

# **Beltwide Cotton Conferences**

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# Simulation Analysis and Economic Impact of Georgia Cotton Production

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# Production Background

- Cotton is largest field crop in Georgia in terms of acreage and revenue.
- 1.4 million acres were planted in 2006.
- Cotton is an important rotation crop with other crops, especially peanuts.

# Financial Background

- Cotton has high variable costs per acre.
- Expensive harvesting equipment leads to high fixed costs.
- FAPRI data indicate that US cotton production derives 20% to 30% of revenue from government payments.

# Georgia Rural Economies

- Many rural economies are dependent on agriculture.
- Georgia derives 8.6% of economy from agricultural production and directly related manufacturing.
- Many GA rural counties derive over 50% of economy from agricultural production and directly related manufacturing.

# Economic Development

- High costs to cotton industry represent economic activity to other industrial sectors.
- DP, CCP, and LDP are utilized for input purchases.
- Government payments flow into industrial sectors outside of agriculture.

# Empirical Analysis

# Methodology

- Industry simulation model  
(Net Returns)
- Input-output model  
(Economic Impact)



# Industry Simulation

- Average production unit is 700 acres.
- Model costs derived from UGA crop enterprise budgets and NASS.
- Georgia yields and prices are from NASS aggregate data.

# Simulation Model

- **NR = Revenue - VC – FC**
- Revenue = (Price \* Yield \* 700 acres)  
+ DP + CCP + LDP
- DP & CCP (GA base yield (FSA),  
700 acres)
- VC = 2006 Baseline (Harvesting costs  
change with yield)

# Costs Data

- VC = \$429 per acre
  - (sell seed to gin)
  - = \$390 per acre
- Fixed costs are \$70,687 for 700 acres.
- Costs are industry average, weighted for irrigated : nonirrigated acreages and cotton seed technologies.

# Average GA Yield and Price Data

- NASS yield 2001 : 2006 (Dec. estimate)  
726 lbs./acre
- FAPRI US price for 2007-2011 is above  
\$0.53/lb.
- Current simulation applies \$0.529/lb.  
(10 year GA average)
- AWP: 2002-2005 averages \$0.048 less  
than GA market price (Average = \$0.481).

# Stochastic Simulation Covariance: Normal Distribution in **Simetar**

	Price	Yield	AWP
Price	0.0053	4.8283	0.0043
Yield		12,963	1.9705
AWP			0.0039

# Average of 500 Iterations

\$26,624 NR to land & unpaid labor

\$99,014 GP

GP is 25.0% of revenue

(Market lint & seed sold + GP)

# Distribution of GP

- 27% goes to farmers and landlords.
- 73% goes to input suppliers.  
Examples: Seed, chemicals, fertilizer, equipment manufacturers and dealers, fuel, electricity, and labor.

# Economic Impact: Input-Output Model

- Itemized cotton industry direct costs are entered into 18 US industrial sectors.  
**IMPLAN** (software)
- Farm expenditures are direct impacts.
- Direct impacts lead to indirect impacts  
(businesses purchasing from businesses and employees spending income).



# Direct and Indirect Impacts to US Economy

	<b>Direct</b>	<b>Indirect</b>	<b>(3.3) Total</b>
Output (\$)	397,423	919,470	1,316,893
Labor Income (\$)	<b>10,021</b>	272,079	282,100
Employment	<b>2</b>	7	9

# Labor Income is Wealth Created

\$72,390 (GP-NR) of industry average  
\$99,014 GP leads to \$282,100 in labor  
income to employees and proprietors in  
US economy. (3.9 Multiple)

This does not include income to farmers  
and landlords.

# Impacts to US Industrial Sectors

Sector	Output (\$)
Agriculture	527,882
Mining & Construction	30,175
Utilities	22,925
Manufacturing	293,165
Transportation, Warehousing	32,390
Trade	63,559
Finance, Insurance, & Real Estate	97,906
Services	212,767
Government and non-NAICS	36,124
<b>Total</b>	<b>1,316,893</b>

# Taxes Generated in US Economy by GA Cotton Production

Federal Taxes (\$)	62,989
State/Local Taxes (\$)	45,774
<b>Sum of Taxes (\$)</b>	<b>108,763</b>

# Compare GP to Taxes Generated

\$99,014 GP to industry average farm

\$108,763 Taxes generated by farm

**\$9,749** more taxes generated than received

**For each tax dollar that the GA cotton industry receives in GP, it generates \$1.10 in tax revenues for federal, state, and local governments in the U.S.**

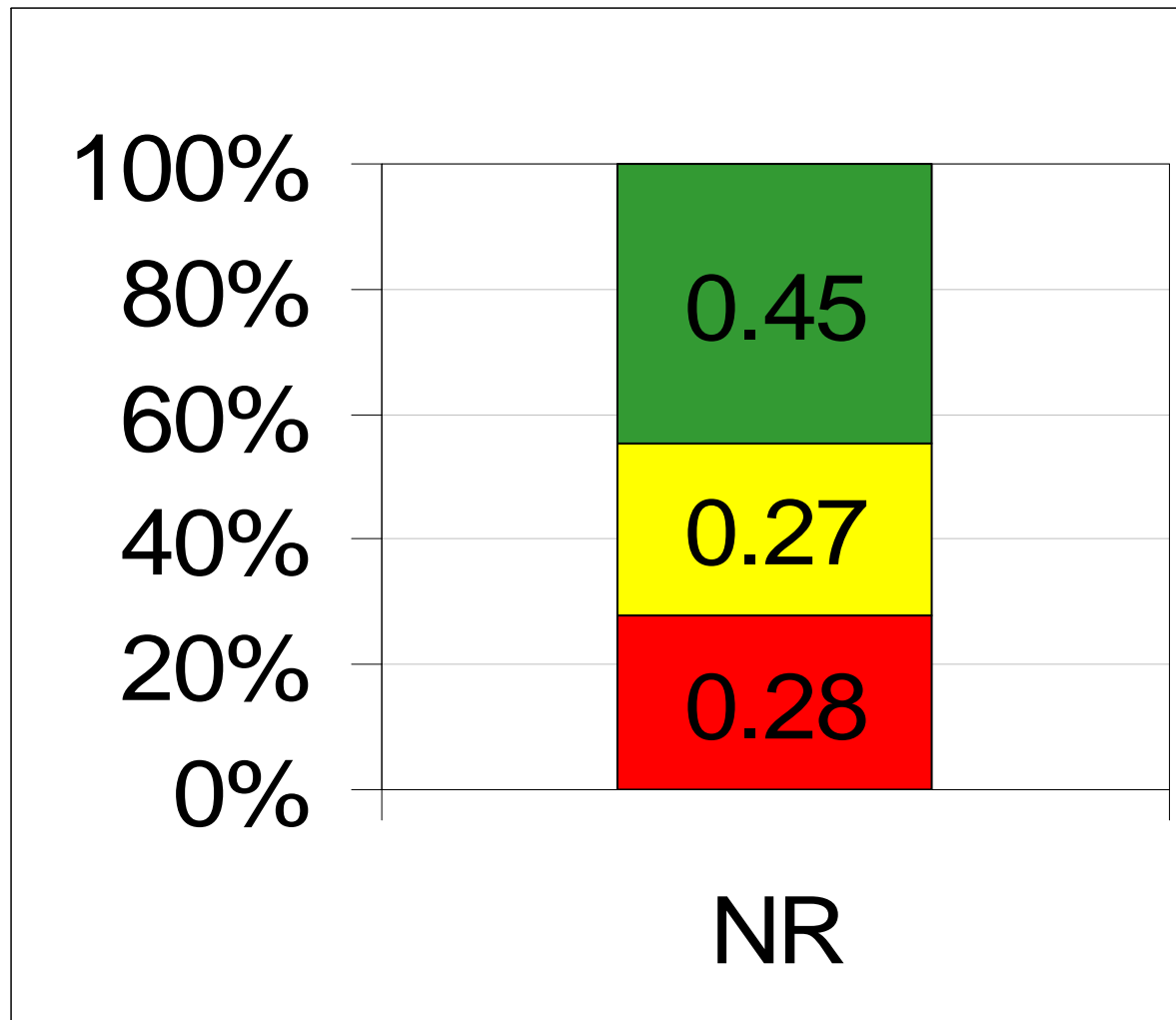
# US Federalist System

- Each level of government does what is most appropriate for it to undertake.
- Federal government is best suited to sponsor programs for US agricultural commodities.
- 58% of taxes generated go back to federal government as new tax revenue.
- Remaining 42% goes to state and local treasuries to apply for programs best undertaken by these levels of government.

# GA Cotton Industry without GP

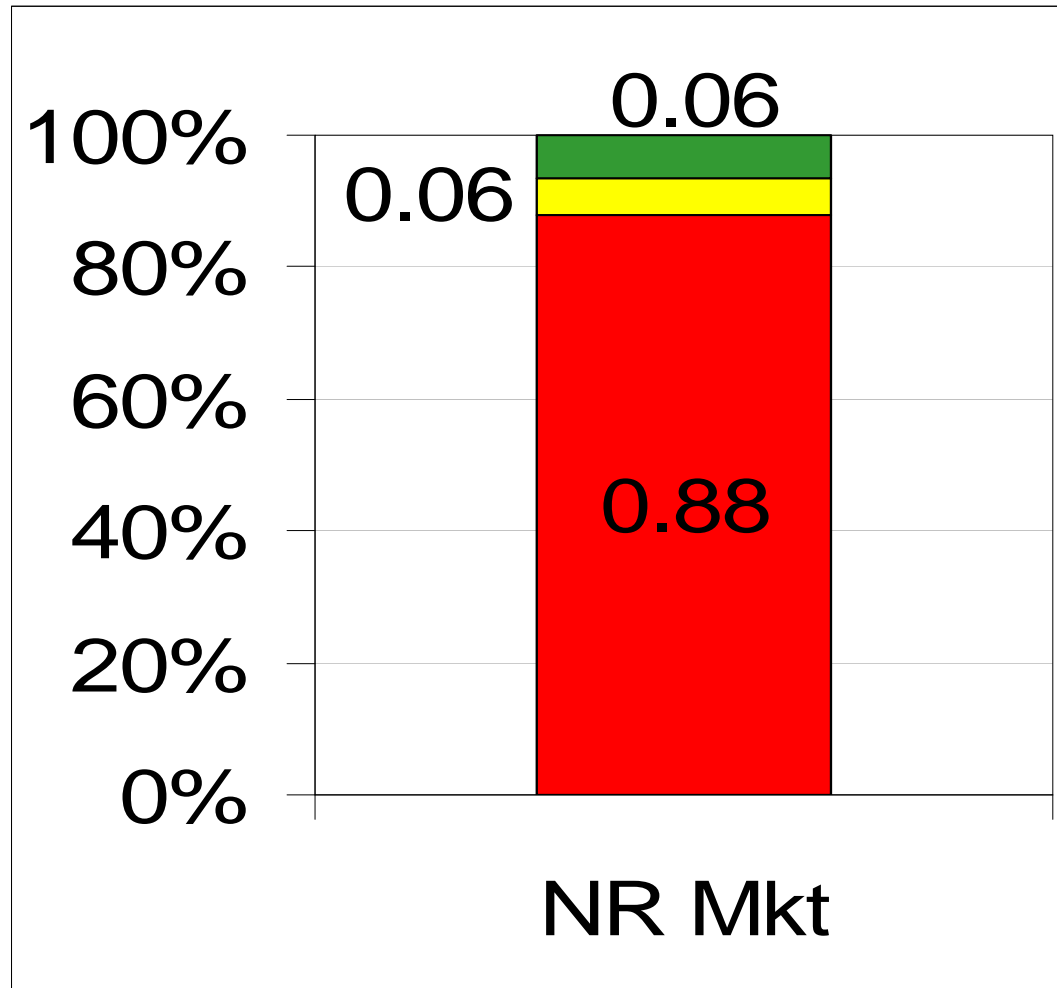
- Average NR with GP is \$26,624
- Average NR without GP is -\$72,390

# Probability of NR < 0 and Greater than \$30,000 with GP





# Probability of NR < 0 and Greater than \$30,000 without GP



# Summary

- 73% of GP goes to input suppliers, 23% goes to farmers and landlords.
- Each dollar received by GA cotton industry as GP leads to \$1.10 in tax revenue.

# Conclusion

- GA cotton industry is not financially viable without GP.
- Economic impacts throughout US economy would be lost without GP.
- Rural economies have few alternatives to agriculture.

# Comments and Questions