

## **ECONOMIC COMPARISON OF NPK RECOMMENDATIONS FROM UNIVERSITY AND PRIVATE SOIL TEST LABS FOR COTTON PRODUCTION**

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### **Introduction**

With the increasing cost of fertilizers ( $P = \$1.05$ ,  $K = \$0.60/\text{lb}$ ) a cotton producers need to minimize inputs with out limiting yields. Soil test fertilizer recommendations are ideally based on research data. For P & K fertilizer recommendations, a critical soil test level (above which a yield increase is not expected), crop yield goal, and fertilizer build up factors are considered. The relative weights of these factors determine the amount of fertilizer recommended. Soil labs vary greatly in their fertilizer recommendations. The University of Missouri will decrease the amount recommended as the amount found rises. When a soil tests very high in P or K the recommended rate is 0. This often leads to a 0 recommendation for P and K on Missouri cotton soils. Other labs continue to recommend P & K to compensate for crop removal at all levels of nutrient found.

The objective of this evaluation is to directly compare the recommendations of several major soil test labs with the University of Missouri in terms of input costs and yields.

The test was conducted at three locations representing the major cotton soil types of Southeast Missouri sand, silt loam, & gumbo). At each location a research area of approximately 200 X 200 feet was selected. At each location a composite soil sample consisting of 50 individual 6 inch cores was collected. These samples were dried & ground, then divided into 5 sub samples. These sub samples were provided to 5 different labs (2 University, and 3 private) with a recommendation request for 2 bale cotton. If applicable a build up period for P & K of four years was requested. The resulting fertilizer recommendations were followed. The resulting N-P-K recommendations are listed in Table 1.

Gross and net returns to producers were calculated based on Commodity Credit Corporation Cotton loan base rate for 2008 crop White Upland Cotton warehoused in Missouri (\$0.5235/lb lint) with allowances made for fiber quality. Input costs were computed at a price for N P & K in effect for each year. Input costs were calculated and compared to net & gross returns for each recommendation.

### **Conclusions**

Significant differences in three-year cumulative yield and net returns to producers were found at all three locations.. Due to a wet fall in 2009 final soil samples have not been collected. Soil test programs call for retesting every third year. Fertilizer programs which recommend little or no fertilizer may eventually lead to inadequate P & K soil test levels at the next testing cycle. This could require large additions of fertilizers at that time, putting economic strains on producers. Definitive conclusions cannot be made without considering the P & K status of the soil.

Table 1. Three year cumulative yields, 3-year total fertilizer costs and 3-year total net returns for fertilizer programs 2007-2009.

Lab	Sand soil, Clarkton, MO			Silt loam soil, Portageville, MO			Clay soil, Portageville, MO		
	Cumulative yield	Total cost	Total net returns	Cumulative yield	Total cost	Total net returns	Cumulative yield	Total cost	Total net returns
University 1	2241	\$311	\$934	2342	\$285	\$950	2946	\$188	\$1561
Private 1	2196	\$321	\$842	2239	\$382	\$817	2632	\$194	\$1355
Private 2	1922	\$365	\$690	2568	\$387	\$984	2775	\$220	\$1383
Private 3	1801	\$296	\$692	2509	\$225	\$1088	2913	\$213	\$1513
University 2	1890	\$222	\$847	2447	\$135	\$1137	2780	\$150	\$1495
LSD 0.05	379	-----	142	*****	-----	*****	185	-----	171
CV%	12.2	-----	17.8	*****	-----	*****	6.6	-----	7.6

\*\*\*\*\* Data not analyzed due to late harvest 2009