



# Center For Agribusiness & Economic Development

A Comparison of Return on Assets and the Probability of Making a Profit  
across a Variety of Georgia Agricultural Commodities

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The University of Georgia

February 3, 1999

Center Special Report No. 4

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To provide accurate information to both producers and policymakers, the Center for Agribusiness and Economic Development recently compiled figures on the cash flow, return on assets, and probability of making a profit for a variety of commonly produced Georgia agricultural commodities: hogs, dairy, broilers, and dryland and irrigated corn, cotton, peanuts, and soybeans. All figures presented below are based on Georgia state average prices for the years of 1995, 1996, 1997, and 1998 as specific years and for 1989-1998 for the 10 year historic average performance. Crop yields, animal production, and production costs are based on Cooperative Extension Service enterprise budgets which are freely available to all on the Department of Agricultural and Applied Economics website ([www.agecon.uga.edu](http://www.agecon.uga.edu)).

Additional assumptions were necessary as to the scale of the operation. The hog operation was assumed to be a 1200 sow enterprise with 19 pigs weaned per female per year. The dairy was assumed to contain 150 cows with calving intervals of 13.3 months. The broiler operation was based on one house of 22,200 birds fed to a market weight of 6.15 pounds and 5 batches per year. It was not felt that owning multiple houses (which is standard) would effect the return to the operation except to multiply the gross profit by the number of houses. Crop returns are presented on a per acre basis in the following table and chart for ease of comparison, but the costs are based on common scales of operation. Peanut costs (other than irrigation) were based on an 100 acre operation, while basic production costs for all other crops were based on 200 planted acres. Irrigation equipment for all crop enterprises was based on the

costs for a 150 acre system. These operation size assumptions are used for computing the per acre cost of such large items as tractors, harvesters, etc. Labor costs were assumed to \$7.00/hr and the interest rate was set to 8% for all years. Also, a returns to management equal to 5% of the variable costs is subtracted before computing net profits and returns to assets. Thus, the profits displayed are above and beyond this management charge which may well accrue to the same owner/operator who also receives the remaining net profit. For further details of factors such as input costs and quantities employed, etc., please see the budgets on the above-referenced website or contact the report authors.

Using these assumptions we computed estimated annual profits for four recent years (1995, 1996, 1997, and 1998) and the average profit over the past ten years (1989-1998) for each enterprise. Then using the capital assets necessary to produce the commodity, we computed the return on assets (profit/total assets) for each enterprise. Returns on assets measures the profitability of a particular enterprise relative to the level of assets required to produce the commodity. Thus, if enterprise A produced twice the annual cash flow of enterprise B but used four times the assets, A would have only half the return on assets of B. Finally, we computed the probability of profit. This is the percentage of years in which an operator can expect to earn a profit from that enterprise, based on the yield and price variability over the last 10 years.

The annual returns for the past four years are shown in Table 1 and the 10 year historical average returns are shown in Table 2. The profits shown are the net returns to the operation of producing that commodity (after subtracting the management fee of 5% of the variable costs) and reflects returns to ownership above and beyond management of the farm operation. The returns to assets (ROA) value takes the number from the profit column and divides it by the total assets used in the operation. Because farm operators typically borrow to finance capital purchases, the returns on assets figure will be considerably lower than the likely returns to equity (or return on investment). For example, if a farm operator has 40% equity and owes 60% of the value of the farm assets, the returns to the farm operator's equity would be 2.5 ( $1 \div 0.40$ ) times the ROA. Using the 1998 value for broilers and a 40% equity value as a representative example, the return on equity would equal 5.025% ( $2.5 \times 2.01\%$ ).

Finally, a graph displays the 10 year historical return results in a manner that shows both the expected profitability and the associated risk as measured by the probability of making a profit in any one particular year. Each commodity is represented by a labeled dot on the graph. The farther the dot is to the right, the higher the returns on assets (the more profitable the enterprise is relative to the assets required to produce it). The higher the dot is on the graph, the more likely that enterprise is to be profitable in any one year. Thus, dots that are more toward the upper right corner of the graph are desirable. An enterprise that is both farther right and higher up than another is superior in terms of both profitability and riskiness (i.e., the farmer gets a bigger return with less risk).

These results should be considered remembering the assumptions inherent in their calculation. Production costs and capital requirements are based on the enterprise budgets of the UGA Cooperative Extension Service and try to emulate best management practices. These results will not accurately reflect all agricultural operations of different sizes, financial conditions, and management styles that may exist in various regions of Georgia or other states.

**Table 1. Estimated Profits and Returns on Assets for a Variety of Georgia Agricultural Commodities**

	1995		1996		1997		1998	
Commodity	Profit	ROA	Profit	ROA	Profit	ROA	Profit	ROA
hogs	-\$369,595	-18.06%	\$128,976	6.16%	\$314,201	15.03%	-\$728,271	-36.50%
dairy	-\$56,385	-6.12%	-\$46,026	-4.99%	-\$9,891	-1.07%	-\$58,288	-6.33%
broiler	\$1,786	1.46%	\$1,786	1.46%	\$1,786	1.46%	\$2,463	2.01%
dryland corn	\$61	20.80%	\$83	28.20%	\$68	23.20%	-\$143	-48.70%
irrigated corn	\$110	15.20%	\$133	18.40%	\$67	9.20%	-\$168	-23.18%
dry. soybeans	\$53	22.60%	\$45	19.20%	-\$8	-3.40%	-\$61	-26.11%
irr. soybeans	\$78	12.00%	\$74	11.41%	\$26	4.01%	-\$61	-9.40%
dry. peanuts	\$195	44.00%	\$331	74.60%	\$203	45.80%	\$302	68.09%
irr. peanuts	\$241	19.50%	\$330	26.70%	\$210	17.00%	\$193	23.42%
dry. cotton	\$42	8.05%	\$107	20.51%	\$30	5.75%	-\$106	-20.32%
irr. cotton	\$198	21.50%	\$221	24.10%	\$145	15.81%	\$48	5.24%

Numbers in columns labeled "Profit" are the net revenue from either the annual animal operation (1200 sows, 150 dairy cows, 111,000 broilers) or from a single acre of a larger crop operation. "ROA" is the return on assets which is calculated as the profit value shown in the column to the left divided by the capital assets necessary for the operation (including land). The capital assets for the animal operations are \$2,046,995 for hogs, \$920,705 for dairy, and \$122,750 for broilers. On a per acre basis for the crops, the capital assets are \$294 for dryland corn, \$725 for irrigated corn, \$234 for dryland soybeans, \$649 for irrigated soybeans, \$444 for dryland peanuts, \$1,236 for irrigated peanuts, \$522 for dryland cotton, and \$917 for irrigated cotton.

Table 2. Ten Year Historical Average Returns

1989-1998

Commodity	Profit	ROA	Prob(Profit)
hogs	\$47,210	2.29%	46%
dairy	-\$41,811	-4.54%	21%
broiler	\$1,854	1.52%	72%
dryland corn	-\$5	-1.70%	47%
irrigated corn	-\$8	-1.10%	45%
dry. soybeans	-\$2	-0.86%	48%
irr. soybeans	\$12	1.85%	60%
dry. peanuts	\$235	52.99%	93%
irr. peanuts	\$273	22.09%	99%
dry. cotton	\$18	3.45%	54%
irr. cotton	\$131	14.29%	95%

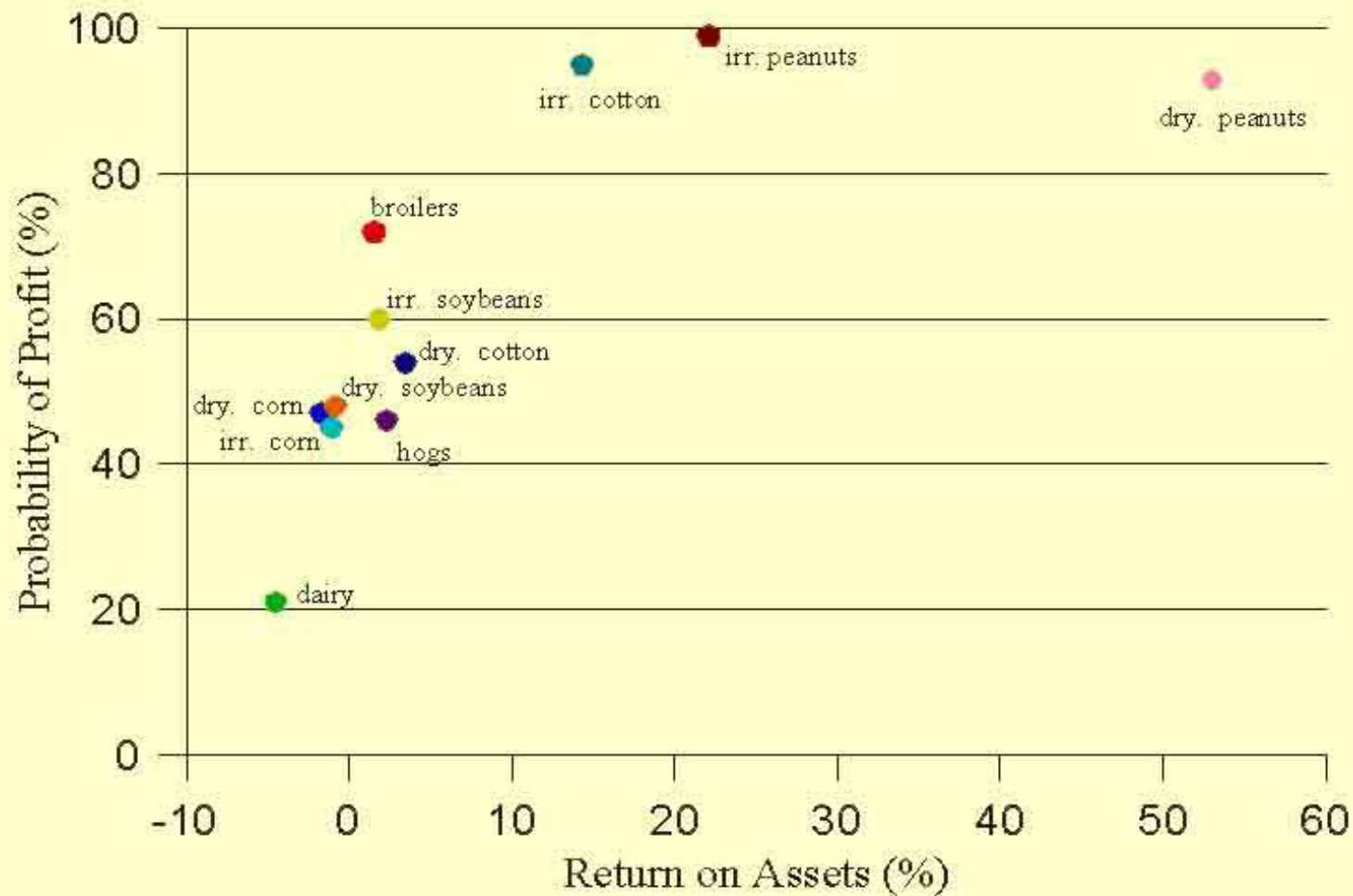
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1. The authors are professor and coordinator of the CAED, graduate research assistants in the CAED, and professor and extension livestock economist, respectively.

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# Risk and Returns for a Variety of Agricultural Enterprises in Georgia

Based on 10 year historical averages



Prepared by the Center for Agribusiness and Economic Development, University of Georgia. Feb. 2, 1999

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