NAFTA AND FLORIDA TOMATOES: HOW WILL FLORIDA GROWERS SURVIVE?

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Abstract. The North American Free Trade Agreement (NAFTA) has altered the rules governing the winter fresh vegetable trade between Mexico and the U.S. and may have been a significant factor behind increased imports of fresh tomatoes (Lycopersicon esculentum Mill.) from Mexico and the consequent weakening of the Florida fresh tomato industry’s position in the U.S. market. Imports of Mexican tomatoes during the winter and early spring seasons have exceeded the tariff-rate quotas in NAFTA implementing legislation in the three seasons since NAFTA came into operation. However, Florida growers have been unsuccessful in obtaining import relief under U.S. trade law. Increased Mexican imports have resulted in decreased grower revenues, income and employment in the Florida tomato industry. Action in the areas of research and development, market promotion and quality improvement will be necessary if Florida growers are to remain competitive.

The North American Free Trade Agreement (NAFTA), a trilateral agreement among the United States (U.S.), Canada and Mexico, came into effect January 1, 1994. Its purpose is to increase national income and employment in the participating countries, lower prices and expand trade through the elimination of tariff and non-tariff barriers. It is also intended to foster a substantial increase in investment in the free trade area.

For the purposes of this paper, attention is limited to the relationship under NAFTA between the U.S. and Mexico. Income growth is expected to be observed in both countries with more significant (short-term) growth occurring in Mexico (Congress of the United States, 1993a; 1993c, Gruben, 1992). A similar outcome is anticipated with respect to employment and investment. However, the impact of NAFTA is not expected to be even across sectors or regions. Not all sectors in any economy will benefit to the same extent and in theory, be compensated. Whether compensation takes place in practice is a separate matter and depends significantly on the political influence of the particular industry or region.

NAFTA and the Agricultural Sector

The agricultural sector was particularly important in the negotiation of NAFTA. In fact, two separate bilateral agreements are included for free trade in agricultural products: one between Mexico and the U.S. and the other between Canada and the U.S. The agriculture provisions address a number of issues including tariffs, quantitative restrictions, standards for grading and marketing products, special safeguards for import-sensitive products, rules of origin, domestic farm supports, and sanitary and phytosanitary requirements. By far the most important provisions are those relating to market access; namely, the removal of barriers to trade, special safeguards and sanitary and phytosanitary requirements. The provisions relating to domestic support policies are tentative with such policies, in effect, remaining outside the influence of NAFTA. The agreements merely suggest that each country should endeavor to work towards measures which do not distort trade or production.

The overall effect of NAFTA on the agricultural sector is expected to be positive but modest in the U.S., though sizeable losses may be experienced in Mexico (Congress of the United States, 1993b). Not all agricultural sectors in Mexico will suffer welfare losses and, indeed, the more export-oriented and labor-intensive segments of Mexico’s agriculture are expected to benefit. One such segment is the fresh fruit and vegetable subsector. On the other hand, some U.S. horticultural products (e.g., the winter fresh vegetable industry) are expected to decline (Congress of the United States, 1993a; 1993c; Krissoff et al., 1992).

When NAFTA came into effect, tariffs and quantitative restrictions on a number of agricultural products were immediately eliminated. However, for certain import-sensitive commodities (e.g., asparagus, cucumbers, cantaloupes), special safeguards were established in the form of transition periods, tariff-rate quotas (TRQs) and snap-back provisions. Transition periods can extend up to fifteen years for some commodities. The TRQ for most products will increase by 3% annually compounded. Imports within the TRQ will be subject to the applicable preferential rate of duty established in NAFTA. Over-quota imports will be subject to tariffs not in excess of the most favored nation (MFN) rate of duty as of July 1, 1991 or the prevailing MFN rate, whichever is lower. Within-quota tariffs will be gradually reduced over the transition period; over-quota tariffs will not be reduced but will be eliminated completely at the end of the transition period.

Special safeguards exist within the context of the NAFTA Implementation Act (Section 316) for fresh tomatoes produced in the U.S. Specifically, a ten-year transition period exists with tariff-rate quotas for the initial 1994-95 season of 172,300 metric tons for the market period of November 15 to end of February and 165,500 metric tons for the period of March 1 to July 14. The TRQ increases by 3% each year until the ten-year transition ends. The initial import tariff rates corresponding to these periods were 4.6 cents/kg. and 3.3 cents/kg. respectively. These tariffs will be phased down evenly over the transitional period at 10 per cent per year beginning January, 1994. For shipments over the quota, the MFN tariff rate would apply. The U.S. International Trade Commission (ITC) has the responsibility under the NAFTA Implementation Act to monitor the imports of fresh tomatoes and to ensure that the intended safeguard mechanism is effective.

The transportation and investment provisions of NAFTA will also likely have a significant impact on trade in fruit and vegetables. NAFTA provides for the liberalization of the transportation sector within six years after its entry into force. By 1997, trucks meeting in-country standards will be able to...
make deliveries to bordering states. Six years after the implementation of NAFTA, trucks will be able to make deliveries anywhere throughout the U.S. and Mexico, thereby eliminating the need for off-loading and re-loading of produce at the border. The current off-loading requirement adds a significant cost to the marketing of Mexican produce in the U.S. and Canadian markets. Liberalization of the transportation sector should result in substantial cost reductions for Mexican produce. Besides, to the extent that improvements in land transportation takes place as a result of increased access of U.S. trucking firms into Mexico, trade could expand at a faster pace than is now possible. Another favorable impact likely to arise from the elimination of the off-loading requirement is improved product quality due to reduced handling.

NAFTA is expected to bring about a significant increase in investment in Mexico. The investment provisions of the agreement in general allows equal treatment for U.S. and Mexican companies, protects U.S. investors from expropriation and facilitates the repatriation of capital and profits. These measures will encourage investment and the modernization of production and processing facilities in Mexico. Moreover, foreign investment grew in anticipation of the implementation of the agreement (Congress of the United States, 1993a). This increased investment has spurred productivity growth, lowering prices for Mexican produce and increasing its attractiveness in the U.S. market.

This situation is compounded when the land reform being undertaken in Mexico is considered. While this land reform has nothing to do with NAFTA, it is related to the agreement in the context of the overall economic liberalization and reduced government intervention taking place in Mexico. Specifically, the reform facilitates the acquisition by individuals of holdings in excess of 100 hectares of irrigated land, the prior limit. Larger land holdings have the potential for increasing efficiency in the production and marketing of Mexican produce by increasing the scale of operations. In addition, because more of a land market now exists, the ability to use land as collateral against loans makes financing more accessible.

While most analyses of the impact of NAFTA focus on the provisions relating to market access, along with productivity and efficiency considerations (e.g., transportation liberalization, increased investment, land reform), other non-economic factors can be important from the standpoint of impact, although difficult to quantify. NAFTA might have clarified the ‘rules of the game’ for Mexican producers. Prior to the agreement and particularly in the 1970s, Mexican fresh tomato producers, with the support of the Mexican government, operated an export restraint policy whereby supply was adjusted by limiting acreage and varying quality and maturity requirements depending on prevailing market conditions. This was done, essentially, to avoid unilateral imposition of stricter import controls by the U.S. in the context of the ‘Tomato War’ and always with a view to wider international considerations (Bredahl et al., 1983; 1987). In other words, Mexico imposed some self-discipline in order to maintain a position in the market and to satisfy broader economic and other objectives. The implementation of NAFTA eliminated the need for Mexico to ‘second guess’ U.S. policy and, at the same time, boosted the confidence of Mexican suppliers. This increased confidence is likely to have a significant impact on Mexican production and exports of fresh tomatoes. Gruben (1992) contends that a free trade agreement “has the credibility-linked benefit of establishing a long-term opening to Mexico’s largest foreign market” and “increases the security of expectations”.

Exchange rate policy is not within the scope of NAFTA. However, in the negotiation of the agreement it was recognized that the exchange rate policy pursued by Mexico can influence in a significant way the trade between Mexico and the U.S. An overvalued exchange rate would be beneficial to U.S. exports but will stymie exports from Mexico. An undervalued exchange rate, on the other hand, will hinder U.S. exports to Mexico and encourage U.S. imports of Mexican products. Prior to NAFTA, some observers feared that Mexico might attempt to maintain too low an exchange rate in order to limit deterioration of its current account balance (Congress of the United States, 1993b).

The impact of any changes in the exchange rate by Mexico will be greater with the removal of tariff and non-tariff barriers under NAFTA. This is because tariff and non-tariff barriers can reduce exchange rate pass-through. By removing trade barriers, NAFTA is more conducive to greater exchange rate pass-through, Mexican export expansion, and increased Mexican market share as a result of expenditure-switching. The fresh fruit and vegetable sector in Mexico is highly susceptible to export market conditions since it is operated generally by farmer-entrepreneurs (Yunez-Naude, 1991) and was developed with the express objective of catering to external demand. The Mexican fresh fruit and vegetable subsector is therefore likely to greatly benefit from any devaluation.

In summary, there are many factors directly and indirectly related to NAFTA, which are conducive to the expansion of imports of Mexican fresh fruits and vegetables. These include the reduction and ultimate removal of tariff and non-tariff barriers, the enhancement of productivity and efficiency in production and marketing, greater confidence on the part of Mexican producers and increased “competitiveness” possible with a devaluation of the Mexican peso. Studies completed prior to the implementation of NAFTA concur that the Mexican fruit and vegetable industry will expand exports to the U.S. and that some segments of the U.S. domestic industry will suffer losses. Recent developments have shown what effects a devaluation of the peso can actually have on the fruit and vegetable trade. The foreseen impact on the domestic industry provided the motivation for the special safeguards contained in the NAFTA Implementation Act to minimize and smooth the effects of transition for the domestic industry.

Impact of NAFTA on the Florida Fresh Tomato Industry

Fresh tomato shipments from Mexico have increased substantially since NAFTA was implemented. Tariff-rate quotas were exceeded in the 1993-94 and 1994-95 seasons. Mexican tomato exports of 183,634 metric tons exceeded the TRQ of 165,500 for the March 1 to July 14 period in 1994. Mexican fresh tomato exports to the U.S. for the November 15 to the end of February totaled 203,883 metric tons in 1994-95, surpassing the TRQ of 172,300 metric tons (J. VanSickle, mimeographed report). Annual shipments of fresh tomatoes from Florida, on the other hand, have declined each year from a peak of 814,370 metric tons in 1991-92. Empirical research has established that increases in Mexican fresh tomato shipments negatively affect shipments made by Florida (Shonkwiler and Emerson, 1982; Jordan, 1995). This does not imply that increased Mexican imports are the sole cause of the re-
duction in shipments from Florida. Although 1992 was an unusual year when Mexican production was adversely affected by weather, the shipments from Florida in 1993 to 1995 seasons have declined and were below shipments in 1988 and 1989. The 1995 shipments were approximately the same as those made in 1991, a year when shipments were severely impacted by a freeze (Table 1).

As a result of increased shipments, average prices received by Florida for fresh tomatoes declined in 1994 and 1995 relative to the 1991 to 1993 period. Demand for fresh tomatoes in the U.S. is inelastic, meaning that a small increase in quantity can bring about a large fall in price. Reduced shipments and prices imply that revenues received by Florida growers also fell consistently over the 1992 to 1995 period (Table 1). The situation in 1995 was severe with a depressed market causing low prices and the consequent abandonment of mature fields. Decreases in harvested acreage and yields in Florida, comparing the above periods, underscore this point (Table 1).

The present analysis cannot indicate definitively that the increased Mexican shipments and the consequent negative impact on Florida producers of fresh tomatoes are a direct impact of NAFTA. However, it would appear that the direction of the anticipated impacts are consistent with recent developments in the U.S. fresh tomato market. Specifically, the effect of the devaluation of the Mexican peso beginning in December, 1994, the overall increase in the confidence of Mexican growers as a result of the implementation of NAFTA, and probable increases in productivity are likely to be much more significant factors. Of these, the effect of the devaluation is, perhaps, the most palpable.

### Florida Petition for Import Relief

On March 29, 1995, fresh tomatoes growers in Florida, represented by the Florida Tomato Exchange (FTE), filed a petition for protection from imports of fresh tomatoes (from Mexico) under Section 202 of the U.S. Trade Act of 1974. The FTE petition was limited to the January-April period (winter market) during which time Florida and Mexico together effectively satisfy the entire U.S. market. The FTE contended that increased imports of fresh tomatoes from Mexico were causing serious injury or were constituting a threat of serious injury to the Florida industry, depressing prices, reducing the quantities shipped by Florida, and bringing about a fall in employment and profitability. Florida producers argued the case for a winter fresh tomato industry because ‘fresh winter tomatoes’ were not directly competitive with fresh tomatoes produced at other times of the year.

Both provisional and permanent relief were requested. Provisional relief was sought for the maximum period of time permitted by the law. The FTE specifically requested that the ITC recommend increasing the current rate of duty on fresh tomatoes to 50% ad valorem. A quota on imports for the maximum period allowed by statute was requested as permanent relief. The ITC was also asked to recommend to the President of the U.S. that international negotiations be initiated to address the underlying causes of increased imports and that consideration be given to the negotiation of a market-sharing arrangement between domestic and foreign suppliers. This was among the first petitions filed with the ITC requesting provisional relief with respect to a perishable agricultural product.

The Florida industry was unsuccessful in its efforts to obtain import relief. The ITC did not agree that the relevant market was the winter tomato market of January to April as contended by the FTE. Rather, it concluded that the industry was a full-year industry and, therefore, fresh winter tomatoes were directly competitive with fresh tomatoes produced at other times of the year. The ITC also determined that there was no significant increase in imports from Mexico whether expressed on an annual or on a January to April basis; that the increased imports were not a substantial cause of injury; and that the timing of the petition, provisional relief could not be effective (United States International Trade Commission, 1995).

Whenever the TRQ is exceeded, the NAFTA Implementation Act requires that the tariff rate which prevailed prior to the implementation of the agreement be reinstated. This is the so-called ‘snap-back’ provision. However, although the TRQs were exceeded in the present case, snap-back provisions were not put into effect while imports crossed the border. Rather, the ITC relied on ‘back billing’ shippers after it was discovered that the TRQ was exceeded. This was due to from this source. Therefore, no significant direct impact due to NAFTA to date is likely. Indirect NAFTA effects, and factors outside of NAFTA are more plausible explanations for the recent increases in Mexican fresh tomato shipments. Specifically, the devaluation of the Mexican peso beginning in December, 1994, the overall increase in the confidence of Mexican growers as a result of the implementation of NAFTA, and probable increases in productivity are likely to be much more significant factors. Of these, the effect of the devaluation is, perhaps, the most palpable.

### Table 1. Data on the Florida Fresh Tomato Production, 1985-95.

<table>
<thead>
<tr>
<th>Year</th>
<th>Shipments (MT)</th>
<th>FOB prices ($/25-lb.)</th>
<th>FOB values ($MT)</th>
<th>Acreage Harvested (MT/acre)</th>
<th>Yields (MT/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>594,910</td>
<td>5.99</td>
<td>314,301,727</td>
<td>44,729</td>
<td>13.3</td>
</tr>
<tr>
<td>1986</td>
<td>594,351</td>
<td>7.78</td>
<td>407,841,542</td>
<td>45,530</td>
<td>13.1</td>
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<tr>
<td>1987</td>
<td>639,076</td>
<td>7.28</td>
<td>410,348,018</td>
<td>50,908</td>
<td>12.6</td>
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<tr>
<td>1988</td>
<td>734,062</td>
<td>7.18</td>
<td>464,876,768</td>
<td>53,939</td>
<td>13.6</td>
</tr>
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<td>1989</td>
<td>735,475</td>
<td>9.29</td>
<td>602,632,230</td>
<td>57,663</td>
<td>12.8</td>
</tr>
<tr>
<td>1990</td>
<td>598,143</td>
<td>7.27</td>
<td>383,537,567</td>
<td>49,306</td>
<td>12.1</td>
</tr>
<tr>
<td>1991</td>
<td>627,771</td>
<td>9.51</td>
<td>515,489,263</td>
<td>45,997</td>
<td>13.8</td>
</tr>
<tr>
<td>1992</td>
<td>814,370</td>
<td>8.95</td>
<td>642,855,337</td>
<td>46,255</td>
<td>17.6</td>
</tr>
<tr>
<td>1993</td>
<td>712,680</td>
<td>9.05</td>
<td>586,688,312</td>
<td>44,477</td>
<td>16.0</td>
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<tr>
<td>1994</td>
<td>668,752</td>
<td>7.26</td>
<td>428,228,281</td>
<td>45,189</td>
<td>14.8</td>
</tr>
<tr>
<td>1995</td>
<td>628,786</td>
<td>7.00</td>
<td>380,212,426</td>
<td>43,735</td>
<td>14.4</td>
</tr>
<tr>
<td>Average</td>
<td>668,036</td>
<td>7.85</td>
<td>466,107,861</td>
<td>47,939</td>
<td>13.9</td>
</tr>
</tbody>
</table>

inadequate monitoring of the TRQ by the appropriate authorities (J. VanSickle, mimeographed report). Therefore, Mexico was in violation of the TRQ without suffering the intended penalty and, accordingly, the restrictive effect of safeguard mechanism was not felt.

Summary and Outlook

Mexican fresh tomato shipments have increased in the last two seasons partly in response to NAFTA. As a consequence, shipments by the Florida industry fell. The direct effects may have been less important than the indirect effects of NAFTA. The Florida industry was unable to get the import relief it sought under U.S. trade law. Moreover, although TRQs were exceeded, snap-back provisions were not applied. That is, the safeguard provisions put in place to ensure a smooth transition for the Florida industry were not effective. If there is any question as to whether increased imports from Mexico were a cause of serious injury, it should be clear that the TRQs were exceeded and that the Florida industry should at least have the protection of the negotiated snap-back provisions.

Recent research has established that the Mexican and Florida fresh tomato industries are integrated in the same market (Jordan and VanSickle, 1995) and that there is significant competition between these supplying areas (VanSickle et al., 1994; Jordan, 1995). It has also been shown that the quantity supplied by Mexico is inversely related to shipments by Florida (Shonkwiler and Emerson, 1982; Jordan, 1995) and that the dominant effect of Mexican tomato imports was on U.S. domestic supply rather than price (Shonkwiler and Emerson, 1982). This implies that Florida will experience market share losses in the face of increased Mexican imports. A devaluation of the Mexican peso is consistent with an increase in Mexican shipments (Jordan, 1995) to the detriment of the Florida industry. A conceptual model indicates that a reduction in the import tariff implies increased Mexican supply, though this was not substantiated empirically (Jordan, 1995). This lack of statistical evidence is, perhaps, indicative of the view that the tariff reduction to-date could not have been a major factor behind the increased Mexican supplies.

As seen previously, in addition to the removal of tariff and non-tariff barriers, there is a constellation of factors and developments which serve to enhance Mexico's competitiveness relative to Florida. These include the transportation provisions of NAFTA, increased investment in Mexico as a result of NAFTA, land reform in Mexico, and an unpredictable Mexican macroeconomic environment, evidenced by the recent peso devaluation (VanSickle, 1995). The probability is, therefore, for significant increases in Mexican production and exports. When considered along with an increased regulatory environment, a probable resumption of trading ties with Cuba, and the movement towards greater economic integration of the Western Hemisphere (VanSickle, 1995), the prospects are for a reduction in the competitive position of the Florida industry due to higher costs in Florida and lower prices in competing industries. For the foreseeable future, competition with Mexico will continue to provide the greatest threat and challenge to Florida if for no other reason than its proximity to the U.S.

Proposals for the Survival of the Florida Industry

How will the Florida industry survive? First, it must be recognized that NAFTA has already been agreed on and that its implementation is under way. While it is not impossible to revise aspects of the agreement with Mexico, the U.S. government may not be willing to do so given the overall projected beneficial impact on the U.S. Besides, imports will benefit consumers through lower prices and the availability of alternative supplies. However, the Florida industry must exploit every opportunity within the “rules” of NAFTA to its benefit. Specifically, it must ensure that safeguard mechanisms operate with maximum effectiveness. What is required is a market intelligence capable of facilitating proper monitoring of imports and the timely imposition of snap-back provisions. In this way, the Florida industry would not suffer any undue setback over and above that anticipated by the transition period. Besides, the industry may seek the implementation of beneficial national policies which are essentially outside the scope of NAFTA. Lastly, in the light of the expected positive economic impact of NAFTA on the U.S. economy as a whole, the industry should pursue adjustment assistance (compensation) as a losing subsector which would assist it in adopting and implementing survival strategies. Increasing research on production and marketing of Florida fresh fruits and vegetables is one means of compensation to this industry.

Given the likelihood of increased competition over the long term, survival of the industry will dictate strategies to foster productivity growth in the fresh tomato industry. Productivity growth would bring about increased supplies at lower prices by reducing of production costs in Florida. Beneficial national policies and adjustment assistance should be sought and applied with this objective in focus. The promotion of productivity growth will not detract from any wider considerations that may be important to the U.S. government in that it would simultaneously advance the interests of producers and consumers. The Florida industry has had the experience, in the 1980s, of responding to increased imports from Mexico by the adopting productivity-enhancing techniques (Kalaitzandonakes and Taylor, 1990; Bredahl et al., 1983). Tefertiller and Ward (1995) found evidence of significant technical change in the Florida fresh tomato industry. Strong research and development programs aimed at effecting technical change which increases yields will be critical if the Florida industry is to remain competitive. Efforts will have to be directed not only towards increasing production but also towards improvements in quality.

The Florida industry has been conducting market promotion programs aimed at increasing the demand for its product in the U.S. market. Efforts in this area must be continued in the U.S. to expand per capita consumption and should also be made in other markets. In the U.S., it has been shown that while price is an important factor, quality may be even of greater significance (Degner and Moss, 1992). Previous research indicates that Florida tomato promotional programs have worked but “that advertising and publicity alone cannot overcome basic product limitations” (Degner and Moss, 1992).

Lastly, Florida tomato producers have filed anti-dumping petitions against the Mexican fresh vegetable industry in 1978 and 1979 without success and have recently given consideration to filing another anti-dumping petition against Mexico. The provisions of the General Agreement on Tariffs and Trade (GATT) allow for protection for national industries against unfair trading practices. A favorable ruling on these petitions requires convincing demonstration that Mexican fresh tomatoes are sold in the U.S. at below production cost.

Given the perishability of tomatoes, some consideration will, perhaps, have to be given to “distress” sales, i.e., sales that must be made for their contribution to fixed costs. The Florida tomato industry must, therefore, develop the capability to monitor the production costs of Mexican producers and the prices they receive in U.S. and other markets or ensure that such a monitoring mechanism is established.

The Florida tomato industry will be hard-pressed to fund research and development, market promotion and market intelligence at the level that will be required. Florida growers have a good track record with respect to innovation and technical change. Tefertiller and Ward (1995) showed that fresh tomato production in Florida increased over 5% per annum due to improved yields and structural changes. This suggests that the Florida tomato industry is in a position to realize reasonable returns on research expenditure. If the industry is to maintain its productivity advantage vis-a-vis Mexico, government funding, at state and federal levels, will be necessary for the implementation of programs in the above areas.

Literature Cited


COLOR IMAGE ANALYSIS SYSTEM FOR AUTOMATIC GRADING OF FLORIDA CITRUS

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Abstract. A PC-based video data acquisition system was assembled to generate an optical data base of surface defects found on Florida citrus. The unit included high frequency fluorescent lighting, 22 KHz, plus an individual fruit rotating device. Images were collected using a 486 computer with special encoder-decoder and frame grabber boards on an AT-bus. Color acquisition was implemented in hue, saturation, and intensity (HSI) space. Samples of both defective and sound fruit were obtained at commercial packinghouses at both pre-grade and final grade locations throughout two seasons. Images were stored on magneto-optical media for analysis. Image analysis algorithms for area normalization and comparison to standard color chips were developed. Classification was based on either Bayesian parametric or non-parametric techniques or a back propagation neural network. The predominate disease was windscars, which ranged from 32.5% (grapefruit; Citrus paradisi Macf.) to 23.0% (tangerine; Citrus reticulata Blanco). Overall, Bayesian approaches yielded the highest percent correct classification ranging from 70.2 to 85.8% dependent upon model selection and fruit variety.

Advances in solid state optical sensors and the economical computational capabilities of computers have been driving forces toward automatic grading of fresh and processed foods. Florida fresh citrus is a leading candidate for such automation due to the large volume of fruit handled, a relatively long packing season, and the difficulty in hiring adequate labor for such monotonous and sometimes arduous work (Miller and Burns, 1992). Other horticultural crops where machine vision has been researched recently include: apple