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# Economic Impacts in North Carolina of a Peanut Support Price and Quota Reduction

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*Abstract:* Excessive government losses and pressure from end users of peanuts have increased the likelihood of a peanut support price and quota reduction in the 1995 farm bill. This study analyzes the economic impacts of reducing the national quota to the estimated level of domestic demand and of reducing the quota support price on North Carolina farm income and rural communities. Effects of policies that reduce quota support price for Virginia-type peanuts from \$675 per ton to levels of \$600 and \$500 per ton are estimated. Reductions in the quota support price have significant impacts on quota owners and peanut producing regions. A 10 percent reduction in quota and a \$500 support price would result in a \$43 million income reduction to North Carolina.

*Key Words and Phrases:* Peanut production, Peanut policy, Farm income.

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Since the 1930s, the government has restricted supply of major agricultural commodities in an effort to stabilize prices and maintain farm income. Set-aside programs have been the principal policy tools used to reduce output and sustain parity price. A unique exception to this standard is the U.S. peanut program. The primary instrument used to control production is a national poundage quota for edible peanuts sold in the domestic market. Producers are guaranteed a minimum price for quota peanuts by means of a support price. Unlike the U.S. tobacco program that operates with similar supply constraints, producers may sell peanuts in excess of quota outside the domestic edible market. These "additional" are contracted to handlers for sale in the export or crush markets, or put on loan to the Commodity Credit Corporation in additional pools (Borges).<sup>1</sup>

If the quantity of quota peanuts marketed is higher than the quantity demanded at the quota support price, then the government buys the surplus peanuts at the quota support price, selling them at a loss in the export or crush market. Under the current program the national quota cannot fall below 1.35 million tons. In recent years, use of peanuts has fallen short of

the national quota with the government purchasing the excess peanuts. As a result, government losses exceeded \$119 million for the 1994 crop and are projected to be \$84 million annually for fiscal years 1995 to 2000 under the current program (Miller). The U.S. Department of Agriculture Farm Service Agency estimated 1996 total domestic use of peanuts to be 1.215 million tons; 135,000 tons (10%) short of the legislated minimum national quota. With a cost conscious Congress and considerable pressure from end users of peanuts to lower support price, both a support price reduction and abolition of the minimum quota level for quota peanuts seem likely in the 1995 farm bill.

Given the likelihood of quota and support price reductions, it is worth examining the potential impacts on peanut producers and rural communities from such a policy initiative. This study analyzes the economic impacts on North Carolina rural communities of reducing the quota support price to two different levels, \$600 and \$500 per ton, and allowing the quota level to fall to the level of estimated demand at those prices. The current support price for Virginia-type quota peanuts is about \$675 per ton. These prices represent realistic alternatives being discussed in the policy arena and are both higher than the current world price of approximately \$400 per ton. The direct effect of the quota and price reductions on farmer, and quota owner, income is examined. In addition, the indirect income effect on local economies of reduced spending by farmers and quota owners is calculated. No income effect from decreased peanut acreage is assumed. Two arguments support this assumption. First, Borges and Thurman, and Borges, claim that changes in the quota support price do not significantly affect producer supply decisions. Their empirical analyses shows that the world price, i.e., the additional price, is more important in determining supply than is the inframarginal quota support price. Second, even if peanut acreage does decrease, it will likely be replaced by increased acreage of other crops of equal or greater value, e.g., cotton. As long as the decreased peanut acreage is replaced by crops of equal or greater income potential, then no income effect will occur because of decreased peanut acreage.

### *Analytcs of a Peanut Support Price Reduction*

Total regional losses from a lower quota and quota support price come from two sources. Farmers and quota owners are made worse off because of the decrease in income. Furthermore, the decrease in income will have a ripple effect over economic activity in the region. Lower incomes result

in less spending, which in turn causes a contraction of economic activity. At this point it is important to examine the income losses resulting from decreases in quota income and declines in economic activity.

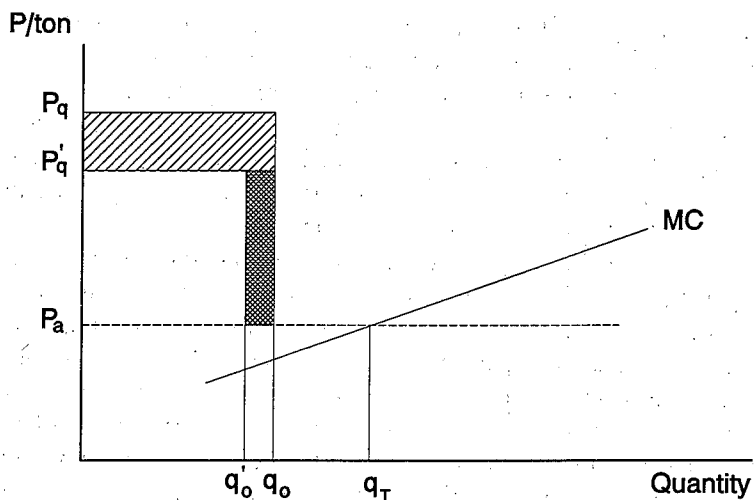
Figure 1 illustrates the production decision facing an individual peanut producer.  $P_q$  represents the initial domestic quota price for edible peanuts. A producer is limited by the amount of peanuts he or she can sell at this price by the poundage quota  $q_0$ . If a grower produces more than his or her allotment, the grower can contract any additional peanuts to handlers for sale in the export or crush markets.  $P_a$  is the market price for additional peanuts, viewed as the world price. A producer's total peanut production will equal  $q_T$ , where marginal cost, MC, equals the additional price,  $P_a$ . The producer sells  $q_0$  at the quota support price and  $q_T - q_0$  pounds are contracted with handlers at the additional price.

Now consider the impact of a policy change that reduces the edible peanut support price to  $P'_q$ . Such a policy will affect both the individual's quota allotment and quota income. The new support price implies a reduction in quota income equal to the rectangle  $(P_q - P'_q) \cdot q_0$  in Figure 1. The loss in quota income is a direct result of the lower domestic price for edible peanuts. However, it is not the total change in direct income. Since the 1995 quota is above the level of domestic demand, a program that allows the quota to be set at estimated demand causes the quota to fall from  $q_0$  to  $q'_0$ . This implies an additional loss of  $(P'_q - P_a) \cdot (q_0 - q'_0)$ . The lower price for domestic edible peanuts also affects the domestic peanut market and, consequently, will change an individual's quota allotment.

Figure 2 illustrates the domestic edible peanut market. Edible peanuts are used in the manufacturing of such products as peanut candy, snack peanuts, peanut butter, and "ballpark peanuts." Therefore, the demand for peanuts is a derived demand by the producers of peanut products or "domestic buyers." The national quota includes peanuts for seed use as well as peanuts for domestic edible use. At the current support price,  $P_0$ , quantity demanded is  $Q^m_0$ , lower than the national quota,  $Q^Q_0$ . Government losses occur since, under the current program, the government purchases the excess supply,  $Q^Q_0 - Q^m_0$ , at the support price and sells the peanuts for a much lower price into the crush (oil) or export market.

A policy that reduces the support price also lowers the market price facing domestic buyers. The lower support price,  $P_1$ , increases the quantity demanded by domestic buyers. If the U.S. Department of Agriculture (USDA) sets the national poundage quota at its estimate of domestic peanut use, then the national quota will be  $Q^Q_1$  and will equal the quantity demanded at the new support price,  $P_1$ . This movement along the demand

Figure 1.

*Production Decision Facing Individual Peanut Producer*

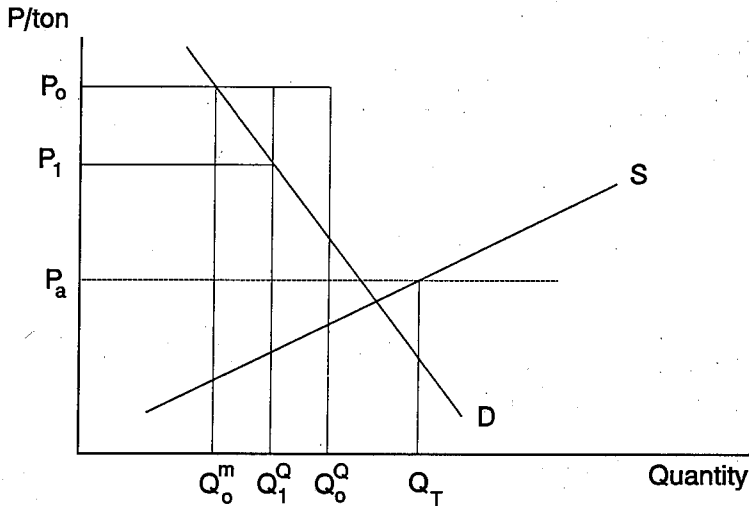
curve partially offsets the income effects of a lower support price and of reducing the quota to the estimate of quantity demanded.

*Simulations of Economic Effects and Conclusions*

As a first step in evaluating the impact of a support price reduction, the net change in quota income for the state of North Carolina and fourteen major peanut producing counties within the state is estimated. Twelve of the fourteen counties are adjoining counties in the northeastern portion of the state. These twelve counties, referred to as the Intercoastal Counties, are treated both as independent counties and as a unique region.

To assess the net change in quota income, it is first necessary to determine the new quota levels corresponding to the two new price support levels. First, the 1994 basic quota levels for North Carolina and the fourteen major peanut producing counties are used as initial quota levels.

Figure 2.  
Domestic Edible Peanut Market



These values are reported in column one of Tables 1 and 2. Since the domestic quantity of peanuts demanded at the current quota support price is 10 percent below the 1994 and 1995 national quotas, the initial 1994 quota levels are adjusted down by 10 percent. Finally, using the adjusted quota levels and a benchmark support price of \$675.30 per ton, estimates of the demand response to the lower price support levels of \$600 per ton and \$500 per ton are determined.<sup>2</sup> This process yields the estimated new quota levels under a policy of setting quota at the estimated quantity demanded and at support prices of either \$600 or \$500 per ton.

Estimating the demand response to the lower price support levels, and therefore the appropriate new quota levels, requires a value for the farm-level elasticity of demand. Earlier research by Rucker and Thurman suggests that the farm-level elasticity of demand for peanuts ranges between -0.09 and -0.14. These estimates are consistent with those reported by previous researchers.<sup>3</sup> This study employs an elasticity of demand,  $\eta^d$ , equal to -0.10 to assess the demand response. The alternative

Table 1.  
Economic Changes Resulting from a Lower Peanut Price Equal to \$600 per Ton

Location	Initial Quota Level <sup>a</sup> (1,000 tons) (1)	New Quota Level (1,000 tons) (2)	Change in Farm Income (\$1,000,000) (3)	Regional Change in Economic Activity (\$1,000,000) (4)	Total Regional Income Change (\$1,000,000) (5)
North Carolina	148.83	135.42	-13.840	-8.140	-21.984
Intercoastal Counties <sup>b</sup>	143.05	130.16	-13.306	-5.602	-18.908
County:					
Bertie	20.26	18.43	-1.884	-0.411	-2.295
Bladen	3.45	3.14	-0.321	-0.097	-0.418
Chowan	6.55	5.96	-0.609	-0.179	-0.788
Columbus	1.02	0.93	-0.095	-0.030	-0.125
Edgecombe	12.87	11.71	-1.197	-0.432	-1.629
Gates	7.91	7.20	-0.736	-0.147	-0.883
Halifax	23.99	21.83	-2.232	-0.707	-2.939
Hertford	13.87	12.62	-1.290	-0.489	-1.779
Martin	16.11	16.11	-1.498	-0.444	-1.942
Nash	2.48	2.26	-0.231	-0.090	-1.321
Northampton	28.72	26.13	-2.671	-0.580	-3.251
Perquimans	3.02	2.75	-0.281	-0.066	-0.347
Pitt	4.71	4.29	-0.438	-0.179	-0.617
Washington	2.56	2.33	-0.238	-0.070	-0.308

<sup>a</sup> Initial quota levels = 1994 basic quota levels.

<sup>b</sup> Intercoastal Counties are those counties listed in the table excluding Bladen County and Columbus County.

Table 2.  
Economic Changes Resulting from a Lower Peanut Price Equal to \$500 per Ton

Location	Initial Quota Level <sup>a</sup> (1,000 tons) (1)	New Quota Level (1,000 tons) (2)	Change in Farm Income (\$1,000,000) (3)	Regional Change in Economic Activity (\$1,000,000) (4)	Total Regional Income Change (\$1,000,000) (5)
North Carolina	148.83	137.77	27.152	15.981	43.133
Intercoastal Counties <sup>b</sup>	143.05	132.42	26.097	11.000	37.097
County:					
Bertie	20.26	18.75	3.696	0.806	4.502
Bladen	3.45	3.19	0.629	0.190	0.819
Chowan	6.55	6.06	1.195	0.351	1.546
Columbus	1.02	0.94	0.186	0.059	0.246
Edgecombe	12.87	11.91	2.347	0.848	3.195
Gates	7.91	7.32	1.443	0.289	1.732
Halifax	23.99	22.21	4.370	1.387	5.764
Hertford	13.87	12.84	2.530	0.959	3.489
Martin	16.11	14.91	2.939	0.870	3.809
Nash	2.48	2.30	0.452	0.176	0.629
Northampton	28.72	26.58	5.239	1.137	6.376
Perquimans	3.02	2.79	0.551	0.129	0.680
Pitt	4.71	4.36	0.859	0.351	1.211
Washington	2.56	2.37	0.467	0.137	0.604

<sup>a</sup> Initial quota levels = 1994 basic quota levels.

<sup>b</sup> Intercoastal Counties are those counties listed in the table excluding Bladen County and Columbus County.



price levels evaluated represent an approximate 11 percent and 26 percent price support decrease, respectively. As a result, quantity demanded increases 1.1 percent and 2.6 percent, respectively, from the 1995 estimated level.<sup>4</sup> With new price support values and quota levels in hand, it is now possible to calculate the net change in quota income from the lower peanut support prices, i.e., the sum of the two shaded rectangles in Figure 1.

Column three in Table 1 and Table 2 details the income losses at the farm level given a 10 percent reduction in quota and lower support prices of \$600 per ton and \$500 per ton, respectively. Farm income in North Carolina will be reduced almost \$14 million if the peanut support price drops to \$600 per ton. If a policy initiative reduces the peanut support price to \$500 per ton, North Carolina farm income from peanuts will fall more than \$27 million. Losses are substantial for major peanut producing regions as well. Northampton County, one of the top peanut producing counties in the state, stands to lose more than \$5 million in farm income given the lower support price of \$500 per ton.

In order to put the potential farm income losses in perspective, it is worth examining the relative importance of peanut production to the state of North Carolina and the fourteen counties investigated. Table 3 provides descriptive statistics of the relative importance of peanut sales for each region and policy parameter. In 1993, cash receipts from North Carolina peanut sales reached nearly \$100 million. During the five years between 1989 and 1993, state peanut receipts averaged approximately \$122 million. A policy change to a \$500 per ton peanut support price results in a \$27 million dollar income loss and reduces average state peanut receipts by more than 22 percent. However, relative impacts on individual regions vary. At one extreme, a policy of \$500 per ton will cause peanut receipts in Columbus County to fall by more than 27 percent. Major peanut producing counties, e.g., Bertie, Hertford, Martin and Northampton, stand to lose more than 20 percent of total peanut revenues given the \$500 per ton support price. The effects from a \$600 per ton policy are less costly. North Carolina peanut revenues would fall by just over 11 percent. Individual counties and the Intercoastal region face similar losses. Clearly, for a major peanut producing state such as North Carolina, the farm income losses from a lower support price policy would be significant.

Beyond the loss in farm income, an additional impact of the reduced peanut support price will be the decrease in economic activity. This occurs because lower incomes reduce consumer spending. The result is a decrease in households' final demand for goods and services.<sup>5</sup> Therefore, a policy change in the peanut program will not only affect peanut farms and quota owners, but also other businesses and rural communities in major peanut

Table 3.  
Relative Importance of Peanut Production and Quota Income

Location	Average Value of Peanut Sales <sup>a</sup> (\$1,000,000)	Average Farm Income <sup>a</sup> (\$1,000,000)	Farm Income Derived from Peanut Sales (%)	Loss in Farm Income as a Percentage of Peanut Receipts (%)
	(1)	(2)	(3)	\$600/ton (4)      \$500/ton (5)
North Carolina	122.198	5,820.840	2.1	11.3
Intercoastal Counties	116.411	858.418	13.6	11.4
County:				
Bertie	17.435	92.292	18.9	10.8
Bladen	3.053	69.315	4.4	10.5
Chowan	5.729	30.205	19.0	10.6
Columbus	1.031	93.939	1.1	9.2
Edgecombe	10.200	82.949	12.3	11.7
Gates	7.730	38.993	19.8	9.5
Halifax	17.520	93.409	18.8	12.7
Hertford	11.440	45.615	25.1	11.3
Martin	13.441	65.606	20.5	11.1
Nash	2.411	124.804	1.9	9.6
Northampton	22.494	77.973	28.8	11.9
Perquimans	2.813	41.526	6.8	10.0
Pitt	3.491	113.661	3.1	12.5
Washington	1.707	51.387	3.3	13.9

<sup>a</sup> Values reported are a five-year average over the years 1989 to 1993. Data taken from various issues of *North Carolina: Estimated Income from Sale of Farm Products and Government Payments, by County, Extension District, and State*, prepared by N.C. Cooperative Extension Service, N.C. State University, Raleigh, NC.

producing regions. To evaluate the decrease in economic activity, estimates of the direct, indirect and induced effects derived from the decrease in farm income are calculated.<sup>6</sup> The sum of these three effects is the regional change in economic activity measured in value-added terms.<sup>7</sup> Column four in Table 1 and Table 2 shows estimates of this income effect for the two proposed support prices. Although economic activity losses are not as large as farm income losses, they are still significant. Given a new support price of \$600 per ton, the value of income lost due to the decrease in economic activity ranges from \$30,000 for Columbus County to \$580,000 for Halifax County. The Intercoastal Counties lose \$5.6 million. If the new policy parameter is \$500 per ton, losses are substantially larger. Columbus County stands to lose almost \$60,000 in economic activity and Halifax County loses almost \$1.34 million. The aggregate Intercoastal Counties face a loss of \$11 million in economic activity. Note that the impact on the Intercoastal Counties is not the sum of each of the individual county effects. Rather, the twelve adjoining counties are treated as one region. Economic impacts are estimated for the region. It is interesting to note that the sum of the individual Intercoastal County losses is only \$7.7 million. Treating the twelve adjacent counties as one large region captures greater trade flows between counties. Consequently, the economic activity losses are greater when reductions in total regional trade flows are analyzed.

To evaluate the overall regional impact of a new support price policy, the change in farm owner income and the change in economic activity are summed. This value represents the potential total loss in regional income. Column five in Table 1 and Table 2 displays this estimate. North Carolina stands to lose more than \$43 million because of a proposed decrease in the support price down to \$500 per ton. Associated with this income reduction is a loss of more than 450 full-time-equivalent jobs. Regional impacts range from more than \$6 million in income losses for Northampton County to \$246,000 for Columbus County. A policy change of \$600 per ton rather than \$500 per ton dampens the economic impacts. However, North Carolina still faces a significant income loss of almost \$22 million and job losses in excess of 350 positions. County-level income losses range from \$3.25 million for Northampton to \$125,000 for Columbus.

Clearly, a policy initiative that reduces the peanut quota and support price will have important consequences for major peanut producing states and regions. Although peanut revenues account for less than 3 percent of total farm income in North Carolina, major peanut producing counties and regions face significant economic impacts from a quota and support price reduction. Rural communities with a notable percentage of total farm

income derived from peanut sales stand to lose 20 to 25 percent of their peanut revenues. Besides the loss in peanut sales, the contraction of economic activity in rural communities will be an important consequence of any new policy affecting the quota level and support price of peanuts. This study offers estimates of the cost to farms, quota owners and rural communities of such a policy.

## Notes

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1. Borges points out that from 1989 to 1991, an average of 66 percent of additional were marketed through contract with handlers.
2. The initial support price used is the 1994 support price for an average grade ton of Virginia-type peanuts. Both producers and handlers pay half of the \$7.46 per ton assessment fee (Jurenas).
3. Previous studies include Fleming and White; Song, Franzmann and Mead; and Nieuwoudt, Bullock and Mathia.
4. The demand response is estimated by using a nonlinear demand function with constant elasticity rather than a simple linear approximation.
5. The change in economic activity is estimated by Micro IMPLAN. A description of this system and corresponding analysis is provided in Appendix A.
6. Although it is theoretically possibly for lower consumer expenditures on peanut products at the national level to either partially or completely offset the loss in quota income, we argue that the effect at the state and regional level is insignificant.
7. A potential change in the level of regional economic activity may occur from the increased production of processed peanuts. However, we assume this effect to be negligible and do not account for it in the estimation. See Appendix A for further discussion.
8. Much of this discussion is based on the *Micro IMPLAN User's Guide: Version 91-F. U.S. Department of Agriculture - Forest Service, January 1993.*
9. Micro IMPLAN was first released in 1989 as a menu-driven microcomputer program. It is a jointly administered project between the Minnesota IMPLAN Group and the USDA Forest Service.

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## Appendix

The impacts of the price support reductions on regional economic activity are estimated by Micro IMPLAN.<sup>9</sup> This microcomputer program performs regional input-output analysis for a given change in an activity level. In

this study, the activity level is a reduction in annual household income caused by the decrease in quota income. The change in quota income is shown graphically in Figure 1 and quantitatively in column two of Table 1 and Table 2. The loss in quota income is analyzed as a loss in personal consumption expenditure for medium income households (\$20,000 to \$40,000 annual income). IMPLAN calculates the regional impacts on final demand caused by the change in the activity level.

Total economic impacts can be separated into three components: direct, indirect and induced effects. Direct effects are regional production changes associated with initial changes in final demand. An initial change in final demand occurs when households buy fewer goods because of lower income due to the decrease in quota income. The backward-linkages to regional input suppliers create indirect effects. Finally, any changes in regional household spending behavior that result from the direct and indirect effects are termed induced effects. For example, a decrease in quota income would cause households to reduce their final demand for, say, furniture. Consequently, furniture manufacturers in the region would produce less output (direct effect). This leads to a reduction in the demand for furniture inputs such as milling services and fabric manufacturing (indirect effect). Finally, the decrease in demand would cause income and employment to decrease, further reducing spending in the region (induced effect). Summing across these three effects, and for all commodities affected by a change in consumer spending, gives an estimate of the change in economic activity caused by the decrease in quota income. Economic activity is measured in terms of value-added, or income, and employment. Value-added includes wages, business taxes, property income and self-employment income (profits).

An additional impact of the quota price reduction may be an increase in the quantity demanded by final users of peanuts and peanut products. This arises because the lower price for edible peanuts, an input into final peanut products, increases the supply of these products. Any changes in final expenditures that result from the increase in supply will have multiplier effects. However, we argue that these effects are negligible and potentially negative for two reasons. First, the increase in quota peanuts is relatively small. The quota increases by only 1.1 percent and 2.6 percent in each of the two price support cases. Any carry-over effects to final demand will therefore also be quite small. Second, the demand for final peanut products is quite inelastic. Carley and Fletcher report own-price elasticities ranging from -0.063 for peanut butter to -0.755 for roasting stock. An inelastic demand implies that a decrease in the retail price will lead to a *decrease* in total expenditures. Therefore, if there is a secondary economic impact

caused by an increase in final quantity consumed, additional regional income losses will result. In that case, the estimates reported in Table 1 and Table 2 will underestimate the impact of a peanut support price reduction.