

MMM 494

February 2, 2009

What are the Break-Even Prices and Yields when Comparing Cotton and Peanuts for 2009?

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With commodity prices fluctuating daily and input costs still near record levels, producers will be challenged to maintain profitability in 2009 as profit margins are shrinking. Currently, the major decision facing producers is determining the enterprise mix for 2009 in the midst of higher commodity prices. This memo compares the Return 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. 2009 Estimated Return over Variable Costs for Cotton and Peanuts.

	Non-Irrigated Cotton	Non-Irrigated Peanuts	Irrigated Cotton	Irrigated Peanuts
Harvest Price <sup>1/</sup>	\$0.5291	\$0.2050	\$0.5291	\$0.2050
Yield	750	3000	1000	4000
Total Variable Costs <sup>2/</sup>	\$555.16	\$575.10	\$677.63	\$730.23
Return over Variable Costs	-\$45.61	\$39.90	\$1.77	\$89.77

<sup>1/</sup> The harvest price for cotton is based on the December Cotton Futures Contract adjusted by harvest-time basis of  $-\$0.03/\text{lb.}$  on January 29, 2009. Peanut price is based on Economist's Forecast on January 29, 2009. Contract prices may differ from this estimate.

<sup>2/</sup> 2009 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 2009 cotton futures contract and is adjusted by the estimated harvest-time basis. Similarly, the cash price for peanuts is based on economist's forecast for the 2009 crop. For this comparison, the harvest cash prices for cotton and peanuts are \$0.5291/lb. and \$0.2050/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  $-\$45/\text{acre}$  while the Return for non-irrigated peanuts is  $\$39/\text{acre}$  (Table 1). Similarly, the estimated Returns over Variable Costs for irrigated cotton and irrigated peanuts are  $\$1.77/\text{acre}$  and  $\$89/\text{acre}$ , 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 will pay for all of the Total Variable Costs. For example, non-irrigated cotton yielding 817 lbs. (Table 2) at a price of \$0.5291 will just pay for the Total Variable Costs of \$555 (Table 1). Similarly, irrigated peanuts yielding 3,562 lbs. (Table 2) at a price of \$0.2050 will just pay for Total Variable Costs of \$730 (Table 1).

Similarly, the Break-Even Price in Table 2 is the price that will pay for all of the Total Variable Costs. For example, non-irrigated peanuts with a price of \$0.1917 (Table 2) yielding 3,000 lbs. will just pay for the Total Variable Costs of \$575 (Table 1). Similarly, irrigated cotton at a price of \$0.5273 (Table 2) with a yield of 1,000 lbs. will just pay for the Total Variable Costs of \$677 (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>	817	2,805	997	3,562
Break-Even Price <sup>2/</sup>	\$0.5899	\$0.1917	\$0.5273	\$0.1826

<sup>1/</sup> The Break-Even Yield is the yield that will cover Total Variable Costs at the prices and costs listed in Table 1. For example, 817 lb. non-irrigated cotton at a price of \$0.5291 will pay for the Total Variable Costs of \$555/acre.

<sup>2/</sup> The Break-Even Price is the price that will cover Total Variable Costs at the yields and costs listed in Table 1. For example, 750 lbs. non-irrigated cotton at \$0.5899 will just pay for the Total Variable Costs of \$555/acre.

The break-even price and yield information in Table 2 will help managers evaluate the feasibility of producing cotton or peanuts. For example, managers know that they will need at least \$0.1917/lb and yields of 3,000 lbs/acre to be profitable at producing non-irrigated peanuts. Similarly, irrigated cotton producers that produce 997 lbs./acre or better will cover variable costs at a price of \$0.5291/lbs. (Table 2).

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

How does yield or price risk affect the analysis of which crop is more profitable? 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 2,251 lbs. have the same Return as 650 lb. non-irrigated cotton (Table 3). For this example, cotton is more profitable when yields are greater than 650 lbs. or peanuts yield less than 2,251 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 \$0.58 for non-irrigated cotton, non-irrigated peanuts must have a price of \$0.1892 to have the same Return (Table 4). For this example, cotton is more profitable when peanuts prices are less than \$0.1892 or cotton prices are greater than \$0.58.

Managers can use Table 3 and Table 4 in guiding their enterprise selection for 2009. 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	Non-Irrigated Peanuts	Irrigated Cotton	Irrigated Peanuts
500	1,754	750	2,742
525	1,837	775	2,825
550	1,920	800	2,908
575	2,003	825	2,991
600	2,086	850	3,074
625	2,169	875	3,156
650	2,251	900	3,239
675	2,334	925	3,322
700	2,417	950	3,405
725	2,500	975	3,488
750	2,583	1000	3,571
775	2,666	1025	3,654
800	2,749	1050	3,736
825	2,831	1075	3,819
850	2,914	1100	3,902
875	2,997	1125	3,985

<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, 2,500 lb. non-irrigated peanuts have the same Return as 725 lb. non-irrigated cotton.

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

Non-Irrigated Cotton	Non-Irrigated Peanuts	Irrigated Cotton	Irrigated Peanuts
\$0.5000	\$0.1692	\$0.5000	\$0.1757
\$0.5200	\$0.1742	\$0.5200	\$0.1807
\$0.5400	\$0.1792	\$0.5400	\$0.1857
\$0.5600	\$0.1842	\$0.5600	\$0.1907
\$0.5800	\$0.1892	\$0.5800	\$0.1957
\$0.6000	\$0.1942	\$0.6000	\$0.2007
\$0.6200	\$0.1992	\$0.6200	\$0.2057
\$0.6400	\$0.2042	\$0.6400	\$0.2107
\$0.6600	\$0.2092	\$0.6600	\$0.2157
\$0.6800	\$0.2142	\$0.6800	\$0.2207
\$0.7000	\$0.2192	\$0.7000	\$0.2257
\$0.7200	\$0.2242	\$0.7200	\$0.2307
\$0.7400	\$0.2292	\$0.7400	\$0.2357
\$0.7600	\$0.2342	\$0.7600	\$0.2407
\$0.7800	\$0.2392	\$0.7800	\$0.2457
\$0.8000	\$0.2442	\$0.8000	\$0.2507

<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 \$0.1792/lb. have the same Return as non-irrigated cotton at \$0.54/lb.