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What are the Break-Even Prices and Yields when Comparing Cotton and Peanuts for 2008?

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The commodity markets have been bidding for acreage due to biofuels creating increased demand for corn and soybeans. Currently, the major decision facing producers is determining the enterprise mix for 2008 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. 2008 Estimated Return over Variable Costs for Cotton and Peanuts.

	Non-Irrigated Cotton	Non-Irrigated Peanuts	Irrigated Cotton	Irrigated Peanuts
Harvest Price [1]	$0.7327	$0.2850	$0.7327	$0.2850
Yield	750	3000	1000	4000
Total Variable Costs [2]	$533.12	$569.70	$673.65	$668.43
Return over Variable Costs	$132.26	$285.30	$213.53	$471.57

[1] The harvest price for cotton is based on the December Cotton Futures Contract adjusted by harvest-time basis of -$0.03/lb.on January 4, 2008. Peanut price is based on Economist's Forecast on January 4, 2008. Contract prices may differ from this estimate.
[2] 2008 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 2008 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 2008 crop. For this comparison, the harvest cash prices for cotton and peanuts are $0.7327/lb. and $0.2850/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 $132/acre while the Return for non-irrigated peanuts is $285/acre (Table 1). Similarly, the estimated Returns over Variable Costs for irrigated cotton and irrigated peanuts are $213/acre and $471/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 601 lbs. (Table 2) at a price of $0.7327 will just pay for the Total Variable Costs of $533 (Table 1). Similarly, irrigated peanuts yielding 2,345 lbs. (Table 2) at a price of $0.2850 will just pay for Total Variable Costs of $668 (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 $0.1899 (Table 2) yielding 3,000 lbs. will just pay for the Total Variable Costs of $570 (Table 1). Similarly, irrigated cotton at a price of $0.5192 (Table 2) with a yield of 1,000 lbs. will just pay for the Total Variable Costs of $674 (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 [1]	601	1,999	759	2,345
Break-Even Price [2]	$0.5564	$0.1899	$0.5192	$0.1671

[1] The Break-Even Yield is the yield that will cover Total Variable Costs at the prices and costs listed in Table 1. For example, 601 bu. non-irrigated cotton at a price of $0.7327 will pay for the Total Variable Costs of $533/acre.
[2] The Break-Even Price is the price that will cover Total Variable Costs at the yields and costs listed in Table 1. For example, 1,000 lbs. non-irrigated cotton at $0.5192 will just pay for the Total Variable Costs of $674/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 $0.1899/lb and yields of 3,000 lbs/acre to be profitable at producing non-irrigated peanuts. Similarly, irrigated cotton producers that produce 759 lbs./acre or better will cover variable costs at a price of $0.7327/lbs. (Table 2).

<u>Break-Even Yield and Price Sensitivity Analysis</u>

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 2,152 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 2,152 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 $0.2358 to have the same Return (Table 4). For this example, cotton is more profitable when peanuts prices are less than $0.2358 or cotton prices are greater than $0.74.

Managers can use Table 3 and Table 4 in guiding their enterprise selection for 2008. 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.

<u>Where do I go for Help in Making this Decision?</u>

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
400	1,373	650	2,005
425	1,451	675	2,083
450	1,529	700	2,161
475	1,607	725	2,239
500	1,685	750	2,316
525	1,763	775	2,394
550	1,840	800	2,472
575	1,918	825	2,550
600	1,996	850	2,628
625	2,074	875	2,705
650	2,152	900	2,783
675	2,230	925	2,861
700	2,307	950	2,939
725	2,385	975	3,017
750	2,463	1000	3,095
775	2,541	1025	3,172

[1] 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, 2,385 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
$0.5800	$0.1958	$0.5800	$0.1823
$0.6000	$0.2008	$0.6000	$0.1873
$0.6200	$0.2058	$0.6200	$0.1923
$0.6400	$0.2108	$0.6400	$0.1973
$0.6600	$0.2158	$0.6600	$0.2023
$0.6800	$0.2208	$0.6800	$0.2073
$0.7000	$0.2258	$0.7000	$0.2123
$0.7200	$0.2308	$0.7200	$0.2173
$0.7400	$0.2358	$0.7400	$0.2223
$0.7600	$0.2408	$0.7600	$0.2273
$0.7800	$0.2458	$0.7800	$0.2323
$0.8000	$0.2508	$0.8000	$0.2373
$0.8200	$0.2558	$0.8200	$0.2423
$0.8400	$0.2608	$0.8400	$0.2473
$0.8600	$0.2658	$0.8600	$0.2523
$0.8800	$0.2708	$0.8800	$0.2573

[1] 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 $0.2508/lb. have the same Return as non-irrigated cotton at $0.80/lb.