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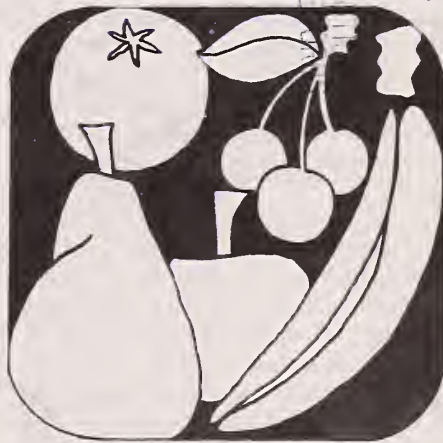
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FRUIT Situation

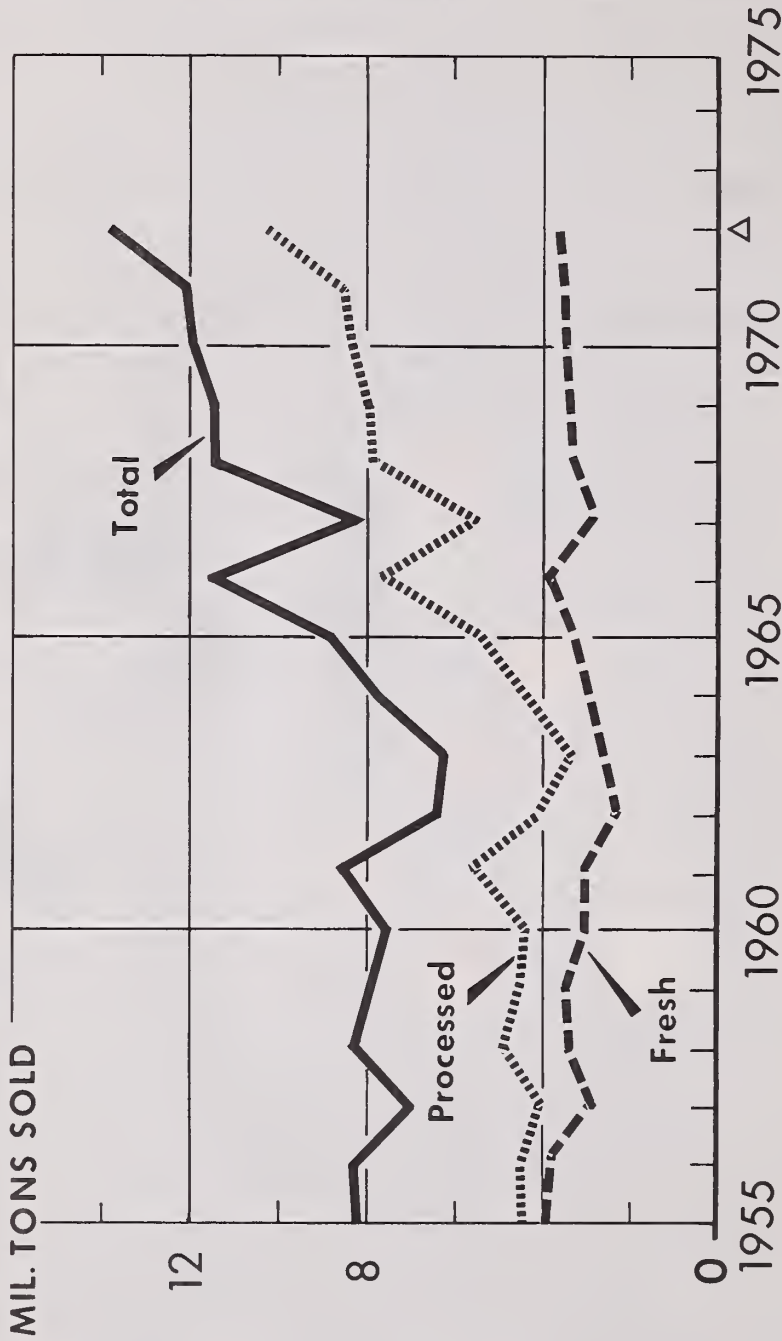
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THE FRUIT SITUATION

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Approved by
The Outlook and Situation Board
and Summary Released
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SUMMARY

A citrus crop nearly as large as last season's record breaker is predicted for the 1973/74 season and non-citrus fruit production is forecast well above last year's limited output. Nevertheless, producer prices have been relatively high in recent months, reflecting low levels of processed non-citrus stocks and strong domestic and foreign demand. October's index of prices received by farmers for fruit was 8 percent above a year ago. Average prices are likely to remain above year-earlier levels at least until midwinter.

October 1 citrus fruit prospects are for a crop (excluding California's Valencia oranges, lemons, and "other" grapefruit) approximately 2 percent below last season.

Florida's round *orange crop* is forecast at 160 million boxes, 6 percent below the record 1972/73 output, but still 17 percent above 2 years ago. California's Navel output is expected to be 7 percent more than a year earlier, but Arizona's orange crop is indicated down one-tenth. Texas production, in continuation of an upward trend, is estimated at 8 million boxes compared with 7.4 million a year ago.

The U.S. *grapefruit crop* (excluding California's late areas) is estimated at 66.1 million boxes, up 5 percent from the preceding season. A record crop of 48 million boxes is expected in Florida, 6 percent above a year ago.

Specialty citrus crops — Temples and tangelos are expected to exceed last season's output, but production of tangerines is estimated moderately smaller. Fewer Arizona lemons are also anticipated.

Opening f.o.b. prices for both Florida oranges and grapefruit were moderately to substantially higher than a year ago on a light, early-season volume. However, with an expected record carryover of frozen concentrated orange juice plus a slightly smaller crop of early, midseason, and Navel varieties, market prospects for oranges through this winter point to prices near year-earlier levels. Even with a larger crop, grapefruit prices may remain close to 1972/73 levels if processor demand for new crop fruit is stimulated by an expected smaller carryover of some items and if fresh grapefruit exports keep increasing.

Output of canned and frozen citrus products in 1973/74 is likely to fall short of last season's record.

However, supplies will be ample since packers' stocks of most processed items are heavy. Demand for frozen concentrated and chilled orange juice has been very strong and further increases in consumption of these products are likely in 1973/74. As a result, prices may be higher this season.

Production of *non-citrus fruit* during 1973 is estimated 23 percent larger than last season, but 2 percent less than 1971. This increase may be somewhat misleading as it mainly reflects the substantially larger grape crop, nearly 50 percent above the 1972 season. The 1973 non-citrus output, excluding grapes, is only 12 percent above last season's abbreviated crop.

Despite the return to a more typical crop situation in 1973 (with the exception of tart cherries) and generally larger packs, smaller carryover stocks indicate that 1973/74 will be another season of tight supplies for most processed non-citrus items. Grower prices for most processing fruit are higher than last season; some have reached all time highs. . . notably for apples and raisin grapes. Strong processor demand has also improved the market prospects for

fresh fruit, with prices remaining firm to slightly higher than year-ago levels.

While new lists vary slightly from packer to packer, prices have all been raised, reflecting higher raw product costs, smaller supplies, and increased processing and marketing costs. The domestic market will undoubtedly remain firm, advancing retail prices during the months ahead.

With dollar devaluation and the tight world supply-demand situation for certain processed fruit items, export prospects are excellent. Domestic users of certain items may face stiffer competition from foreign buyers.

The deal for *tree nuts* is similar. Production of the four major edible tree nuts. . . almonds, filberts, walnuts, and pecans. . . is 420,000 tons, nearly a quarter above last year's utilized crop. The carryover into the 1973 season was one of the lowest in recent years for walnuts, almonds, and pecans. Foreign demand is reportedly strong for the new-crop almonds. Thus, with continued strong demand domestically, prices of tree nuts are expected to rise moderately.

RECENT DEVELOPMENTS AND OUTLOOK

FRESH CITRUS

Oranges

Slightly Less Production

October 1 prospects suggest a 4 percent decrease in orange production in the 1973/74 season. Excluding California Valencias, the U.S. crop is forecast at 192.6 million boxes. While smaller than last season's record crop, this is still 13 percent above the crop of 2 years ago. The smaller crop prospect is mostly due to the 6 percent reduction in Florida.

The U.S. output of early, midseason, and Navel varieties is forecast at 114.2 million boxes, only slightly below year-earlier levels, but still one-fifth larger than 1971/72. Prospective production for Florida is down only slightly and Arizona which accounts for a small proportion of the total is down 30 percent from last season. California output of 20 million boxes is up 7 percent from last season's freeze-damaged crop, but is still one-tenth below the large crop of 2 years ago. Texas production, continuing an upward trend, is estimated at 5.4 million boxes, up 8 percent from a year ago.

Florida's 1973/74 Valencia crop is indicated at 72 million boxes, one-tenth below last season. A crop of this size would still be 6 percent above the 1971/72 crop. An expected reduction in Arizona is offset by the increase in Texas. The first forecast of California Valencia production will be released on December 10.

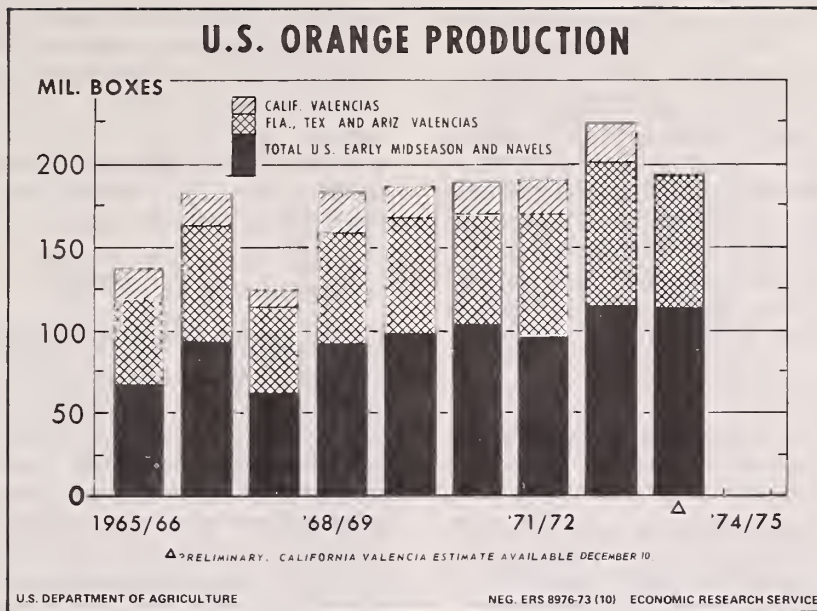
Harvest Underway

Light picking of the Florida orange crop started in early September, slightly earlier than last season, but shipments of fresh fruit through late-October were running behind year-earlier levels. However, California is still moving the 1972/73 Valencia crop, and only light movement of 1973/74 Navels is expected before mid-November.

Although the U.S. orange crop is indicated a little smaller than last season, the orange industry is still faced with the task of marketing a large supply of fresh oranges and processed orange products. There is an expected large carryover of processed items, mainly frozen concentrated orange juice. Thus, market prospects for oranges through this winter point to prices near year-earlier levels.

U.S. average orange prices were estimated at \$2.51 per box (equivalent packinghouse door) in 1972/73 compared with \$2.87 the previous season. Total value of orange sales last season was estimated at a record \$561 million. However, Florida with a sharp increase in orange production had only a slight increase in total value of orange sales last season, \$403.2 versus \$402.7 million. Florida Valencias averaged \$2.53 per box, almost 50 cents below the previous crop. The 1972/73 season average price for all Florida oranges has been estimated at \$2.38 per box, down almost one-fifth from the preceding season.

In contrast, the 1972/73 California orange prices average moderately higher than in 1971/72 as a



result of the smaller crop. California Navel and miscellaneous varieties averaged \$3.54 per box last season, up substantially from \$3.11 recorded for 1971/72. California is still moving the 1972/73 Valencia crop, but prices for the season have been estimated at \$2.78 a box, almost one-tenth above a year earlier. The 1972/73 season average price for all California oranges has been estimated at \$3.12 a box, also up one-tenth from year-earlier levels.

Exports Down, Imports Up

Exports of fresh oranges and tangerines during the first 10 months of the 1972/73 season totaled 7.7 million boxes, one-tenth less than during the same period a year ago. Decreases were recorded for both Canada and Europe while exports to the rest of the world went up slightly.

Even with a record orange crop in 1972/73, imports of fresh oranges during the first 8 months of 1973 totaled 0.9 million boxes compared with 0.7 million during the same period a year ago. Mexico contributed most of the rise. Imports from Israel were also up substantially.

Large Specialty Fruit Crop Expected

The 1973/74 Florida tangelo crop is estimated at a record 4.8 million boxes, more than one-third above the small crop last season. Harvest of this crop extends from late October into winter, but is heaviest in the late November-December period. Utilization of the 1972/73 crop was almost equally divided between fresh and processed. Despite the smaller crop last season, the season average price to growers averaged \$2.35 a box (equivalent packinghouse door) down from \$2.81 a year earlier.

Florida's Temple crop, estimated at 5.3 million boxes, is up slightly from last year's output, but the same as two years ago. Normally, a large proportion of Temples is processed for frozen concentrated orange juice. But because of improved fresh market demand, utilization of the 1972/73 crop of Temples for processing was substantially below a year earlier. The season average prices to growers averaged \$2.80 a box (equivalent packinghouse door) almost the same as year-earlier levels.

Production of tangerines in 1973/74 is estimated at 4.4 million boxes, almost 8 percent below last season. The decrease is primarily due to a smaller crop prospect in Florida. The Florida tangerine crop is expected to be 2.7 million boxes, or one-tenth below last season. Tangerine production in California is expected to be the same as a year ago, but a smaller crop is in prospect in Arizona. Harvesting of the new crop in Florida is expected to begin in late October, reaching a peak in December.

Although tangerines are primarily a fresh market crop, one-third of the 1972/73 Florida crop was sold to processing outlets. Despite a smaller crop, the season average prices to growers averaged \$4.18 a box (equivalent packinghouse door). This was 10 percent below 1971/72. In addition to a smaller crop in prospect, tangerine prices to growers may strengthen somewhat this season because of a reduced crop of oranges.

Grapefruit

Larger Crop in Prospect

Grapefruit production in 1973/74 (for California includes only desert valley fruit) is estimated at 66.1

million boxes. This would be up 5 percent from the preceding season.

A record crop of 48 million boxes is expected in Florida, 6 percent above a year ago. Florida crops of pink and white seedless are both at record levels of 12.5 and 25.0 million boxes, respectively. Other grapefruit output at 10.5 million boxes is up 3 percent from a year ago. Texas, in continuation of the upward trend, is expected to produce 12.5 million boxes, up 6 percent from last season. Arizona's crop is also estimated up 6 percent, but California desert valleys are down 7 percent from a year ago.

Market Prospects and Prices

Consumer demand is expected to expand further and exports may register a moderate gain over 1972/73 when a record 5.3 million boxes were shipped. This was approximately 5 percent more than in 1971/72. Canada and Europe took half of the exports and Japan got the lion's share of the remainder. U.S. exports to the Japanese market are expected to continue to grow. Processor demand for the new crop remains somewhat uncertain, partly because of the mixed picture for carryover stocks of processed products.

Grapefruit prices for 1972/73 were generally lower than a year earlier. The average U.S. price of \$2.75 per box (equivalent packinghouse door) was 5 percent below the previous season's average. Despite a smaller crop, Florida grapefruit prices averaged \$2.94 per box (equivalent packinghouse door) versus \$3.03 in 1971/72.

Very light shipments of grapefruit started from Florida in early September. Through late-October, Florida had shipped slightly less than 3,000 carlots of

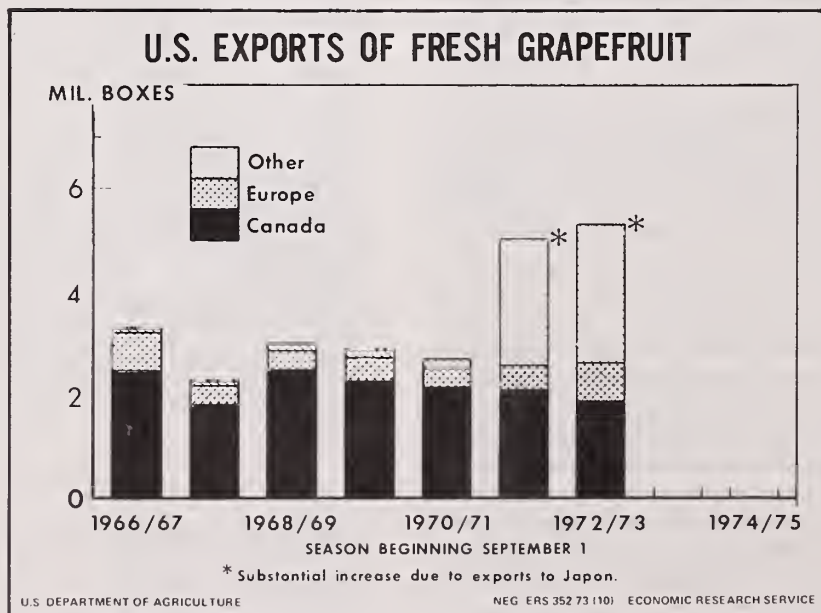
new-crop grapefruit to fresh markets. Grapefruit prices were high on a light, early-season volume. But they declined substantially as marketings began to reflect increased output. However, if processor demand for new crop fruit is stimulated by a reduced carryover in prospect for some items and exports continue to gain, grapefruit prices may hold near year-earlier levels during the 1973/74 season.

Lemons

Arizona Lemon Crop Down Substantially

Arizona's lemon crop is expected to total 3.6 million boxes in 1973/74, 22 percent below last season's record output, but still 17 percent above two years ago. Through mid-October, fresh market shipments of new-crop lemons from Arizona were running behind those of a year earlier, but the crop was reported in satisfactory condition although sizes are generally small. Harvest of the 1973/74 crop was in full swing in the Yuma area and increasing in the Salt River Valley. Also, substantial quantities of 1973/74 season California lemons were being shipped. California lemon prices received by growers in September averaged \$9.77 a box, more than double a year ago due to the unseasonably warm weather and limited availability of fresh market quality lemons. However, prices have started to decline seasonally as shipment of the new crop gets underway.

In 1972/73, 41 percent of Arizona's 4.6 million boxes of lemon crop was sold to fresh market outlets, 59 percent was used for processing. With a record crop, fresh use was about 43 percent larger than in the preceding season; processing use was up even more in



part due to freeze damage, an increase of more than 54 percent. Despite a larger crop, the season average price received by growers was \$4.05 per box (equivalent packinghouse door), 5 percent above year-earlier levels.

PROCESSED CITRUS

Processed Use Record Large

Utilization of the 1972/73 citrus crop for processing was a record-large 10.3 million tons. This is 19 percent larger than in the preceding season.

Processing accounted for about 74 percent of total citrus sales in 1972/73, up from 71 percent the preceding season. More than four-fifths of the oranges sold were processed, as were nearly three-fifths of the grapefruit and half of the lemons. The increased processors' share of the total tonnage reflected a continued strong market for processed products.

Processing use of citrus varies widely among States. Florida's record orange crop resulted in a high level of both fresh and processing utilization, although the relative share of the crop used fresh continued to trend downward. Of the 1972/73 Florida oranges marketed, processing accounted for 93 percent of sales, up from 92 percent a year earlier. Frozen concentrate accounted for about 81 percent of all Florida oranges including tangelos, murcotts, and Temples processed in 1972/73, up from 79 percent the preceding season. However, the share of the total crop used for chilled products fell even though a record volume of chilled orange juice was produced. A smaller quantity of oranges used for chilled products was attributed mainly to the increases in chilled orange juice pack from reconstituted bulk frozen concentrate. Utilization of oranges for canned products remained relatively stable at 6 percent the last two seasons.

With a slightly smaller 1972/73 Florida grapefruit crop, grapefruit used for processing declined to 28.4 million boxes from 30 million in the preceding season. The share used for processing also fell from 64 to 62 percent. Although the quantity used for fresh market remained almost the same as the preceding season, it made up a larger share. The good export demand generally helped maintain the fresh grapefruit market. Of the 28.4 million boxes of grapefruit processed in 1972/73, the quantity used for chilled sections and salads—1.2 million boxes—exceeded that of 1971/72. Use declined for chilled juice, canned, and frozen products. This was not only attributed to the smaller crop, but also the heavy inventories of most processed grapefruit products at the beginning of the season.

In California, fresh sales are normally the most important outlet for oranges. Because of appearance and quality factors associated with unfavorable

weather last December, slightly more than 40 percent of California's 1972/73 orange crop was diverted to processing outlets, compared with 37 percent the previous season. Freeze-damaged grapefruit and lemons also forced diversion to processing outlets. Over half of California's grapefruit crop was processed and 48 percent of lemons were used for processing as compared with 47 and 39 percent respectively the preceding season.

Texas and Arizona also moved larger than normal shares of their crops to processors. Three-fifths of the Texas orange crop was used for processing, as was nearly half of its grapefruit. More than half of the Arizona grapefruit and lemon crop was used for processing, but higher fresh orange prices attracted a larger share so the share of oranges used for processing declined to 43 percent from 58 percent a year ago.

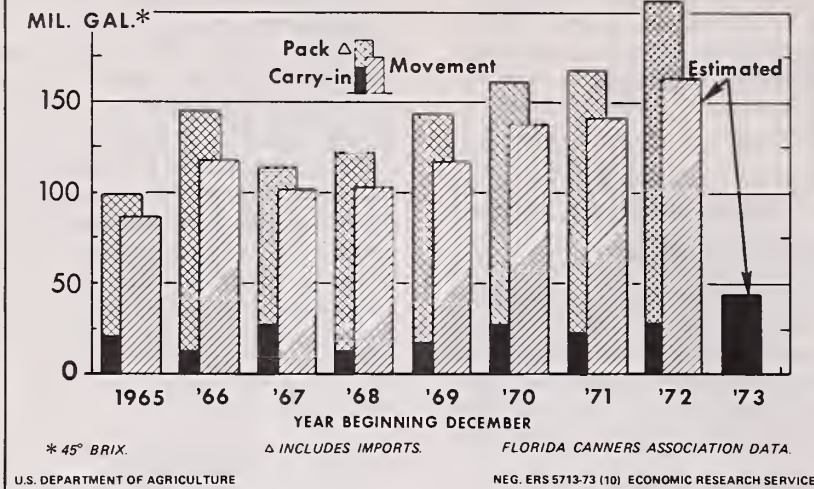
Frozen Concentrate Stocks Up

A record pack of Florida frozen concentrated orange juice at 176 million gallons was recorded in the 1972/73 season, up nearly a third from the previous season's output. This reflects not only the increase in the volume of oranges used for frozen concentrate, but also the higher juice yield per box of fruit. The quantity of fruit used for frozen concentrate in Florida in 1972/73 was up 27 percent from a year earlier. Processors recovered about 1.33 gallons of FCOJ per box, compared with 1.28 gallons per box in the preceding season. With the heavy pack plus a 24 percent larger carry-in at the beginning of the 1972/73 season, the Florida packers' stocks of frozen concentrated orange juice on October 13 were 69 million gallons, 21 million gallons above the heavy stocks on hand a year earlier.

F.o.b. prices for frozen concentrate had declined from \$1.88 to \$1.61 per dozen 6-ounce can (unadvertised brands) in May when Florida citrus packers offered an off-invoice promotion allowance, but because of the Administration's Economic Stabilization Program, prices were not permitted to return to \$1.88 until mid-September. Despite the larger supply, retail prices of frozen concentrate so far this year have remained relatively steady at last year's levels of approximately 25 cents per 6-ounce can. Demand for frozen concentrate has been very strong. Total movement so far this season has been almost one-fifth more than a year ago. Exports of frozen orange concentrate for the season through August were 9 million gallons, about 38 percent more than a year earlier. If movement continues at this rate, carryover at the end of the season (December 1) would be approximately 43 million gallons, more than 50 percent above last season's record carryover.

As a result of the smaller Florida orange crop and lower juice yield in prospect, total pack of FCOJ in 1973/74 is expected to be smaller than in 1972/73. But

FLORIDA SUPPLY AND MOVEMENT OF FROZEN ORANGE JUICE CONCENTRATE



with an expected heavy stock on hand at the beginning of the 1973/74 season, total supplies of frozen concentrated orange juice for 1973/74 probably will be near year-earlier levels. Despite the expected supply of FCOJ for 1973/74, continued good demand may result in higher prices.

Excluding reprocessed gallonage, the 1972/73 pack of frozen concentrated grapefruit juice reached 8.7 million gallons, slightly less than last season's output. Movement of frozen concentrate through October 13 was 12 percent above last year. But with a carryover 1½ times above last year, added to the 1972/73 pack, Florida packers' supplies of frozen concentrated grapefruit juice in inventory on October 13 stood at 4.8 million gallons, an increase of 20 percent over a year ago. If the movement of frozen concentrated grapefruit juice continues at this rate for the balance of this season, carryover of FCGJ would be approximately 3.6 million gallons, compared to the 2.8 million gallons carried into the 1972/73 season.

The USDA recently announced the purchase of 3,449,000 gallons of frozen concentrated orange juice for distribution through child nutrition programs. This brings total purchases of frozen concentrate for the 1972/73 season to approximately 6.5 million gallons. No purchase of this item was made last season.

Demand Strong for Chilled Juices

The total pack of chilled orange juice for the 1972/73 season was a record 125.7 million gallons (excluding reprocessed bulk single-strength). This was about 7 percent larger than the preceding record pack

season. Total pack from fresh oranges was only slightly above year-earlier levels even though a record orange crop was produced. Reconstituted FCOJ will provide much of the volume of chilled orange juice until new-crop processing gets underway later this fall.

Demand for chilled orange juice has been very strong. Total domestic movement in the 1972/73 season was 123 million gallons, up from 107 million a year earlier in spite of slightly higher retail prices. Retail prices for chilled orange juice averaged about 47.8 cents per quart for the first 11 months of the 1972/73 shipping season, much the same as those months in 1971/72. Even with a 35 percent larger carryover at the beginning of the 1972/73 season and a heavy pack, Florida packers' stocks of chilled orange juice ended the season at 18.4 million gallons, approximately 8 percent below a year ago.

In view of the smaller Florida orange crop and lower juice yield, the total pack of chilled orange juice may be smaller this season than last. Thus, the reduced pack coupled with a smaller carryover may result in higher retail prices of chilled orange juice in 1973/74.

The rate of gain in movement of chilled grapefruit juice was also remarkable. Movement of chilled grapefruit juice last season reached a record 16.9 million gallons, nearly 10 percent above 1971/72. Florida pack of chilled grapefruit juice in 1972/73 (16.1 million gallons excluding reprocessed bulk single-strength) was 8 percent smaller than in 1971/72. Although total supply for the 1972/73 season was up as a result of a larger carryover, stocks of chilled grapefruit juice ended the season substantially smaller, 2.2 versus 3.0 million gallons.

Florida Canned Citrus Stocks Up

Movement of canned citrus products during the 1972/73 season was up moderately. There was a substantial increase in canned single-strength orange juice, while canned single-strength grapefruit juice volume was up only slightly. Processor prices of canned single-strength orange juice have been steady at \$4.00 (12/46 ounces, f.o.b. Florida canneries), the same as a year ago. F.o.b. prices of canned single-strength grapefruit juice were reduced twice this season from \$4.45 to \$4.00 and later to \$3.75 (12/46 ounces, f.o.b. Florida canneries), but prices were raised to \$4.25 in mid-September after the Phase IV Program became effective. Current prices are 20 cents below a year ago.

With a sharply larger carryover at the beginning of the 1972/73 season plus a slightly larger pack, the increased movement of canned citrus products was not enough to offset increased supplies. As a result, canners' stocks of Florida canned citrus products on hand were approximately 8 million cases (basis 24/2's) at the end of the season. This was about 10 percent larger than a year ago.

Therefore, with a relatively large citrus crop for the 1973/74 season in prospect, the total supply of canned citrus products is likely to be ample.

FRESH NON-CITRUS

The October 1 estimate of 1973 non-citrus fruit production is 23 percent larger than last season but 2 percent under 1971 (Table 1). Much of the increase reflects the substantially larger grape crop this season, nearly 50 percent above last year's level. Excluding grapes, which make up about 37 percent of the non-citrus total, other non-citrus fruit production is 12 percent above last season's abbreviated crop.

Despite the generally larger production of non-

citrus fruit, with the exception of tart cherries, most grower prices to date have remained firm to slightly higher than year-ago levels.

Apples

U.S. Crop Up Slightly

As of October 1, this year's commercial apple crop is expected to total 6 billion pounds. A crop this size would be 4 percent more than the 1972 utilized crop, but one percent less than 1971. The crop in the Western States is big, about 36 percent above last year and will more than offset expected declines in Central and Eastern States.

Table 2.—Regional apple production

Area	Utilized		Indicated 1973
	1971	1972	
	<i>Billion pounds</i>	<i>Billion pounds</i>	<i>Billion pounds</i>
East	2.90	2.53	2.40
Central States	1.25	1.25	.86
West	1.93	2.03	2.77
Total U.S.	6.08	5.81	6.03

The largest share of apple production is centered in the West this year, with a record 1.8 billion pound crop expected in Washington State, up 31 percent from last year's utilized production. The Eastern States expect a 5 percent smaller crop, while output in the Central States is down sharply. Production by States is shown in Table 15.

Market Outlook Strong

At the start of the current season, fresh apple prices in most areas were well above last year's high level.

Table 1.—U.S. noncitrus fruit: Production, 1971, 1972, and indicated 1973

Crop	Utilized		1973
	1971	1972	
	<i>tons</i>	<i>tons</i>	<i>tons</i>
Apples	3,040	2,905	3,013
Apricots	150	127	157
Cherries, sweet	140	95	146
Cranberries	139	135	85
Grapes	¹ 113	¹ 104	103
Nectarines	3,997	2,570	3,826
Peaches	69	86	85
Pears	1,431	1,207	1,323
Prunes and plums	707	608	709
Strawberries	559	353	688
Total	260	229	232
	10,605	8,419	10,367

¹ Includes cranberries put in set aside under the cranberry marketing orders.

In mid-October, f.o.b. quotations for Red Delicious apples compared with 1972 and 1971 were:

Shipping Points	Mid-October F.o.b. prices			Unit
	1973	1972	1971	
Western Michigan	\$6.02	\$3.62	\$3.05	Per carton, U.S. Fancy, 2-1/4" up, 12-3-lb. film bags.
Appalachian District	6.25	5.75	4.92	Per carton, tray pack, U.S. Extra Fancy & Fancy, 125's and larger.
Yakima Valley, Washington	5.62	6.12	6.55*	Per carton, tray pack, U.S. Extra Fancy, 125's and larger.

*138's and larger, mostly 125's and larger.

Despite the record crop in Washington, prices for fresh apples are likely to remain relatively high for the season. The smaller supply of apples for processing use in the Central and Eastern States, together with very low inventories of all processed apple products, has resulted in strong processor demand for apples. It appears that prices of apples for processing will reach all time highs this season. Many processors in the East have agreed to pay \$7.25 to \$7.35 per cwt. for processing variety apples, U.S. No. 1 canner grade, 2 1/2 inch and up, delivered to processors. Last year's initial prices ranged from \$3.25 to \$3.50 per cwt. In California, grower prices for juice apples range between \$75 and \$110 per ton, while in the Northwest growers are receiving between \$80 and \$100 per ton depending on quality.

The large crop in the West and the high prices for processing apples have made processors in the Central and Eastern States active competitors for available supplies. Although the extent of diversion of fresh apple varieties to processing uses is unknown, these circumstances helped Washington State shippers get off to a fast start moving their record crop. Washington State shipments through late-October ran nearly a third ahead of last year's rate. However, certain shippers are reportedly having some difficulty due to rail car and truck shortages. Should this difficulty become widespread early in the season, the record crop could become less manageable and likely result in lower grower returns than otherwise expected.

Grapes

The U.S. grape crop for this season is estimated at 3.8 million tons, 49 percent larger than last year's abbreviated crop but 4 percent below the 1971 crop. (See table 16.)

California's Production Prospects Improve

The October 1 forecast for California grapes, accounting for more than 90 percent of the U.S. crop, increased relative to earlier estimates. California

production at 3.5 million tons is up 3 percent from prospects on September 1 and 55 percent more than last year. Increases are expected for all varietal groups of California grapes. Output of wine varieties, estimated at 900,000 tons, is 43 percent larger than in 1972 and 17 percent greater than 1971. Production of table varieties is forecast at 420,000 tons, an increase of 53 percent above last year but 6 percent lower than the 1971 season. The State's production of raisin varieties, mostly Thompson seedless, is forecast at 2.2 million tons, up 62 percent above 1972 but about 5 percent below 1971. The October 1 forecast for raisin grapes is 5 percent above the September 1 estimate since yields are running better than previously expected.

Eastern Grape Crop

Estimated production in New York at 126,000 tons is 22 percent above last year's utilized crop but 37 percent below the 1971 season. Production in Pennsylvania at 40,000 tons is up slightly from a year ago but 30 percent below the 1971 utilized production. The recent production prospect in New York is 9 percent below the September 1 forecast, while Pennsylvania's current production estimate is 3 percent below the September 1 forecast. As a result, production prospects for grape juice and frozen concentrate this season declined relative to earlier estimates.

Fresh Shipments

Through late-October, combined rail and truck shipments of California fresh grapes were running moderately above a year earlier, at 17,263 carlot equivalents compared with 15,504 carlots during the same period a year earlier.

U.S. exports during the June-August period totaled about 14,082 tons, compared with 20,679 tons during the same period in 1972.

Raisin Output to Nearly Double

Fortunately for consumers of raisins, this year's production of raisins is expected to total over 200,000 tons. This is nearly double last year's record low of 105,000 tons and is about the same as during the 1971 season. A crop this size comes at a time when raisins are scarce in both domestic and foreign distribution channels, due to last year's short crop and the utilization of raisin varieties by the expanding wine industry.

Crushing Active

Reported use of California grapes for crushing through mid-October was 2.2 million tons (fresh basis), up sharply from the 1.4 million tons during the same period last season and also above the 1.8 million tons in 1971.

Record Grower Prices

The highest field price in the history of the raisin industry has been established this season. Raisin packers have agreed to pay \$700 per ton as the Thompson seedless raisin field tonnage price (sweat box weight) \$159 per ton above the 1972 season average grower price. The major contributing factor is the excellent market prospect both domestically and abroad. The carryover of raisins this season was for all practical purposes nil. In addition, Turkey and Greece had smaller crops than were anticipated earlier.

Winery prices to growers this season have remained at last year's high level and occasionally higher despite this year's larger crop. As expected, prices varied greatly by producing areas and variety of grape . . . in most areas the wine grape price for Thompson seedless was mostly \$75 per ton, with no sugar stipulated, the same as last season.

Shipping point prices for table grape varieties have been moderately to slightly lower relative to year-earlier high levels, and will likely remain firm due to the strong winery and raisin demand.

Some prices for juice grapes have also been established. In Washington State, the grower price is now reported to be \$180 per ton for Concord grapes at 16 degree Brix, \$35 per ton higher than a year earlier. In New York, Pennsylvania, and all Great Lake States, grower prices have been established at \$200 per ton for 16 degree Brix Concord grapes.

Pears

Pacific Coast Crop Up Sharply

The Nation's pear crop is estimated at 709,400 tons, about 17 percent above last year's utilized crop, and about the same as 1971. The larger crop in Oregon-55 percent greater than last season-is responsible for most of the increase.

The Pacific Coast's Bartlett crop at 508,000 tons is 17 percent above last year's utilized production. Since mid-September, shipping point prices have been increasing seasonally at levels slightly to moderately below a year ago.

Production of other West Coast pears is estimated at 162,000 tons, up nearly a third over last year's utilized crop but only slightly larger than the 1971 crop. With a larger crop of fall and winter pears and large stocks of Bartletts in cold storage (about 86,000 tons on September 30, 34 percent above a year earlier), farm prices are likely to remain slightly to moderately below last year's high level. A factor which may keep prices firm this season is the potentially favorable market situation abroad. The combined 1973 pear crop in the major exporting countries (France, Italy, and the Netherlands) is slightly less than last year's small crop and well below the 1969-71 average. In several important

European markets for U.S. pears, production for 1973 is also below last year. Canada, the major importer of U.S. pears, had a crop a fourth smaller than the last 2 seasons.

Cranberries

A smaller cranberry crop is now in prospect for 1973, with the October 1 forecast at 2.06 million barrels, 5 percent below the August estimate. A larger crop is expected in Massachusetts and New Jersey, while Wisconsin and the Northwest expect smaller crops. While the estimated production is 1 percent below last year's total production, it is 4 percent above the quantity utilized.

Shipping point prices at Cape Cod, Mass., opened at \$5.10 per carton of Early Blacks, 24-1 lb. film bags, up slightly from a year ago. Early season prices for fresh cranberries on the Chicago wholesale market were moderately above those a year earlier, while prices on the New York market were about the same as last year.

PROCESSED NON-CITRUS

Despite the return to a more typical crop situation in 1973 and generally larger packs, smaller carryover stocks indicated that 1973/74 will be another season of tight supplies for most processed non-citrus items.

Larger Canned Pack Likely But Supplies Down

Complete carryover and pack data are available for 8 items so far this season (table 17). Total supplies of these items are 5 percent below last year's tight supply and 16 percent below the 1971/72 season. The carryover at the beginning of this season was down 53 percent from last year.

Briefly, this season's supply of California *canned clingstone peaches* is down 8 percent from last season and the smallest since 1958/59. The slightly larger pack this season was offset by a small carryover, thus the available supply is about 367,000 cases (equivalent 24 No. 2½'s) less than canners shipped last season. The 1973/74 supply of California *canned freestone peaches* is about equal to the number of cases canners shipped last season. Supply of *canned tart cherries* is down drastically and the pack is reportedly well committed.

This season's supply of *fruit cocktail* at 15.7 million cases (equivalent 24 No. 2½'s) is 3 percent lower than last season but about 1.9 million cases more than canners moved last season.

California's *canned apricot* supply this season is 22 percent larger than last year's very low level, and about 1 million cases more than canners moved during the 1972/73 season. This year's supply is not considered burdensome, with freestone peaches,

cling peaches, and cherries all in tight supply.

The total supply of *canned apples and applesauce* will also be tight this season. Carryover is low and the apple crop is substantially smaller in major processing areas, therefore supplies will be less than the relatively low level of last season. However, this season's pack of *pears* is expected to be moderately larger than last season.

Canners prices have been raised reflecting the higher raw product costs, smaller supplies, and increased processing and marketing costs. The market will undoubtedly remain firm with retail prices advancing during the months ahead.

Frozen Pack

Based on partial data on movement of fruit to processors, the pack of frozen strawberries and blueberries will increase substantially this season. However, total supplies of red cherries, peaches, blackberries, and black raspberries are down substantially.

The freezers' pack of blueberries is expected to be in excess of the record 1969 production of 37.7 million pounds. Industry sources do not expect this large pack to result in lower prices. The demand from pie makers, bakers, and preservers is very active since the supply of red cherries, peaches, blackberries, and likely apples, is on the tight side.

The season's supply of red cherries is estimated at 122 million pounds, 34 percent lower than last year and 36 million pounds less than freezers moved last season.

Cold Storage Stocks Up

Frozen fruit stocks (excluding juices) on September

30 totaled 525 million pounds, 2 percent more than a year earlier. All frozen fruit stocks increased except apricots, blackberries, cherries, grapes, and black raspberries.

Dried Non-citrus Output Larger

U.S. dried fruit production for the current season is substantially above last season's limited output. As reported earlier, California may produce over 200,000 tons of raisins, almost double last year's level. Dried prune production in California is estimated at 170,000 tons, more than double last year's small crop. Dried apricot tonnage is estimated at 3,400 tons dried basis, up 15 percent from 1972.

An important factor concerning the 1973/74 season is the negligible carryover of most dried items, including raisins, prunes, and apricots. The supply of dried apricots will be much less than a year ago due to a negligible carryover. Although the domestic total supply of prunes and raisins is larger, packers are busy attempting to fill the market pipelines. New pack prices on some raisin varieties announced in mid-September were moderately higher than the last list.

The foreign crop of raisins and prunes in major producing areas is expected to decline. World raisin supplies are scarce again, and prices of raisins in overseas markets are the highest on record. U.S. prospects in the foreign market are excellent and consequently the domestic users may have stiff competition in obtaining supplies.

Although the supply of prunes is larger, the entire 1973 crop is salable. The average field price is expected to be well above a year ago.

Table 3.—Stocks of frozen fruit: End of September, 1971, 1972, and 1973

Frozen fruit	1971	1972	1973
	<i>Thousand pounds</i>	<i>Thousand pounds</i>	<i>Thousand pounds</i>
Apples	39,580	23,051	25,208
Apricots	12,994	14,705	13,965
Blackberries	21,076	17,733	11,561
Blueberries	31,311	34,751	52,359
Boysenberries	6,251	3,709	4,800
Cherries	123,489	122,674	71,392
Grapes	4,441	4,814	3,310
Peaches	51,621	41,014	51,590
Raspberries, Red	20,611	15,366	19,750
Raspberries, Black	2,455	1,853	1,841
Strawberries	194,367	143,751	164,506
Other frozen fruits	107,562	92,247	104,764
Total frozen fruits	615,758	515,668	525,046

TREE NUTS

Larger Crops

Production of the four major edible tree nuts (almonds, filberts, walnuts, and pecans) is expected to be substantially larger than last season. At an estimated 420,050 tons in-shell basis, supplies this season are nearly a quarter above last year's utilized crop and slightly larger than in 1971.

U.S. Almond Crop Slightly Larger

The 1973 California almond crop, forecast at 130,000 tons in-shell basis (77,500 tons kernel weight), is slightly larger than last season. Regarding this season's market allocation, USDA has designated the entire almond crop as salable, with no reserve percentage announced.

World almond production for the 1973 season is estimated at 154,000 short tons (kernel weight basis), the third largest on record, but about 5 percent below 1972. Foreign almond production is down sharply in major producing countries. Adverse weather during the spring caused extensive damage to the almond crop in Spain and Italy. The current estimate of the Italian crop at 8,000 short tons (kernel weight) is the lowest in decades, while Spanish production at 44,000 tons is far below the 1972 level of 55,000 tons.

Despite the larger crop this season, the industry is faced with strong demand in both the domestic and foreign markets and prices are expected to increase substantially over last season. In addition, the beginning inventory this season at about 8 thousand tons shelled basis is nearly 15 percent below last year's low level.

Pecan Crop Up Substantially

The U.S. pecan crop at 138,050 tons is 51 percent above last year's short crop and 12 percent larger than the 1971 crop. Prospects are above year-ago levels in all States except Florida and Texas. A late spring freeze in April plus extensive insect damage reduced this year's crop in the major producing areas in Texas. The October 1 forecast nationally is up 5 percent from September 1 because prospects improved materially in Georgia, Mississippi, Louisiana, Oklahoma, and New Mexico.

This season's opening prices paid to growers at Southeastern delivery points ranged from slightly lower to slightly higher than last season depending on variety and quality. In Texas and Louisiana, prices of Natives being offered were moderately lower than last year. Grower prices will increase seasonally and may average slightly higher than last season. Partially offsetting the larger new crop are substantially smaller cold storage holdings of both shelled. September 30 stocks were down 40 percent from 1972 levels, and unshelled stocks were down 76 percent.

Record Walnut Crop

Production of walnuts in California and Oregon is forecast at a record 140,500 tons, up a fifth from last year and slightly above 1971.

Exports of unshelled walnuts from October 1972 through August were 11,300 tons, up 8 percent from a similar period a year earlier. The Walnut Control Board has recommended to the Secretary of Agriculture that 20 percent of the walnuts in California and 10 percent of those in Oregon be

Table 4.—Tree nuts: Production in principal States, 1971, 1972, and indicated 1973

Crop and State	1971	1972	1973	Crop and State	1971	1972	1973
	Tons	Tons	Tons		Tons	Tons	Tons
Almonds:				Pecans:			
California	134,000	125,000	130,000	North Carolina	3,250	250	1,750
Filberts:				South Carolina	5,500	50	3,000
Oregon	11,000	9,600	11,000	Georgia	45,000	24,000	45,000
Washington	370	550	500	Florida	2,000	3,200	2,550
2 States	11,370	10,150	11,500	Alabama	18,500	10,000	17,500
Walnuts:				Mississippi	8,000	3,500	10,000
English:				Arkansas	3,750	900	3,750
California	135,000	116,000	140,000	Louisiana	14,000	6,000	17,500
Oregon	1,400	800	500	Oklahoma	9,500	2,100	20,000
2 States	136,400	116,800	140,500	Texas	12,000	37,500	11,500
Macadamia nuts:				New Mexico	2,100	4,050	5,500
Hawaii	7,035	7,083	N.A.	Total	123,600	91,550	138,050
				Improved varieties ¹	71,550	44,495	80,950
				Native and seedling	52,050	47,055	57,100
				Total 4 tree nuts	405,370	343,500	420,050

¹ Budded, grafted, or topworked varieties. N.A.—Data not available.

diverted from the domestic market this season. The Department has proposed surplus percentages of 18 percent for California and 9 percent for Oregon and Washington. Most of the surplus walnuts will be exported and the remainder of the crop will be available for the domestic market.

The carryover of unsold walnuts, unshelled and shelled, for the current season was one of the smallest in recent history. Although the walnut crop is large, price prospects this season are favorable as demand appears strong.

Filberts

The Nation's filbert crop, all of which comes from the Northwest, is forecast at 11,500 tons, 13 percent

more than last year but about the same as in 1971. Oregon expects to harvest 11,000 tons compared with 9,600 tons in 1972.

World production has been estimated at 375,500 tons, in-shell basis, second only to the 1970 crop. Most of the increases reflects near-record crops in Turkey and Italy.

Proposed market allocation percentages for the filberts grown in Oregon and Washington have been announced by USDA's Agricultural Marketing Service. Sixty-five percent of the merchantable part of this year's crop, estimated at 9,775 tons, would be allocated for sale in the shell in U.S. markets. The remaining 35 percent would be exported or used in other outlets not competitive with the domestic in-shell market.

Table 5.—Citrus fruit: Production, 1971/72, 1972/73 and indicated 1973/74¹

Crop and State	1971/72	1972/73	1973/74
	1,000 boxes ²	1,000 boxes ²	1,000 boxes ²
Oranges:			
Early, Midseason and Navel varieties:³			
California	22,300	18,700	20,000
Florida	68,800	90,000	88,000
Texas	3,800	5,000	5,400
Arizona	900	1,060	750
Total	95,800	114,760	114,150
Valencias:			
California	21,100	22,900	(⁴) Dec.
Florida	68,200	79,700	72,000
Texas	2,000	2,400	2,600
Arizona	4,000	4,000	3,800
Total	95,300	109,000	(⁴) Dec.
All Oranges:			
California	43,400	41,600	(⁴) Dec.
Florida	137,000	169,700	160,000
Texas	5,800	7,400	8,000
Arizona	4,900	5,060	4,550
Total oranges	191,100	223,760	(⁴) Dec.
Grapefruit:			
Florida, all	47,000	45,400	48,000
Seedless	36,100	35,200	37,500
Pink	12,300	11,700	12,500
White	23,800	23,500	25,000
Other	10,900	10,200	10,500
Texas	9,200	11,800	12,500
Arizona	2,540	2,640	2,800
California, all	5,400	5,400	(⁴) Dec.
Desert Valleys	3,200	3,000	2,800
Other areas	2,200	2,400	(⁴) Dec.
Total grapefruit	64,140	65,240	(⁴) Dec.
Lemons:			
California	13,600	17,600	(⁴) Nov.
Arizona	3,080	4,600	3,600
Total lemons	16,680	22,200	(⁴) Nov.
Limes:			
Florida	1,100	1,100	1,200
Tangelos:			
Florida	3,900	3,500	4,800
Tangerines:			
Florida	3,200	3,000	2,700
Arizona	570	530	470
California	1,260	1,200	1,200
Total tangerines	5,030	4,730	4,370
Temples:			
Florida	5,300	5,100	5,300

¹ The crop year begins with bloom of the first year and ends with completion of harvest the following year. ² Net content of box varies. Approximate averages are as follows: Oranges-California and Arizona, 75 lbs.; other States, 90 lbs.; Grapefruit-California, Desert Valleys, and Arizona, 64 lbs.; other California areas, 67 lbs.; Florida, 85 lbs. and Texas, 80 lbs.;

lemons-76 lbs.; Limes-80 lbs.; Tangelos-90 lbs.; Tangerines-California and Arizona, 75 lbs.; Florida, 95 lbs.; and Temples-90 lbs. ³ Navel and Miscellaneous varieties in California and Arizona. Early and Midseason varieties in Florida and Texas, including small quantities of tangerines in Texas. ⁴ Month indicates crop report containing data.

Table 6.—Seven citrus fruit: Production and use, United States, 1964/65 through 1972/73¹

Fruit and season	Production ²	Utilization of production			
		Fresh		Processed ¹	
		Quantity	Percentage	Quantity	Percentage
	1,000 tons	1,000 tons	Percent	1,000 tons	Percent
Oranges:					
1964/65	4,988	1,681	33.7	3,307	66.3
1965/66	5,808	1,750	30.1	4,058	69.9
1966/67	7,924	1,978	25.0	5,946	75.0
1967/68	5,436	1,369	25.2	4,067	74.8
1968/69	7,898	1,809	22.9	6,089	77.1
1969/70	8,023	1,790	22.3	6,233	77.7
1970/71	8,223	1,784	21.7	6,439	78.3
1971/72	8,237	1,727	21.0	6,510	79.0
1972/73	9,721	1,719	17.7	8,002	82.3
Grapefruit:					
1964/65	1,667	891	53.4	776	46.6
1965/66	1,894	921	48.6	973	51.4
1966/67	2,286	1,024	44.8	1,262	55.2
1967/68	1,781	887	49.8	894	50.2
1968/69	2,207	910	41.2	1,297	58.8
1969/70	2,186	951	43.5	1,235	56.5
1970/71	2,472	988	40.0	1,484	60.0
1971/72	2,623	1,088	41.5	1,535	58.5
1972/73	2,663	1,103	41.4	1,560	58.6
Lemons:					
1964/65	540	341	63.1	199	36.9
1965/66	599	348	58.1	251	41.9
1966/67	681	353	51.8	328	48.2
1967/68	641	358	55.9	283	44.1
1968/69	600	336	56.0	264	44.0
1969/70	590	356	60.3	234	39.7
1970/71	625	370	59.2	255	40.8
1971/72	634	365	57.6	269	42.4
1972/73	844	420	49.8	424	50.2
Limes:					
1964/65	22	12	54.5	10	45.5
1965/66	17	11	64.7	6	35.3
1966/67	17	11	64.7	6	35.3
1967/68	29	14	48.3	15	51.7
1968/69	28	15	53.6	13	46.4
1969/70	29	15	51.7	14	48.3
1970/71	35	16	45.7	19	54.3
1971/72	44	19	43.2	25	56.8
1972/73	44	21	47.7	23	52.3
Tangelos:					
1964/65	45	36	80.0	9	20.0
1965/66	54	44	81.5	10	18.5
1966/67	76	58	76.3	18	23.7
1967/68	76	63	82.9	13	17.1
1968/69	81	55	67.9	26	32.1
1969/70	113	63	55.8	50	44.2
1970/71	122	73	59.8	49	40.2
1971/72	176	86	48.9	90	51.1
1972/73	158	77	48.7	81	51.3
Tangerines:					
1964/65	200	143	71.5	57	28.5
1965/66	193	149	77.2	44	22.8
1966/67	227	168	74.0	59	26.0
1967/68	163	126	77.3	37	22.7
1968/69	197	136	69.0	61	31.0
1969/70	185	138	74.6	47	25.4
1970/71	233	162	69.5	71	30.5
1971/72	221	149	67.4	72	32.6
1972/73	208	134	64.4	74	35.6

Continued

Table 6.—Seven citrus fruit: Production and use, United States, 1964/65 through 1972/73¹—Continued

Fruit and season	Production ²	Utilization of production			
		Fresh		Processed ¹	
		Quantity	Percentage	Quantity	Percentage
	1,000 tons	1,000 tons	Percent	1,000 tons	Percent
Temples:					
1964/65	171	101	59.1	70	40.9
1965/66	202	112	55.4	90	44.6
1966/67	225	135	60.0	90	40.0
1967/68	202	126	62.4	76	37.6
1968/69	202	94	46.5	108	53.5
1969/70	234	127	54.3	107	45.7
1970/71	225	100	44.4	125	55.6
1971/72	239	81	33.9	158	66.1
1972/73	230	111	48.3	119	51.7
Total:					
1964/65	7,633	3,205	42.0	4,428	58.0
1965/66	8,767	3,335	38.0	5,432	62.0
1966/67	11,436	3,727	32.6	7,709	67.4
1967/68	8,328	2,943	35.3	5,385	64.7
1968/69	11,213	3,355	29.9	7,858	70.1
1969/70	11,360	3,440	30.3	7,920	69.7
1970/71	11,935	3,493	29.3	8,442	70.7
1971/72	12,174	3,515	28.9	8,659	71.1
1972/73	13,868	3,585	25.9	10,283	74.1

¹ 1972/73 preliminary. ² Production having value.

Data prepared from citrus production and utilization reports, SRS, USDA.

Table 7.—Selected citrus fruit: Use for processing by percentages of total production, Florida and California, 1964/65 through 1972/73

State, variety, and season	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73 ¹
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
ORANGES:									
Florida:									
Total ²	80.5	82.2	85.6	81.1	88.5	88.7	89.0	90.9	91.6
Temple	40.9	44.7	40.0	37.8	53.3	45.7	55.4	66.4	52.1
Other early and midseason	81.7	80.5	86.2	81.7	88.7	89.7	90.0	91.2	92.6
Valencia	82.9	87.3	88.2	84.3	90.9	91.1	90.4	92.4	93.0
California:									
Total	19.6	29.7	27.2	38.7	40.5	32.0	31.4	36.8	40.9
Navel and miscellaneous	8.7	22.5	13.9	39.0	23.3	24.5	18.0	25.6	33.2
Valencia	30.0	37.2	38.6	38.4	52.9	41.0	43.6	48.7	47.2
GRAPEFRUIT:									
Florida:									
Total	50.3	56.8	60.4	55.3	64.7	61.9	65.1	63.7	62.5
Seedless	34.9	41.5	47.0	41.6	52.1	50.9	53.4	53.6	52.4
Pink	24.4	25.8	30.4	26.5	37.9	34.4	35.5	36.5	38.0
White	41.9	51.6	57.2	51.5	61.1	60.4	63.1	62.4	59.5
Other (seeded)	83.1	89.2	90.2	90.7	93.3	94.1	95.9	97.4	97.2
TANGERINES:									
Florida:									
Total	31.2	24.1	26.0	23.8	31.6	20.6	28.1	30.4	32.7

¹ Preliminary. ² Including temples.

Table 8.—Oranges, grapefruit, and tangerines processed, Florida, 1968/69 through 1972/73¹

Crop and season	Frozen concentrates	Chilled products		Other processed	Total processed
		Juice	Sections and salads		
	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes
ORANGES:²					
1968/69	92,125	17,843	773	9,350	120,091
1969/70	100,739	18,640	841	8,206	128,426
1970/71	103,521	19,772	703	8,834	132,830
1971/72	104,399	19,509	535	7,726	132,169
1972/73	132,210	20,465	654	8,949	162,278
GRAPEFRUIT:					
1968/69	6,550	1,631	1,676	15,976	25,833
1969/70	4,579	1,824	1,158	15,577	23,138
1970/71	6,819	2,348	1,091	17,682	27,940
1971/72	8,725	3,206	994	17,036	29,961
1972/73	8,212	2,908	1,209	16,025	28,354
TANGERINES:					
1968/69	944	---	---	129	1,073
1969/70	586	---	---	31	617
1970/71	1,000	---	---	39	1,039
1971/72	961	---	---	11	972
1972/73	961	---	---	21	982

¹ 1972/73 preliminary. ² Includes tangelos, temples, and honey tangerines.

Table 9.—Citrus fruit for processing: Season average price per box delivered to processing plant, by kind, variety, State, and United States, 1964/65 through 1972/73

Kind, variety and State	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73 ¹
	<i>Dollars (equivalent packinghouse door returns)</i>								
ORANGES:									
Florida:									
Temple	2.60	1.65	0.80	1.97	2.01	1.51	1.78	2.48	1.70
Other early and midseason	3.05	2.10	1.44	2.46	2.33	1.91	1.90	2.81	2.20
Valencia	2.85	2.40	1.77	2.93	2.59	1.90	2.76	3.00	2.50
California:									
Navel and miscellaneous	1.28	.78	.72	.84	.56	.42	.60	.68	.24
Valencia	2.22	1.94	1.32	1.80	.92	1.18	1.22	1.36	1.10
GRAPEFRUIT:									
Florida:									
Seedless	1.23	1.48	.92	1.75	1.12	2.01	2.31	2.54	2.30
Seeded	1.50	1.65	1.16	2.03	1.40	2.07	2.35	2.71	2.50
Texas	1.43	1.15	.62	1.44	.65	1.05	1.15	1.57	1.56
California74	.93	.73	.80	.45	.68	1.04	1.18	1.00
Arizona46	.79	.65	1.00	.65	1.05	.50	.85	.95
LEMONS:									
California	1.56	1.70	1.66	1.88	1.78	1.85	2.18	2.36	2.16
Arizona	1.80	1.80	1.55	1.65	1.65	2.05	1.70	1.85	2.10
TANGERINES:									
Florida	2.05	1.45	1.12	2.29	1.82	1.65	1.77	2.12	1.15
California	3.14	.77	.44	1.38	.70	.88	.70	.96	.46
Arizona	1.35	1.30	1.00	1.31	1.35	.75	1.00	.50	.45
TANGELOS:									
Florida	2.55	1.30	.90	1.64	1.60	1.30	1.35	2.16	1.30
LIMES:									
Florida	1.88	1.75	2.24	2.21	1.80	1.68	1.68	2.00	2.10

¹ Preliminary.

Table 10.—Frozen concentrated orange and grapefruit juice: Packs, stocks, supply and movement, Florida, 1968/69 through 1972/73

Item and season	Beginning stocks	Pack	Imports ¹	Total supply	Season movement	Ending stocks
	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>
Orange:²						
1968/69	12,885	103,750	4,293	120,928	103,528	17,400
1969/70	17,400	124,947	1,455	143,803	117,236	26,566
1970/71	26,566	125,187	8,557	160,310	137,742	22,568
1971/72	22,568	134,229	11,668	168,465	140,465	28,000
1972/73	28,000	176,073				
Grapefruit:						
1968/69	991	5,920	---	6,911	5,482	1,429
1969/70	1,429	4,294	---	5,723	5,256	467
1970/71	467	6,870	---	7,337	6,189	1,148
1971/72	1,148	8,798	---	9,946	7,115	2,831
1972/73	2,831	8,658	---	11,489		

¹ Includes foreign and domestic imports and reprocessed frozen concentrated tangerine juice. ² 45° Brix in gallons including concentrated orange juice for manufacture.

Prepared from reports of Florida Canners Association.

Table 11.—Canned citrus products: Packs, stocks, supply and movement, selected items, Florida, 1970/71 through 1972/73¹

Item and season ²	Packers' carryin	Pack	Total supply	Season movement	Packers' carryout
	<i>1,000 cases (basis equivalent cases of 24 No. 2 cans)</i>				
CANNED JUICE:³					
Orange:					
1970/71	1,113	11,749	12,862	11,532	1,330
1971/72	1,330	10,942	12,272	10,477	11,795
1972/73	1,795	13,670	15,465	12,578	2,887
Grapefruit:					
1970/71	819	19,366	20,185	18,580	1,605
1971/72	1,605	21,173	22,778	18,468	4,310
1972/73	4,310	19,059	23,369	19,166	4,203
Blend:					
1970/71	299	2,214	2,513	2,114	399
1971/72	399	1,832	2,231	1,904	327
1972/73	327	1,898	2,225	1,823	402
Tangerine:					
1970/71	22	35	57	39	18
1971/72	18	16	34	31	3
1972/73	3	24	27	20	7
CANNED FRUIT:					
Grapefruit sections:					
1970/71	720	3,506	4,226	3,560	666
1971/72	666	2,752	3,418	2,978	440
1972/73	440	2,687	3,127	2,804	323
Citrus salad and sections:					
1970/71	96	248	344	257	87
1971/72	87	278	365	215	150
1972/73	150	149	299	221	78

¹ Beginning with this table, data from the Florida Canners Association relating to "No. 2 Basis" are derived from the use of new conversion factors based on the "net fill" of container. Figures shown in this table for the 1970/71 and 1971/72 seasons

are slightly greater than figures reported previously. ² Season beginning October 1, approximately. ³ Single strength.

Prepared from reports of Florida Canners Association.

Table 12.— Chilled citrus products: Packs, stocks, supply and movement, Florida, 1968/69 through 1972/73

Item and season ¹	Beginning stocks	Pack ²	Total supply	Season movement	Ending stocks
	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>
Orange juice, s.s.:					
1968/69	12,007	94,479	106,486	93,882	12,604
1969/70	12,604	107,940	120,544	106,064	14,480
1970/71	14,480	112,388	126,868	112,090	14,778
1971/72	14,778	116,970	131,748	111,756	19,992
1972/73	19,992	125,683	145,675	127,255	18,420
Grapefruit juice, s.s.:					
1968/69	827	7,719	8,546	7,479	1,067
1969/70	1,067	9,430	10,497	10,128	369
1970/71	369	12,949	13,318	12,394	924
1971/72	924	17,358	18,282	15,261	3,021
1972/73	3,021	16,071	19,092	16,871	2,221
Grapefruit sections:					
1968/69	714	1,988	2,702	2,005	697
1969/70	697	1,992	2,689	2,157	532
1970/71	532	2,038	2,570	1,976	594
1971/72	594	1,784	2,378	2,057	321
1972/73	321	2,051	2,372	1,989	383
Orange sections:					
1968/69	387	807	1,194	996	198
1969/70	198	1,611	1,809	1,132	677
1970/71	677	962	1,639	968	671
1971/72	671	819	1,490	1,063	427
1972/73	427	804	1,231	945	286
Citrus salad:					
1968/69	853	5,608	6,461	5,403	1,058
1969/70	1,058	4,929	5,987	4,903	1,084
1970/71	1,084	4,535	5,619	4,644	975
1971/72	975	3,822	4,797	4,485	312
1972/73	312	4,818	5,130	4,349	781

¹Season beginning October 1, approximately. ²Packs of chilled juices include products of fresh fruit and frozen concentrate and excludes reprocessed single strength bulk.

Prepared from reports of Florida Canners Association.

Table 13.—Citrus fruit: United States exports of selected fresh and processed items, by areas of destination, 1967/68-1971/72¹

Item and season	Canada	Europe				Other	Total
		United Kingdom	Common Market	Other	Total		
	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>	<i>1,000 boxes²</i>
Fresh fruit:							
Oranges³:							
1967/68	3,361	6	273	21	300	960	4,621
1968/69	4,507	75	2,129	259	2,463	1,813	8,783
1969/70	4,628	132	1,298	209	1,639	2,159	8,426
1970/71	4,638	112	992	108	1,212	1,974	7,824
1971/72	5,135	130	1,223	146	1,499	2,993	9,627
Grapefruit:							
1967/68	1,826	8	377	71	456	53	2,335
1968/69	2,498	10	380	40	430	72	3,000
1969/70	2,279	7	434	62	503	96	2,878
1970/71	2,180	10	314	27	351	158	2,689
1971/72	2,087	30	438	27	495	2,438	5,020
1972/73	1,892	69	625	35	729	2,674	5,295
Lemons and limes:							
1967/68	449	46	1,413	314	1,773	1,236	3,458
1968/69	500	23	999	249	1,271	1,289	3,060
1969/70	436	51	1,222	341	1,614	1,687	3,737
1970/71	455	39	1,121	349	1,509	1,889	3,853
1971/72	425	24	1,217	425	1,666	2,453	4,544
	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>	<i>1,000 gallons</i>
Canned juice, s.s.:							
Orange:							
1967/68	5,455	29	3,740	3,272	7,041	690	13,186
1968/69	4,337	14	2,034	2,215	4,263	683	9,283
1969/70	4,781	80	2,987	3,461	6,528	825	12,134
1970/71	5,017	137	3,015	2,123	5,275	639	10,931
1971/72	5,251	45	2,170	881	3,096	595	8,942
Grapefruit:							
1967/68	2,344	6	1,476	442	1,924	204	4,472
1968/69	3,066	5	1,524	410	1,939	221	5,226
1969/70	3,448	50	1,303	239	1,592	1,009	6,049
1970/71	3,182	136	1,291	229	1,656	281	5,119
1971/72	3,575	28	982	124	1,134	247	4,956
Orange juice concentrate:							
Hot pack:							
1967/68	122	---	278	137	415	187	724
1968/69	115	---	315	155	470	185	770
1969/70	157	81	688	336	1,105	378	1,640
1970/71	111	47	616	387	1,050	256	1,417
1971/72	128	7	617	209	833	349	1,310
Frozen:							
1967/68	2,804	440	533	272	1,245	177	4,226
1968/69	2,919	377	379	359	1,115	193	4,227
1969/70	3,552	505	945	612	2,062	202	5,816
1970/71	3,836	526	719	2,424	3,669	203	7,708
1971/72	4,408	327	1,362	1,557	3,246	271	7,925

¹ Season beginning September 1 for fresh grapefruit; November 1 for all other items. ² Box weights, pounds: Oranges, 70; grapefruit, 80; lemons, 76. Figures revised for these weights. ³ Includes tangerines.

Table 14.—Fresh and processed citrus fruits: Average retail prices, selected cities, United States, by months, 1968-73

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
FRESH												
Oranges (dozen):												
1968	89.6	71.7	93.5	90.1	92.8	90.3	94.3	103.0	109.3	111.9	106.2	86.0
1969	83.0	82.7	82.9	82.5	82.4	81.9	83.5	86.6	86.2	86.1	86.4	81.6
1970	78.7	80.6	81.2	79.2	80.1	83.6	87.8	90.5	91.9	99.0	94.5	89.7
1971	83.9	86.8	87.7	87.5	91.2	93.8	96.5	101.5	103.7	102.9	98.8	96.3
1972	92.9	91.7	91.2	88.2	88.7	92.7	95.4	101.3	100.6	100.9	97.0	90.0
1973	97.1	97.0	99.8	101.7	103.2	101.5	101.5	110.6				
Grapefruit (each):												
1968	13.8	14.0	14.2	14.9	16.6	17.2	17.5	18.5	18.7	20.4	18.1	15.0
1969	14.0	13.9	13.2	13.2	13.5	14.1	15.3	19.1	20.2	18.0	14.1	13.9
1970	14.1	14.9	14.7	14.9	15.7	18.6	21.1	20.9	20.4	18.6	14.6	13.9
1971	13.8	14.3	14.6	15.9	16.6	20.2	22.7	23.8	23.2	20.8	17.1	16.3
1972	16.3	16.3	16.7	16.4	17.7	19.5	20.5	24.2	24.6	25.2	18.4	17.5
1973	17.2	17.5	17.5	17.3	17.8	19.5	21.8	25.0				
Lemons (pound):												
1968	27.6	27.3	27.0	27.5	27.5	26.7	25.9	26.0	25.9	26.2	27.0	26.0
1969	27.0	28.3	28.2	28.3	28.1	28.5	28.6	29.5	29.5	30.8	31.3	31.8
1970	31.6	31.1	31.5	31.0	30.9	30.3	29.9	30.6	31.2	32.1	32.5	31.9
1971	31.9	32.4	32.5	32.8	32.9	32.9	33.2	32.8	32.7	33.1	33.4	33.8
1972	34.1	34.5	34.6	34.6	34.6	34.4	33.7	34.6	35.1	35.6	35.1	35.1
1973	34.8	35.8	36.4	36.6	36.5	35.8	36.2	37.7				
CHILLED JUICE												
Orange (quart):												
1968	38.6	39.3	39.7	40.4	41.2	41.3	41.7	42.3	43.5	42.8	42.8	43.1
1969	43.0	43.3	44.4	45.1	44.9	45.2	45.0	45.2	45.3	45.3	45.2	45.0
1970	44.5	44.6	44.6	44.3	44.3	44.0	44.3	44.6	44.2	44.5	44.3	43.9
1971	43.6	42.8	42.8	43.7	44.6	45.2	46.2	46.7	47.1	47.0	47.3	47.5
1972	47.4	47.4	47.4	47.6	47.4	47.4	47.4	47.8	47.2	47.3	47.4	47.6
1973	47.9	48.0	47.8	47.8	47.9	48.2	48.1	48.1				
FROZEN												
Concentrated orange juice (6-oz. can):												
1968	19.4	19.9	20.1	20.6	21.0	21.2	21.4	21.4	21.7	22.1	22.3	22.2
1969	22.6	23.1	24.3	24.9	25.3	24.6	24.5	24.4	24.2	23.9	23.7	23.7
1970	23.5	23.5	22.8	22.5	22.5	22.5	22.3	22.4	22.3	21.9	21.8	21.6
1971	21.5	21.6	21.6	22.1	22.3	23.2	23.9	24.5	25.0	25.0	24.9	24.9
1972	24.9	25.0	25.1	25.1	25.0	24.9	25.0	24.9	25.0	24.8	25.0	25.0
1973	25.0	25.1	25.1	25.4	25.1	24.8	24.9	24.9				
Concentrated lemonade (6-oz. can):												
1968	12.4	12.6	12.6	12.6	12.4	12.3	11.9	12.1	12.1	12.4	12.4	12.5
1969	12.4	12.5	12.5	12.6	12.7	12.6	12.4	12.7	12.8	12.8	12.9	13.0
1970	13.1	13.1	13.2	13.3	13.4	13.2	13.0	13.1	13.0	13.3	13.4	13.6
1971	13.6	13.7	13.7	13.8	13.8	13.9	13.9	14.0	14.1	14.2	14.1	14.3
1972	14.3	14.4	14.4	14.4	14.3	14.3	14.1	14.1	14.3	14.4	14.6	14.6
1973	14.6	14.6	14.7	14.8	14.8	14.6	14.6	14.6				

Data from Bureau of Labor Statistics, U.S. Department of Labor.

Table 15.—Apples: Commercial production¹, 1971, 1972, and indicated 1973

State and area	Utilized		1973	State and area	Utilized		1973
	1971	1972			1971	1972	
	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>		<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>
Eastern States:				Central States cont'd:			
New England	351.9	294.8	254.8	Iowa	10.6	13.3	10.4
New York	925.0	770.0	720.0	Missouri	56.2	60.0	51.0
New Jersey	110.0	88.0	100.0	Kansas	15.0	12.0	15.0
Pennsylvania	505.0	400.0	410.0	Kentucky	19.4	14.1	10.0
Delaware	12.0	11.0	12.0	Tennessee	9.4	9.2	4.0
Maryland	69.0	66.0	66.0	Arkansas	9.6	8.6	6.0
Virginia	480.0	420.0	400.0	Total	1,251.7	1,248.2	861.4
West Virginia	250.0	215.0	210.0	Western States:			
North Carolina	185.0	245.0	210.0	Idaho	90.0	50.0	125.0
South Carolina	15.0	20.0	15.0	Colorado	74.0	11.0	91.0
Total	2,902.9	2,529.8	2,397.8	New Mexico	12.0	2.0	40.0
Central States:				Utah	25.0	4.0	55.0
Ohio	150.0	135.0	100.0	Washington	1,200.0	1,370.0	1,800.0
Indiana	90.0	75.0	63.0	Oregon	125.0	105.0	145.0
Illinois	103.0	100.0	85.0	California	400.0	490.0	510.0
Michigan	700.0	730.0	440.0	Total	1,926.0	2,032.0	2,766.0
Wisconsin	65.0	65.0	50.0	United States	6,080.6	5,810.0	6,025.2
Minnesota	23.5	26.0	27.0				

¹ In orchards of 100 or more bearing trees.

Table 16.—Grapes: Production in principal States, 1971, 1972 and indicated 1973

State	1971	1972	1973	State and variety	1971	1972	1973
	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>		<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
New York	200,000	103,000	126,000	Arkansas	9,200	9,500	8,000
New Jersey	1,300	600	1,250	Arizona	14,000	13,600	11,600
Pennsylvania	57,000	37,600	40,000	Washington	79,400	62,100	71,000
Ohio	19,000	12,000	15,000	California:			
Michigan	69,000	53,000	23,000	Wine	769,000	630,000	900,000
Missouri	3,500	3,600	1,500	Table	448,000	274,000	420,000
North Carolina	2,800	2,200	2,600	Raisin	2,317,000	1,362,000	2,200,000
South Carolina	6,300	5,200	4,800	Dried ¹	191,000	105,000	---
Georgia	1,220	1,250	1,300	Not dried	1,439,000	926,000	---
				All	3,534,000	2,266,000	3,520,000
				United States	3,996,720	2,569,650	3,826,050

¹ Dried basis. 1 ton of raisins is equivalent to 4.60 tons of fresh grapes for 1971 and 4.15 for 1972.

Table 17.—Canned noncitrus fruit: Cannery carryin, pack and supplies, current season, with comparisons

Item and season ¹	Carryin	Pack	Total supply	Item and season ¹	Carryin	Pack	Total supply
	<i>1,000 equivalent cases, 24 No. 2½'s</i>				<i>1,000 equivalent cases, 24 No. 2½'s</i>		
Total—8 items:				Fruit cocktail: ²			
1969/70	12,156	61,780	73,936	1969/70	3,316	16,686	20,002
1970/71	15,326	47,084	62,410	1970/71	³ 3,426	13,081	16,507
1971/72	13,841	43,954	57,795	1971/72	3,453	13,334	16,787
1972/73	10,476	41,160	51,636	1972/73	4,336	11,855	16,191
1973/74	4,915	43,893	48,808	1973/74	2,335	13,400	15,735
Apricots: ²				Clingstone peaches: ²			
1969/70	1,037	5,543	6,580	1969/70	5,637	31,479	37,116
1970/71	³ 2,067	3,766	5,833	1970/71	³ 7,375	24,878	32,253
1971/72	1,696	3,262	4,958	1971/72	6,763	21,839	28,602
1972/73	561	3,041	3,602	1972/73	3,890	21,233	25,123
1973/74	298	4,094	4,392	1973/74	1,591	21,574	23,165
Cherries, RSP:				Freestone peaches: ²			
1969/70	100	1,505	1,605	1969/70	1,562	4,104	5,666
1970/71	152	978	1,130	1970/71	³ 1,415	2,512	3,927
1971/72	102	1,041	1,143	1971/72	1,064	2,463	3,527
1972/73	243	1,299	1,542	1972/73	792	1,863	2,655
1973/74	9	579	588	1973/74	181	2,306	2,487
Cherries, sweet:				Mixed fruits: ²			
1969/70	112	947	1,059	1969/70	162	728	890
1970/71	³ 330	663	993	1970/71	262	548	810
1971/72	385	536	921	1971/72	158	695	853
1972/73	315	393	708	1972/73	114	752	866
1973/74	190	503	693	1973/74	99	610	709
Fruits for salad: ²							
1969/70	230	788	1,018				
1970/71	³ 299	658	957				
1971/72	220	784	1,004				
1972/73	225	724	949				
1973/74	212	827	1,039				

¹ Season beginning July 1 for RSP cherries and June 1 for all other items. ² California only. ³ 1970/71 canners carryin excludes cyclamate packs.

Prepared from reports of National Cannery Association and Cannery League of California.

Table 18.—Fresh fruit: Retail price, marketing margin, and grower and packer return per pound, sold in New York City, seasonal average, 1970/71-1972/73

Commodity and Season	Retail price (cents)	Marketing margin		Grower and packer return ¹ (F.o.b. shipping point price) ²	
		Cents	Percentage of retail price	Cents	Percentage of retail price
Apples, Eastern Red Delicious³					
1972/73	25.5	9.1	36	16.4	64
1971/72	23.5	10.9	46	12.6	54
1970/71	22.7	9.9	44	12.8	56
Apples, Eastern McIntosh⁴					
1972/73	28.0	15.9	57	12.1	43
1971/72	24.2	16.0	66	8.2	34
1970/71	22.9	14.7	64	8.2	36
Apples, Western Red Delicious⁵					
1972/73	38.6	20.8	54	17.8	46
1971/72	34.7	18.9	54	15.8	46
1970/71	33.8	18.8	56	15.0	44
Grapes, Thompson Seedless⁶					
1972	61.1	33.2	54	27.9	46
1971	52.5	30.0	57	22.5	43
1970	47.0	25.2	54	21.8	46
Lemons, Western⁷					
1972/73	36.4	22.8	63	13.6	37
1971/72	34.8	22.0	63	12.8	37
1970/71	34.5	22.2	64	12.3	36
Oranges, California Navel⁸					
1972/73	29.3	19.1	65	10.2	35
1971/72	25.9	17.3	67	8.7	33
1970/71	25.5	16.3	64	9.2	36
Oranges, California Valencia⁸					
1972	25.1	17.0	68	8.1	32
1971	23.7	15.0	63	8.7	37
1970	23.4	15.3	65	8.1	35
Oranges, Florida⁹					
1972/73	16.0	10.6	66	5.4	34
1971/72	15.8	10.2	65	5.6	35
1970/71	14.5	9.7	67	4.8	33

¹For quantity of product equivalent to retail unit sold to consumers: Because of waste and spoilage during marketing, equivalent quantity exceeds retail unit. ²Production areas and Season: Apples, Eastern Delicious-New York State (Oct.-May); Apples, Eastern McIntosh-New York State (Nov.-May); Apples, Western Delicious-Washington (Oct.-June); Grapes-California

(July-Oct.); Lemons-California (Nov.-Oct.); California Navel Oranges-(Dec.-May); California Valencia Oranges-(May-Nov.); Florida Oranges-(Nov.-May). ³Combination U.S. fancy and U.S. extra fancy, size 125 and larger. ⁴U.S. fancy, size 2 1/4" and larger. ⁵Extra fancy, size 138 and larger. ⁶U.S. No. 1. ⁷Size 140-165. ⁸All sizes. ⁹All sizes and varieties.

WASHINGTON'S APPLE INDUSTRY: FUTURE TREE NUMBERS AND PRODUCTION

By

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ABSTRACT: Future tree numbers, production and prices were forecast for the Washington State apple industry under present and alternative market policies. An economic model integrating supply, demand, and the random effects of weather was constructed for 1972-81. The first market policy, a facsimile of the present market policy, resulted in low fresh and processing prices. This led to a reduction in the State's apple tree population. The second policy allocated production between the fresh and processing market so that returns to growers were maximized. This increased average prices above those of the present policy. Tree numbers increased slightly by 1981 but production almost doubled as presently young trees matured. Most of this increased production would be diverted into the processing market.

KEY WORDS: Apples, economic models, fresh apples, market allocation prices, processing apples, production, tree populations.

Introduction

Washington State is the Nation's leading apple producer, accounting for 22 percent of U.S. production of apples and 30 percent of total fresh apple sales during the last 10 years. Thus, future supplies of Washington apples are of national interest.

Since the early 1950's production of Washington apples has been increasing (Fig. 1). Production is going to continue to trend upward because of the large number of nonbearing apple trees and young bearing trees (Fig. 2). Plantings have proceeded at an unprecedented rate since the late 1960's. As a result, today's potential production is capable of surpassing all previous records (Harrington, 1972). In 1971 there were an estimated 6.5 million bearing apple trees in Washington. Nonbearing trees indicate a possible 4 million increase in bearing trees in the next few years, which could potentially increase production by as much as 60 percent.

An economic model was used to project future prices, production, and tree numbers for

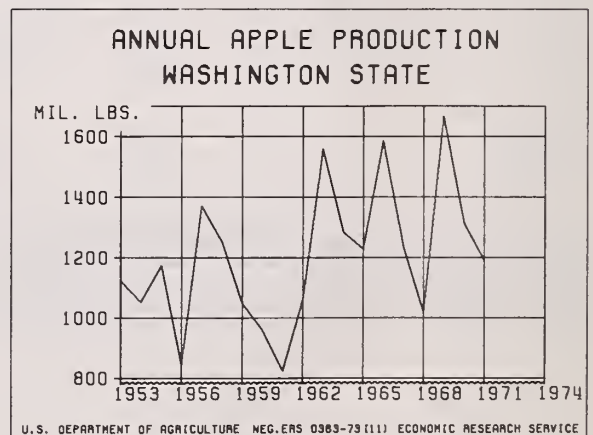


Figure 1

Washington's apple industry from 1972 through 1981. The model integrated supply, demand, and random components such as weather into a computer stimulation model. The model operated under two *alternative* assumptions:

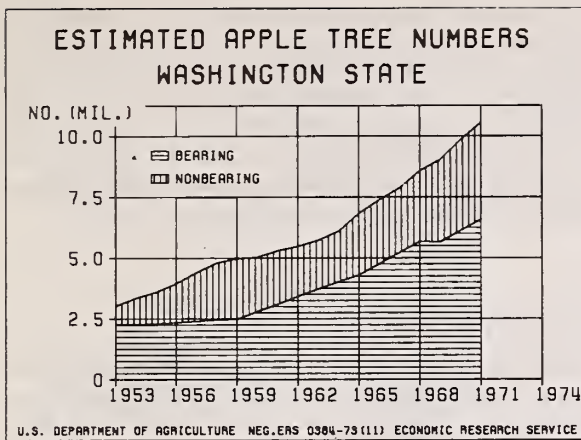


Figure 2

- I. The industry will continue its present form of market allocation to the fresh and processing markets where approximately 80 percent of Washington's apple production is sold in the fresh market.
- II. The industry will be reorganized so that it allocates production to maximize total growers' revenues. Under this policy a large proportion of the crop goes into the processing market.

The analysis did not account for varietal differences. Thus, since Red Delicious have not been

as acceptable for processing as other varieties, and since a significant proportion of Washington's production is Red Delicious, an analysis by variety may show the maximum return point to have a smaller proportion being processed.

While there has been considerable work done on demand relationships for Washington apples, little work had previously been done on the supply relationships.

Supply Relationships

Grower supply response relationships for perennial crops such as Washington apples are characterized by both short and long-run aspects. These relationships are expressed in Figure 3. Total apple production is determined by the number of bearing trees in each age group times the yield per tree for each age group. Yield per tree, however, is primarily a function of current and past weather. A major freeze not only has the immediate effect of killing trees and reducing production but may also affect the general health, vigor, and production of an orchard for many years. Frosts or rain during the bloom period, hail, and untimely hot spells prior to harvest are just a few of the possible short-run factors that have an effect on the yield per tree and also on the quality of fruit. The effect of meteorological, physiological, and management links with production are complex, and difficult if not impossible to specify directly. Therefore in computer simulation work, yield can be

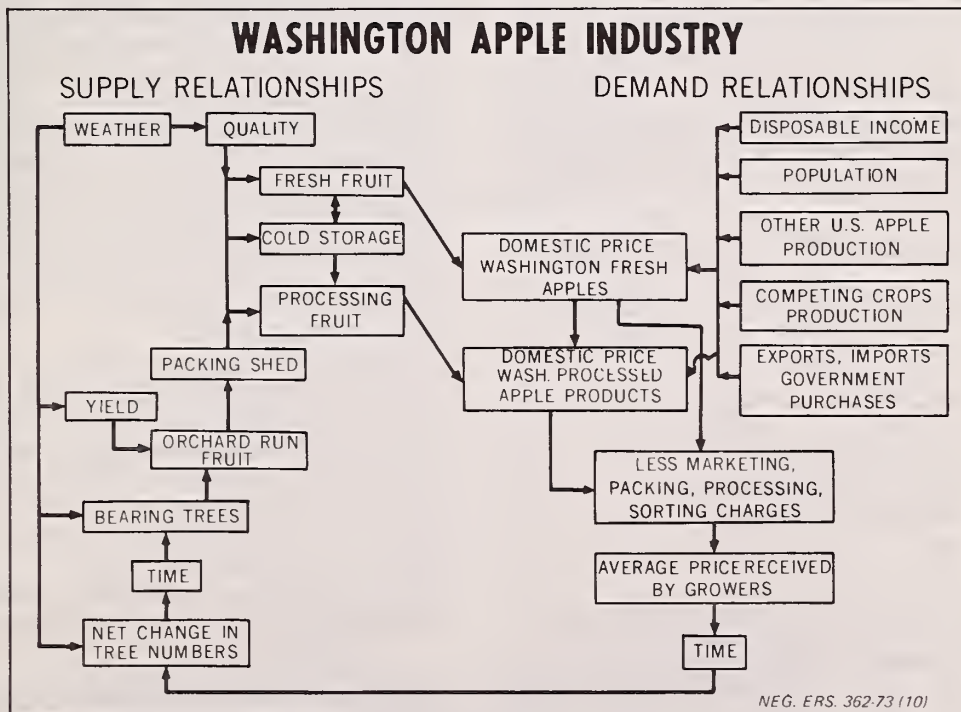


Figure 3

treated as a random variable with a distribution determined by historical patterns. Similarly, quality of apples produced can be treated as a random variable with either a normal quality crop or a poor quality crop occurring.

Freezes, severe enough to kill trees, were also introduced into the model. The chance of several types of freezes occurring was specified and when a freeze did occur the damage took place over a 3-year period.

The number of apple trees is equal to the number of trees the previous year minus the number of trees killed by a freeze (provided one or more freezes occurred in the previous 3 years) plus the net change in tree numbers due to economic factors (number of new plantings less removals). The number of new trees planted by growers each year is a function of what growers anticipate they will receive for their apples in the future. Research has shown that growers base their expectations on prices received in the past (Baritelle, 1973)¹.

To project future tree numbers and production, future average prices received by growers must be estimated. To accomplish this, the demand relationships for Washington fresh and processing markets must be integrated with the supply relationships as expressed in Figure 3. Given annual production, a marketing strategy is imposed so as to determine the quantity sold fresh and the quantity sold for processing. A weighted average price received by growers is then computed. This price together with prices for the previous seasons' is used to determine the net change in tree numbers. Tree numbers can be updated and the random variables freeze and yield can be determined. Production can then be simulated for the next year and so on. This process is repeated through crop year 1981. The problem is to project average prices², production, and tree numbers. This was accomplished by repeating

the above process a sufficient number of times, since the outcome for each run will be different due to the random components such as freeze and yield. After running the model numerous times, for the period 1972-81, expected (or average) total production and tree numbers were ascertained. Average values and an indication of how widely they varied are presented in the remainder of the article.³

Results

Alternative I

Over the past 10 years, Washington apple growers have sent an average of 80 percent of their crop to the fresh market. The percentage has varied depending on the size of the crop. In years of large crops they have sold nearly 70 percent of their apples to the fresh market, while in years of extremely short supply they have sold nearly 90 percent fresh. The model initially assumed that the traditional 80 percent of total production went to the fresh market. This only approximates what the industry might do in the future. A further provision was included in the model to assure that in future years with unprecedented large crops the price in the fresh market would not drop below the price in the processing market.

The expected average prices received by growers plus and minus one standard deviation through crop year 1981 are displayed in Figure 4. The expected future prices generated by the model decline to about 3.3 cents per pound in 1975. Projected prices show a marked increase in the late 1970's and early 1980's. This is due to reduced production caused by the removal of trees. This removal was in turn caused by the low prices received earlier and resulted in a decline in per capita production.

The likely total Washington apple production is also shown in Figure 4. Expected production increases markedly until 1975, primarily due to the large number of young apple trees presently planted. As they mature they become increasingly productive. Expected annual production seems to stabilize at around 1.8 billion pounds throughout the remainder of the projection period.

The effect of low prices in the early to mid-1970's has a rather dramatic effect on total tree population. The expected number of trees declines from 10.9 million in 1972 to approximately 8.3 million in 1981. This is due to the expected low prices which encourage removal or abandonment of apple trees. Production continues to increase and stabilize despite the decrease in tree numbers.

The reduced tree population suggested by a continuation of the present policy is such a severe

¹The following estimated equation with its associated test statistics was selected for use in the simulation model:

$$(1.14) \quad N_t = 2,791,640 + 50,487.92P_{t-0} + 77,142.94P_{t-1} \\ + 94,379.10P_{t-2} \\ (6.823) \\ + 102,136.40P_{t-3} + 100,594.84P_{t-4} \\ (5.909) \quad (6.035) \\ + 89,574.42P_{t-5} \\ (6.046) \\ + 69,135.14P_{t-6} + 39,277.00P_{t-7} \\ (6.011) \quad (5.971) \\ R^2 = .696$$

Durbin Watson = 1.912

where

N_t = the net change in apple trees in year t
 P_{t-r} = the average price received by growers r years past.

²All prices are deflated in terms of farm purchasing power as of 1967. Therefore, all projected prices are in terms of 1967 prices.

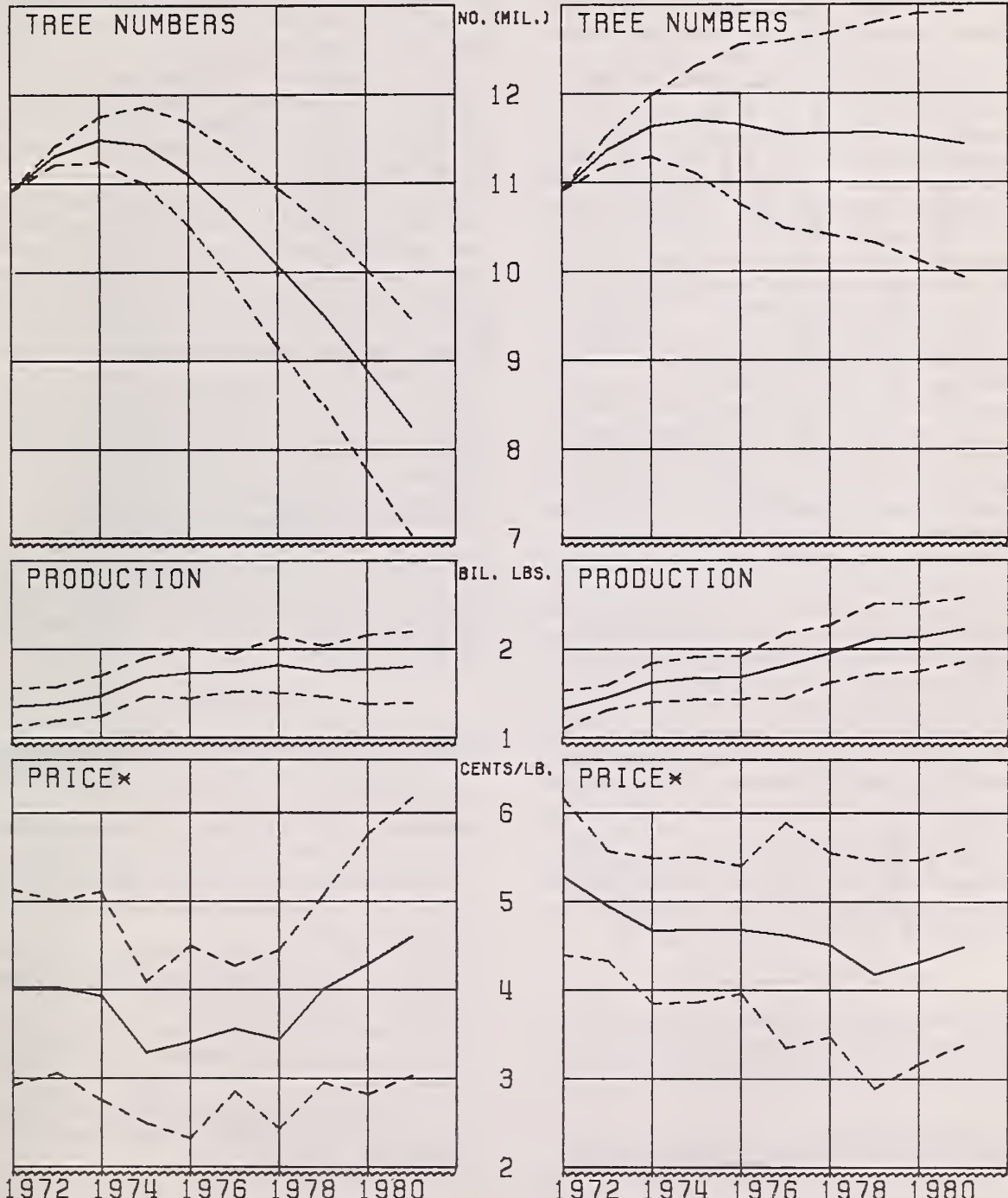
³The expected average value plus and minus one standard deviation includes 66 percent of the possible expected outcomes.

APPLE TREE NUMBERS, PRODUCTION, AND PRICE*

WASHINGTON STATE PROJECTIONS

PRESENT MARKET POLICY (I)

ALTERNATIVE POLICY (II)



1972 1974 1976 1978 1980
 ——— EXPECTED AVERAGE - - - ±1 STANDARD DEVIATION
 *AVERAGE PRICE RECEIVED BY GROWER (PACKING HOUSE DOOR).

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Figure 4

adjustment that it is probably unrealistic. The industry would probably not permit prices to fall to such low levels when alternatives exist for better prices.

Alternative II

Scott (1972) and others have shown that Washington growers could increase the average prices they receive by selling a greater proportion of their crop in the processing market. Briefly, price in the processing market is much less sensitive to a given quantity of apples being placed in that market than in the fresh market. Thus, in large crop years the season's fresh market price falls dramatically while the processing price falls by a relatively small amount. Allocating more production to the processing market causes price in the fresh market to increase far more than the corresponding price decrease in the processing market.

An alternative marketing policy was simulated, which changed from the 80 percent fresh allocation to an allocation of annual production that would maximize the total revenues for a given year and given crop size.⁴ Although it is doubtful that the industry would organize in a manner necessary to implement such a policy, it serves to illustrate the direction the industry might follow when faced with the impending increased production and low prices.

The expected average price received by growers under the alternative policy is shown in Figure 4. Expected prices drop only to 4.6 cents per pound. Figure 4 shows these prices are high enough to cause tree numbers to increase to about 11.5 million in 1981. Although tree numbers stabilize, expected production increases to about 2,200 million pounds by the year 1981, above the 1,800 million pounds expected if the present marketing policy continues. Either figure represents a considerable increase over the estimated 1972 production of approximately 1,350 million pounds. Actual reported production in 1972 was 1,370 million pounds. Should Washington growers decide to take greater advantage of their processing market within the next few years, their total apple production could increase from 1.8 to 2.2 billion pounds.

Summary and Implications

Future tree numbers, production and price were simulated under two different market allocation assumptions. The *present allocation* method yields

⁴This was done by equating the marginal revenues in each market. It can be shown that this maximizes revenues.

expected returns to growers of 3.3 to 4.6 cents per pound during the 1972-81 period. These prices result in a reduction of the state's apple trees from an estimated 10.9 million in 1972 to approximately 8.3 million trees in crop year 1981. Despite the reduction in tree population, expected apple production increases to over 1.8 billion pounds by 1978. However, by 1980 the increasing productivity per tree will be offset by reduced tree population, and expected production stabilizes at 1.8 billion pounds in crop year 1981. Because of the severe adjustments indicated by the present allocation of apples between the fresh and processing markets, an alternative market policy was examined.

The *alternative policy* maximizes annual grower revenues by reallocating annual production from the fresh market to the processing market. Expected prices received by growers increase. The expected prices of 4.2 to 5.2 cents per pound result in a slight increase in the number of apple trees to about 11.5 million. Expected production increases to about 2.2 billion pounds.

It is doubtful that the Washington apple industry could or would organize in a manner necessary to take full advantage of this type of allocation policy. However, the results of this policy show the usefulness of the processing market in maintaining average returns to growers. Thus, in the next decade as expected production increases, the Washington apple industry is likely to voluntarily increase the proportion of the crop going into the processing market which would tend to maintain present prices and tree numbers.

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