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**Development of Best Management Practice Simulations with Enterprise Budgets for
Production in the Flint and Suwanee River Basins**

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Development of Best Management Practice Simulations with Enterprise Budgets for Production in the Flint and Suwanee River Basins

Abstract

Water use and management practices are critical in South Georgia and North Florida. As populations increase and environmental regulations are signed into law, water security in these areas continues to become threatened. Furthermore, recent water controversies between Georgia and Florida have escalated to the United States Supreme Court. Long-term economic and environmental sustainability of agriculture is also necessary because of its productivity in and economic contribution to the region. Alternative land use practices need to be identified and implemented to improve water quality and ensure efficient water use in crop production. By interviewing extension agents and agricultural producers, we developed enterprise budgets to reflect the current land use management practices in the Flint and Suwanee River Basins. These enterprise budgets documented cultural practices for cotton production. Farm-scale production costs and revenues associated with current best management practices (BMP) were also included in the enterprise budgets. These bundles of BMPs were evaluated at three scenario levels: intensive, typical, and minimal implementation. Economic simulation analysis will be conducted using @Risk software to compare the alternative BMP scenarios and the impact of these scenarios on land profitability.

Introduction

The Upper Floridan Aquifer is vital in sustaining silviculture and agriculture production in large portions of the Southeastern United States (O'Reilly and Kuniansky 2013). Expanding across multiple states, the Upper Floridan Aquifer is the primary water source for millions of individuals in Georgia and Florida (Marella and Berndt 2005). However, as populations in the region continue to increase in this area, the aquifer is increasingly under the pressure of environmental threats and increased demand for water. Various factors such as silviculture and agricultural land management practices lead to different amount of environmental pollution and water useage. Among the management practices that have the greatest impacts on water pollution and useage are the amounts of fertilizer and irrigation used in agricultural production. Threatened water security could have a negative impact on food security, public health, and economy. The purpose of this research is to guarantee long-term water quality and quantity.

It is well documented that different agricultural management practices impact the amount of nitrogen leached from the soil and the amount of water necessary to produce crops (Nielsen and Jensen 1990). Lower fertilizer levels and more efficient irrigation application are beneficial in promoting water security. However, it is not clear how various best management production practices influence individual farm profitability. Therefore, a critical aspect of this research is to identify the different cost and revenues associated with each of the best management practice in the Upper Floridan Aquifer region. To determine how farm profitability is impacted by different management practices, detailed enterprise budgets were developed to reflect the differences in costs and revenue between three different levels of management practices, including intensive, typical, and minimal conservation management practice. Finally,

economic simulation analysis will be conducted using @Risk software to compare the alternative best management practice scenarios and the impact of these scenarios on land profitability.

Data and Methods

The data for this research was collected by interviewing agricultural producers, extension specialists, county extension agents, and fertilizer and chemical suppliers. Interviews were conducted in both Georgia's Lower Flint River Basin and Florida's Lower Suwannee River Basin in the summer of 2018. The interviews were conducted in Mitchell, Lee, Miller, Terrell, Dougherty, and Baker counties in Georgia as well as Suwannee, Columbia, Lafayette, and Union counties in Florida. These enterprise budgets included the revenues and costs associated with management practices for cotton, bermudagrass, and bahiagrass production systems. In this paper, the results for cotton enterprise budgets are discussed. Three individual budgets were developed for each crop to reflect intensive (Level 1), typical (Level 2), and minimal levels (Level 3) of management practices for each crop.

Level 1 represents the intensive level of management practice, where producers strive to constantly improve the efficiency of their production systems. Common practices of level 1 producers would include actions such as planting cover crops, taking soil and tissue samples, and fully utilizing modern agricultural technology to ensure they are using water and fertilizer as efficiently as possible. Furthermore, level 1 producers employ production practices that minimize nitrogen leaching from the soil. Level 2 represents the typical level of management practices. Producers in this level use some modern practices that would make their farms more efficient. However, producers in this level tend to be hesitant about experimenting with new

practices that do not have a long proven track record of success. These individuals in level 2 rarely plant cover crops or conduct uniformity testing on farm irrigation pivots, but they do implement some conservation practices such as strip-tillage as the farm's tillage method. Level 3 represents the minimal level of management practices, where producers in this level lag behind most producers in adopting modern practices to ensure water and nitrogen usage efficiency. It would not be expected that a level 3 producer would plant cover crops, take soil or tissue samples, perform uniformity testing on irrigation pivots, nor use any other practice that would improve farm efficiency. The production practices used by level 3 producers result in the greatest amount of nitrogen leaching from the soil.

Each of these different management practice levels produces different costs, revenues, and in many cases different crop yields. Therefore, different profitability is associated with each of the different management practice levels. Economic simulations will be conducted for each management practice level to identify how different practices impact farm profitability. Crop yield data will be inputted into @Risk Software for each of the different levels of management practices. The crop yield data that will be used to complete simulations for each level has been collected from crops that would fit into each of the three best management practice levels.

Results

The enterprise budgets that were developed for each management level revealed how production costs were different for each level. Tables 1 – 3 display the irrigated enterprise budgets for cotton BMP levels 1-3. As seen in table 1, the costs of using soil moisture sensors, planting cover crops, and soil and tissue sampling costs maximized the cost of cotton production for level 1 production, the most efficient level. The variable cost for level 1 cotton

production was found to be \$561.29 per acre and the fixed cost per acre was identified to \$290.76 per acre resulting in a total production cost of \$852.05 per acre. Level 2 is the moderately efficient production level as displayed in table 2. The cost, which differs from level 3, is that level 2 incurred the cost of soil and tissue sampling and level 3 did not include the cost of sampling. Variable and fixed cost per acre for level 2 production was found to be \$535.64 and \$283.90 per acre resulting in a total cost of \$819.55 of per acre. Level 3 production resulted in the lowest production cost per acre as only minimal production inputs were utilized to increase water and nutrient efficiency. The total cotton production cost per acre was calculated to be \$816.03 with variable and fixed costs estimated to be \$532.44 and \$283.58 per acre as is seen in table 3. Tables 4 – 6 display the non-irrigated enterprise budgets for cotton BMP levels 1-3.

Conclusion

The enterprise budgets for each production efficiency level reveal that as water and nutrient efficiency practices increase the cost of cotton production increases. Therefore, for a more efficient water and nutrient production level to be the most profitable set of management practices for a farm to utilize, it would be necessary that the more efficient level generates higher yields to compensate for the higher production costs. However, yield data for each production level is not yet available for this analysis. When yield data becomes available, it will be possible to complete the necessary economic simulations to determine if yield differences between levels would justify the decision to implement more efficient production practices.

References

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Aquifer System

Table 1. Estimated Costs and Returns for Level 1 Irrigated Cotton Production in Lower Flint River Basin of Georgia

Expected Yield	1,250	Lbs/Acre	Seeding Rate	34,250	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 962.50	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 190.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.006
Seed	1000/Seed	34.25	\$ 2.76	\$ 94.53	\$ 0.076
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.010
Nitrogen	Lbs	97	\$ 0.42	\$ 40.74	\$ 0.033
Phosphate	Lbs	70	\$ 0.37	\$ 25.90	\$ 0.021
Potash	Lbs	80	\$ 0.28	\$ 22.40	\$ 0.018
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.004
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.006
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.030
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.011
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.010
PGR	Ounces	36	\$ 0.05	\$ 1.84	\$ 0.001
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.010
Irrigation	Acre App.	8	\$ 8.90	\$ 71.20	\$ 0.057
Fuel & Lube	Gallon	12.96	\$ 2.58	\$ 33.44	\$ 0.027
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.023
Labor	Hours	1.99	\$ 13.00	\$ 25.87	\$ 0.021
Interest on Operating	\$473.018	6	6%	\$ 14.19	\$ 0.011
Ginning	Lbs	1250	\$ 0.08	\$ 100.00	\$ 0.080
Storage & Warehousing	Bale	2.52	\$ 10.50	\$ 26.46	\$ 0.021
Marketing, Boards, Etc.	Bale	2.52	\$ 6.06	\$ 15.27	\$ 0.012
Cottonseed Credit	Ton	0.78	\$ 125.00	\$ (97.66)	\$ (0.078)
BWEP	Bale	2.52	\$ 0.75	\$ 1.89	\$ 0.002
Tissue Sampling	Acre	0.05	\$ 25.00	\$ 1.25	\$ 0.001
Soil Sampling	Acre	0.05	\$ 7.00	\$ 0.35	\$ 0.000
Cover Crop Seed	Lbs	51.00	\$ 0.25	\$ 12.75	\$ 0.010
Cover Crop Burndown	Acre	1.00	\$ 12.90	\$ 12.90	\$ 0.010
Total Variable Cost				\$ 560.43	\$ 0.448
Net Return Above Variable Cost				\$ 402.07	\$ 0.322

Table 1. Estimated Costs and Returns for Level 1 Irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.038
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.01
Irrigation	Acre	1	\$ 94.00	\$ 94.00	\$ 0.08
Soil Moisture Sensors	Acre	0.007	\$ 600.00	\$ 4.29	\$ 0.003
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.06
Misc. Overhead	% of Var. Cost		5%	\$ 28.02	\$ 0.02
Management	% of Var. Cost		5%	\$ 28.02	\$ 0.02
Total Fixed Costs				\$ 290.67	\$ 0.233
Total Costs				\$ 851.09	\$ 0.68
Expected Net Return				\$ 111.41	\$ 0.09

Table 2. Estimated Costs and Returns for Level 2 Irrigated Cotton Production in Lower Flint River Basin of Georgia

Expected Yield	1,250	Lbs/Acre	Seeding Rate	34,250	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 962.50	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 190.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.006
Seed	1000/Seed	34.25	\$ 2.76	\$ 94.53	\$ 0.076
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.010
Nitrogen	Lbs	97	\$ 0.42	\$ 40.74	\$ 0.033
Phosphate	Lbs	70	\$ 0.37	\$ 25.90	\$ 0.021
Potash	Lbs	80	\$ 0.28	\$ 22.40	\$ 0.018
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.004
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.006
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.030
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.011
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.010
PGR	Ounces	36	\$ 0.05	\$ 1.84	\$ 0.001
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.010
Irrigation	Acre App.	8	\$ 8.90	\$ 71.20	\$ 0.057
Fuel & Lube	Gallon	12.96	\$ 2.58	\$ 33.44	\$ 0.027
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.023
Labor	Hours	1.99	\$ 13.00	\$ 25.87	\$ 0.021
Interest on Operating	\$473.018	6	6%	\$ 14.19	\$ 0.011
Ginning	Lbs	1250	\$ 0.08	\$ 100.00	\$ 0.080
Storage & Warehousing	Bale	2.52	\$ 10.50	\$ 26.46	\$ 0.021
Marketing, Boards, Etc.	Bale	2.52	\$ 6.06	\$ 15.27	\$ 0.012
Cottonseed Credit	Ton	0.78	\$ 125.00	\$ (97.66)	\$ (0.078)
BWEP	Bale	2.52	\$ 0.75	\$ 1.89	\$ 0.002
Tissue Sampling	Acre	0.05	\$ 25.00	\$ 1.25	\$ 0.001
Soil Sampling	Acre	0.05	\$ 7.00	\$ 0.35	\$ 0.000
Total Variable Cost				\$ 534.78	\$ 0.428
Net Return Above Variable Cost				\$ 427.72	\$ 0.342

Table 2. Estimated Costs and Returns for Level 2 Irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.038
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.01
Irrigation	Acre	1	\$ 94.00	\$ 94.00	\$ 0.08
Soil Moisture Sensors	Acre	0.000	\$ -	\$ -	\$ -
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.06
Misc. Overhead	% of Var. Cost		5%	\$ 26.74	\$ 0.02
Management	% of Var. Cost		5%	\$ 26.74	\$ 0.02
Total Fixed Costs				\$ 283.82	\$ 0.227
Total Costs				\$ 818.59	\$ 0.65
Expected Net Return				\$ 143.91	\$ 0.12

Table 3. Estimated Costs and Returns for Level 3 Irrigated Cotton Production in Lower Flint River Basin of Georgia

Expected Yield	1,250	Lbs/Acre	Seeding Rate	34,250	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 962.50	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 190.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.006
Seed	1000/Seed	34.25	\$ 2.76	\$ 94.53	\$ 0.076
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.010
Nitrogen	Lbs	97	\$ 0.42	\$ 40.74	\$ 0.033
Phosphate	Lbs	70	\$ 0.37	\$ 25.90	\$ 0.021
Potash	Lbs	80	\$ 0.28	\$ 22.40	\$ 0.018
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.004
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.006
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.030
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.011
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.008
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.010
PGR	Ounces	36	\$ 0.05	\$ 1.84	\$ 0.001
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.010
Irrigation	Acre App.	8	\$ 8.90	\$ 71.20	\$ 0.057
Fuel & Lube	Gallon	12.96	\$ 2.58	\$ 33.44	\$ 0.027
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.023
Labor	Hours	1.99	\$ 13.00	\$ 25.87	\$ 0.021
Interest on Operating	\$473.018	6	6%	\$ 14.19	\$ 0.011
Ginning	Lbs	1250	\$ 0.08	\$ 100.00	\$ 0.080
Storage & Warehousing	Bale	2.52	\$ 10.50	\$ 26.46	\$ 0.021
Marketing, Boards, Etc.	Bale	2.52	\$ 6.06	\$ 15.27	\$ 0.012
Cottonseed Credit	Ton	0.78	\$ 125.00	\$ (97.66)	\$ (0.078)
BWEP	Bale	2.52	\$ 0.75	\$ 1.89	\$ 0.002
Total Variable Cost				\$ 533.18	\$ 0.427
Net Return Above Variable Cost				\$ 429.32	\$ 0.343

Table 3. Estimated Costs and Returns for Level 3 Irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.038
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.01
Irrigation	Acre	1	\$ 94.00	\$ 94.00	\$ 0.08
Soil Moisture Sensors	Acre	0.000	\$ -	\$ -	\$ -
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.06
Misc. Overhead	% of Var. Cost		5%	\$ 26.66	\$ 0.02
Management	% of Var. Cost		5%	\$ 26.66	\$ 0.02
Total Fixed Costs				\$ 283.66	\$ 0.227
Total Costs				\$ 816.83	\$ 0.65
Expected Net Return				\$ 145.67	\$ 0.12

Table 4. Estimated Costs and Returns for Level 1 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia

Expected Yield	780	Lbs/Acre	Seeding Rate	30,500	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 600.60	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 90.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.010
Seed	1000/Seed	29.5	\$ 2.76	\$ 81.42	\$ 0.104
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.015
Nitrogen	Lbs	65	\$ 0.42	\$ 27.30	\$ 0.035
Phosphate	Lbs	50	\$ 0.37	\$ 18.50	\$ 0.024
Potash	Lbs	55	\$ 0.28	\$ 15.40	\$ 0.020
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.006
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.010
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.049
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.017
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.016
PGR	Ounces	26	\$ 0.05	\$ 1.33	\$ 0.002
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.016
Fuel & Lube	Gallon	12.69	\$ 2.58	\$ 32.74	\$ 0.042
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.037
Labor	Hours	1.83	\$ 13.00	\$ 23.79	\$ 0.031
Interest on Operating	\$357.581	6	6%	\$ 10.73	\$ 0.014
Ginning	Lbs	780	\$ 0.08	\$ 62.40	\$ 0.080
Storage & Warehousing	Bale	1.57	\$ 10.50	\$ 16.51	\$ 0.021
Marketing, Boards, Etc.	Bale	1.57	\$ 6.06	\$ 9.53	\$ 0.012
Cottonseed Credit	Ton	0.49	\$ 125.00	\$ (60.94)	\$ (0.078)
BWEP	Bale	1.57	\$ 0.75	\$ 1.18	\$ 0.002
Tissue Sampling	Acre	0.05	\$ 25.00	\$ 1.25	\$ 0.002
Soil Sampling	Acre	0.05	\$ 7.00	\$ 0.35	\$ 0.000
Cover Crop Seed	Lbs	51.00	\$ 0.25	\$ 12.75	\$ 0.016
Cover Crop Burndown	Acre	1.00	\$ 12.90	\$ 12.90	\$ 0.017
Total Variable Cost				\$ 424.24	\$ 0.544
Net Return Above Variable Cost				\$ 176.36	\$ 0.226

Table 4. Estimated Costs and Returns for Level 1 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.061
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.02
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.09
Misc. Overhead	% of Var. Cost		5%	\$ 21.21	\$ 0.03
Management	% of Var. Cost		5%	\$ 21.21	\$ 0.03
Total Fixed Costs				\$ 178.76	\$ 0.229
Total Costs				\$ 603.01	\$ 0.77
Expected Net Return				\$ (2.41)	\$ (0.00)

Table 5. Estimated Costs and Returns for Level 2 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia

Expected Yield	780	Lbs/Acre	Seeding Rate	30,500	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 600.60	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 90.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.010
Seed	1000/Seed	29.5	\$ 2.76	\$ 81.42	\$ 0.104
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.015
Nitrogen	Lbs	65	\$ 0.42	\$ 27.30	\$ 0.035
Phosphate	Lbs	50	\$ 0.37	\$ 18.50	\$ 0.024
Potash	Lbs	55	\$ 0.28	\$ 15.40	\$ 0.020
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.006
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.010
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.049
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.017
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.016
PGR	Ounces	26	\$ 0.05	\$ 1.33	\$ 0.002
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.016
Fuel & Lube	Gallon	12.69	\$ 2.58	\$ 32.74	\$ 0.042
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.037
Labor	Hours	1.83	\$ 13.00	\$ 23.79	\$ 0.031
Interest on Operating	\$357.581	6	6%	\$ 10.73	\$ 0.014
Ginning	Lbs	780	\$ 0.08	\$ 62.40	\$ 0.080
Storage & Warehousing	Bale	1.57	\$ 10.50	\$ 16.51	\$ 0.021
Marketing, Boards, Etc.	Bale	1.57	\$ 6.06	\$ 9.53	\$ 0.012
Cottonseed Credit	Ton	0.49	\$ 125.00	\$ (60.94)	\$ (0.078)
BWEP	Bale	1.57	\$ 0.75	\$ 1.18	\$ 0.002
Tissue Sampling	Acre	0.05	\$ 25.00	\$ 1.25	\$ 0.002
Soil Sampling	Acre	0.05	\$ 7.00	\$ 0.35	\$ 0.000
Total Variable Cost				\$ 398.59	\$ 0.511
Net Return Above Variable Cost				\$ 202.01	\$ 0.259

Table 5. Estimated Costs and Returns for Level 2 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.061
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.02
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.09
Misc. Overhead	% of Var. Cost		5%	\$ 19.93	\$ 0.03
Management	% of Var. Cost		5%	\$ 19.93	\$ 0.03
Total Fixed Costs				\$ 176.20	\$ 0.226
Total Costs				\$ 574.79	\$ 0.74
Expected Net Return				\$ 25.81	\$ 0.03

Table 6. Estimated Costs and Returns for Level 3 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Expected Yield	780	Lbs/Acre	Seeding Rate	30,500	Seed/Acre
Price	\$0.77	\$/Lb	Expected Income	\$ 600.60	\$/Acre
Variable Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Land Rent	Acre	0	\$ 90.00	\$ -	\$ -
Crop Insurance	Acre	1	\$ 8.00	\$ 8.00	\$ 0.010
Seed	1000/Seed	29.5	\$ 2.76	\$ 81.42	\$ 0.104
Lime	Ton	0.33	\$ 36.50	\$ 12.05	\$ 0.015
Nitrogen	Lbs	65	\$ 0.42	\$ 27.30	\$ 0.035
Phosphate	Lbs	50	\$ 0.37	\$ 18.50	\$ 0.024
Potash	Lbs	55	\$ 0.28	\$ 15.40	\$ 0.020
Other Nutrients	Acre	1	\$ 5.00	\$ 5.00	\$ 0.006
Pre-Emergent	Acre	1	\$ 7.55	\$ 7.55	\$ 0.010
POST	Acre	1	\$ 37.90	\$ 37.90	\$ 0.049
Layby	Acre	1	\$ 13.60	\$ 13.60	\$ 0.017
Hand Weeding	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Scouting	Acre	1	\$ 10.00	\$ 10.00	\$ 0.013
Stink Bug Treat.	Acre App.	2.2	\$ 5.50	\$ 12.10	\$ 0.016
PGR	Ounces	26	\$ 0.05	\$ 1.33	\$ 0.002
Defoliant & Boil Opener	Acre App.	1	\$ 12.33	\$ 12.33	\$ 0.016
Fuel & Lube	Gallon	12.69	\$ 2.58	\$ 32.74	\$ 0.042
Repairs & Maintenance	Acre	1	\$ 28.58	\$ 28.58	\$ 0.037
Labor	Hours	1.83	\$ 13.00	\$ 23.79	\$ 0.031
Interest on Operating	\$357.581	6	6%	\$ 10.73	\$ 0.014
Ginning	Lbs	780	\$ 0.08	\$ 62.40	\$ 0.080
Storage & Warehousing	Bale	1.57	\$ 10.50	\$ 16.51	\$ 0.021
Marketing, Boards, Etc.	Bale	1.57	\$ 6.06	\$ 9.53	\$ 0.012
Cottonseed Credit	Ton	0.49	\$ 125.00	\$ (60.94)	\$ (0.078)
BWEP	Bale	1.57	\$ 0.75	\$ 1.18	\$ 0.002
Total Variable Cost				\$ 396.99	\$ 0.509
Net Return Above Variable Cost				\$ 203.61	\$ 0.261

Table 6. Estimated Costs and Returns for Level 3 Non-irrigated Cotton Production in Lower Flint River Basin of Georgia (Continued)

Fixed Costs	Unit	No. Units	\$/Unit	Cost/Acre	\$/Lb
Tractor & Sprayer	Acre	1	\$ 47.57	\$ 47.57	\$ 0.061
Equipment/Implements	Acre	1	\$ 16.71	\$ 16.71	\$ 0.02
Picker/BB/MB	Acre	1	\$ 72.06	\$ 72.06	\$ 0.09
Misc. Overhead	% of Var. Cost		5%	\$ 19.85	\$ 0.03
Management	% of Var. Cost		5%	\$ 19.85	\$ 0.03
Total Fixed Costs				\$ 176.04	\$ 0.226
Total Costs				\$ 573.03	\$ 0.73
Expected Net Return				\$ 27.57	\$ 0.04