PBTC 02-5

International Agricultural Trade and Policy Center

THE EXPECTED COST OF AN INCOME SUPPORT PROGRAM FOR PROCESSING ORANGES

By

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PBTC O2-5 October 2002

POLICY BRIEF SERIES

UNIVERSITY OF FLORIDA

Institute of Food and Agricultural Sciences

INTERNATIONAL AGRICULTURAL TRADE AND POLICY CENTER

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Abstract: The Florida citrus industry operates in a competitive global market. However, unlike program crops, producers in this industry do not benefit from direct income support under the new Farm Bill. There is concern about the impact of elimination of the orange juice tariff on the financial health of the Florida orange industry. The purpose of this paper is to examine the level of government expenditure that would be needed to provide income support to orange producers if the orange juice tariff were eliminated. For the span of the Bill direct payments to corn are estimated to total $25.1 billion. By comparison the direct expenditures incurred for an income support program for oranges would be substantially less. In the early years with the tariff in place the expenditures are estimated to be about $300 million and would fall below $200 million by 2007. If the tariff were removed government support would initially be $925 million but would decline to about $700 million in 2007. Over the six-year period, 2002-2007, the direct payment to orange producers would be $1,538.5 million with retention of the tariff and $4,721.8 million if the tariff were eliminated.

Keywords: income support program, oranges, tariff, FSRIA

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Richard N. Weldon and John J. VanSickle[1]

The Florida citrus industry is an important contributor to the Florida economy, accounting for more than $760 million in sales (2000/01 season) and estimated to have greater than a $9 billion overall impact on the state. Florida is the leading producing state in the U.S. for citrus with acreage and production totaling more than all other states combined. The Florida citrus industry is heavily oriented to processed orange production. Of the 832,426 acres planted to citrus in January 2000, most of that was planted to oranges (605,000 acres). That round orange acreage produced 223.3 million boxes in 2000/01 with 95.7 percent of that production utilized for processing.

The Florida citrus industry operates in a competitive global market with Brazil as the major competitor in the processed orange market. Florida and Brazil account for almost 85 percent of the global production of processed oranges. The U.S. allows the import of orange juice duty-free to countries identified with the Caribbean Basin Economic Recovery Act. Under NAFTA, both Mexico and the U.S. agreed to phase out all tariffs over a 15-year period beginning in 1994.

The larger concern related to the tariff is the tariff imposed on Brazilian imports. Brazil pays the Most Favored Nation (MFN) tariff rate of 28.8 cents per pound solid for FCOJ exports to the U.S. and 29.7 cents per pound solid equivalent for single-strength orange juice. With current negotiations for a Free Trade Area of the Americas (FTAA), Florida growers are concerned that elimination of the tariff would have devastating

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consequences. Analyses performed by Spreen et al. (2002) indicate that such an outcome could result in a decline in on-tree values of $1.20 to $1.40 per box for Florida oranges.

The Florida citrus industry does not benefit from farm programs that provide direct income support to producers of program crops that are part of the Farm Bill. Those commodity groups that benefit from the income support measures of the Farm Bill generally support the notion of more open markets. Most of those crops are net exporters of their products. However, regardless of whether these programs are net importers or exporters, the farm program stands to protect the income of those producers. As noted there is concern about the impact of elimination of the orange juice tariff on the financial health of the Florida orange industry. The purpose of this paper is to examine the level of government expenditure that would be needed to provide income support to orange producers if the orange juice tariff were eliminated and orange producers operated in markets conditions analogous to program commodities covered by the Farm Bill.

Summary of FSRIA

The Farm Security and Rural Investment Act (FSRIA) of 2002 replaced the Freedom to Farm Act of 1996. FSRIA provides income support for wheat, feed grains, upland cotton, rice, and oilseeds through 3 separate payment programs: fixed direct payments, counter-cyclical payments (CCP), and loan deficiency payments (LDP) associated with marketing loans. The level of support is a function of the loan rate, direct payment rate and target price (table 1) all of which were set by the new Bill.

Direct payments will be the amount of direct, decoupled payments on covered commodities. The actual dollar amount received will be equal to the product of the direct payment rate, the direct payment or base acres and the direct payment yields. Provisions were also made for updating base acreage and yields.

Counter-cyclical payments will be made whenever the effective price for a covered commodity is less than the target price. The effective price is equal to the sum of (1) the higher of the national average market price during the 12-month marketing year for the commodity or the national loan rate, and (2) the payment rate for direct decoupled payments for the commodity. This effective price is subtracted from the target price to calculate the counter-cyclical payment rate (when positive). Consequently,

payment rate = target price – [direct payment rate + (higher of market price or loan rate)]

payment rate = target price – [effective price]

The actual payment amount for counter-cyclical payments is the product of the payment rate, the payment acres, and the payment yield. If market prices (plus direct payment rate) are above target prices the producer would not receive a payment and there would be no government expenditures for CCPs.

Marketing Loans or non-recourse commodity loans with marketing loan provisions were extended as defined in the 1996 Bill. Loan rates (table 1) are fixed in this legislation for the life of the Bill. For covered commodities all production is eligible for the marketing loans and loan deficiency payments.

Table 1: Loan Rates, Direct Payment Rates and Target Prices as Set by FSRIA for Selected Covered Commodities

	-------Loan Rates-------		Direct Payment ------Rates------	------Target Prices------	
	2002-03	2004-07	2002-07	2002-03	2004-07
Corn ($/bu)	1.98	1.95	0.28	2.60	2.63
Wheat ($/bu)	2.80	2.75	0.52	3.86	3.92
Soybeans ($/bu)	5.00	5.00	0.44	5.80	5.80
Cotton ($/lb)	.5200	.5200	0.0667	0.7240	0.7240
Rice (cwt)	$6.50	$6.50	$2.35	$10.50	$10.50

Summary of FAPRI Baseline Analysis of FSRIA

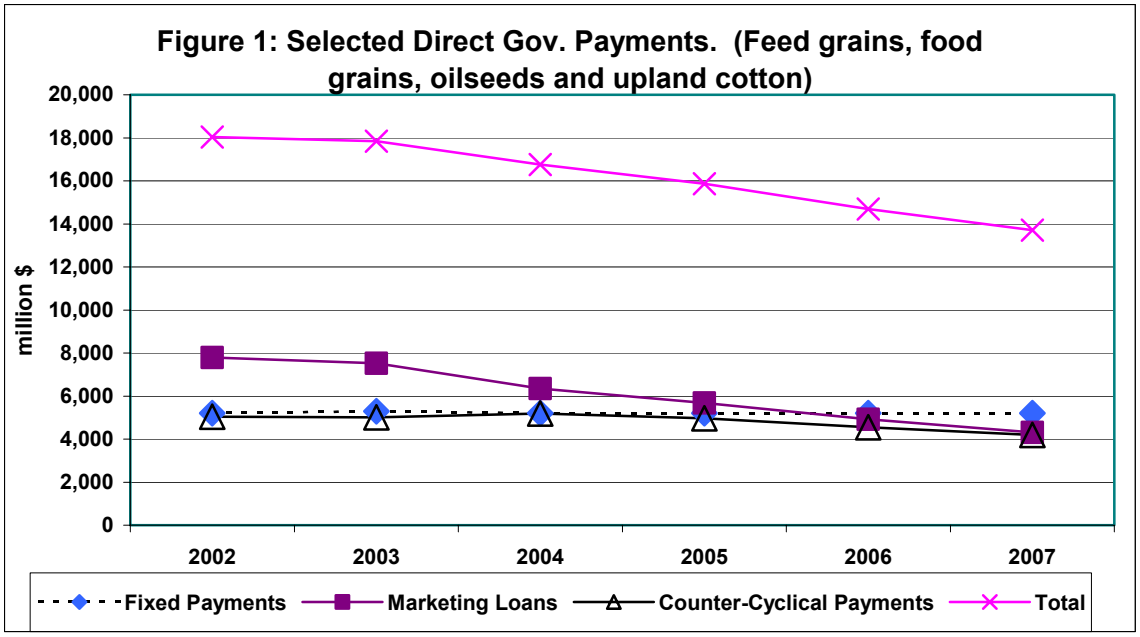
The Food and Agricultural Policy Research Institute (FAPRI) analyzed the impact of FSRIA on both domestic supply and use for covered commodities and the subsequent impact on farm level prices and government program expenditures[i]. The FAPRI analysis was both deterministic and stochastic (this study relies primarily on the deterministic analysis).

For covered commodities the FAPRI analysis provides baseline projections for the major covered commodities to 2007 and beyond, of:

- Acreage (contract, planted and harvested)
- Yields (actual and program)
- Supply and Domestic Use
- Exports and Stocks, and
- Price and Returns that include
  - Farm Prices
  - Average Loan Deficiency Payment Rates
  - Counter-Cyclical Payment Rates.

These FAPRI estimates provide the basis for projecting annual government program costs for basic covered commodities. Figure 1 provides projections of *selected* direct government outlays over the six-year life of the farm bill. The six-year total of $96.8 billion is the amount of fixed payments, counter-cyclical payments and marketing loan payments for food grains, feed grains, oilseeds and upland cotton. This amount does not reflect conservation reserve payments, disaster payments, and payments to other commodities such as peanuts, sugar, dairy, and any other potential FSRIA Commodity

Credit Corporation outlays. These selected direct government payments total $18.0 billion in 2002 but fall steadily to $13.7 billion in 2007.



It is estimated that in 2002 corn's share of the $18.0 billion will be $5.6 billion, or 32% of total expenditures, while cotton's $3.6 billion of expenditures is about 20% of the total for the selected commodities. Over the life of the Bill it is projected that increases in farm prices for corn will eliminated the loan deficiency payments and significantly reduce the counter-cyclical payments. By the end of the Farm Bill corn's share of the expenditures will fall to about 21% ($2.9 billion). However, over the duration of the Bill cotton market prices remain at levels that continue to generate large loan deficiency payments and counter-cyclical payments, so that by the 2007 cotton's share of the total is very similar to that of corn. Tables 2 and 3 provide details on the FAPRI projections of levels of production, prices and government rates and resulting estimates of the various direct payment expenditures (revenues to producers) for corn and cotton under FSRIA.

Table 2: Projected Production, Prices and Returns for Corn under FSRIA for 2002-2007[i]

	2002	2003	2004	2005	2006	2007
			Million bushels			
Actual Production	9847.4	10094.4	10174.4	10303.2	10468.6	10657.0
CCP Production	9643.7	9643.7	9643.7	9643.7	9643.7	9643.7
Fixed Payment Production	8201.1	8201.1	8201.1	8201.1	8201.1	8201.1
			Dollars per bushel			
Farm Price	2.03	2.04	2.10	2.15	2.19	2.23
Loan Rate	1.98	1.98	1.95	1.95	1.95	1.95
Average LDP Rate	0.13	0.12	0.03	0.00	0.00	0.00
Target Price	2.60	2.60	2.63	2.63	2.63	2.63
CCP Rate	0.29	0.28	0.25	0.20	0.16	0.12
Fixed Payment	0.28	0.28	0.28	0.28	0.28	0.28
			Million dollars			
Gross Market Revenue	19990	20593	21366	22152	22926	23765
LDP Payments	1280.2	1211.3	305.2	0.0	0.0	0.0
CCP Payments	2377.2	2295.2	2049.3	1639.4	1311.5	983.7
Fixed Payments	1951.9	1951.9	1951.9	1951.9	1951.9	1951.9
Annual Sum of Direct Payments	5609.2	5458.4	4306.4	3591.3	3263.4	2935.5
Sum of Direct Payments over 6 yrs						25164.2

Table 3: Projected Production, Prices and Returns for Cotton under FSRIA for 2002-2007[i]

	2002	2003	2004	2005	2006	2007
			Million pounds			
Actual Production	8166.4	8378.7	8495.6	8508.5	8514.7	8395.2
CCP Production	10907.7	10907.7	10907.7	10907.7	10907.7	10907.7
Fixed Payment Production	10515.1	10515.1	10515.1	10515.1	10515.1	10515.1
			Dollars per pound			
Farm Price	0.385	0.423	0.448	0.471	0.482	0.508
Loan Rate	0.520	0.520	0.520	0.520	0.520	0.520
Average LDP Rate	0.219	0.190	0.168	0.146	0.119	0.098
Target Price	0.724	0.724	0.724	0.724	0.724	0.724
CCP Rate	0.137	0.137	0.137	0.137	0.137	0.137
Fixed Payment	0.067	0.067	0.067	0.067	0.067	0.067
			Million dollars			
Gross Market Revenue	3816.9	4220.3	4501.1	4729.0	4844.1	5013.8
LDP Payments	1791.0	1592.6	1423.9	1244.7	1013.9	819.0
CCP Payments	1272.2	1272.2	1272.2	1272.2	1272.2	1272.2
Fixed Payments	596.1	596.1	596.1	596.1	596.1	596.1
Annual Sum of Direct Payments	3659.3	3460.9	3292.2	3113.0	2882.2	2687.4
Sum of Direct Payments over 6 yrs						19094.9

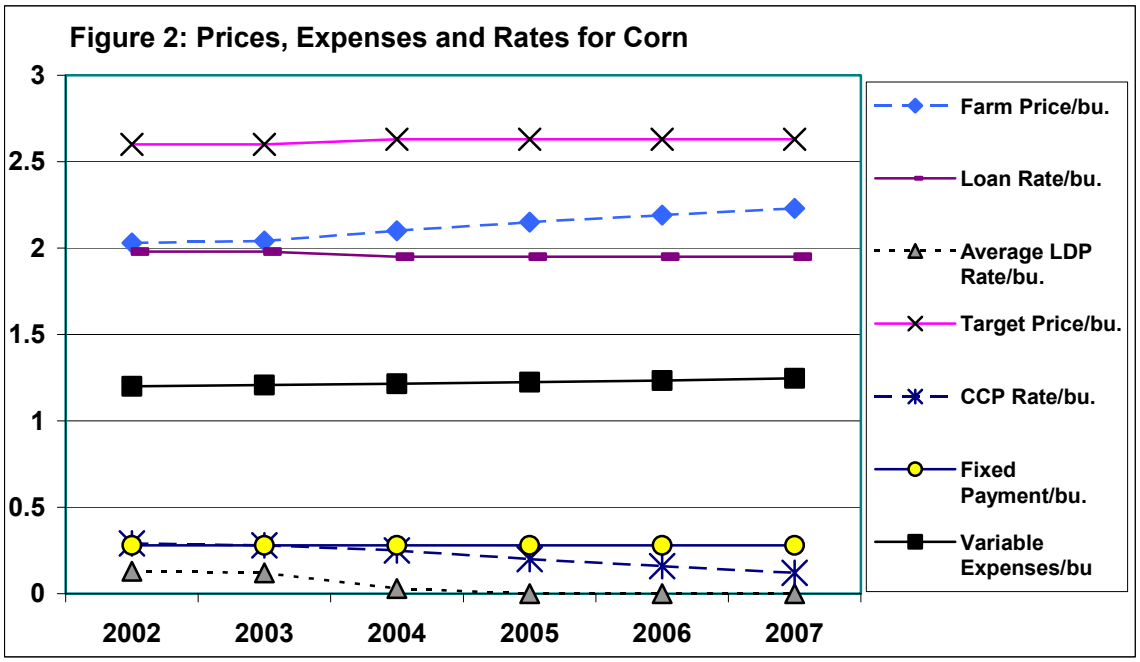
Extending Government Income Support Programs to Florida Orange Production

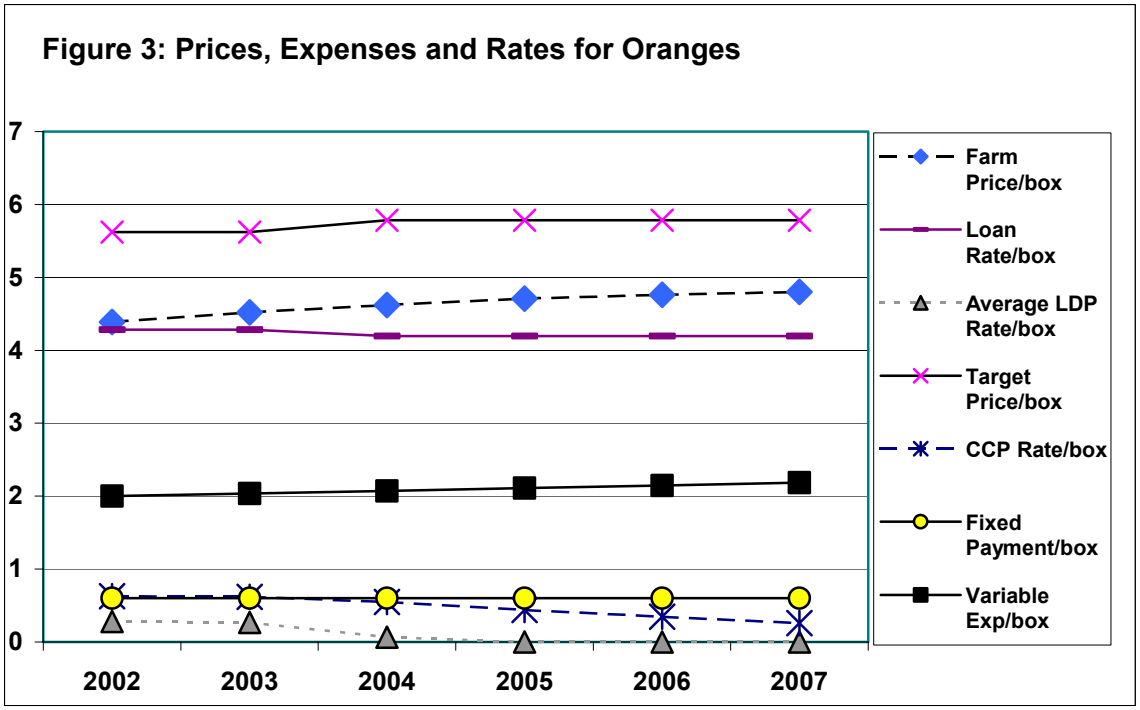
The analysis that follows contains an estimate of the cost to implement an income support program for oranges produced for processing that would be designed similar to those for the major program crops. This analysis is based on retention of the tariff on imported orange juice, primarily from Brazil. That analysis is then repeated with an adjustment in prices that reflects prices that are expected if the tariff is eliminated.

The key elements in the establishment of an income support program for oranges in Florida similar to that of presently covered commodities would be the determination of a target price and loan rate. For this study it is assumed that the relative relationship of the loan rate, target price and projected farm price for oranges is the same as that for U.S. corn. Corn is selected since, as noted above, it is represents about one-fourth of government expenditures over the life of the Bill. Specifically, the target price for oranges in 2002 of $5.62 per on-tree box (Table 3) is established as follows:

Target Price Oranges$_{2002}$ = Farm Price Oranges$_{2002}$ x (Target Price Corn$_{2002}$/Farm Price Corn$_{2002}$)
5.62 = 4.39 x (2.60/2.03)

The 2003 target price is set equal to the 2002 price. The target price in 2004 is calculated using the above equation but with 2004 projected farm prices, then 2005, 2006 and 2007 are set equal to 2005. This is to be consistent with program commodities where target rates are the same in 2002 and 2003 and increased to a higher amount in 2004-2007. The loan rate is set in a similar manner. Figure 2 provides a graph of the relationship of the target price, loan rate and the FAPRI projected farm price for corn. Figure 3 provides, for comparison, graphs of the calculated (Table 3) target price, loan rate and projected orange prices.[ii]





The annual average loan deficiency payment rate (LDP) and the counter-cyclical rate are calculated in a similar manner as the target price and loan rate. For example, the average LDP rate in 2003 in Table 3 for oranges is:

LPD Rate Oranges$_{2003}$ = Farm Price Oranges$_{2003}$ x (Average LPD Rate Corn$_{2003}$/Farm Price Corn$_{2003}$

.27 = 4.52 x (.12/2.04)

The average LPD rate and farm price for corn are from the FAPRI baseline projections. The fixed payment rate is found in a similar manner for 2002 and this rate is fixed for the six-year life of the bill to be consistent with the constant fixed payment rate for the covered commodities.

Projected Government Direct Costs Associated with an Income Support Program for Florida Oranges (under U.S. current orange juice tariff)

Table 3 provides the six-year projected farm (on-tree) price and productions levels for 2002 through 2007, assuming the current orange juice tariff (Spreen et al.). Increased world consumption and world production levels of orange juice result in 2002

Florida production of 251.1 million boxes increasing to 259.9 million boxes in 2007 and farm prices increasing from $4.39 in 2002 to $4.80 in 2007.

Table 3: Projected Production, Prices and Returns for Oranges for 2002-2007 Under Current U.S. Tariff Assuming a Government Income Support Program

	2002	2003	2004	2005	2006	2007
			Million boxes			
Actual production	251.2	253.2	254.7	256.0	257.7	259.9
			$ Per box			
Farm Price	4.39	4.52	4.62	4.71	4.76	4.80
Loan Rate	4.28	4.28	4.20	4.20	4.20	4.20
Average LDP Rate	0.28	0.27	0.07	0.00	0.00	0.00
Target Price	5.62	5.62	5.79	5.79	5.79	5.79
CCP Rate	0.63	0.62	0.55	0.44	0.35	0.26
Fixed Payment	0.60	0.60	0.60	0.60	0.60	0.60
			Million dollars			
Gross Market Revenue	1103	1145	1177	1206	1227	1247
LDP Payment	70.6	67.3	16.8	0.0	0.0	0.0
CCP Payment	133.9	133.5	119.1	95.3	76.2	57.1
Fixed Payment	128.1	128.1	128.1	128.1	128.1	128.1
Annual Sum of Direct Payments	332.6	329.0	264.0	223.5	204.3	185.2
Sum of Direct Payments over 6 yrs						1538.5

Under an income support program the total amount of direct expenditures is estimated to be $332.6 million in 2002 (Table 3). This is made up of $70.6 million in LDP, $133.9 million in CCP and $128.1 million in fixed payments. As farm level prices increase the annual direct payments fall steadily over the six years with total payments of $185.2 million in 2007. For comparative purposes in Table 2 the direct payments for corn are $5.6, $5.5, $4.3, $3.6, $3.2 and $2.9 billion for 2002-2007, respectively. Total government outlays for oranges would total $1,538.5 million over the six years (compared to $25.2 billion for corn).

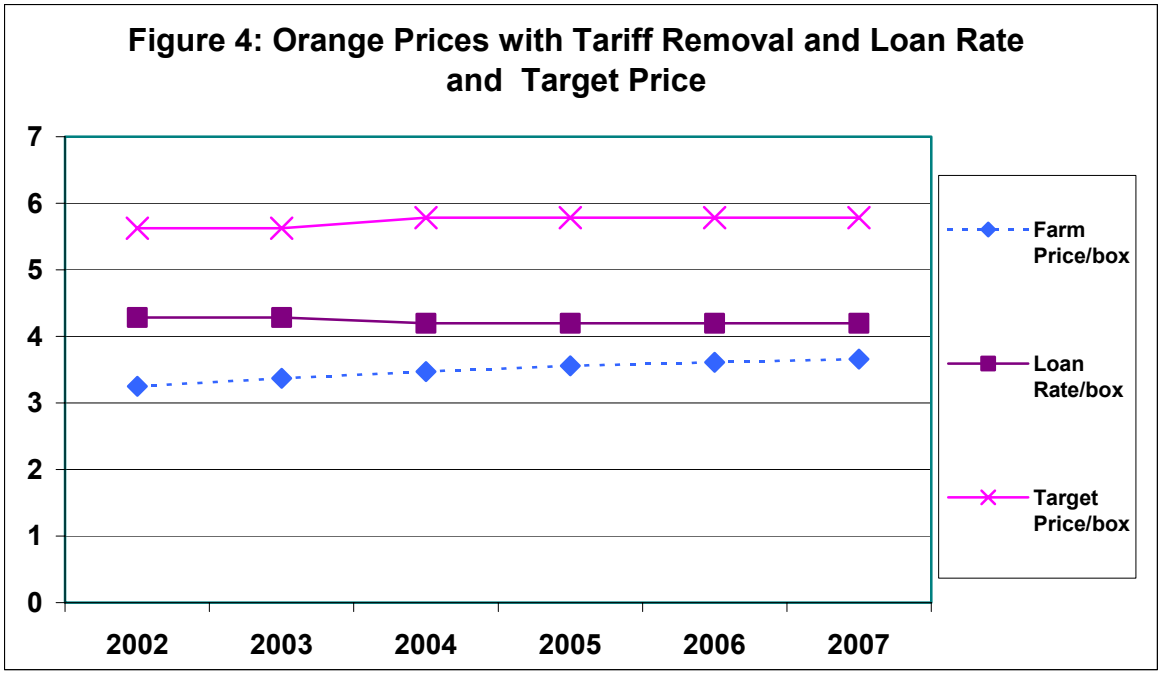
It needs to be noted that the contract or base acreage and yield for oranges is assumed to be equal to the states harvested acreage yields and as with covered commodities the CCP and fixed payments are on 85% of the base production.

Projected Government Direct Costs Associated With An Income Support Program For Florida Oranges If U.S. Current Orange Juice Tariff Is Eliminated

Elimination of the U.S. orange juice tariff would ultimately translate into a reduction in the on-tree price of Florida oranges. Table 4 provides the projected farm price (on-tree) for Florida oranges if the tariff were eliminated immediately. The farm price would be $3.25 per box on 2002 and increase to $3.66 in 2007 with all prices being well below the with-tariff projections (Table 3). Consequently, the relationship of the farm price, with no tariff, to the target prices and loan rate would change significantly. As shown in Figure 4 with no tariff the farm price would be less than the loan rate in all years and consequently under a government income support program would generate significant marketing loan payments and CCP (fixed payment would not change).

Table 4: Projected Production, Prices and Returns for Oranges for 2002-2007 with ELIMINATION of Tariff

	2002	2003	2004	2005	2006	2007
			Million boxes			
Actual Production	251.2	253.2	254.7	256.0	257.7	259.9
			Dollars per box			
Farm Price	3.25	3.37	3.47	3.56	3.61	3.66
Loan Rate	4.28	4.28	4.20	4.20	4.20	4.20
Average LDP Rate	2.41	2.13	1.70	1.49	1.37	1.25
Target Price	5.62	5.62	5.79	5.79	5.79	5.79
CCP Rate	0.90	0.90	1.07	1.07	1.07	1.07
Fixed Payment	0.60	0.60	0.60	0.60	0.60	0.60
			Million dollars			
Gross Market Revenue	816.4	853.3	883.8	911.4	930.3	951.2
LDP Payment	604.6	538.5	432.1	380.6	353.0	325.7
CCP Payment	192.3	193.8	231.0	232.2	233.7	235.7
Fixed Payment	128.1	128.1	128.1	128.1	128.1	128.1
Annual Sum of Direct Payments	925.0	860.4	791.2	740.8	714.8	689.5
Sum of Direct Payments over 6 yrs						4721.8



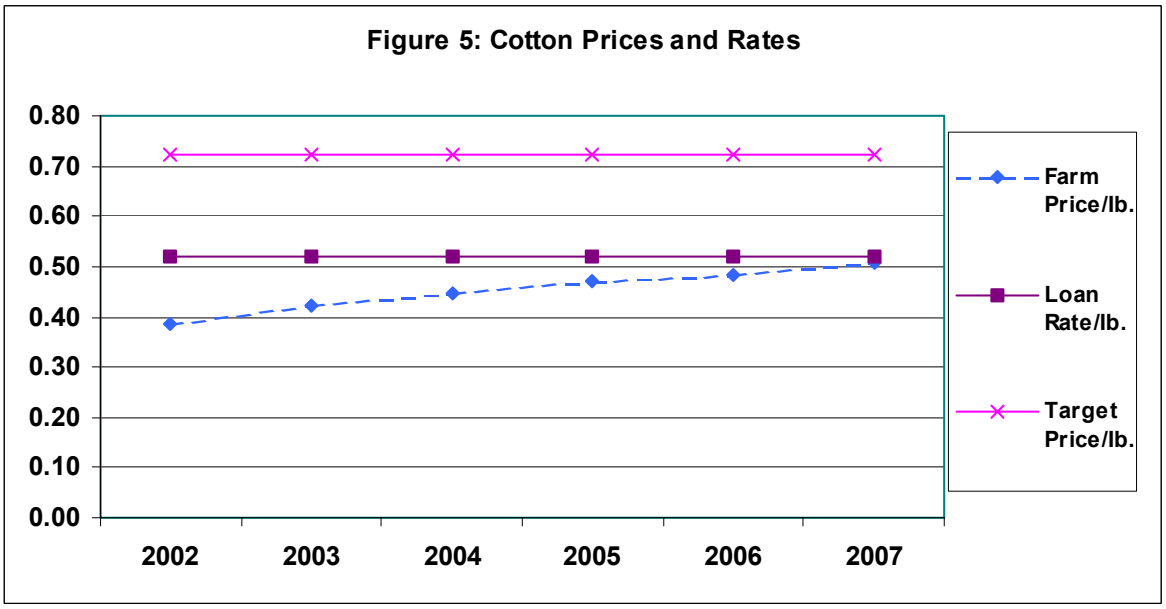


Figure 5 gives the FAPRI projected relationship over the six-year life of FSRIA for cotton. It is expected that the farm price for cotton, though increasing over the life of the farm bill, will remain below the loan price for cotton and consequently generate significant loan and CCPs. Thus the projected cotton prices (farm and target) and loan

rates have a similar relationship to those projected for oranges if the tariff is removed. For this study it is assumed that this parallel relative relationship of the average LPD rate, CCP rate and projected farm price for oranges and cotton would translate similar LDPs and CCPs. For example:

LPD Rate Oranges$_{2003}$ = Farm Price Oranges$_{2003}$ x (Average LPD Rate Corn$_{2003}$/Farm Price Corn$_{2003}$

.27 = 4.52 x (.12/2.04).

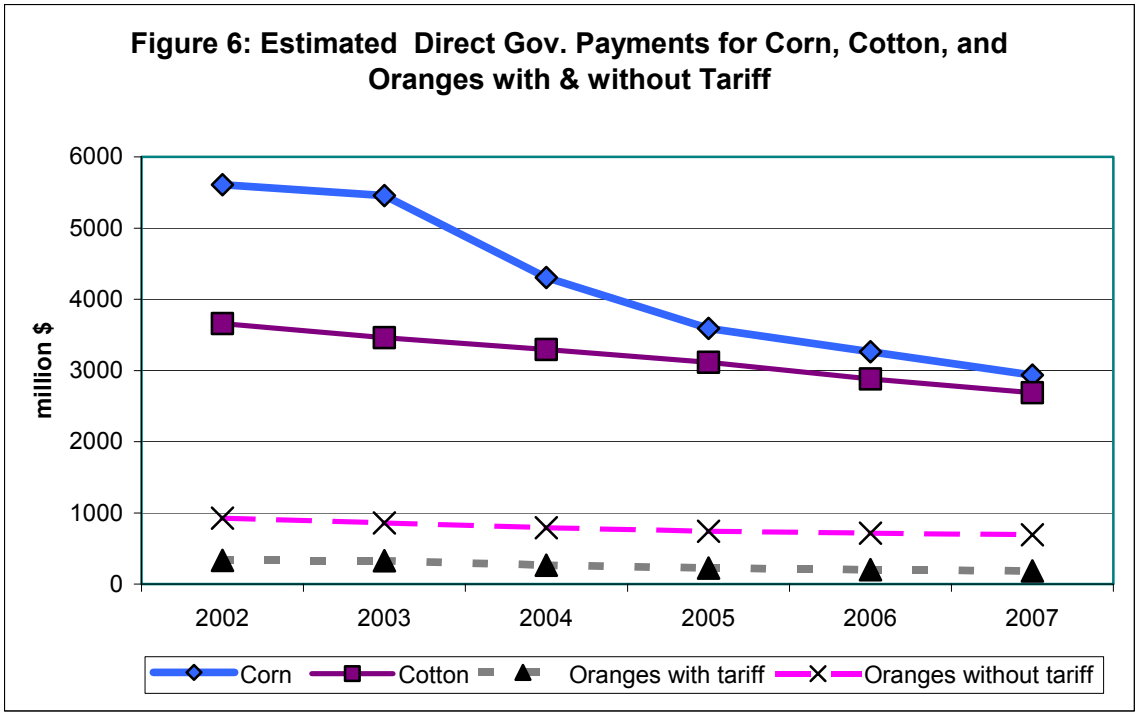
Table 4 provides the six-year projected productions levels for 2002 through 2007, assuming the current orange juice tariff is eliminated (Spreen et al). The total amount of direct expenditures is estimated to be $925.0 million in 2002. This is made up of $604.6 million in LDP, $192.l million in CCP and $128.1 million in fixed. This is almost $600 million above direct expenditures under the tariff (Table 3), primarily due to an additional $534 million in LDPs. The annual direct payments fall over the six years with total payments of just below $700 million in 2007. Total government outlays would be $4,721.8 million over the six years.

Concluding Comments

This straightforward but elementary analysis estimated the cost, in terms of government expenditure to implement an income support program for oranges produced for processing similar to those for the major program crops (corn and cotton). For the span of the Bill direct payments to corn start at a level in excess of $5.6 billion and decline to just under $3.0 billion while cotton starts at about $3.6 billion and moderately fall off to $2.6 billion (figure 6). By comparison the direct incurred for an income support program for oranges would be substantially less. In the early years with the tariff in place the expenditures are estimated to be about $300 million and by 2007 would fall below $200 million. If the tariff were removed there would be a sizeable annual

increases in government support. From a high of $925 million payments would decline to about $700 million in 2007. Over the six-year period, 2002-2007, the direct payment to orange producers would be $1,538.5 million with retention of the tariff as compared to $4,721.8 million if the tariff were eliminated.

This analysis focused exclusively on the impact of tariff elimination on Florida orange production. Several issues would need to be addressed in a more sophisticated and comprehensive analysis. Due to the close similarity of oranges and grapefruit from a production and investment standpoint in Florida it would be necessary to broaden the analysis to include Florida grapefruit. Likewise, since government programs of this nature are national in scope it would be necessary to expand the analysis to include other citrus, for juice, producing states, particularly California. In addition, future research is needed to identify underlying commodity characteristics, such as cost structure and marketing alternatives for a broader range of commodities (not just corn and cotton) that describe or explain more accurately the relationship between market price, target prices, loan rates, CCP rates, and fixed payment rates. It would also be helpful to assess the implications of risk differences of covered crop versus citrus, and the impact of other government-supported programs such as crop yield and crop revenue insurances. And finally consumer costs and welfare implications need to be examined.



[i] FAPRI 2002 U.S. Baseline Briefing Book, FAPRI-UMC Data Report 02-02, July 2002.

[ii] Spreen, Thomas H., Charlene Brewster, and Mark G. Brown. "The Free Trade Area of the Americas and the World Processed Orange Market." *Journal of Agricultural and Applied Economics*, April 2003, forthcoming.