

# MANAGEMENT MARKETING MEMO

Department of Agricultural and Applied Economics, Clemson University, Clemson, SC, 29634-0355

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## What are the Break-Even Prices and Yields when Comparing Cotton and Peanuts for 2007?

Todd D. Davis and Charles E. Curtis, Jr.  
Extension Economists

The corn and soybean markets have been bidding for acreage due to a bullish final crop report for 2006. Currently, the major decision facing producers is determining the enterprise mix for 2007. This memo compares the Returns over Variable Costs for cotton and peanuts and analyzes the break-even yields and prices for non-irrigated and irrigated production.

### Return over Variable Costs

Table 1. 2007 Estimated Return over Variable Costs for Cotton and Peanuts.

	Non-Irrigated	Non-Irrigated		Irrigated	Irrigated
	Cotton	Peanuts		Cotton	Peanuts
Harvest Price <sup>1/</sup>	\$0.60	\$0.21		\$0.60	\$0.21
Yield	750	3000		1000	4000
Variable Cost <sup>2/</sup>	<u>\$476</u>	<u>\$583</u>		<u>\$599</u>	<u>\$654</u>
Return over Variable Costs	-\$26	\$47		\$1	\$186

<sup>1/</sup> The harvest price for cotton is the December Cotton Futures Contract adjusted by harvest-time basis of -0.03 and an estimated harvest-time LDP of \$0.03. Peanut price is based on Economist's Forecast on January 18, 2007. Contract prices may differ from this estimate.

<sup>2/</sup> 2007 Clemson University Crop Enterprise Budgets (<http://cherokee.agecon.clemson.edu/budgets.htm>).

The estimated Returns over Variable Costs for cotton and peanuts are reported in Table 1. The harvest cash price for cotton is based on the December 2007 cotton futures contract and is adjusted by the estimated harvest-time basis and estimated harvest-time LDP. Similarly, the cash price for peanuts is based on economist's forecast for the 2007 crop. For this comparison, the harvest cash prices for cotton and peanuts are \$0.60/lb. and \$0.21/lb., respectively (Table 1). The variable costs are based on Clemson University Extension crop enterprise budgets. Based on the assumptions listed in Table 1, the estimated Return over Variable Costs for non-irrigated cotton is -\$26/acre while the Return for non-irrigated peanuts is \$47/acre (Table 1). Similarly, the estimated Returns over Variable Costs for irrigated cotton and irrigated peanuts are \$1/acre and \$186/acre, respectively (Table 1).

### Break-Even Yields and Prices

Based on the assumptions listed in Table 1, peanuts provide a greater Return over Variable Costs than cotton. Since prices, yields and costs will vary from these assumptions, managers need to understand the break-even yields and break-even prices when comparing cotton and peanuts. Table 2 reports the Break-Even Yields and Break-Even Prices for cotton and peanuts produced with and without irrigation.

The Break-Even Yield in Table 2 is the yield that makes the two Returns over Variable Costs equal. For example, non-irrigated cotton yielding 872 lbs. (Table 2) at a price of \$0.60 and Variable Costs of \$476 (Table 1) will have the same Return as non-irrigated peanuts yielding 3,000 lbs. at a price of \$0.21 and Variable Costs of \$583 (Table 1). Similarly, irrigated peanuts yielding 3,119 lbs. (Table 2) at a price of \$0.21 and Variable Costs of \$654 (Table 1) will have the same Return as irrigated cotton yielding 1000 lbs. at a price of \$0.60 and Variable Costs of \$599 (Table 1).

Similarly, the Break-Even Price in Table 2 is the price that makes the two Returns over Variable Costs equal. For example, non-irrigated peanuts with a price of \$0.1857 (Table 2) yielding 3,000 lbs. and Variable Costs of \$583 (Table 1) will have the same Return as non-irrigated cotton yielding 750 lbs. at a price of \$0.60 and Variable Costs of \$476 (Table 1). Similarly, irrigated cotton at a price of \$0.7850 (Table 2) with a yield of 1000 lbs. and Variable Costs of \$599 (Table 1) will have the same Return as irrigated peanuts yielding 4,000 lbs. at a price of \$0.21 and Variable Costs of \$654 (Table 1).

Table 2. Break-Even Yields and Prices for Non-Irrigated and Irrigated Cotton and Peanuts.

	Non-Irrigated Cotton	Non-Irrigated Peanuts	Irrigated Cotton	Irrigated Peanuts
Break-Even Yield <sup>1/</sup>	872	2,652	1,308	3,119
Break-Even Price <sup>2/</sup>	\$0.6973	\$0.1857	\$0.7850	\$0.1638

<sup>1/</sup> The Break-Even Yield is the yield that equates the Returns over Variable Costs for the two commodities at the prices and costs listed in Table 1. For example, 872 lb. non-irrigated cotton at \$0.60 has the same Return as 3000 lb. non-irrigated peanuts at \$0.21.

<sup>2/</sup> The Break-Even Price is the price that equates the Returns over Variable Costs for the two commodities at the yields and costs listed in Table 1. For example, 750 lb. non-irrigated cotton at \$0.6973 has the same Return as 3000 lb. non-irrigated peanuts at \$0.21.

The break-even price and yield information in Table 2 will help managers evaluate when cotton is more profitable than peanuts. For example, non-irrigated cotton at \$0.60 with yields greater than 872 lbs. is more profitable than non-irrigated peanuts with a price of \$0.21 yielding 3,000 lbs. Similarly, irrigated cotton yielding 1000 lbs. with prices greater than \$0.7850 is more profitable than irrigated peanuts yielding 4,000 lbs. at a price of \$0.21 (Table 2).

#### Break-Even Yield and Price Sensitivity Analysis

How does yield or price risk affect this analysis? Table 3 lists the break-even yields for peanuts for a range of potential cotton yields at the prices and costs listed in Table 1. Managers can use Table 3 to understand the yields necessary for peanuts to be competitive with cotton. For example, non-irrigated peanuts yielding 2,510 lbs. have the same Return as 700 lb. non-irrigated cotton (Table 3). For this example, cotton is more profitable when yields are greater than 700 lbs. or peanuts yield less than 2,510 lbs.

Similarly, Table 4 lists the break-even prices for peanuts for a range of potential cotton prices at the yields and costs listed in Table 1. This table tells managers what price is needed from the market for peanuts to be competitive with cotton. For example, at a price of \$0.74 for non-irrigated cotton, non-irrigated peanuts must have a price of \$0.2207 to have the same Return (Table 4). For this example, cotton is more profitable when peanuts prices are less than \$0.2207 or cotton prices are greater than \$0.74.

Managers can use Table 3 and Table 4 in guiding their enterprise selection for 2007. By using their own price and yield expectations, managers will have a better idea of the relative profitability of cotton and peanuts for both production systems.

#### Where do I go for Help in Making this Decision?

Clemson University Extension has developed budgets for the major agronomic crops to help you evaluate their profitability for your farm business. There is also a decision spreadsheet available that can be used to compare the Returns over Variable Costs for cotton and peanuts. The budgets and decision spreadsheet are available at <http://cherokee.agecon.clemson.edu/budgets.htm>. Your local extension office will be able to help you download these budgets and the decision spreadsheet and can help you understand how to use this information in making this comparison.

Table 3. Break-Even Yields for Peanuts for Varying Cotton Yields for Non-Irrigated and Irrigated Production.

Non-Irrigated Cotton Yield	Non-Irrigated Peanuts Yield <sup>1/</sup>		Irrigated Cotton Yield	Irrigated Peanuts Yield
500	1,938		750	2,405
525	2,010		775	2,476
550	2,081		800	2,548
575	2,152		825	2,619
600	2,224		850	2,690
625	2,295		875	2,762
650	2,367		900	2,833
675	2,438		925	2,905
700	2,510		950	2,976
725	2,581		975	3,048
750	2,652		1000	3,119
775	2,724		1025	3,190
800	2,795		1050	3,262
825	2,867		1075	3,333
850	2,938		1100	3,405
875	3,010		1125	3,476
900	3,081		1150	3,548
925	3,152		1175	3,619
950	3224		1200	3,690

<sup>1/</sup> The Break-Even Yield is the yield that equates the Returns over Variable Costs for the two commodities at the prices and costs listed in Table 1. For example, 2,938 lb. non-irrigated peanuts have the same Return as 850 lb. non-irrigated cotton.

Table 4. Break-Even Prices for Peanuts for Varying Cotton Prices for Non-Irrigated and Irrigated Production.

Non-Irrigated Cotton Price	Non-Irrigated Peanuts Price <sup>1/</sup>		Irrigated Cotton Price	Irrigated Peanuts Price
\$0.6000	\$0.1857		\$0.6000	\$0.1638
\$0.6200	\$0.1907		\$0.6200	\$0.1688
\$0.6400	\$0.1957		\$0.6400	\$0.1738
\$0.6600	\$0.2007		\$0.6600	\$0.1788
\$0.6800	\$0.2057		\$0.6800	\$0.1838
\$0.7000	\$0.2107		\$0.7000	\$0.1888
\$0.7200	\$0.2157		\$0.7200	\$0.1938
\$0.7400	\$0.2207		\$0.7400	\$0.1988
\$0.7600	\$0.2257		\$0.7600	\$0.2038
\$0.7800	\$0.2307		\$0.7800	\$0.2088
\$0.8000	\$0.2357		\$0.8000	\$0.2138
\$0.8200	\$0.2407		\$0.8200	\$0.2188
\$0.8400	\$0.2457		\$0.8400	\$0.2238
\$0.8600	\$0.2507		\$0.8600	\$0.2288
\$0.8800	\$0.2557		\$0.8800	\$0.2338
\$0.9000	\$0.2607		\$0.9000	\$0.2388
\$0.9200	\$0.2657		\$0.9200	\$0.2438
\$0.9400	\$0.2707		\$0.9400	\$0.2488
\$0.9600	\$0.2757		\$0.9600	\$0.2538

<sup>1/</sup> The Break-Even Price is the price that equates the Returns over Variable Costs for the two commodities at the yields and costs listed in Table 1. For example, non-irrigated peanuts at \$0.2307/lb. have the same Return as non-irrigated cotton at \$0.78/lb.