CLEMSON UNIVERSITY COOPERATIVE EXTENSION SERVICE

MANAGEMENT MARKETING MEMO

Department of Applied Economics and Statistics, Clemson University, Clemson, SC 29634-0313

MMM 491 February 2, 2009

What are the Break-Even Prices and Yields when Comparing Corn and Soybeans for 2009?

Todd D. Davis
Extension Economist

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. This memo compares the Returns over Variable Costs for corn and soybeans 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 Corn and Soybeans.

	Non-Irrigated Corn	Non-Irrigated Soybeans	Irrigated Corn	Irrigated Soybeans
Harvest Price [1/]	$4.17	$9.01	$4.17	$9.01
Yield	120	35	160	50
Total Variable Costs [2/]	$339.37	$276.77	$461.36	$351.77
Return over Variable Costs	$161.03	$38.58	$205.84	$98.73

[1/] The harvest prices are based on the December Corn and November Soybeans Futures Contract adjusted by harvest-time basis of -$0.10/bu. and -$0.30/bu., respectively, on January 29, 2009.
[2/] 2009 Clemson University Crop Enterprise Budgets (http://cherokee.agecon.clemson.edu/budgets.htm).

The estimated Returns over Variable Costs for corn and soybeans are reported in Table 1. The harvest cash prices for corn and soybeans are based on the December 2009 corn futures contract and November 2009 soybeans futures contract, respectively, and are adjusted by the estimated harvest-time basis. For this comparison, the harvest cash prices for corn and soybeans are $4.17 and $9.01 per bushel, 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 corn is $161/acre while the Return for non-irrigated soybeans is $38/acre (Table 1). Similarly, the estimated Returns over Variable Costs for irrigated corn and irrigated soybeans are $205/acre and $98/acre, respectively (Table 1).

Break-Even Yields and Prices

Based on the assumptions listed in Table 1, corn provides a greater Return over Variable Costs than soybeans. Since prices, yields and costs will vary from these assumptions, managers need to understand the break-even yields and break-even prices when comparing corn and soybean production. Table 2 reports the Break-Even Yields and Break-Even Prices that cover variable costs for corn and soybeans 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 corn yielding 81 bu. (Table 2) at a price of $4.17 will just pay for the Total Variable Costs of $339 (Table 1). Similarly, irrigated soybeans yielding 39 bu. (Table 2) at a price of $9.01 will just pay for Total Variable Costs of $352 (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 soybeans with a price of $7.91 (Table 2) yielding 35 bu. will just pay for the Total Variable Costs of $277 (Table 1). Similarly, irrigated corn at a price of $2.88 (Table 2) with a yield of 160 bu will just pay for the Total Variable Costs of $461 (Table 1).

Table 2. Break-Even Yields and Prices for Non-Irrigated and Irrigated Corn and Soybeans

	Non-Irrigated Corn	Non-Irrigated Soybeans	Irrigated Corn	Irrigated Soybeans
Break-Even Yield [1/]	81	31	111	39
Break-Even Price [2/]	$2.83	$7.91	$2.88	$7.04

[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, 81 bu. non-irrigated corn at a price of $4.17 will pay for the Total Variable Costs of $339/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, 120 bu. non-irrigated corn at $2.83 will just pay for the Total Variable Costs of $339/acre.

The break-even price and yield information in Table 2 will help managers evaluate the feasibility of producing corn or soybeans. For example, managers know that they will need at least $7.91/bu and yields of 35/bu/acre to be profitable at producing non-irrigated soybeans. Similarly, irrigated corn producers that produce 111 bu/acre will cover variable costs at a price of $4.17/bu. (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 soybeans for a range of potential corn yields at the prices and costs listed in Table 1. Managers can use Table 3 to understand the yields necessary for soybeans to be competitive with corn. For example, non-irrigated soybeans yielding 39 bu. has the same Return as 100 bu. non-irrigated corn (Table 3). For this example, corn is more profitable when yields are greater than 100 bu. or soybeans yield less than 39 bu.

Similarly, Table 4 lists the break-even prices for soybeans for a range of potential corn prices at the yields and costs listed in Table 1. This table tells managers what price is needed from the market for soybeans to be competitive with corn. For example, at a price of $4.10 for non-irrigated corn, non-irrigated soybeans must have a price of $12.27 to have the same Return (Table 4). For this example, corn is more profitable when soybean prices are less than $12.27 or corn prices are greater than $4.10.

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 corn and soybeans 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 corn and soybeans. 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 Soybeans for Varying Corn Yields for Non-Irrigated and Irrigated Production.

Non-Irrigated Corn	Non-Irrigated Soybeans	Irrigated Corn	Irrigated Soybeans
40	12	60	16
50	16	70	20
60	21	80	25
70	25	90	29
80	30	100	34
90	35	110	39
100	39	120	43
110	44	130	48
120	49	140	53
130	53	150	57
140	58	160	62
150	62	170	67
160	67	180	71
170	72	190	76
180	76	200	80
190	81	210	85

[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, 35 bu. non-irrigated soybeans have the same Return as 90 bu. non-irrigated corn.

Table 4. Break-Even Prices for Soybeans for Varying Corn Prices for Non-Irrigated and Irrigated Production.

Non-Irrigated Corn	Non-Irrigated Soybeans	Irrigated Corn	Irrigated Soybeans
$3.80	$11.24	$3.80	$9.97
$3.90	$11.58	$3.90	$10.29
$4.00	$11.93	$4.00	$10.61
$4.10	$12.27	$4.10	$10.93
$4.20	$12.61	$4.20	$11.25
$4.30	$12.95	$4.30	$11.57
$4.40	$13.30	$4.40	$11.89
$4.50	$13.64	$4.50	$12.21
$4.60	$13.98	$4.60	$12.53
$4.70	$14.33	$4.70	$12.85
$4.80	$14.67	$4.80	$13.17
$4.90	$15.01	$4.90	$13.49
$5.00	$15.35	$5.00	$13.81
$5.10	$15.70	$5.10	$14.13
$5.20	$16.04	$5.20	$14.45
$5.30	$16.38	$5.30	$14.77

[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 soybeans at $11.24/bu. have the same Return as non-irrigated corn at $3.80/bu.