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## ABSTRACT

A survey of Georgia peanut producers revealed that the Southwest corner of Georgia could be targeted for a new generation peanut cooperative (FS 01-07). The objective of this study was to examine the feasibility of this option. Preliminary results revealed that this might be an economically feasible solution to peanut producers' marketing problems. The projected discounted benefit-cost ratios ranged from 1.9 to 1.4 over a ten-year period.

*Key words: Feasibility study, Georgia, new generation cooperative, peanuts, value-added.*

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Selected Paper Presentation at the Southern Agricultural Economics Association Meetings, Ft. Worth, Texas, Jan. 28-31, 2001

# A NEW GENERATION PEANUT COOPERATIVE IN GEORGIA: A BENEFIT-COST ANALYSIS

A recent survey of Georgia peanut producers revealed that Southwest Georgia could be a likely target area to start a new generation peanut cooperative (Ray, et.al 2001). This cooperative was assumed to add value to members' farmer stock peanuts by operating a shelling facility. This would allow producers to pool their production for greater market power as well as capture profits beyond the farm gate. The objective of this research was to test the feasibility of starting a new generation peanut cooperative in Southwest Georgia through a benefit-cost approach.

*Assumptions*

This benefit-cost analysis was completed within the parameters of several assumptions. First, the authors were trying to illustrate a marketing structure under the assumption that there was no peanut program. This assumption carried a certain level of difficulty because experts have been unable to predict specific effects that the termination of the peanut program would have. As a result, detrended data was utilized to reflect the current political and marketing environment in the peanut industry. Even though prices would inevitably drop from the current $610 quota price support, the authors felt that the profit (per pound) margin would remain constant. Basically, it is being assumed that a drop in the shelled peanut price would be proportional to a decrease in the price for farmer stock peanuts.

Second, all budget estimates were completed under the assumption that brand new facilities and equipment would be utilized. There are currently several shelling plants

and buying points already in existence that could be purchased by the cooperative. However, there is no guarantee that these sites would still be available or that the quoted closing price would have stayed the same between the time the estimates were gathered and the time the cooperative is established.

Third, all cost estimates are reported in a conservative (overestimated costs and underestimated revenue) manner. This was done to increase the possibility that any "surprises" that should arise during the organization of the cooperative and the building of its infrastructure would have already been accounted for. These rounding and loading techniques will be described later in the paper.

Fourth, the assumed throughput for the cooperative was 69,000 tons of farmer stock peanuts per year. The capacity of the sheller is 18 to 20 tons per hour (Williams, 7/8/00). The cooperative was assumed to run in two, eight-hour shifts per day, five days per week, and 48 weeks per year. The final four weeks of the year are needed for repairs and to meet the GFA June 31 deadline for having the warehouses cleaned out (Spearman, 10/30/00).

Finally, it was assumed that no cold storage facility would be purchased by the cooperative. The shelling industry is continuously progressing toward a Just-In-Time marketing structure, which has reduced the number of peanuts requiring cold storage. By not building its own cold storage facility, the cooperative can save about $3 million in start-up costs and rent space in cold storage facilities that already exist.

These five general assumptions were not the only ones made in this report. Others will be mentioned for the specific topic to which it applies.

*Locations*

The survey results presented in Section III revealed that if 100% of those who responded they would be willing to invest in the cooperative followed through, two counties would be necessary to fulfill the efficient level of throughput (Early and Miller)[1]. This assumption will be applied to the best-case scenario. The assumed facility sites for this scenario are as follows:

**Table 1: Location of Cooperative Facilities (Best Case Scenario)**

| Facility | Location (County) | Assumed Production Contracted From County | Approximate Distance to Shelling Plant |
|---|---|---|---|
| Shelling/Buying | Blakely (Early) | 37,280 tons | ---------- |
| Buying | Colquitt (Miller) | 32,700 tons | 25 miles |

The locations were decided on based on production concentration and transportation costs accrued by both members and cooperative employees. The shelling plant site was chosen in Early County because of the higher concentration in production there and the accessibility to rail lines[2]. Since a higher concentration of production will be delivered to the buying point at the shelling plant, less cooperative trucking will be involved[3].

The average-case scenario assumes that 75% of those who responded they would be willing to invest actually followed through. For the cooperative to maintain an

[1] This process involved calculating the percentage of peanut pounds produced for the 1998 growing season reported by producers who responded that they would be willing to invest in a cooperative and extrapolating that out over the 1998 total county production.
[2] Even though a specific town is listed, rural land prices were utilized, and the town is listed only to illustrate a general location.
[3] Once membership has been established, the locations should be altered to reflect membership concentration rather than overall concentration.

efficient level of throughput under this scenario, Baker County will also need to be targeted.

**Table 2: Location of Cooperative Facilities (Average-Case Scenario)**

| Facility | Location (County) | Assumed Production Contracted From County | Approximate Distance to Shelling Plant |
|---|---|---|---|
| Shelling/Buying | Blakely (Early) | 27,960 tons | ---------- |
| Buying | Colquitt (Miller) | 24,520 tons | 25 miles |
| Buying | Elmodel (Baker) | 22,000 tons | 35 miles |

The worst-case scenario allows for the assumption that only 50% of those responding that they would be willing to invest in the cooperative actually followed through. For this assumption, the counties of Baker, Decatur, Early, Miller, and Mitchell would need to be targeted in order to maintain an efficient level of throughput. For cooperative transportation efficiency and rail line accessibility, the shelling plant is assumed to be located in Colquitt, Georgia[4].

**Table 3: Location of Cooperative Facilities (Worst-Case Scenario)**

| Facility | Location (County) | Assumed Production Contracted From County | Approximate Distance to Shelling Plant |
|---|---|---|---|
| Buying | Blakely (Early) | 18,640 tons | 25 miles |
| Shelling/Buying | Colquitt (Miller) | 16,350 tons | ---------- |
| Buying | Elmodel (Baker) | 14,675 tons | 35 miles |
| Buying | Camilla (Mitchell) | 16,440 tons | 40 miles |
| Buying | Bainbridge (Decatur) | 9,675 tons | 25 miles |

*Start-up Costs*

The start-up costs for this project depend on the assumed scenario. Five primary cost categories were considered for this item. Lewis M. Carter Manufacturing LLC

[4] A cost minimization calculation was used to determine the location of the shelling plant based on the assumed locations of the buying points.

supplied construction estimates for the *cooperative shelling plant* and *buying points* (Williams, 7/8/00). *Truck and trailer prices* were estimated from prices provided by Mack Trucks Inc. and Mack Sales Atlanta (9/7/00). *Land values* were estimated from a 1992 report published by the Southern Rural Development Center at Mississippi State University (9/7/00). The cropland values for the targeted counties ranged from $800 to $1,000 per acre. To allow for inflation and a commercial premium, land costs were assumed to be $4000 per acre. *Operating costs* were derived from the following formula.

Start-Up Operating Costs = $O^{csu} = L^{csu} + P^{csu} + U^{csu} + M^{csu}$

where: Start-Up Labor Costs= $L^{csu} = E^{ssu} + E^{hsu}$

where: Start-Up Cost for Salaried Employees= $E^{ssu} = S^{y} * \frac{W^{bfs}}{W^{t}}$

(Includes Benefits)

where: $S^{y}$ = Total Annual Salary Paid

$W^{bfs}$ = (Weeks Before First Sale)

$W^{t}$ = 52 (Total Weeks in a Year)

Start-Up Cost for Hourly Employees= $E^{hsu} = h^{w} * w^{r} * N^{eh} * W^{bfs}$

where: $h^{w}$ = Weekly Hours Per Employee = 40

$w^{r}$ = Hourly Wage Rate = $9.00

$N^{eh}$ = Number of Hourly Employees

Start-Up Peanut Cost= $P^{csu} = \left(Q^{fsp} * l\right) * \left(p^{fsp} * f\right)$

where: $Q^{fsp}$ = Quantity of Farmer Stock Peanuts Purchased = 69,000 tons

$l$ = Percent of Total Throughput Purchased Before First Sale

$p^{fsp}$ = Price Paid by Co-op for Farmer Stock Peanuts

$f$ = Percent of Total Price Paid at Delivery = 80%

Start-Up Utility Costs= $U^{csu} = U^{c} * \frac{W^{bfs}}{W^{t}}$

where: $U^{c}$ = Annual Utility Costs

Start-Up Maintenance Cost= $M^{csu} = M^{c} * \frac{W^{bfs}}{W^{t}}$

where: $M^{c}$ = Annual Maintenance Costs = $100,000 (Williams, 7/8/00)

It should also be noted that the cooperative would also accrue expenses involved with transporting peanuts from the distant buying[5] points to the sheller. These costs are assumed to not be accrued until after the sale of cooperative shelled peanuts begins. Instead, throughput should be limited to the peanuts delivered to the buying point that is located with the shelling plant until a solid cash flow is developed.

The time between the first buy from cooperative members and the first sale to processors is assumed to be one week ($W^{bfs}$ = 1 for Best-Case), two weeks ($W^{bfs}$ = 2 for Average-Case), and three weeks ($W^{bfs}$ = 3 for Worst-Case). Ideally this time period would be limited to a couple of days, however, the authors felt that a more sufficient cushion should be allotted for.

[5] A distant buying point is defined as any buying point not located at the shelling plant. Only one buying point for each scenario is located at the shelling plant.

The percentage of total capacity assumed to be purchased before the first sale ( $l$ ) also varied over the three assumptions. This number was assumed to be 20%, 22%, or 24% for the best, average, and worst-case scenario respectively. Again, it should be mentioned that these numbers are high estimates. The first sale would ideally be contracted for delivery a few days after operations begin and before this high of a percentage of throughput would have arrived at any of the buying points.

The best-case scenario assumptions require the construction of a shelling plant and buying point near Blakely, Georgia one buying point near Colquitt, Georgia. Two semi trucks at each of the two distant buying points are required for transportation of farmer stock peanuts to the shelling plant. The shelling plant requires 25 acres of land and the distant buying points require 5 acres each (Williams, 7/10/00).

**Table 4: Start-up Costs (Best-Case Scenario)**

| UNIT | # OF UNITS | UNIT COST (Dollars) | TOTAL COST (Dollars) |
|---|---|---|---|
| Shelling Plant | 1 | $25,040,000 | $25,040,000 |
| Buying Points | 2 | $800,000 | $1,600,000 |
| Trucks | 4 | $40,000 | $160,000 |
| Land | 35 acres | $4,000 | $140,000 |
| Operation | ---------- | ---------- | $7,000,000 |
| **TOTAL** | **----------** | **----------** | **$33,940,000** |

The average-case scenario assumption requires that another buying point be constructed for farmer-member delivery convenience (near Elmodel, GA). Since this would also require more transportation and other operating costs, $500,000 was added to the operation costs. An additional five acres of land and two semi trucks were also added to account for the extra buying point.

**Table 5: Start-up Costs (Average-Case Scenario)**

| UNIT | # OF UNITS | UNIT COST (Dollars) | TOTAL COST (Dollars) |
|---|---|---|---|
| Shelling Plant | 1 | $25,040,000 | $25,040,000 |
| Buying Points | 3 | $800,000 | $1,600,000 |
| Trucks | 6 | $40,000 | $240,000 |
| Land | 40 acres | $4,000 | $160,000 |
| Operation | ---------- | ---------- | $7,500,000 |
| **TOTAL** | **----------** | **----------** | **$34,540,000** |

For the worst-case scenario assumption, two more buying points were added for farmer-member delivery convenience (near Camilla and Bainbridge, GA). This also required additional start-up costs for four more trucks, ten more acres of land, and an extra $750,000 in operating costs.

**Table 6: Start-up Costs (Worst-Case Scenario)**

| UNIT | # OF UNITS | UNIT COST (Dollars) | TOTAL COST (Dollars) |
|---|---|---|---|
| Shelling Plant | 1 | $25,040,000 | $25,040,000 |
| Buying Points | 5 | $800,000 | $4,000,000 |
| Trucks | 8 | $40,000 | $320,000 |
| Land | 50 acres | $4,000 | $200,000 |
| Operation | ---------- | ---------- | $8,250,000 |
| **TOTAL** | **----------** | **----------** | **$37,810,000** |

## Cooperative Capitalization

Since this cooperative is assumed to have typical NGC traits, two methods of financing will be utilized. The first involves an up front equity investment on the part of the farmer. This method involves the cooperative selling shares in the form of common stock to potential members, where each share gives the farmer the right and the obligation to deliver a certain quantity and quality of peanuts at a specific time. In order

to calculate the cost per share, it was assumed that one share would equal delivery rights on one ton of peanuts. Since an efficient throughput for the cooperative was estimated at 69,000 tons, 69,000 shares of common stock will be sold.

The second financing method involves borrowing money from a private or semi-private institution. Estimates were gathered from Southwest Georgia Farm Credit, ACA on interest rates and down payment requirements (Monson, 8/5/00). The interest rate is estimated at 10%, and a 30% down payment is required[6]. This 30% will be raised through the sale of equity shares. Both a 10 and 15-year loan amortization schedule will be considered with annual payments.

*Best-case Financing*

Capitalization under the best-case scenario was organized assuming a start up cost of $33,940,000 (Table 4). About $10.18 million (30%) will be raised through the sale of equity in the cooperative. This means that potential members will have to pay about $148 per share, which entitles and obligates the member to deliver one ton of peanuts to the cooperative. The remaining $23.76 million will need to be financed through some private or semi-private institution. Assuming a 10% interest rate, annual payments will be about $3.9 million for a 10-year schedule and $3.1 million for a 15-year schedule (Table 7). The total cost of the loan for the 10 and 15-year schedule is about $38.7 million and $46.9 million respectively.

[6] The 30% down payment quoted by Southwest Georgia Farm Credit is consistent with the industry requirement for similar agribusiness ventures.

**Table 7: Loan Amortization Schedule (Best-Case Scenario)**

| **DURATION** | **10-Year** | | **15-Year** | |
|---|---|---|---|---|
| **YEAR #** | **Payment** | **Balance** | **Payment** | **Balance** |
| **1** | $3,866,505.09 | $22,267,294.91 | $3,123,554.07 | $23,010,245.93 |
| **2** | $3,866,505.09 | $20,627,519.31 | $3,123,554.07 | $22,187,716.46 |
| **3** | $3,866,505.09 | $18,823,766.15 | $3,123,554.07 | $21,282,934.04 |
| **4** | $3,866,505.09 | $16,839,637.67 | $3,123,554.07 | $20,287,673.38 |
| **5** | $3,866,505.09 | $14,657,096.34 | $3,123,554.07 | $19,192,886.66 |
| **6** | $3,866,505.09 | $12,256,300.89 | $3,123,554.07 | $17,988,621.26 |
| **7** | $3,866,505.09 | $9,615,425.88 | $3,123,554.07 | $16,663,929.32 |
| **8** | $3,866,505.09 | $6,710,463.38 | $3,123,554.07 | $15,206,768.18 |
| **9** | $3,866,505.09 | $3,515,004.63 | $3,123,554.07 | $13,603,890.94 |
| **10** | $3,866,505.09 | 0 | $3,123,554.07 | $11,840,725.96 |
| **11** | N/A | 0 | $3,123,554.07 | $9,901,244.50 |
| **12** | N/A | 0 | $3,123,554.07 | $7,767,814.88 |
| **13** | N/A | 0 | $3,123,554.07 | $5,421,042.30 |
| **14** | N/A | 0 | $3,123,554.07 | $2,839,592.47 |
| **15** | N/A | 0 | $3,123,554.07 | 0 |
| **TOTAL** | **$38,665,051.00** | **0** | **$46,853,311.00** | **0** |

*Average-Case Financing*

Capitalization under this scenario was organized assuming a start up cost of about $35,230,000 (Table 5). This was an increase of about 3% from the best-case figure. About $10.6 million (30%) will be raised through the sale of equity in the cooperative. This increase in equity funding requires about a 3% increase in share price from the best-case price to $153 per share. The remaining $24.2 million will need to be financed through some private or semi-private institution. Assuming a 10% interest rate, annual payments will be about $4 million for a 10-year schedule and $3.2 million for a 15-year schedule (Table 8). The total cost of the loan for the 10 and 15-year schedule is about $39 million and $48 million respectively.

**Table 8: Loan Amortization Schedule (Average-Case Scenario)**

| **DURATION** | **10-Year** | | **15-Year** | |
|---|---|---|---|---|
| **YEAR #** | **Payment** | **Balance** | **Payment** | **Balance** |
| **1** | $3,934,858.16 | $22,660,941.84 | $3,178,773.05 | $23,417,026.95 |
| **2** | $3,934,858.16 | $20,992,177.87 | $3,178,773.05 | $22,579,956.59 |
| **3** | $3,934,858.16 | $19,156,537.50 | $3,178,773.05 | $21,659,179.19 |
| **4** | $3,934,858.16 | $17,137,333.09 | $3,178,773.05 | $20,646,324.06 |
| **5** | $3,934,858.16 | $14,916,208.24 | $3,178,773.05 | $19,532,183.41 |
| **6** | $3,934,858.16 | $12,472,970.91 | $3,178,773.05 | $18,306,628.70 |
| **7** | $3,934,858.16 | $9,785,409.84 | $3,178,773.05 | $16,958,518.52 |
| **8** | $3,934,858.16 | $6,829,092.67 | $3,178,773.05 | $15,475,597.32 |
| **9** | $3,934,858.16 | $3,577,143.78 | $3,178,773.05 | $13,844,384.00 |
| **10** | $3,934,858.16 | 0 | $3,178,773.05 | $12,050,049.35 |
| **11** | N/A | 0 | $3,178,773.05 | $10,076,281.23 |
| **12** | N/A | 0 | $3,178,773.05 | $7,905,136.30 |
| **13** | N/A | 0 | $3,178,773.05 | $5,516,876.87 |
| **14** | N/A | 0 | $3,178,773.05 | $2,889,791.51 |
| **15** | N/A | 0 | $3,178,773.05 | 0 |
| **TOTAL** | **$39,348,582.00** | **0** | **$47,681,596.00** | **0** |

*Worst-Case Financing*

Capitalization under this scenario was organized assuming a start up cost of about $37,810,000 (Table 6). This was an increase of about 11% from the best-case figure and 8% from the average-case figure. About $11.3 million (30%) will be raised through the sale of equity in the cooperative. This increase in equity funding requires about a 8% increase in share price from the average-case price to about $164 per share. The remaining $26.5 million will need to be financed through some private or semi-private institution. Assuming a 10% interest rate, annual payments will be a little over $4 million for a 10-year schedule and $3.5 million for a 15-year schedule (Table 9). The total cost of the loan for the 10 and 15-year schedule is about $43.1 million and $52.2 million respectively.

**Table 9: Loan Amortization Schedule (Worst-Case Scenario)**

| **DURATION** | **10-Year** | | **15-Year** | |
|---|---|---|---|---|
| **YEAR #** | **Payment** | **Balance** | **Payment** | **Balance** |
| **1** | $4,305,104.40 | $24,793,196.00 | $3,477,875.90 | $25,620,424.10 |
| **2** | $4,305,104.40 | $22,967,411.60 | $3,477,875.90 | $24,704,590.60 |
| **3** | $4,305,104.40 | $20,959,048.76 | $3,477,875.90 | $23,697,173.76 |
| **4** | $4,305,104.40 | $18,749,849.64 | $3,477,875.90 | $22,589,015.24 |
| **5** | $4,305,104.40 | $16,319,730.60 | $3,477,875.90 | $21,370,040.86 |
| **6** | $4,305,104.40 | $13,646,599.66 | $3,477,875.90 | $20,029,169.04 |
| **7** | $4,305,104.40 | $10,706,155.63 | $3,477,875.90 | $18,554,210.04 |
| **8** | $4,305,104.40 | $7,471,667.19 | $3,477,875.90 | $16,931,755.15 |
| **9** | $4,305,104.40 | $3,913,729.91 | $3,477,875.90 | $15,147,054.76 |
| **10** | $4,305,104.40 | 0 | $3,477,875.90 | $13,183,884.33 |
| **11** | N/A | 0 | $3,477,875.90 | $11,024,396.86 |
| **12** | N/A | 0 | $3,477,875.90 | $8,648,960.65 |
| **13** | N/A | 0 | $3,477,875.90 | $6,035,980.81 |
| **14** | N/A | 0 | $3,477,875.90 | $3,161,702.99 |
| **15** | N/A | 0 | $3,477,875.90 | 0 |
| **TOTAL** | **$43,051,044.00** | **0** | **$52,168,139.00** | **0** |

## ANNUAL BUDGET ESTIMATION

Now that the groundwork has been presented for starting the cooperative, this section of the analysis will focus on the budget estimation process. The method by which each number was derived will be laid out in detail.

### Gross Revenue Estimation

There were several factors considered while estimating revenue. Projected revenue for year t was calculated from the following equation.

Projected Revenue in year t =

$$R_t^P = ((Q_t^{fsp} * s^{J}) * p_t^J) + ((Q_t^{fsp} * s^{M}) * p_t^M) + ((Q_t^{fsp} * s^{1}) * p_t^1) + ((Q_t^{fsp} * s^{S}) * p_t^S) + ((Q_t^{fsp} * s^{O}) * p_y^O)$$

where: $Q^{fsp}$ = 69,000 tons = Cooperative purchase of farmer stock peanuts

$S$ = Shelling outturn rate

where: J = Jumbo

M = Medium

1 = Number One's

S = U.S. Splits

O = Oil Stock

$p_t$ = Detrended price in year t

The assumed capacity for the cooperative is 69,000 tons of farmer stock peanuts. A constant shelling outturn rate was used based on the five-year shell-out average for irrigated and non-irrigated peanuts (Lamb, 9/15/00). Irrigated/non-irrigate is assumed to be at a 50/50 ratio for the best-case scenario, 40/60 for the average-case, and 30/70 for the worst-case. While non-irrigated peanuts could also include other quality issues, irrigation will only be considered as it affects the shelling outturn rates in this research (Table 10).

**Table 10: Five-year Average Shelling Outturn Rates**

| Type | Irrigated (%) | Non-irrigated (%) |
|---|---|---|
| **Jumbo** | 16.99 | 14.88 |
| **Medium** | 33.27 | 33.04 |
| **Number One's** | 7.28 | 8.31 |
| **US Splits** | 12.71 | 11.87 |
| **Oil Stock** | 6.61 | 7.63 |
| **Hulls** | 23.06 | 24.30 |

Source: Lamb, Marshall. National Peanut Research Laboratory

*Price Data*

Price data were detrended for the model because it allows for prices to be adjusted for a base year (Hancock, Samuel J., Jerry R. Skees, Kimberly A. Zeuli, 2000). This means that the prices' time trend can be minimized so that only supply and demand issues in a given year control the price fluctuations. This process also helps remove distortions created by changes in government programs over time. The base year used for this process is 1998. This year was chosen because it reflects the current price support of $610/ton for quota peanuts.

**Table 11: Illustration of Price Detrending Process (Jumbo's)**

| Year | Aug | July | Difference | % Change | Base Price | Estimated Price |
|---|---|---|---|---|---|---|
| 1989 | 59 | 58.38 | -0.62 | -0.01 | 59.96 | 59.33 |
| 1990 | 86 | 93.25 | 7.25 | 0.08 | 59.96 | 65.02 |
| 1991 | 65 | 72.25 | 7.25 | 0.11 | 59.96 | 66.65 |
| 1992 | 68 | 60.38 | -7.62 | -0.11 | 59.96 | 53.24 |
| 1993 | 65 | 63.38 | -1.62 | -0.02 | 59.96 | 58.47 |
| 1994 | 64 | 57 | -7 | -0.11 | 59.96 | 53.41 |
| 1995 | 64 | 70 | 6 | 0.09 | 59.96 | 65.59 |
| 1996 | 64 | 60 | -4 | -0.06 | 59.96 | 56.22 |
| 1997 | 61 | 63 | 2 | 0.03 | 59.96 | 61.93 |
| 1998 | 62 | 55 | -7 | -0.11 | 59.96 | 53.19 |

A ten-year example (1989-1998) with Jumbo peanuts was used to illustrate this process (Table 11). The first step was to collect the average daily price during the months of August and July for each type of shelled peanut. This was done for all 10 years. Next, the percentage change from August to July was calculated. This percentage was then multiplied by the average 1998 price to calculate each individual year's detrended price.

**Variable Cost Information**

The equations used in estimating the variable costs for operating the cooperative shelling plant are laid out in this section of the paper. The specific variable cost categories include peanut purchasing, marketing, management salaries and benefits, general labor, fuel, utilities, maintenance, insurance, cold storage, and miscellaneous.

*Peanut Purchasing Cost Estimation*

The largest annual cost involved with undertaking this venture is the cooperative purchasing of farmer stock peanuts from its members. It is important to note that the more spread out the payments are over time, the greater chance the cooperative will have at remaining economically viable. The peanut purchasing cost listed in the budget is an annual cost and does not reflect the timing of the payments. It was calculated in a straightforward manner with the following equation.

Peanut Purchasing Costs in Year t = = $C_t^P = \left(Q_t^{fsp}\right) * \left(p_t^f\right)$

where: $Q_t^{fsp}$ = Quantity of Farmer Stock Peanuts Purchased in year t

= 69,000 tons

$p_t^f$ = Contract price for Farmer Stock Peanuts in year t = $610/ton

As seen in the equation, the contract price was set at the current $610 price support level for all ten years. The authors feel that this is a reasonable practice considering the prices received by the cooperative for shelled peanuts were detrended for this input price. In reality the cooperative would need to set a competitive contract price based on the projected marketing environment for that year. This contract price does not have any direct effects on the farmer-members income other than the time value of

money, because all cooperative profits are distributed to the membership at the end of the year. The contract price only reflects what the farmer-member will receive in the first 90 days after delivery.

*Marketing Cost Estimation*

The general manager of the peanut-shelling firm generally makes marketing decisions relating to the timing of sales. Even though these decisions are made in house, a brokerage firm is used as a liaison between shellers and processors. Brokerage firms are paid a commission for services rendered. The standard commission is 1% of the sale value (Reid, 11/22/00). The marketing cost category is the projected commission paid annually. This cost was derived from the following formula.

Projected Marketing Costs in year t = $C_t^M = \left(R_t^P\right) * \left(h\right)$

Where: $R_t^P$ = Projected Revenue in year t

$h$ = Commission Rate = 1%

*Management Cost Estimation*

Management salary and benefits costs were calculated assuming that an assistant manager's package would cost $50,000 per year and the general manager/marketing specialist's package would cost $150,000 per year. It is important for the cooperative to offer an enticing package to a potential G.M., because his/her performance can make or break the venture. The individual has to have a superior understanding of the current world and domestic peanut markets as well as run the internal workings of the shelling plant in an efficient manner. The three assistant managers at the shelling facility will act as foremen overseeing specific aspects of the shelling operation. There will also be one assistant manager located at each buying point to oversee operations there.

*General Labor Cost Estimation*

The assumed pay rate for general labor is $9.00 per hour. Although training is involved for hourly employees, their labor classification is assumed to be unskilled. The competitive wage rate can vary depending on the unemployment rate in the area, but this estimate is competitive with other unskilled agricultural processing positions. The 40 hourly employees allotted for the shelling plant is estimated from the assumption of operating in two shifts of 20 employees each. Three of the assumed five hourly employees at each buying point could be part-time since the busiest time is the harvest period from August through October, however, this report assumes that all labor is full time as a method of loading the labor costs for any unexpected expenses.

*Fuel Cost Estimation*

This cost category is an estimation of the diesel fuel required for the cooperative transportation of peanuts from the distant buying points to the shelling plant. The following equation was used in this estimation.

Fuel Costs in year t = $$F_t^c = \left( \frac{\left( \frac{Q_t^{DB}}{T^c} \right) * 2m}{T^M} \right) * D_t^C$$

Where: $Q_t^{DB}$ = Quantity Delivered to Distant Buying Points in year t

$T^c$ = Truck Capacity = 20 tons

$m$ = Miles Between Distant Buying Points and Shelling Plant

$T^M$ = Truck Gas Mileage = 10mpg

$D_t^C$ =Diesel Cost in Year t = $1.50

The cost of diesel is assumed to be $1.50 per gallon. The trucks are assumed to average 10 miles per gallon, and can hold 20 tons of peanuts (Givan, 8/23/00). After the calculation was complete, the total was rounded up to allow for any margin of error.

*Utility Cost Estimation*

Georgia Power provided utility cost estimation methodology (11/16/00). The estimation required adding up all the horsepower used to run the shelling process and multiplying it by a factor of .75 to get the kilowatts per hour used. Based on the volume of electricity required, the cost should run 8 cents per kilowatt-hour. After this calculation was complete, a general estimate was added to cover other utilities at the shelling plant and buying points (Georgia Power, 11/16/00). It is important to note that this budget figure does not include the electricity or gas required to dry the peanuts at the buying points, because producers are required to pay for this service.

*Maintenance Cost Estimation*

The manufacturers of the peanut sheller estimated that $40,000 per year would be needed to maintain the shelling system (Williams, 7/8/00). This base figure was then loaded differently for each scenario to account for other maintenance that would be

needed around the shelling plant and at the buying points. This number was assumed to be $100,000 for the best-case scenario, $200,000 for the average-case scenario, and $300,000 for the worst-case scenario.

*Insurance Cost Estimation*

This line of the budget estimate reflects the cost of insuring the trucks and cooperative facilities. It also includes workers compensation insurance to mitigate the risk of employee injury. It does not include any insurance that is part of the employees' benefits packages.

*Cold Storage Cost Estimation*

Since the cooperative is assumed to not have its own cold storage facilities, this line in the budget estimate reflects the cost of leasing cold storage space in an existing facility. Estimates were gathered for leasing costs, average percentage of throughput requiring cold storage, and the average duration that a lot will be in cold storage. The estimate was derived from the following equation.

Cold Storage Inventory Costs in year t= $$I_t^c = \left( \frac{\left(e_t * Q_t^{sp}\right) * 2000}{100} \right) * i_t^{cwt} * t_t^{CS}$$

where: $Q_t^{sp}$ = Quantity of Shelled Peanut Output in year t =

$$(Q_t^{fsp} * s^{J}) + (Q_t^{fsp} * s^{M}) + (Q_t^{fsp} * s^{1}) + (Q_t^{fsp} * s^{S}) + (Q_t^{fsp} * s^{O})$$

where: $Q^{fsp}$ = 69,000 tons = Co-op purchase of farmer stock peanuts

$s$ = Shelling outturn rate

$e_t$ = Percentage of Output Requiring Cold Storage in year t

$i_t^{cwt}$ = Cold Storage Cost per cwt per Month = 29 cents

$t_t^{CS}$ = Average Time a Lot Stays in Cold Storage = 3 months

Cost estimates as well as industry standards were attained from Coastal Cold Storage Company, Flint River Services, and Georgia Cold Storage Company (10/24/00). The average lot stays in cold storage about two to three months ($t_t^{CS}$).

**Table 12: Assumed Throughput Percentage in Cold Storage**

| | Year 1 | Year 2 | Year 3-10 |
|---|---|---|---|
| **Best-Case** | 20% | 15% | 10% |
| **Average-Case** | 30% | 25% | 20% |
| **Worst-Case** | 40% | 35% | 30% |

About 10% of these facilities' clients' throughput goes into cold storage ($e_t$). In order to allot for predatory tactics from competitors, this percentage was assumed to be 20 for the best-case, 30 for the average-case, and 40 for the worst-case scenario (Table 12). These percentages are steadily declined until year three and remain constant after that. The average of the three estimates was 29 cents/cwt/month ($i_t^{cwt}$).

*Miscellaneous Cost Estimation*

This budget item was estimated to account for office supplies or any other expenses that might arise. No specific calculation was used. This cost was assumed to be $100,000 per year for the best-case scenario, $200,000 for the average-case scenario, and $300,000 for the worst-case scenario.

**Fixed Cost Information**

Explanations for fixed costs are laid out in this section. The cost categories include depreciation for buildings and equipment, depreciation for trucks, and interest on the capital investment.

*Depreciation for Buildings and Equipment*

This line of the budget was not a true accounting depreciation technique. Instead, it accounts for the principal portion of the loan payment made each year. That is why this item gets progressively larger over the ten years included in the budget. This was done in order to illustrate the annual cash flow so that earnings per share could be calculated. This item varies over the three scenarios based on the amount of start up costs dictated by the scenario parameters.

*Interest on Capital Investment*

This line item is the annual cost for interest paid by the cooperative on the capital investment. This line item added to the depreciation for buildings and equipment equals the annual loan payment.

## RESULTS

For the best-case scenario, the net present value of the ten-year stream of earnings per share was calculated at $282.30 for year one at a 4% discount rate (Table 13). Since the cost per share to the investor is $148, the projected benefit/cost ratio for the first ten years is 1.91.

**Table 13: Operating Budget (Best-Case Scenario)**

| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | YEAR 6 | YEAR 7 | YEAR 8 | YEAR 9 | YEAR 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Income** | | | | | | | | | | |
| Net Sales | $58,118,524 | $69,833,867 | $59,936,567 | $50,473,844 | $50,386,044 | $50,291,473 | $62,693,661 | $53,567,580 | $59,512,725 | $51,115,097 |
| **Total Income** | **$58,118,524** | **$69,833,867** | **$59,936,567** | **$50,473,844** | **$50,386,044** | **$50,291,473** | **$62,693,661** | **$53,567,580** | **$59,512,725** | **$51,115,097** |
| | | | | | | | | | | |
| **Expenses** | | | | | | | | | | |
| Variable Costs | | | | | | | | | | |
| Peanut Purchasing | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 |
| Marketing | $581,185 | $698,339 | $599,366 | $504,738 | $503,860 | $502,915 | $626,937 | $535,676 | $595,127 | $511,151 |
| Management | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 | $400,000 |
| General Labor | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 | $936,000 |
| Fuel | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 | $13,000 |
| Utilities | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 | $900,000 |
| Maintenance | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| Insurance | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 |
| Cold Storage | $150,000 | $115,000 | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 |
| Misc. | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| **Total Variable** | **$46,270,185** | **$46,352,339** | **$46,213,366** | **$46,118,738** | **$46,117,860** | **$46,116,915** | **$46,240,937** | **$46,149,676** | **$46,209,127** | **$46,125,151** |
| | | | | | | | | | | |
| Fixed Costs | | | | | | | | | | |
| Depreciation (B&E) | $1,490,705 | $1,639,776 | $1,803,753 | $1,984,128 | $2,182,541 | $2,400,795 | $2,640,875 | $2,904,963 | $3,195,459 | $3,515,005 |
| Depreciation (Trucks) | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 |
| Interest on Investment | $2,375,800 | $2,226,729 | $2,062,752 | $1,882,377 | $1,683,964 | $1,465,710 | $1,225,630 | $961,543 | $671,046 | $351,500 |
| **Total Fixed** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** | **$3,874,505** |
| | | | | | | | | | | |
| **Total Costs** | **$50,144,690** | **$50,226,844** | **$50,087,871** | **$49,993,244** | **$49,992,366** | **$49,991,420** | **$50,115,442** | **$50,024,181** | **$50,083,632** | **$49,999,656** |
| | | | | | | | | | | |
| **Profit (Loss)** | **$7,973,834** | **$19,607,023** | **$9,848,696** | **$480,601** | **$393,678** | **$300,053** | **$12,578,219** | **$3,543,399** | **$9,429,093** | **$1,115,441** |
| | | | | | | | | | | |
| **Earnings per Share** | **$104.92** | **$257.99** | **$129.59** | **$6.32** | **$5.18** | **$3.95** | **$165.50** | **$46.62** | **$124.07** | **$14.68** |

For the average-case scenario, the net present value of the ten-year stream of earnings per share was calculated at $252.68 for year one at a 4% discount rate (Table 14). Since the cost per share to the investor is $150, the projected benefit/cost ratio for the first ten years is 1.68.

**Table 14: Operating Budget (Average-Case Scenario)**

| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | YEAR 6 | YEAR 7 | YEAR 8 | YEAR 9 | YEAR 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Income** | | | | | | | | | | |
| Net Sales | $57,959,774 | $69,669,782 | $59,754,114 | $50,334,256 | $50,232,626 | $50,147,427 | $62,519,186 | $53,417,292 | $59,349,405 | $50,973,782 |
| **Total Income** | **$57,959,774** | **$69,669,782** | **$59,754,114** | **$50,334,256** | **$50,232,626** | **$50,147,427** | **$62,519,186** | **$53,417,292** | **$59,349,405** | **$50,973,782** |
| **Expenses** | | | | | | | | | | |
| Variable Costs | | | | | | | | | | |
| Peanut Purchasing | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 |
| Marketing | $579,598 | $696,698 | $597,541 | $503,343 | $502,326 | $501,474 | $625,192 | $534,173 | $593,494 | $509,738 |
| Management | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 | $450,000 |
| General Labor | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 | $1,029,600 |
| Fuel | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 | $18,000 |
| Utilities | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 | $1,000,000 |
| Maintenance | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| Insurance | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 |
| Cold Storage | $300,000 | $260,000 | $225,000 | $225,000 | $225,000 | $225,000 | $225,000 | $225,000 | $225,000 | $225,000 |
| Misc. | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| **Total Variable** | **$46,967,198** | **$47,044,298** | **$46,910,141** | **$46,815,943** | **$46,814,926** | **$46,814,074** | **$46,937,792** | **$46,846,773** | **$46,906,094** | **$46,822,338** |
| | | | | | | | | | | |
| Fixed Costs | | | | | | | | | | |
| Depreciation (B&E) | $1,517,058 | $1,668,764 | $1,835,640 | $2,019,204 | $2,221,125 | $2,443,237 | $2,687,561 | $2,956,317 | $3,251,949 | $3,577,144 |
| Depreciation (Trucks) | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 | $16,000 |
| Interest on Investment | $2,417,800 | $2,266,094 | $2,099,218 | $1,915,654 | $1,713,733 | $1,491,621 | $1,247,297 | $978,541 | $682,909 | $357,714 |
| **Total Fixed** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** | **$3,950,858** |
| | | | | | | | | | | |
| **Total Costs** | **$50,918,056** | **$50,995,156** | **$50,860,999** | **$50,766,801** | **$50,765,784** | **$50,764,932** | **$50,888,650** | **$50,797,631** | **$50,856,952** | **$50,773,196** |
| | | | | | | | | | | |
| **Profit (Loss)** | **$7,041,719** | **$18,674,626** | **$8,893,115** | **-$432,545** | **-$533,159** | **-$617,505** | **$11,630,537** | **$2,619,661** | **$8,492,453** | **$200,586** |
| | | | | | | | | | | |
| **Earnings per Share** | **$92.65** | **$245.72** | **$117.01** | **-$5.69** | **-$7.02** | **-$8.13** | **$153.03** | **$34.47** | **$111.74** | **$2.64** |

For the worst-case scenario, the net present value of the ten-year stream of earnings per share was calculated at $233.64 for year one at a 4% discount rate (Table 15). Since the cost per share to the investor is $164, the projected benefit/cost ratio for the first ten years is 1.42.

**Table 15: Operating Budget (Worst-Case Scenario)**

| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | YEAR 6 | YEAR 7 | YEAR 8 | YEAR 9 | YEAR 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Income** | | | | | | | | | | |
| Net Sales | $57,801,024 | $69,505,697 | $59,571,660 | $50,194,667 | $50,079,208 | $50,003,381 | $62,344,712 | $53,267,003 | $59,186,085 | $50,832,466 |
| **Total Income** | **$57,801,024** | **$69,505,697** | **$59,571,660** | **$50,194,667** | **$50,079,208** | **$50,003,381** | **$62,344,712** | **$53,267,003** | **$59,186,085** | **$50,832,466** |
| | | | | | | | | | | |
| **Expenses** | | | | | | | | | | |
| Variable Costs | | | | | | | | | | |
| Peanut Purchasing | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 | $42,090,000 |
| Marketing | $578,010 | $695,057 | $595,717 | $501,947 | $500,792 | $500,034 | $623,447 | $532,670 | $591,861 | $508,325 |
| Management | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 | $550,000 |
| General Labor | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 | $1,216,800 |
| Fuel | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 |
| Utilities | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 | $1,100,000 |
| Maintenance | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 |
| Insurance | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 | $1,200,000 |
| Cold Storage | $335,000 | $290,000 | $250,000 | $250,000 | $250,000 | $250,000 | $250,000 | $250,000 | $250,000 | $250,000 |
| Misc. | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 | $300,000 |
| **Total Variable** | **$47,699,810** | **$47,771,857** | **$47,632,517** | **$47,538,747** | **$47,537,592** | **$47,536,834** | **$47,660,247** | **$47,569,470** | **$47,628,661** | **$47,545,125** |
| | | | | | | | | | | |
| Fixed Costs | | | | | | | | | | |
| Depreciation (B&E) | $1,659,804 | $1,825,785 | $2,008,363 | $2,209,199 | $2,430,119 | $2,673,131 | $2,940,444 | $3,234,489 | $3,557,937 | $3,913,731 |
| Depreciation (Trucks) | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 |
| Interest on Investment | $2,645,300 | $2,479,320 | $2,296,741 | $2,095,905 | $1,874,985 | $1,631,973 | $1,364,660 | $1,070,616 | $747,167 | $391,373 |
| **Total Fixed** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** | **$4,341,104** |
| | | | | | | | | | | |
| **Total Costs** | **$52,040,915** | **$52,112,961** | **$51,973,621** | **$51,879,851** | **$51,878,696** | **$51,877,938** | **$52,001,352** | **$51,910,574** | **$51,969,765** | **$51,886,229** |
| | | | | | | | | | | |
| **Profit (Loss)** | **5,760,109** | **17,392,736** | **7,598,039** | **(1,685,184)** | **(1,799,489)** | **(1,874,557)** | **10,343,361** | **1,356,429** | **7,216,320** | **(1,053,763)** |
| | | | | | | | | | | |
| **Earnings per Share** | **83.48** | **252.07** | **110.12** | **(24.42)** | **(26.08)** | **(27.17)** | **149.90** | **19.66** | **104.58** | **(15.27)** |

## CONCLUSION

Georgia's peanut producers are currently facing several marketing challenges. These challenges include increasing concentration in the first buyer market (i.e. shellers), downward price pressure from imports, and political uncertainty with the current peanut program. This purpose of this research was to investigate the possibility of forming a new generation cooperative through a benefit-cost approach to help producers meet these new challenges.

Preliminary results revealed that forming a new peanut cooperative shelling plant could be an economically viable option. The projected benefit-cost ratios ranged from 1.91 to 1.42 over a ten-year schedule. However, there are many other factors to consider when examining the feasibility of forming a peanut NGC. First, farmers must be willing to cooperate with each other. Without cooperation, there can be no cooperative. Second, the management decisions made by the president and board of directors could make or break the venture. The cooperative has to be able to attract skilled managers that have a good knowledge of the industry. Third, predatory practices could be a concern. Even though some predatory behavior was budgeted for in this study, this cooperative would be competing with two very large firms. Finally, the structure of payments from the cooperative to the farmer-members for farmer stock peanuts can dictate the viability of the venture. If the cooperative were required to pay the total value of one year's throughput to its members at harvest, cash flow could become a problem.

Further research should include a follow-up survey that includes hard numbers for projected share price and returns so an accurate level of producer interest can be determined. Once producers are educated on the costs and potential benefits of forming a new generation peanut cooperative, and feedback on the idea is received, the feasibility of this venture can be more accurately determined.

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