 | 4.14 | 148 | 1.64 | 133 | 5.48 | 186 | 3.65 | 153 |
| 1978-79 | 4.66 | 167 | 2.41 | 196 | 5.20 | 177 | 4.21 | 177 |
| 1979-80 | 3.72 | 133 | 3.31 | 269 | 3.79 | 129 | 3.64 | 153 |
| 1980-81 | 4.46 | 160 | 3.65 | 297 | 4.19 | 143 | 4.28 | 180 |
| Index | 2.79 | | 1.23 | | 2.94 | | 2.38 | |

Source: [1]

^aIncludes Temples, tangelos, tangerines, honey tangerines and limes.

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

Orange harvesting and hauling costs in 1979-80 are estimated to have increased to 196 percent (1959-60 through 1963-64 as base years) while grapefruit and tangerine picking and hauling costs are estimated to have increased to 137 and 113 percent (Table 6, 7, 8). Of the items that make up total picking and hauling costs for oranges, picking labor is the item accounting for the largest proportion of the total. Accounting for 47 percent of the total, it increased steadily from 1959-60 through 1973-74 and then declined slightly and started increasing again in 1976-77. Other labor, however, has increased and continues to increase. Finally, fuel, maintenance, and depreciation have increased significantly since 1968-69.

The relatively slow increase in picking labor costs for tangerines (Table 8) reflects a change in the picking method. Clipping involves manually handling each piece of fruit and using a shear to remove each fruit from the tree. Because clipping tangerines reduces a picker's capacity, pickers generally require a higher per box wage when clipping is required. As the proportion of tangerines pulled rather than clipped has increased, the cost of picking tangerines has decreased relative to the cost of picking oranges and grapefruit.

In addition to the type of fruit and grove conditions, several other economic factors have been found to be related to the piece rate for citrus pickers. Walker [14] has shown that the most important determinants of the piece rate for citrus pickers are the nonfarm wage rate and the unemployment rate. The results indicate that the piece rate and the nonfarm wage rate in food and kindered industries in Florida are positively related and that the piece rate and the Florida unemployment rate are negatively related.

Table 6. Picking and hauling costs and indices for Florida oranges, 1959-60 through 1979-80 seasons.

| Season | Oranges | | | | | | | | | |
|---------|---------|--------------------|--------------------|--------------------|--------------------------------|--------------------|--------------------|--------------------|--------|--------------------|
| | Labor | | | | Fuel, maintenance depreciation | | Administrative & b | | Total | |
| | Pickers | | Other ^a | | | | Other ^b | | | |
| | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c |
| | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent |
| 1959-60 | 18.77 | 90 | 10.59 | 84 | 8.43 | 94 | 7.61 | 113 | 45.40 | 93 |
| 1960-61 | 18.90 | 91 | 12.52 | 100 | 8.37 | 94 | 6.34 | 94 | 46.13 | 94 |
| 1961-62 | 19.64 | 94 | 12.17 | 97 | 7.56 | 85 | 4.83 | 72 | 44.20 | 90 |
| 1962-63 | 22.50 | 108 | 13.29 | 106 | 9.98 | 112 | 6.74 | 100 | 52.51 | 107 |
| 1963-64 | 24.24 | 116 | 14.17 | 113 | 10.33 | 116 | 8.03 | 120 | 56.77 | 116 |
| 1964-65 | 26.38 | 127 | 13.35 | 106 | 9.72 | 109 | 5.64 | 84 | 55.09 | 112 |
| 1965-66 | 28.54 | 137 | 14.43 | 115 | 9.88 | 111 | 5.23 | 78 | 58.08 | 119 |
| 1966-67 | 29.53 | 142 | 13.79 | 110 | 8.42 | 94 | 5.25 | 78 | 56.99 | 116 |
| 1967-68 | 33.42 | 161 | 16.96 | 135 | 10.88 | 122 | 6.15 | 92 | 67.41 | 138 |
| 1968-69 | 37.51 | 180 | 15.69 | 125 | 10.82 | 121 | 5.73 | 85 | 69.75 | 142 |
| 1969-70 | 38.54 | 185 | 17.00 | 135 | 12.32 | 138 | 6.44 | 96 | 74.30 | 152 |
| 1970-71 | 38.70 | 186 | 17.99 | 143 | 12.75 | 143 | 8.46 | 126 | 77.90 | 159 |
| 1971-72 | 40.91 | 197 | 22.34 | 178 | 13.38 | 150 | 7.83 | 117 | 84.47 | 172 |
| 1972-73 | 52.60 | 253 | 22.00 | 175 | 15.06 | 169 | 7.20 | 107 | 98.86 | 202 |
| 1973-74 | 57.86 | 278 | 23.10 | 184 | 16.57 | 186 | 9.21 | 137 | 106.74 | 218 |
| 1974-75 | 51.87 | 249 | 22.87 | 182 | 16.53 | 185 | 8.25 | 123 | 99.52 | 203 |
| 1975-76 | 50.61 | 243 | 25.52 | 203 | 17.38 | 195 | 7.20 | 107 | 100.71 | 206 |
| 1976-77 | 54.96 | 264 | 27.60 | 220 | 19.29 | 216 | 9.34 | 139 | 111.19 | 227 |
| 1977-78 | 58.96 | 283 | 33.46 | 267 | 20.34 | 228 | 10.92 | 163 | 123.68 | 252 |
| 1978-79 | 65.76 | 316 | 40.31 | 321 | 23.32 | 261 | 11.08 | 165 | 140.47 | 287 |
| 1979-80 | 67.82 | 326 | 39.60 | 316 | 25.47 | 285 | 12.32 | 184 | 145.21 | 296 |
| Index | 20.81 | | 12.55 | | 8.93 | | 6.71 | | 49.00 | |

Source: [8, 12]

^a Supervisory, loaders, drivers, semi-drivers, miscellaneous and payroll taxes and workman's compensation.

^b Insurance, taxes, licenses, supplies, equipment rental, migratory labor, misc.

^c Percentage of average value for 1959-60 through 1963-64 seasons (Index).

Table 7. Picking and hauling costs and indices for Florida grapefruit, 1959-60 through 1979-80 seasons.

| Season | Grapefruit | | | | | | | | | |
|---------|------------|--------------------|--------------------|--------------------|--------------------------------|--------------------|-------------------------------------|--------------------|-------|--------------------|
| | Labor | | | | Fuel, maintenance depreciation | | Administrative & other ^b | | Total | |
| | Pickers | | Other ^a | | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c |
| | Cost | Index ^c | Cost | Index ^c | | | | | | |
| | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent |
| 1959-60 | 13.55 | 92 | 10.42 | 92 | 7.14 | 87 | 4.77 | 96 | 35.88 | 91 |
| 1960-61 | 13.84 | 94 | 11.25 | 99 | 8.13 | 100 | 4.64 | 93 | 37.86 | 96 |
| 1961-62 | 14.31 | 97 | 10.93 | 96 | 7.09 | 87 | 3.83 | 77 | 36.16 | 92 |
| 1962-63 | 15.11 | 102 | 11.66 | 103 | 9.05 | 111 | 5.44 | 109 | 41.26 | 105 |
| 1963-64 | 17.19 | 116 | 12.40 | 109 | 9.43 | 115 | 6.18 | 124 | 45.20 | 115 |
| 1964-65 | 18.78 | 127 | 12.83 | 113 | 8.97 | 110 | 4.16 | 84 | 44.74 | 114 |
| 1965-66 | 21.18 | 143 | 13.51 | 119 | 10.29 | 126 | 4.75 | 96 | 49.73 | 127 |
| 1966-67 | 21.75 | 147 | 13.55 | 120 | 8.86 | 108 | 4.23 | 85 | 48.39 | 123 |
| 1967-68 | 24.21 | 164 | 15.36 | 136 | 10.59 | 130 | 4.61 | 93 | 54.77 | 139 |
| 1968-69 | 25.39 | 172 | 14.60 | 129 | 10.48 | 128 | 4.50 | 91 | 54.97 | 140 |
| 1969-70 | 26.86 | 181 | 16.59 | 146 | 11.68 | 143 | 5.03 | 101 | 60.16 | 153 |
| 1970-71 | 26.73 | 181 | 16.96 | 150 | 12.18 | 149 | 5.78 | 116 | 61.65 | 157 |
| 1971-72 | 28.68 | 194 | 18.40 | 162 | 12.66 | 155 | 6.28 | 126 | 66.02 | 168 |
| 1972-73 | 33.86 | 229 | 20.22 | 178 | 14.28 | 175 | 5.45 | 110 | 73.81 | 188 |
| 1973-74 | 38.75 | 262 | 23.02 | 203 | 15.54 | 190 | 7.72 | 155 | 85.03 | 217 |
| 1974-75 | 38.54 | 260 | 22.52 | 199 | 15.70 | 192 | 6.54 | 132 | 83.30 | 212 |
| 1975-76 | 38.46 | 260 | 22.72 | 201 | 17.52 | 214 | 5.80 | 117 | 84.50 | 215 |
| 1976-77 | 39.64 | 268 | 24.81 | 219 | 18.94 | 232 | 7.42 | 149 | 90.81 | 231 |
| 1977-78 | 41.00 | 277 | 24.62 | 217 | 11.25 | 138 | 5.20 | 105 | 82.07 | 209 |
| 1978-79 | 44.41 | 300 | 28.28 | 250 | 12.74 | 156 | 5.20 | 105 | 90.63 | 231 |
| 1979-80 | 45.16 | 305 | 30.27 | 267 | 11.69 | 143 | 6.05 | 122 | 93.17 | 237 |
| Index | 14.80 | | 11.33 | | 8.17 | | 4.97 | | 39.27 | |

Source: [8, 12]

^aSupervisory, loaders, drivers, other labor, payroll taxes.

^bInsurance, taxes, licenses, supplies, equipment rental, migratory labor, misc.

^cPercentage of average value for 1959-60 through 1963-64 seasons (Index).

Table 8. Picking and hauling costs and indices for Florida tangerines, 1959-60 through 1979-80 seasons.

| Season | Tangerines | | | | | | | | | |
|---------|------------|--------------------|--------------------|--------------------|--------------------------------|--------------------|-------------------------------------|--------------------|---------|--------------------|
| | Labor | | | | Fuel, maintenance depreciation | | Administrative & Other ^b | | Total | |
| | Pickers | | Other ^a | | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c |
| | Cost | Index ^c | Cost | Index ^c | | | | | | |
| | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent | ¢/box | Percent |
| 1959-60 | 58.06 | 93 | 18.03 | 93 | 8.19 | 85 | 9.85 | 104 | 94.13 | 93 |
| 1960-61 | 57.11 | 92 | 18.86 | 97 | 9.73 | 101 | 9.00 | 95 | 94.70 | 94 |
| 1961-62 | 59.79 | 96 | 17.78 | 92 | 7.89 | 82 | 6.61 | 70 | 92.07 | 91 |
| 1962-63 | 66.86 | 107 | 20.33 | 105 | 11.01 | 114 | 10.71 | 113 | 108.91 | 108 |
| 1963-64 | 69.83 | 112 | 21.83 | 113 | 11.41 | 118 | 11.37 | 120 | 1114.44 | 113 |
| 1964-65 | 73.57 | 118 | 21.68 | 112 | 10.59 | 110 | 8.45 | 89 | 114.29 | 113 |
| 1965-66 | 75.03 | 120 | 24.19 | 125 | 11.04 | 114 | 9.17 | 96 | 119.43 | 118 |
| 1966-67 | 79.55 | 128 | 26.18 | 135 | 9.64 | 100 | 8.84 | 93 | 124.21 | 123 |
| 1967-68 | 82.66 | 133 | 27.52 | 142 | 2.03 | 125 | 9.57 | 101 | 131.78 | 131 |
| 1968-69 | 83.73 | 134 | 27.71 | 143 | 12.19 | 126 | 8.90 | 94 | 132.53 | 131 |
| 1969-70 | 91.02 | 146 | 29.33 | 151 | 13.63 | 141 | 9.02 | 95 | 143.00 | 142 |
| 1970-71 | 87.52 | 140 | 33.16 | 171 | 14.85 | 154 | 12.02 | 126 | 147.55 | 146 |
| 1971-72 | 87.99 | 141 | 39.61 | 204 | 15.60 | 162 | 10.87 | 114 | 154.07 | 153 |
| 1972-73 | 96.22 | 154 | 37.49 | 194 | 17.39 | 180 | 10.75 | 113 | 161.85 | 160 |
| 1973-74 | 100.38 | 161 | 42.19 | 218 | 18.85 | 195 | 12.33 | 130 | 173.75 | 172 |
| 1974-75 | 104.19 | 167 | 40.01 | 207 | 18.30 | 190 | 11.09 | 117 | 173.59 | 172 |
| 1975-76 | 102.97 | 165 | 41.41 | 214 | 19.55 | 203 | 9.34 | 98 | 173.27 | 172 |
| 1976-77 | 108.88 | 175 | 46.64 | 241 | 21.43 | 222 | 14.40 | 151 | 191.35 | 190 |
| 1977-78 | 110.06 | 177 | 50.55 | 261 | 13.74 | 142 | 11.30 | 119 | 185.65 | 184 |
| 1978-79 | 110.08 | 177 | 54.12 | 279 | 12.97 | 134 | 11.49 | 121 | 188.66 | 187 |
| 1979-80 | 130.85 | 210 | 54.75 | 283 | 16.93 | 175 | 12.68 | 133 | 215.21 | 213 |
| Index | 62.33 | | 19.37 | | 9.65 | | 9.51 | | 100.85 | |

Source: [8, 12]

^aSupervisory, loaders, drivers, other labor, payroll taxes.

^bInsurance, taxes, licenses, supplies, equipment rental, migratory labor, misc.

^cPercentage of average value for 1959-60 through 1963-64 seasons (Index).

FRESH PACKING AND SELLING COSTS

While over 97 percent of oranges, 66 percent of grapefruit and 33 percent of tangerines are generally used in processed citrus products (Figure 1), the total volume of Florida citrus packed for fresh shipment has increased every season between 1968-69 and 1976-77, a freeze year (Figure 2). Since then, total shipments have not returned to 1975-76 levels. For some growers, the fresh market is their primary market and packing cost is the second key cost element in the marketing channel that affects on-tree grower returns.

Packing Costs

The 4/5 bushel fiberboard carton is the predominant container used. For the 1980-81 season, 71 and 64 percent of commercial orange and tangerine shipments and 89 percent of commercial grapefruit shipments were in the 4/5 corrugated carton. Total packing and selling costs for grapefruit and oranges have risen steadily since 1959-60 (Tables 9, 10). All expense categories have not risen by the same proportions. Direct operating expenses have increased more relative to the base period than any other category.

Labor costs have not increased as much as most other items. This may be attributed in part to increasing mechanization in the handling and packing operations. The shift to pallet box instead of field box receiving and dumping and increased use of mechanical packer aids are two changes that have helped temper the increase in labor costs.

Other factors that influence packing costs include packout percentage (Figure 3) and packinghouse size. Kilmer and Tilley estimate that a 10 percent increase in packout will decrease packing

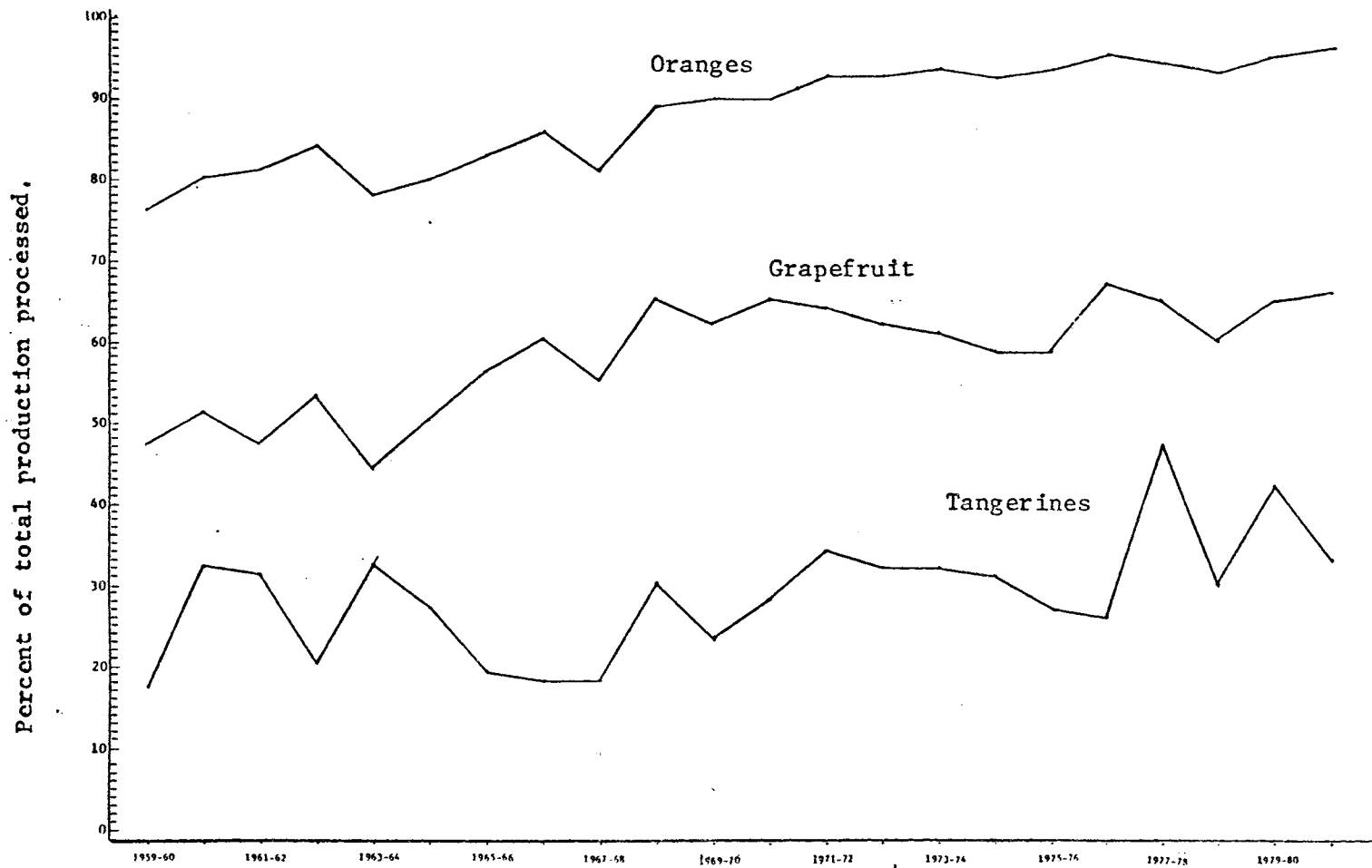


Figure 1. Utilization of Florida citrus from 1959-60 through 1980-81 seasons.

Source: [2]

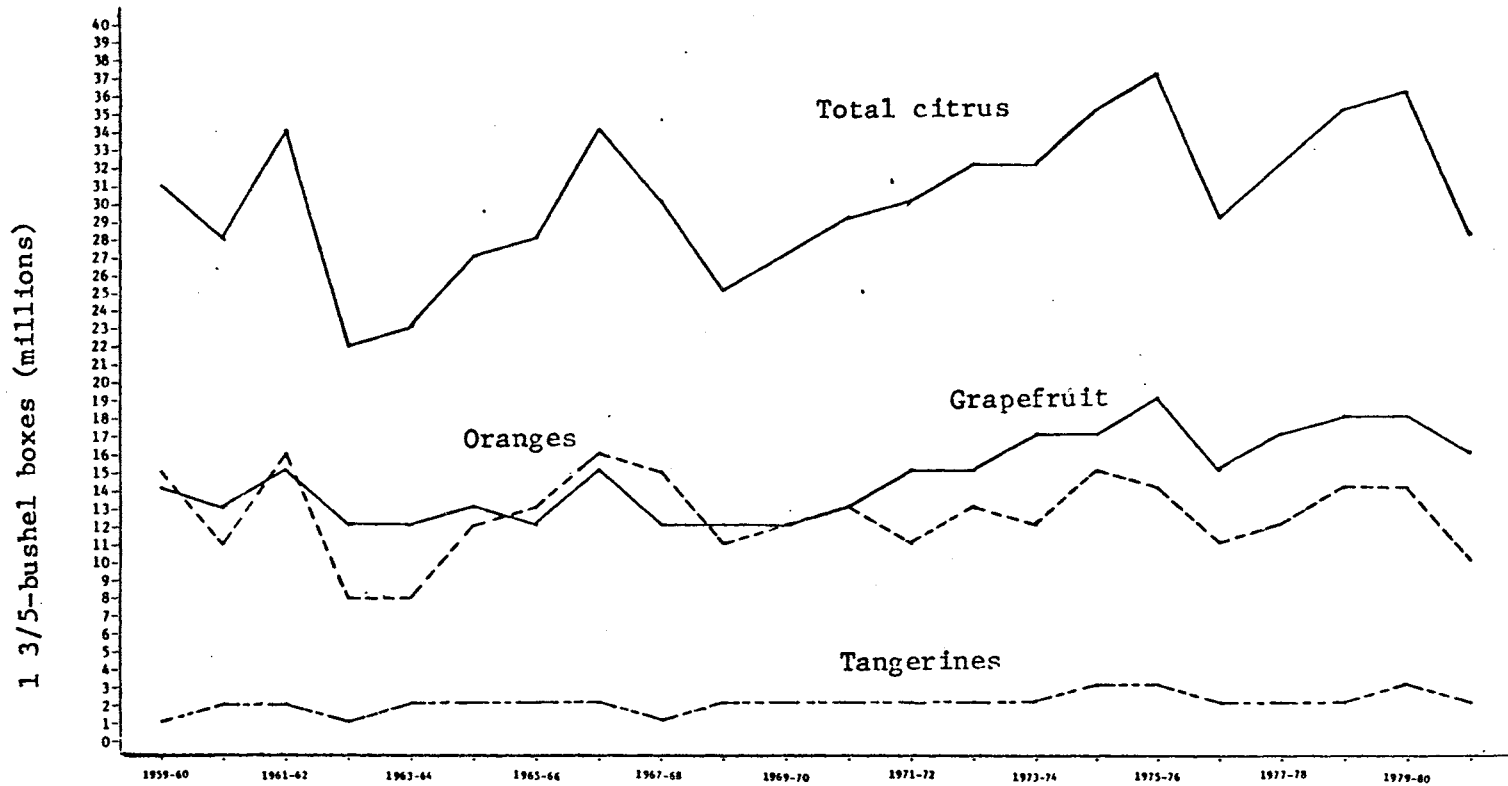


Figure 2. Certified fresh citrus fruit shipments from Florida 1959-60 through 1980-81.

Source: [4]

Table 9. Relative changes in the cost components that make up the total cost of packing 1-3/5 bushels of Florida oranges in 4/5 bushel cartons, 1959-60 through 1979-80 seasons.

| Year | Materials | | Labor | | Direct operating ^a | | Indirect operating ^b | | Selling administrative & other | | Total packing & selling | |
|---------|-----------|--------------------|--------|--------------------|-------------------------------|--------------------|---------------------------------|--------------------|--------------------------------|--------------------|-------------------------|--------------------|
| | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c |
| | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent |
| 1959-60 | .4649 | 99 | .3697 | 90 | .0805 | 89 | .0739 | 92 | .2758 | 86 | 1.2648 | 92 |
| 1960-61 | .4818 | 103 | .3998 | 98 | .0896 | 100 | .0833 | 104 | .2784 | 87 | 1.3329 | 97 |
| 1961-62 | .4857 | 103 | .4012 | 98 | .0850 | 94 | .0693 | 87 | .2776 | 87 | 1.3188 | 96 |
| 1962-63 | .4639 | 99 | .4507 | 110 | .1076 | 120 | .0915 | 114 | .3819 | 119 | 1.4956 | 109 |
| 1963-64 | .4372 | 93 | .4277 | 104 | .0926 | 103 | .0804 | 101 | .3823 | 119 | 1.4202 | 104 |
| 1964-65 | .4433 | 94 | .4531 | 111 | .0906 | 101 | .0776 | 97 | .3749 | 117 | 1.4395 | 105 |
| 1965-66 | .4634 | 99 | .4795 | 117 | .0926 | 103 | .0843 | 105 | .3743 | 117 | 1.4941 | 109 |
| 1966-67 | .4723 | 100 | .4790 | 117 | .0850 | 94 | .0820 | 103 | .3667 | 115 | 1.4850 | 108 |
| 1967-68 | .4645 | 99 | .5182 | 126 | .1059 | 118 | .0877 | 110 | .3950 | 123 | 1.5713 | 115 |
| 1968-69 | .4637 | 99 | .5415 | 132 | .1273 | 141 | .1053 | 132 | .3977 | 124 | 1.6355 | 119 |
| 1969-70 | .4756 | 101 | .4938 | 120 | .1185 | 132 | .1019 | 127 | .4734 | 148 | 1.6632 | 121 |
| 1970-71 | .4699 | 100 | .5187 | 127 | .1275 | 142 | .1361 | 170 | .4756 | 149 | 1.7278 | 126 |
| 1971-72 | .4440 | 94 | .5765 | 141 | .1484 | 165 | .1534 | 192 | .4885 | 153 | 1.8108 | 132 |
| 1972-73 | .4984 | 106 | .6037 | 147 | .1397 | 155 | .1243 | 155 | .4986 | 156 | 1.8647 | 136 |
| 1973-74 | .5751 | 122 | .6601 | 161 | .1700 | 189 | .1616 | 202 | .5247 | 164 | 2.0915 | 153 |
| 1974-75 | .6747 | 144 | .6449 | 157 | .1829 | 203 | .1265 | 158 | .5476 | 171 | 2.1766 | 159 |
| 1975-76 | .7082 | 151 | .6493 | 158 | .1829 | 203 | .1287 | 161 | .5464 | 171 | 2.2155 | 162 |
| 1976-77 | .7144 | 152 | .7768 | 189 | .2565 | 285 | .1941 | 243 | .6614 | 207 | 2.6032 | 190 |
| 1977-78 | .6988 | 149 | .7541 | 184 | .2102 | 234 | .1673 | 209 | .6286 | 196 | 2.4590 | 179 |
| 1978-79 | .7668 | 163 | .8011 | 195 | .2523 | 280 | .1785 | 223 | .6365 | 199 | 2.6352 | 192 |
| 1979-80 | .8871 | 189 | .9151 | 223 | .2969 | 330 | .1872 | 234 | .6380 | 199 | 2.9243 | 213 |
| Index | .47 | | .41 | | .09 | | .08 | | .32 | | 1.37 | |

Source: [5, 12]

^aOther direct operating expenses include power, lights, water, repair, maintenance and other misc. supplies.

^bIndirect operating expenses include insurance, taxes, licenses, depreciation and rent.

^cPercent of average value for 1959-60 through 1963-64 seasons (Index).

Table 10. Cost components that make up the total cost of packing and selling 1-3/5 bushels of grapefruit in 4/5 bushel fiberboard cartons, 1959-60 through 1979-80 seasons.

| Year | Materials | | Labor | | Direct operating ^a | | Indirect operating ^b | | Selling administrative & other | | Total packing & selling | |
|---------|-----------|--------------------|--------|--------------------|-------------------------------|--------------------|---------------------------------|--------------------|--------------------------------|--------------------|-------------------------|--------------------|
| | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c | Cost | Index ^c |
| | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent |
| 1959-60 | .5979 | 115 | .2914 | 86 | .0581 | 97 | .0405 | 81 | .2763 | 92 | 1.2642 | 100 |
| 1960-61 | .5193 | 100 | .3020 | 89 | .0608 | 101 | .0430 | 86 | .2791 | 93 | 1.2042 | 96 |
| 1961-62 | .5242 | 101 | .3492 | 103 | .0594 | 99 | .0545 | 109 | .2946 | 98 | 1.2819 | 102 |
| 1962-63 | .4818 | 93 | .3621 | 107 | .0723 | 121 | .0551 | 110 | .3144 | 105 | 1.2857 | 102 |
| 1963-64 | .4534 | 87 | .3733 | 110 | .0646 | 108 | .0607 | 121 | .3337 | 111 | 1.2857 | 102 |
| 1964-65 | .4721 | 91 | .4038 | 119 | .0772 | 129 | .0663 | 133 | .3519 | 117 | 1.3713 | 109 |
| 1965-66 | .4835 | 93 | .4229 | 124 | .0753 | 126 | .0675 | 135 | .3628 | 121 | 1.4120 | 112 |
| 1966-67 | .4952 | 95 | .4192 | 123 | .0666 | 111 | .0668 | 134 | .3651 | 122 | 1.4129 | 112 |
| 1967-68 | .4918 | 95 | .4862 | 143 | .0919 | 153 | .0850 | 170 | .4009 | 134 | 1.5558 | 123 |
| 1968-69 | .4752 | 91 | .5085 | 150 | .1029 | 172 | .0974 | 195 | .3849 | 128 | 1.5689 | 125 |
| 1969-70 | .4756 | 91 | .4938 | 145 | .1185 | 198 | .1019 | 204 | .4734 | 158 | 1.6632 | 132 |
| 1970-71 | .4864 | 94 | .5055 | 149 | .1196 | 199 | .1083 | 217 | .4914 | 164 | 1.7112 | 136 |
| 1971-72 | .4718 | 91 | .5270 | 155 | .1217 | 203 | .1017 | 203 | .4965 | 166 | 1.7187 | 136 |
| 1972-73 | .5150 | 99 | .5147 | 151 | .1193 | 199 | .1068 | 214 | .5181 | 173 | 1.7739 | 141 |
| 1973-74 | .6017 | 116 | .6210 | 183 | .1430 | 238 | .1484 | 297 | .5471 | 182 | 2.0612 | 164 |
| 1974-75 | .6903 | 133 | .6347 | 187 | .1954 | 326 | .1346 | 269 | .5520 | 184 | 2.2070 | 175 |
| 1975-76 | .7517 | 145 | .6175 | 182 | .1752 | 292 | .1403 | 281 | .5864 | 195 | 2.2711 | 180 |
| 1976-77 | .7592 | 146 | .7286 | 214 | .2232 | 372 | .1613 | 323 | .6814 | 227 | 2.5537 | 203 |
| 1977-78 | .7001 | 135 | .7457 | 219 | .1979 | 330 | .1454 | 291 | .6435 | 215 | 2.4326 | 193 |
| 1978-79 | .7988 | 154 | .7771 | 229 | .2166 | 361 | .1446 | 289 | .6864 | 229 | 2.6235 | 208 |
| 1979-80 | .9175 | 176 | .8375 | 246 | .2500 | 417 | .1477 | 295 | .7388 | 246 | 2.8915 | 229 |
| Index | .52 | | .34 | | .06 | | .05 | | .30 | | 1.26 | |

Source: [5, 12]

^aPower, lights, water, supplies equipment.

^bInsurance, taxes, licenses, depreciation, rent.

^cPercentage of average value for 1959-60 through 1963-64 seasons (Index).

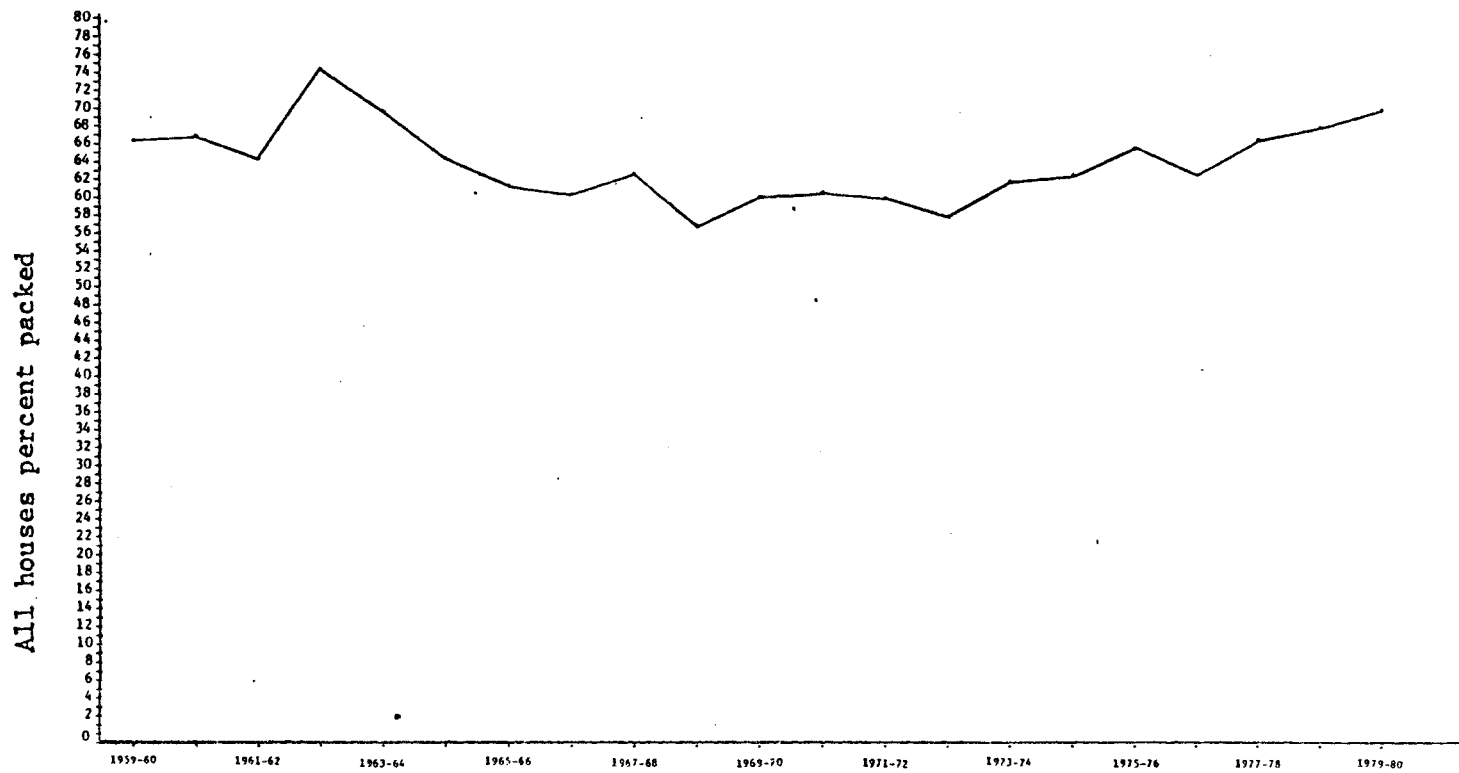


Figure 3. Proportion of Florida Citrus fruit delivered to packinghouses that is actually packed, 1959-60 through 1979-80 seasons,

Source: [5, 12]

costs about 3 cents per box. High (low) packout means that less (more) fruit must be handled in order to pack a given volume.

If low packout adversely affects the volume of fruit a packing-house packs in a given year, low packout may have a secondary impact on costs because of the decrease in volume. While the total volume of fruit handled has been increasing, the number of firms commercially packing fruit has decreased and the average volume per house has generally increased except for freeze years and the year following the freeze year (Figure 4).

PROCESSING, WAREHOUSING AND SELLING

Over 97 percent of oranges and 66 percent of grapefruit enter the processing channel (Figure 1). The processing channel is a multiple product channel in which frozen concentrate, chilled and canned products are produced. For each product there are a different set of factors that may influence costs. In order to simplify presentation, the major product for oranges and grapefruit will be used to illustrate the cost trends.

For oranges, frozen concentrate is the dominant product form (Table 11). For one case of 48 six-ounce cans, warehousing costs have shown the greatest variability and the greatest percentage increase (Table 12) of all processing, warehousing, and selling costs. Carryover has also increased and shown a great deal of variability since the 1959-60 season (Table 13). During the period, average warehousing costs increased from \$0.08 to \$0.23 per case of 48-six ounce cans, and ending inventory of concentrate increased from 9.7 million gallons to 66 million gallons. Both data series have shown great variability.

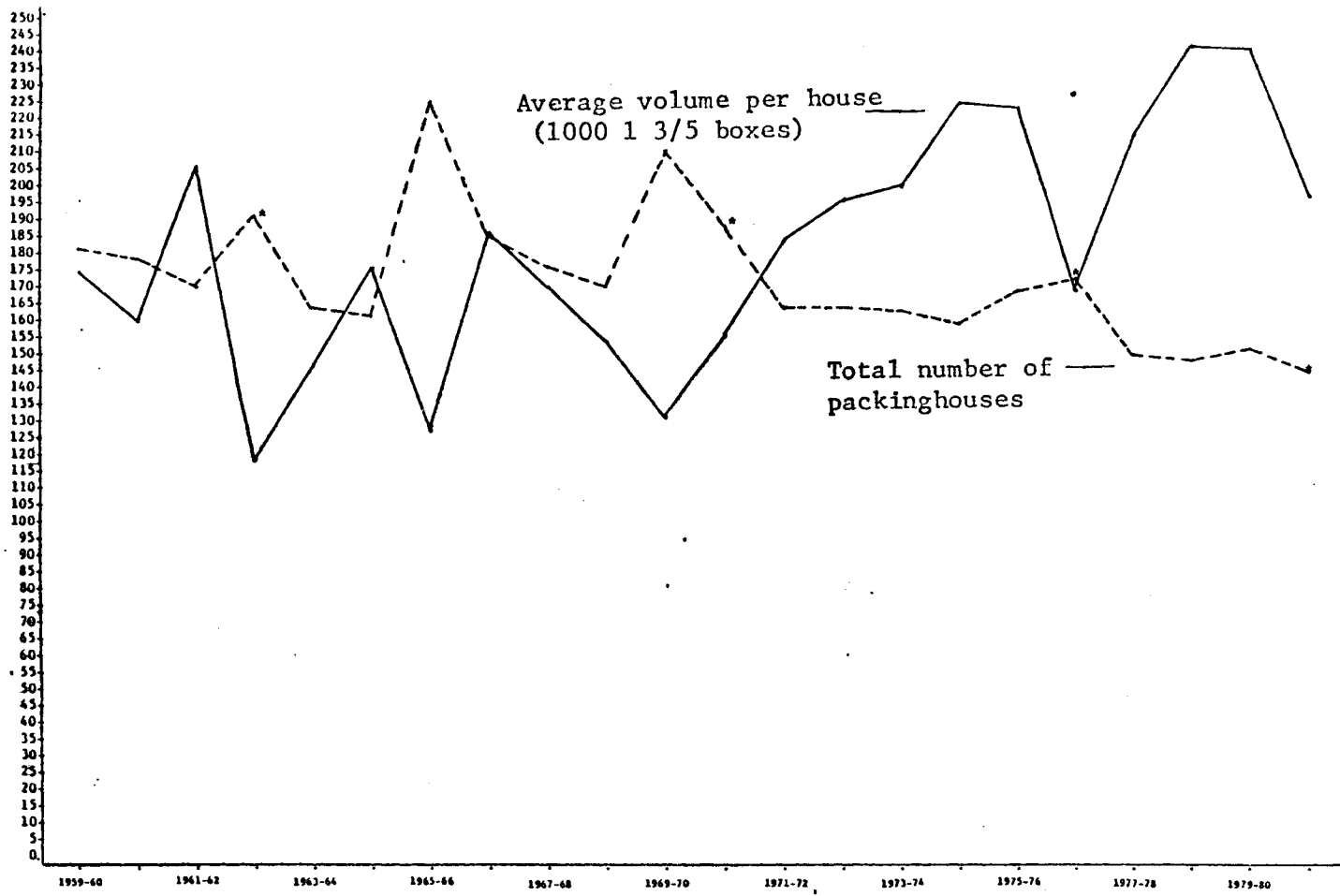


Figure 4. Certified fresh citrus shippers in Florida and average volume per packinghouse 1959-60 through 1980-81 seasons.

Source: [4]

Table 11. Utilization of oranges and Temples by type of processed products, 1959-60 through 1980-81 seasons.

| Season | Canned single-strength juice, sections and salads | | Frozen concentrate ^a | | Chilled juice, sections and salads | | Total Processed | |
|---------|---|------------------|---------------------------------|------------------|------------------------------------|------------------|-----------------|------------------|
| | Boxes used | Percent of total | Boxes used | Percent of total | Boxes used | Percent of total | Boxes used | Percent of total |
| | 1000 boxes | Percent | 1000 boxes | Percent | 1000 boxes | Percent | 1000 boxes | Percent |
| 1959-60 | 10,231 | 14.6 | 51,957 | 74.3 | 7,769 | 11.1 | 69,957 | 100 |
| 1960-61 | 7,309 | 10.5 | 56,039 | 80.5 | 6,297 | 9.0 | 69,645 | 100 |
| 1961-62 | 9,673 | 10.6 | 73,986 | 80.7 | 7,970 | 8.7 | 91,629 | 100 |
| 1962-63 | 9,084 | 14.6 | 47,176 | 75.7 | 6,066 | 9.7 | 62,326 | 100 |
| 1963-64 | 5,467 | 12.1 | 34,206 | 75.6 | 5,548 | 12.3 | 45,227 | 100 |
| 1964-65 | 6,933 | 10.0 | 54,511 | 78.7 | 7,833 | 11.3 | 69,276 | 100 |
| 1965-66 | 7,879 | 9.5 | 61,853 | 74.7 | 13,109 | 15.8 | 82,841 | 100 |
| 1966-67 | 9,960 | 8.0 | 96,857 | 78.1 | 17,289 | 13.9 | 124,106 | 100 |
| 1967-68 | 6,668 | 7.8 | 61,988 | 72.5 | 16,841 | 19.7 | 85,497 | 100 |
| 1968-69 | 9,064 | 7.6 | 92,167 | 76.9 | 18,629 | 15.5 | 119,860 | 100 |
| 1969-70 | 7,952 | 6.2 | 100,776 | 78.6 | 19,482 | 15.2 | 128,209 | 100 |
| 1970-71 | 8,622 | 6.5 | 103,554 | 78.1 | 20,476 | 15.4 | 132,652 | 100 |
| 1971-72 | 7,216 | 5.5 | 104,410 | 79.3 | 20,038 | 15.2 | 131,664 | 100 |
| 1972-73 | 8,766 | 5.4 | 132,211 | 81.6 | 21,135 | 13.0 | 162,112 | 100 |
| 1973-74 | 7,284 | 4.5 | 132,475 | 82.4 | 21,056 | 13.1 | 160,815 | 100 |
| 1974-75 | 7,102 | 4.3 | 135,515 | 81.7 | 23,311 | 14.0 | 165,928 | 100 |
| 1975-76 | 6,890 | 3.9 | 144,527 | 82.1 | 24,628 | 14.0 | 176,043 | 100 |
| 1976-77 | 7,937 | 4.3 | 147,782 | 80.6 | 27,628 | 15.1 | 183,347 | 100 |
| 1977-78 | 7,784 | 4.8 | 130,929 | 79.6 | 25,790 | 15.6 | 164,504 | 100 |
| 1978-79 | 6,546 | 4.1 | 129,124 | 81.3 | 23,108 | 14.6 | 158,777 | 100 |
| 1979-80 | 7,098 | 3.5 | 173,229 | 84.5 | 24,739 | 12.0 | 205,067 | 100 |
| 1980-81 | 6,369 | 3.7 | 144,323 | 84.6 | 19,867 | 11.7 | 170,559 | 100 |

Source: [3]

^aIncludes oranges used in blended concentrates and processed hot pack concentrates orange juice.

Table 12. Costs of processing, warehousing, and selling Florida concentrated orange juice in 48/6-ounce cans in cases, 45° Brix, 1959-60 through 1979-80 seasons.

| Season | Materials | | Processing labor | | Other processing expenses ^a | | Warehousing | | Selling, administrative & other expenses | | Total processing cost | |
|----------------------|-----------|--------------------|------------------|--------------------|--|--------------------|-------------|--------------------|--|--------------------|-----------------------|--------------------|
| | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b |
| | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent |
| 1959-60 ^c | 1.1769 | 108 | .2459 | 102 | .4135 | 94 | .0812 | 74 | .2849 | 59 | 2.2024 | 93 |
| 1960-61 ^c | 1.1368 | 104 | .2422 | 101 | .4245 | 96 | .0838 | 76 | .3000 | 63 | 2.1873 | 93 |
| 1961-62 ^c | 1.0586 | 97 | .1743 | 73 | .3168 | 72 | .1232 | 112 | .3485 | 73 | 2.0214 | 86 |
| 1962-63 ^c | 1.0283 | 94 | .2588 | 108 | .6065 | 138 | .1487 | 135 | .6138 | 128 | 2.6561 | 113 |
| 1963-64 ^c | 1.0300 | 94 | .2892 | 121 | .4430 | 101 | .1209 | 110 | .8403 | 175 | 2.7234 | 115 |
| 1964-65 ^c | .9789 | 90 | .2167 | 90 | .3716 | 84 | .1198 | 109 | .4535 | 94 | 2.1405 | 91 |
| 1965-66 | .9982 | 92 | .2656 | 111 | .3782 | 86 | .1234 | 113 | .6126 | 128 | 2.3780 | 101 |
| 1966-67 | 1.0208 | 94 | .2117 | 88 | .2759 | 63 | .1053 | 96 | .4526 | 94 | 2.0663 | 88 |
| 1967-68 | 1.0128 | 93 | .2729 | 114 | .3705 | 84 | .1395 | 127 | .4593 | 96 | 2.2550 | 96 |
| 1968-69 | 1.0279 | 94 | .2776 | 116 | .3380 | 77 | .1112 | 101 | .4853 | 101 | 2.2408 | 95 |
| 1969-70 | 1.0271 | 94 | .2943 | 123 | .3355 | 76 | .1278 | 116 | .5990 | 125 | 2.3837 | 101 |
| 1970-71 | 1.0627 | 97 | .2881 | 120 | .3769 | 86 | .1354 | 123 | .5641 | 118 | 2.4272 | 103 |
| 1971-72 | 1.0771 | 99 | .2666 | 111 | .3728 | 85 | .1147 | 104 | .5539 | 115 | 2.3851 | 101 |
| 1972-73 | 1.1815 | 108 | .2978 | 124 | .4170 | 95 | .1358 | 123 | .5789 | 121 | 2.6640 | 113 |
| 1973-74 | 1.3285 | 122 | .3865 | 161 | .4864 | 111 | .1930 | 175 | .6283 | 131 | 3.0227 | 128 |
| 1974-75 | 1.6534 | 152 | .3654 | 152 | .5130 | 117 | .2240 | 204 | .6637 | 138 | 3.4195 | 145 |
| 1975-76 | 1.5213 | 140 | .3394 | 141 | .5468 | 124 | .2005 | 182 | .6359 | 132 | 3.2439 | 137 |
| 1976-77 | 1.4557 | 134 | .4463 | 186 | .6302 | 143 | .2196 | 200 | .7366 | 153 | 3.4884 | 148 |
| 1977-78 | 1.5049 | 138 | .4517 | 188 | .6854 | 156 | .2204 | 200 | .7661 | 160 | 3.6285 | 154 |
| 1978-79 | 1.6011 | 147 | .4515 | 188 | .6615 | 150 | .2268 | 206 | .8188 | 171 | 3.7597 | 159 |
| 1979-80 | 1.7419 | 160 | .4779 | 199 | .6954 | 158 | .2310 | 210 | .7604 | 158 | 3.9066 | 166 |
| Index | 1.09 | | .24 | | .44 | | .11 | | .48 | | 2.36 | |

Source: [7, 12]

^aIncludes utilities, maintenance and repairs, depreciation, rent, taxes, insurance and misc. other expenses.

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

^c42° Brix

Table 13. Warehousing cost, carryover ending stocks and indices for Florida FCOJ, 1959-60 through 1980-81 seasons.

| Season | Total December 1 carryover ^a | Index ^b | Warehousing ^c | Index ^b |
|----------------------|---|--------------------|--------------------------|--------------------|
| | mil. gal. 45° Brix | Percent | \$/case 48 6-oz. cans | Percent |
| 1959-60 ^d | 9.663 | 61 | .0812 | 73 |
| 1960-61 ^d | 13.631 | 87 | .0838 | 75 |
| 1961-62 ^d | 33.750 | 215 | .1232 | 110 |
| 1962-63 ^d | 11.399 | 73 | .1487 | 133 |
| 1963-64 ^d | 10.136 | 64 | .1209 | 108 |
| 1964-65 ^d | 21.814 | 139 | .1198 | 107 |
| 1965-66 | 12.828 | 82 | .1234 | 111 |
| 1966-67 | 27.225 | 173 | .1053 | 94 |
| 1967-68 | 12.885 | 82 | .1395 | 125 |
| 1968-69 | 17.400 | 111 | .1112 | 100 |
| 1969-70 | 26.566 | 169 | .1278 | 115 |
| 1970-71 | 22.568 | 144 | .1354 | 121 |
| 1971-72 | 28.000 | 178 | .1147 | 103 |
| 1972-73 | 48.431 | 308 | .1358 | 122 |
| 1973-74 | 48.861 | 311 | .1930 | 173 |
| 1974-75 | 50.759 | 323 | .2240 | 201 |
| 1975-76 | 53.709 | 342 | .2005 | 180 |
| 1976-77 | 25,526 | 162 | .2196 | 197 |
| 1977-78 | 30.909 | 197 | .2204 | 197 |
| 1978-79 | 37.386 | 238 | .2268 | 203 |
| 1979-80 ^e | 54.856 | 349 | .2310 | 207 |
| 1980-81 | 66.353 | 422 | - | - |
| Index | 15.716 | | .1116 | |

^aSource: [2]

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

^cSource: [7, 12]

^d42° Brix.

^e43.4° Brix.

Other items were quite stable until the last six seasons. Material costs were just below base period levels during the 1971-72 season but increased to 152 percent of the base period level in the 1974-75 season and then decreased, only to increase five years later to 160 percent. Labor expenses have almost doubled since the 1971-72 season. Both processing and administrative expenses have increased to 158 percent and total processing costs have trended upward since the 1964-65 season.

For grapefruit, the dominant product form is frozen concentrated grapefruit juice Table. It replaced canned single strength juice as the dominant product form during the 1978-79 season. A cost series of sufficient length does not exist for frozen concentrated grapefruit juice; therefore, canned single strength juice will be used to illustrate cost trends. For one case of 12 46-ounce cans, many of the items have followed trends similar to those for frozen concentrated orange juice. Other processing expenses have shown the greatest increase relative to the base period (202 in 1979-80). Total processing costs have increased significantly since the 1977-78 seasons (Table 15).

WHOLESALE AND RETAILING COSTS

In order to complete the marketing channel, transportation, wholesaling and retailing costs in addition to F.O.B. shipping point and retail prices would have to be available. Unfortunately, few of the data needed to examine the components of the F.O.B.-retail margin are available for specific products. However, the F.O.B.-retail price differential can be examined to determine the nature of

Table 14. Utilization of grapefruit by type of processed products, 1959-60 through 1980-81 seasons.

| Season | Canned single-strength juice, sections and salads | | Frozen concentrate ^a | | Chilled juice, sections and salads | | Total Processed | |
|---------|---|------------------|---------------------------------|------------------|------------------------------------|------------------|-----------------|------------------|
| | Boxes used | Percent of total | Boxes used | Percent of total | Boxes used | Percent of total | Boxes used | Percent of total |
| | 1000 boxes | Percent | 1000 boxes | Percent | 1000 boxes | Percent | 1000 boxes | Percent |
| 1959-60 | 11,494 | 80.8 | 1,613 | 11.3 | 1,119 | 7.9 | 14,226 | 100 |
| 1960-61 | 11,046 | 69.8 | 3,603 | 22.7 | 1,195 | 7.5 | 15,844 | 100 |
| 1961-62 | 12,385 | 74.8 | 2,773 | 16.7 | 1,402 | 8.5 | 16,506 | 100 |
| 1962-63 | 11,439 | 71.7 | 3,260 | 20.4 | 1,258 | 7.9 | 15,957 | 100 |
| 1963-64 | 7,387 | 63.8 | 2,407 | 20.8 | 1,784 | 15.4 | 11,578 | 100 |
| 1964-65 | 10,937 | 68.7 | 3,551 | 22.3 | 1,441 | 9.0 | 15,929 | 100 |
| 1965-66 | 13,242 | 67.6 | 4,010 | 20.4 | 2,363 | 12.0 | 19,615 | 100 |
| 1966-67 | 18,105 | 69.0 | 5,405 | 20.6 | 2,736 | 10.4 | 26,241 | 100 |
| 1967-68 | 13,411 | 74.1 | 1,793 | 9.9 | 2,904 | 16.0 | 18,108 | 100 |
| 1968-69 | 15,940 | 61.8 | 6,550 | 25.4 | 3,307 | 12.8 | 25,797 | 100 |
| 1969-70 | 15,604 | 67.4 | 4,579 | 19.7 | 2,983 | 12.9 | 23,166 | 100 |
| 1970-71 | 17,679 | 63.3 | 6,819 | 24.4 | 3,439 | 12.3 | 27,937 | 100 |
| 1971-72 | 17,121 | 57.0 | 8,725 | 29.0 | 4,201 | 14.0 | 30,047 | 100 |
| 1972-73 | 16,034 | 56.5 | 8,212 | 29.0 | 4,119 | 14.5 | 28,365 | 100 |
| 1973-74 | 16,794 | 57.2 | 8,732 | 29.7 | 3,843 | 13.1 | 39,369 | 100 |
| 1974-75 | 13,664 | 53.1 | 7,779 | 30.2 | 4,305 | 16.7 | 25,748 | 100 |
| 1975-76 | 14,410 | 50.8 | 8,987 | 31.7 | 4,974 | 17.5 | 28,371 | 100 |
| 1976-77 | 16,217 | 47.0 | 13,020 | 37.7 | 5,265 | 15.3 | 34,503 | 100 |
| 1977-78 | 14,173 | 42.0 | 13,999 | 42.0 | 5,293 | 16.0 | 33,465 | 100 |
| 1978-79 | 13,037 | 43.1 | 13,276 | 43.9 | 3,933 | 13.0 | 30,246 | 100 |
| 1979-80 | 12,461 | 35.3 | 18,506 | 52.3 | 4,393 | 12.4 | 35,360 | 100 |
| 1980-81 | 10,140 | 30.6 | 19,490 | 58.9 | 3,489 | 10.5 | 33,118 | 100 |

Source: [3]

^aIncludes grapefruit used in blended concentrates and processed hot pack concentrated grapefruit juice.

Table 15. Cost of processing, warehousing, and selling Florida unsweetened grapefruit juice in 12 46-ounce cans of juice in cases, 1959-60 through 1979-80 seasons.

| Season | Materials | | Processing labor | | Other processing expenses ^a | | Warehousing | | Selling, administrative & other expenses | | Total processing cost | |
|---------|-----------|--------------------|------------------|--------------------|--|--------------------|-------------|--------------------|--|--------------------|-----------------------|--------------------|
| | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b | Cost | Index ^b |
| | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent | \$/case | Percent |
| 1995-60 | 1.0348 | 98 | .1449 | 111 | .1355 | 97 | .0283 | 40 | .1596 | 76 | 1.5031 | 93 |
| 1960-61 | 1.0616 | 100 | .1447 | 111 | .1378 | 98 | .0375 | 54 | .1854 | 88 | 1.5670 | 97 |
| 1961-62 | 1.0623 | 100 | .0895 | 69 | .1167 | 83 | .0837 | 120 | .1917 | 91 | 1.5439 | 96 |
| 1962-63 | 1.0726 | 101 | .1174 | 90 | .1505 | 108 | .1054 | 151 | .2752 | 131 | 1.7211 | 107 |
| 1963-64 | 1.0678 | 101 | .1298 | 100 | .1676 | 120 | .0942 | 135 | .2621 | 125 | 1.7215 | 107 |
| 1964-65 | 1.0849 | 102 | .1120 | 86 | .1218 | 87 | .0809 | 116 | .2220 | 106 | 1.6216 | 101 |
| 1965-66 | 1.1175 | 105 | .1210 | 93 | .1312 | 94 | .0947 | 135 | .2385 | 114 | 1.7029 | 106 |
| 1966-67 | 1.1241 | 106 | .1304 | 100 | .1164 | 83 | .0929 | 133 | .2133 | 102 | 1.6771 | 104 |
| 1967-68 | 1.1537 | 109 | .1688 | 130 | .1588 | 113 | .1245 | 178 | .2729 | 130 | 1.8787 | 117 |
| 1968-69 | 1.1971 | 113 | .1745 | 134 | .1497 | 107 | .1109 | 158 | .2320 | 110 | 1.8642 | 116 |
| 1969-70 | 1.1882 | 112 | .2101 | 162 | .1752 | 125 | .1133 | 162 | .2977 | 142 | 1.9845 | 123 |
| 1970-71 | 1.1780 | 111 | .2081 | 160 | .1983 | 142 | .1337 | 191 | .3412 | 162 | 2.0593 | 128 |
| 1971-72 | 1.2005 | 113 | .2004 | 154 | .2007 | 143 | .1352 | 193 | .3217 | 153 | 2.0585 | 128 |
| 1972-73 | 1.2583 | 119 | .2104 | 162 | .2157 | 154 | .1756 | 251 | .2956 | 141 | 2.1556 | 134 |
| 1973-74 | 1.3664 | 129 | .1856 | 143 | .2273 | 162 | .2321 | 332 | .3813 | 182 | 2.3927 | 149 |
| 1974-75 | 1.8672 | 176 | .1920 | 148 | .2336 | 167 | .2293 | 328 | .3470 | 165 | 2.8691 | 178 |
| 1975-76 | 1.7765 | 168 | .1985 | 153 | .3062 | 219 | .1797 | 257 | .3639 | 173 | 2.8248 | 175 |
| 1976-77 | 1.7825 | 168 | .2501 | 192 | .3143 | 225 | .2007 | 287 | .3715 | 177 | 2.9191 | 181 |
| 1977-78 | 1.9602 | 185 | .2721 | 209 | .3186 | 228 | .2011 | 287 | .3978 | 189 | 3.1498 | 196 |
| 1978-79 | 2.2258 | 210 | .2805 | 216 | .3699 | 264 | .2014 | 288 | .4115 | 196 | 3.4891 | 217 |
| 1979-80 | 2.5544 | 241 | .3146 | 242 | .4229 | 302 | .2109 | 301 | .4891 | 233 | 3.9919 | 248 |
| Index | 1.06 | | .13 | | .14 | | .07 | | .21 | | 1.61 | |

Source: [7, 12]

^aIncludes utilities, maintenance and repairs, depreciation, rent, taxes, insurance and misc. other expenses.

^bPercentage of average value for 1959-60 through 1963-64 seasons (Index).

changes in the relationship for several seasons for fresh grapefruit, frozen concentrated orange juice, and canned single-strength grapefruit juice. Even then, data on F.O.B. prices are not perfect because sales at prices that deviate from "card" or "posted" prices are generally not publicized nor reported. In addition, F.O.B. prices for advertised branded products were not available. At the retail level, prices reported for frozen products by the Market Research Corporation of America and NPD Research Inc., and USDA prices for fresh fruit were used.

It must be emphasized that only relative changes in the marketing margin can be measured and that little can be said about wholesale or retail profit levels. In addition, because of the nature of a retail outlet, it is possible that a retailer may have very low or negative margins on certain products in order to generate traffic through his store and sell products with higher unit profits. The extent to which citrus and citrus products are used as "loss leaders" is not known.

The F.O.B.-retail margin accounts for over 60 percent of the retail value of fresh fruit (Table 16). Less than 40 percent of the retail price paid for fresh Florida grapefruit is paid for growing, picking and hauling, and packing and selling fresh grapefruit. On the other hand, the F.O.B.-retail margins for frozen concentrated orange juice and canned single-strength grapefruit juice average 27 and 26 percent of retail value (Tables 17 and 18). No trend in the F.O.B.-retail margin is indicated.

It is difficult to explain why the F.O.B.-retail margin for processed products is a smaller percentage of the retail price than

Table 16. Proportion of the consumer's retail food dollar spent on fresh grapefruit that is returned to various marketing channel participants, 1964-65 through 1979-80 seasons.

| Season | Retail Value ^a | | F.O.B.-retail margin | | Packing cost ^c | | Picking & hauling costs ^c | | On-tree value plus marketing firm profits ^d | |
|--------------------------|---------------------------|---------|----------------------|---------------------|---------------------------|---------------------|--------------------------------------|---------------------|--|---------------------|
| | Cost | Share | Cost | Share | Cost | Share | Cost | Share | Cost | Share |
| | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent | \$/box | Percent |
| 1964-65 | 10.57 | 100 | 6.45 | 61 | 1.37 | 13 | .45 | 4 | 2.30 | 22 |
| 1965-66 | 10.00 | 100 | 5.69 | 57 | 1.41 | 14 | .50 | 5 | 2.40 | 24 |
| 1966-67 | 9.33 | 100 | 5.94 | 64 | 1.41 | 15 | .48 | 5 | 1.50 | 16 |
| 1967-68 | 10.85 | 100 | 5.82 | 54 | 1.56 | 14 | .55 | 5 | 2.92 | 27 |
| 1968-69 | 11.02 | 100 | 7.21 | 65 | 1.57 | 14 | .55 | 5 | 1.70 | 15 |
| 1969-70 | 11.48 | 100 | 6.82 | 60 | 1.66 | 14 | .60 | 5 | 2.40 | 21 |
| 1970-71 | 11.22 | 100 | 6.68 | 60 | 1.71 | 15 | .62 | 5 | 2.21 | 20 |
| 1971-72 | 12.54 | 100 | 7.27 | 58 | 1.72 | 14 | .66 | 5 | 2.89 | 23 |
| 1972-73 | 13.47 | 100 | 7.98 | 59 | 1.77 | 13 | .74 | 6 | 2.98 | 22 |
| 1973-74 | 13.97 | 100 | 8.81 | 63 | 2.06 | 15 | .85 | 6 | 2.25 | 16 |
| 1974-75 | 15.02 | 100 | 9.40 | 63 | 2.21 | 15 | .83 | 5 | 2.58 | 17 |
| 1975-76 | 14.48 | 100 | 9.22 | 63 | 2.27 | 16 | .85 | 6 | 2.14 | 15 |
| | (16.32) ^b | (100) | (11.06) | (68) | (2.27) | (14) | (.85) | (5) | (2.14) | (13) |
| 1976-77 | 15.76 | 100 | 10.08 | 64 | 2.55 | 16 | .91 | 6 | 2.22 | 14 |
| | (18.79) ^b | (100) | (13.11) | (70) | (2.55) | (13) | (.91) | (5) | (2.22) | (12) |
| 1977-78 | 18.11 | 100 | 12.62 | 70 | 2.43 | 13 | .82 | 5 | 2.24 | 12 |
| 1978-79 | 28.22 | 100 | 21.22 | 75 | 2.62 | 9 | .90 | 3 | 3.48 | 13 |
| 1979-80 | 36.04 ^b | 100 | 27.86 | 77 | 2.89 | 8 | .93 | 3 | 4.36 | 12 |
| Standard Deviation | | | 3.24 | (3.81) ^b | .967 | (2.70) ^b | .599 | (1.10) ^b | 4.13 | (.548) ^b |
| Mean | | | 60.8 | (72) ^b | 14.5 | (11.4) ^b | 5.2 | (4.2) ^b | 19.4 | (12.4) ^b |
| Coefficient of Variation | | | .053 | (.053) ^b | .067 | (.237) ^b | .115 | (.262) ^b | .213 | (.054) ^b |

Source:

^aSix-month weighted average (Nov.-April), white seedless, size 40 packed in two 4/5-bushel cartons, average for Atlanta, Boston, Chicago, and Pittsburgh. Returns to retailer for saleable fruit (3 percent allowance for loss incurred during marketing process).

^bSix-month weighted average (Nov.-April), grapefruit, reported as cents per pound in New York City.

^cCosts do not include profits.

^dThis value includes pick and haul and packinghouse firm profits.

Table 17. Proportion of the consumer's food dollar spent on six-ounce cans of frozen concentrated orange juice that is returned to various marketing channel participants, 1964-65 through 1979-80 seasons.

| Season | Retail value | | F.O.B.-retail margin | | Processing costs ^a | | Picking & hauling costs ^a | | On-tree value plus marketing firm profits ^b | |
|--------------------------|----------------|----------------|----------------------|----------------|-------------------------------|----------------|--------------------------------------|----------------|--|----------------|
| | Cost | Share | Cost | Share | Cost | Share | Cost | Share | Returns | Share |
| | <u>\$/doz.</u> | <u>Percent</u> | <u>\$/doz.</u> | <u>Percent</u> | <u>\$/doz.</u> | <u>Percent</u> | <u>\$/doz.</u> | <u>Percent</u> | <u>\$/doz.</u> | <u>Percent</u> |
| 1964-65 | 2.32 | 100 | .70 | 30 | .54 | 23 | .19 | 8 | .89 | 39 |
| 1965-66 | 2.20 | 100 | .58 | 26 | .59 | 27 | .26 | 12 | .77 | 35 |
| 1966-67 | 1.75 | 100 | .56 | 32 | .52 | 30 | .24 | 14 | .43 | 24 |
| 1967-68 | 2.15 | 100 | .53 | 25 | .56 | 26 | .28 | 13 | .78 | 36 |
| 1968-69 | 2.44 | 100 | .66 | 27 | .56 | 23 | .35 | 14 | .87 | 36 |
| 1969-70 | 2.17 | 100 | .71 | 33 | .60 | 28 | .34 | 16 | .52 | 24 |
| 1970-71 | 2.22 | 100 | .62 | 28 | .61 | 28 | .36 | 16 | .63 | 28 |
| 1971-72 | 2.46 | 100 | .58 | 24 | .60 | 24 | .37 | 15 | .91 | 37 |
| 1972-73 | 2.39 | 100 | .65 | 27 | .67 | 28 | .41 | 17 | .66 | 28 |
| 1973-74 | 2.44 | 100 | .64 | 26 | .76 | 31 | .46 | 19 | .58 | 24 |
| 1974-75 | 2.60 | 100 | .57 | 22 | .60 | 23 | .43 | 17 | 1.00 | 38 |
| 1975-76 | 2.67 | 100 | .67 | 25 | .81 | 30 | .44 | 17 | .75 | 28 |
| 1976-77 | 3.20 | 100 | .75 | 24 | .87 | 27 | .58 | 18 | 1.00 | 31 |
| 1977-78 | 4.33 | 100 | 1.03 | 24 | .91 | 21 | .56 | 13 | 1.83 | 42 |
| 1978-79 | 4.61 | 100 | 1.11 | 24 | .94 | 20 | .59 | 13 | 1.97 | 43 |
| 1979-80 | 4.51 | 100 | 1.47 | 33 | .73 | 16 | .61 | 13 | 1.70 | 38 |
| Standard Deviation | | | | 3.44 | | 4.13 | | 2.75 | | 6.46 |
| Mean | | | | 26.9 | | 25.3 | | 14.7 | | 33.2 |
| Coefficient of Variation | | | | .128 | | .163 | | .187 | | .195 |

^aCosts do not include profits.

^bThis value includes pick and haul and processing firm profits.

Table 18. Proportion of the consumer's food dollar spent on 12 46-ounce cans of single strength grapefruit juices that is returned to various marketing channel participants, 1964-65 through 1979-80 seasons.

| Season | Retail value | | F.O.B.--retail margin | | Processing costs ^a | | Picking & hauling costs ^a | | On-tree value plus marketing firm profits ^b | |
|--------------------------|----------------|----------------|-----------------------|----------------|-------------------------------|----------------|--------------------------------------|----------------|--|----------------|
| | Cost | Share | Cost | Share | Cost | Share | Cost | Share | Cost | Share |
| | <u>\$/case</u> | <u>Percent</u> | <u>\$/case</u> | <u>Percent</u> | <u>\$/case</u> | <u>Percent</u> | <u>\$/case</u> | <u>Percent</u> | <u>\$/case</u> | <u>Percent</u> |
| 1964-65 | 4.43 | 100 | 1.27 | 29 | 1.62 | 37 | .42 | 9 | 1.12 | 25 |
| 1965-66 | 4.67 | 100 | 1.38 | 30 | 1.70 | 36 | .49 | 10 | 1.10 | 24 |
| 1966-67 | 4.03 | 100 | 1.34 | 33 | 1.68 | 42 | .46 | 11 | .55 | 14 |
| 1967-68 | 4.71 | 100 | 1.20 | 26 | 1.88 | 40 | .53 | 11 | 1.10 | 23 |
| 1968-69 | 4.50 | 100 | 1.43 | 32 | 1.86 | 41 | .55 | 12 | .66 | 15 |
| 1969-70 | 5.42 | 100 | 1.36 | 25 | 1.98 | 37 | .58 | 11 | 1.50 | 28 |
| 1970-71 | 5.74 | 100 | 1.34 | 23 | 2.06 | 36 | .59 | 10 | 1.75 | 31 |
| 1971-72 | 5.81 | 100 | 1.33 | 23 | 2.06 | 36 | .60 | 10 | 1.82 | 31 |
| 1972-73 | 5.60 | 100 | 1.48 | 26 | 2.16 | 39 | .68 | 12 | 1.28 | 23 |
| 1973-74 | 5.59 | 100 | 1.40 | 25 | 2.52 | 45 | .78 | 14 | .89 | 16 |
| 1974-75 | 5.91 | 100 | 1.57 | 27 | 2.87 | 49 | .78 | 13 | .69 | 11 |
| 1975-76 | 5.90 | 100 | 1.51 | 26 | 2.82 | 48 | .78 | 13 | .79 | 13 |
| 1976-77 | 6.52 | 100 | 1.51 | 23 | 2.92 | 45 | .96 | 15 | 1.13 | 17 |
| 1977-78 | 6.78 | 100 | 1.73 | 26 | 3.15 | 46 | .80 | 12 | 1.10 | 16 |
| 1978-79 | 7.62 | 100 | 1.58 | 21 | 3.49 | 46 | .84 | 11 | 1.71 | 22 |
| 1979-80 | 9.44 | 100 | 2.34 | 25 | 3.99 | 42 | .85 | 9 | 2.26 | 24 |
| Standard Deviation | | | | 3.32 | | 4.50 | | 1.71 | | 6.28 |
| Mean | | | | 26.3 | | 41.6 | | 11.4 | | 21.1 |
| Coefficient of Variation | | | | .126 | | .108 | | .150 | | .298 |

Source:

^aCosts do not include profits.

^bThis value includes pick and haul and processing firm profits.

the margin for fresh fruit because of the absence of accurate wholesaling and retailing cost data. Factors that would have to be considered include comparative sales revenues per unit of floor space, added packaging that may be added to fresh fruit and the weight of fresh fruit relative to its value. Perishability may also be an important factor although fresh citrus wholesale and retail spoilage have been estimated at very low levels [15].

COSTS OF MARKETING CHANNEL FUNCTIONS

While previous sections have been concerned with individual stages in the marketing channel, the purpose of this section is to look simultaneously at the total marketing channel and determine how much of the consumer's dollar spent on citrus and citrus products is returned to various marketing channel participants. Three products, orange concentrate, canned single-strength grapefruit juice and fresh grapefruit are examined.

The amount and percentage of the retail dollar that is returned at various levels in the marketing channel was calculated for frozen concentrated orange juice (Table 17). On-tree returns have shown the greatest variability and are followed closely by picking and hauling costs (Table 17). F.O.B.-retail margins have shown the least amount of variation.

For the 16 years shown, on-tree returns are 33 percent of the average retail price paid for orange concentrate in 6-ounce cans. The F.O.B.-retail and processing costs have averaged 27 and 25 percent. Picking and hauling costs have been the element accounting for the lowest percentage of the retail dollar.

For canned grapefruit juice the relative proportion of the retail dollar to processing costs is much higher than for concentrate (42 compared to 25) (Table 17 and 18). Picking and hauling costs represent a lower percentage of the retail dollar (11 percent) while grower returns are 21 percent and show the most variation (.298). The F.O.B.-retail margin is approximately 26 percent of the retail dollar and shows slightly more variation than processing costs.

The most striking contrast between relative margins for marketing channel participants is the extremely high F.O.B.-retail margin in fresh grapefruit accounting for 61 (72) percent of the retail food dollar for the past 13 (5) seasons (Table 16). For every dollar a consumer has spent on fresh grapefruit the past 13 seasons, 61 (72) cents pays for services after it leaves Florida packinghouses. Growers receive 19 (12) cents and picking, hauling, packing and selling expenses account for another 20 (16) cents. On-tree returns (packing, picking and hauling costs) display the greatest variability.

SUMMARY

Total citrus acreage has stabilized after decreasing since 1970-71. Orange, grapefruit, and specialty fruit acreage represents 75, 17 and 8 percent of total acreage. Nominal on-tree value of citrus more than doubled since 1975-76. Growers have generally received a lower percentage of the consumer's dollar spent on fresh fruit than on processed products even though returns for fresh fruit have generally been higher than returns from processed products. Costs of picking, hauling, packing, and processing citrus products have increased.

Comparison of the coefficients of variation reveals that, in general, on-tree returns and pick and haul costs are more variable than any of the components of the citrus marketing bill, except for fresh grapefruit during the last five seasons (Tables 16, 17, 18). During the last five seasons, packing cost and pick and haul costs have been more variable.

Finally, total citrus packed has not returned to 1975-76 levels. The 4/5 fiberboard carton continues to be the predominate container for packing citrus. Since 1972-73, the packout percentage has trended upward.

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