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CYMIDA—A COTTON YIELD MONITOR INVESTMENT DECISION AID

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Abstract

The Cotton Yield Monitor Investment Decision Aid (CYMIDA) is an interactive computer program that can help cotton farmers evaluate the yield gains and input savings required to pay for a cotton yield monitoring system. Electronic yield monitoring technology provides farmers with a way to collect detailed field spatial information about crop yields, but as cotton producers know, the technology does not come cheap. Using partial budgeting and break-even analysis, CYMIDA allows farmers to develop a custom analysis based on their individual farm situation and determine if a yield monitor will be a wise investment.

Extended Summary

New software is available to help producers determine whether purchasing a cotton yield monitoring system would be a wise investment. The Cotton Yield Monitor Investment Decision Aid (CYMIDA) is an interactive computer program that can help cotton farmers evaluate the yield gains and input savings required to pay for investing in a cotton yield monitoring system. Computer-based technologies such as CYMIDA are an integral part of precision farming. Electronic yield monitoring technology provides farmers with a way to collect detailed field spatial information about crop yields, but as cotton producers know, the technology does not come cheap. Cost-conscious producers welcome tools that can help determine if an investment is worth it. Using partial budgeting and break-even analysis, CYMIDA allows farmers to develop a custom analysis based on their individual farm situation. The software determines cotton yield monitor information system costs as a function of farm size and evaluates breakeven yield gains and input savings required to cover the ownership costs of the system. (Figure 1). Required yield gains and input savings to pay for investment in the information system can be evaluated for the following crop input decisions: seed, nitrogen, phosphorus, potassium, lime, growth regulators, fungicides, herbicides, insecticides, harvest aids, and drainage (Figure 2).

In an example analysis using breakeven yield gains and input savings needed to cover the ownership costs of the information system for a nitrogen fertilization decision, CYMIDA results indicate that most of the cost advantage for the information system is achieved for farms with at least 1,424 acres of cotton. The ownership cost of the information system is $4.33 per acre for a 1,424-acre cotton enterprise compared with $ 11.98 per acre for a farm with only 356 acres of cotton. Assuming no change in the nitrogen fertilization rate for variable rate versus uniform rate application, and assuming that all costs are allocated to the cotton enterprise, CYMIDA determined that a 27 lb/acre yield gain is required to cover fixed costs for the 356 acre cotton enterprise. A 13 lb/acre yield gain is required to cover fixed costs for the 1,424-acre cotton enterprise. The required yield gains for the nitrogen fertilization decision are less if ownership costs are allocated over all crop acres or if the information system is used for more than one input decision.

CYMIDA features a printable user's guide, easy point and click operation, context sensitive help, default input costs that serve as a starting point for the user, default yield monitor purchase costs to serve as a starting point for the user, and sensitivity analysis for changes in cotton lint and crop input prices (Figure 3). Contact James A. Larson (jlarson2@utk.edu), Burton C. English (benglish@utk.edu), Roland K. Roberts (rrobert3@utk.edu), or Rebecca L. Cochran (rcohra2@utk.edu) at the University of Tennessee [http://economics.ag.utk.edu; phone: (865) 974-7231] for more information on CYMIDA. A free copy of CYMIDA to download to your computer is available at the Cotton Incorporated Web site: [http://www.cottoninc.com/Agriculture/homepage.cfm?PAGE=3518]. Funding for the development of CYMIDA was provided by the University of Tennessee Agricultural Experiment Station and Cotton Incorporated.

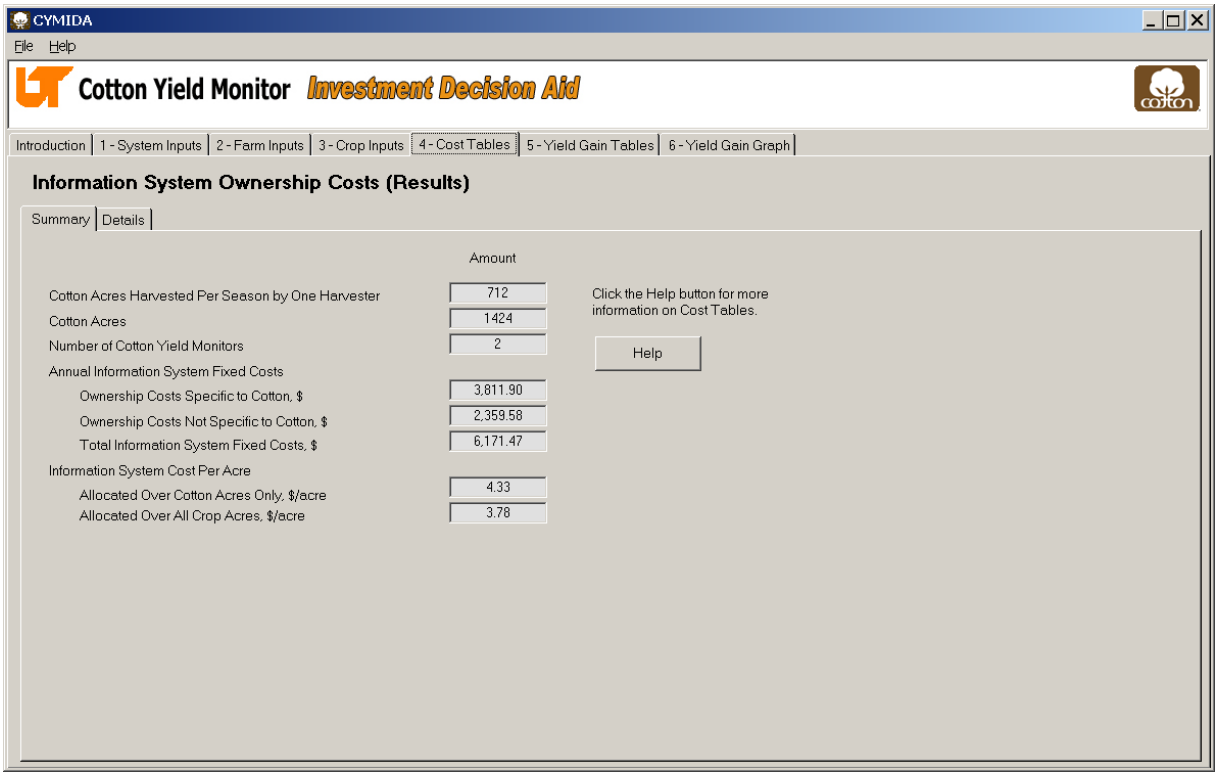
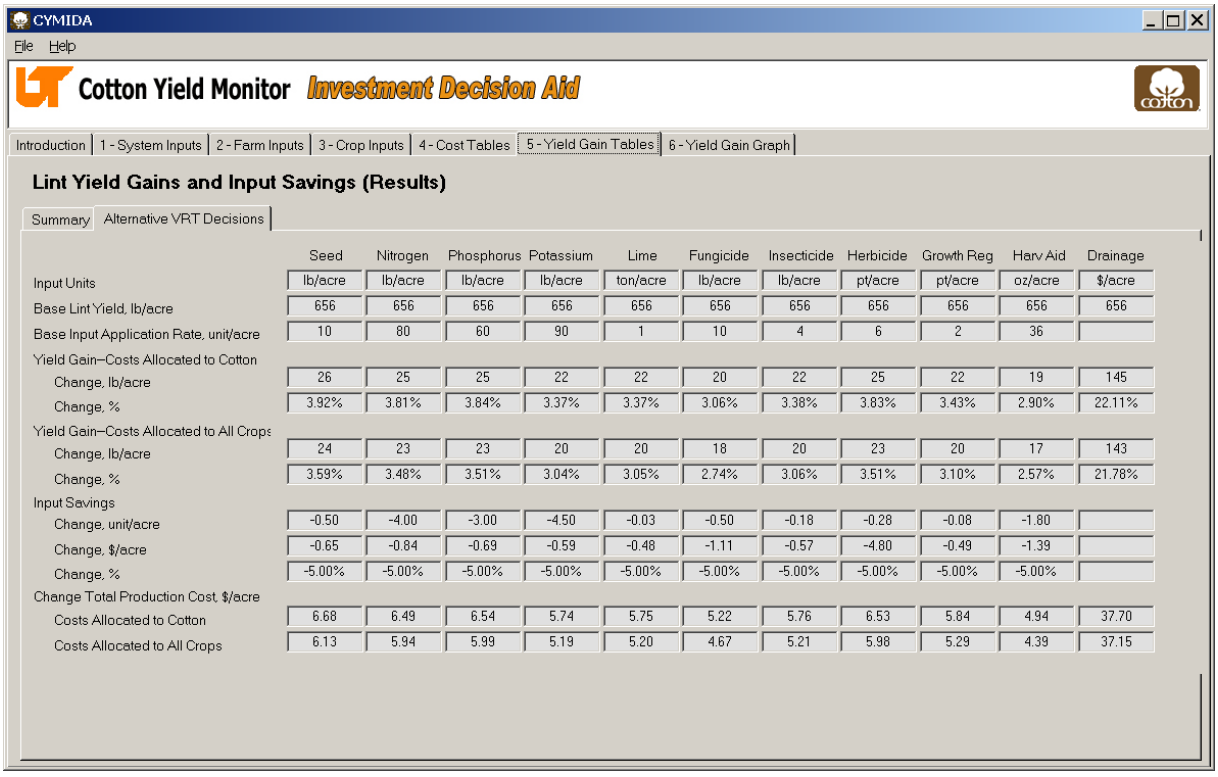


Figure 1. Cotton yield monitor ownership cost screen.



	Seed	Nitrogen	Phosphorus	Potassium	Lime	Fungicide	Insecticide	Herbicide	Growth Reg	Harv Aid	Drainage
Input Units	lb/acre	lb/acre	lb/acre	lb/acre	ton/acre	lb/acre	lb/acre	pt/acre	pt/acre	oz/acre	$/acre
Base Lint Yield, lb/acre	656	656	656	656	656	656	656	656	656	656	656
Base Input Application Rate, unit/acre	10	80	60	90	1	10	4	6	2	36	
Yield Gain–Costs Allocated to Cotton											
Change, lb/acre	26	25	25	22	22	20	22	25	22	19	145
Change, %	3.92%	3.81%	3.84%	3.37%	3.37%	3.06%	3.38%	3.83%	3.43%	2.90%	22.11%
Yield Gain–Costs Allocated to All Crops											
Change, lb/acre	24	23	23	20	20	18	20	23	20	17	143
Change, %	3.59%	3.48%	3.51%	3.04%	3.05%	2.74%	3.06%	3.51%	3.10%	2.57%	21.78%
Input Savings											
Change, unit/acre	-0.50	-4.00	-3.00	-4.50	-0.03	-0.50	-0.18	-0.28	-0.08	-1.80	
Change, $/acre	-0.65	-0.84	-0.69	-0.59	-0.48	-1.11	-0.57	-4.80	-0.49	-1.39	
Change, %	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	-5.00%	
Change Total Production Cost, $/acre											
Costs Allocated to Cotton	6.68	6.49	6.54	5.74	5.75	5.22	5.76	6.53	5.84	4.94	37.70
Costs Allocated to All Crops	6.13	5.94	5.99	5.19	5.20	4.67	5.21	5.98	5.29	4.39	37.15

Figure 2. Required annual yield gains and input savings to pay for investment in a cotton yield monitoring information system for alternative crop inputs.

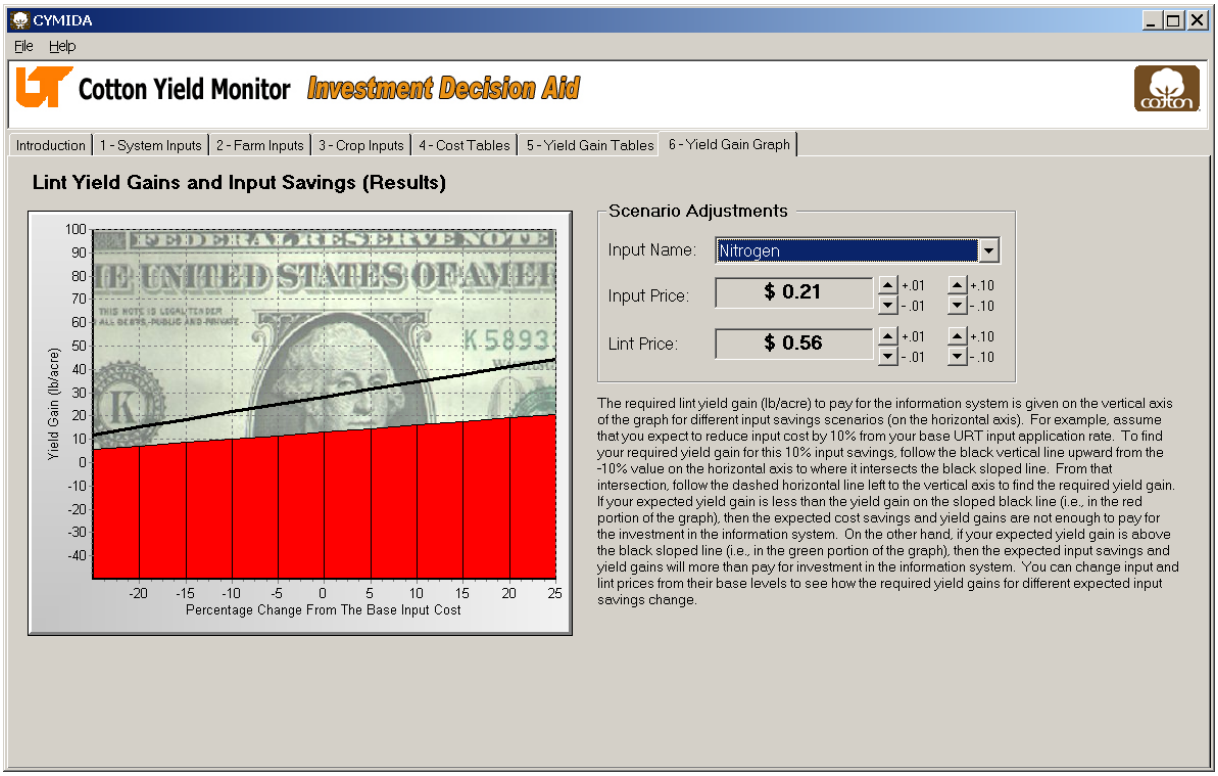


Figure 3. Two-way yield gain and input savings sensitivity results.