K-Mag AGRI FACTS

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Managing Cotton To Maximize Profitability

- **Investment in crop nutrition pays dividends**

Your next cotton harvest is just around the corner. Now is the time many growers can look at changes they have made in their production systems and evaluate the benefits. Of course, the final analysis will be the yield numbers that come in late this fall.

Today, many grower publications are publishing articles with ideas that affect cotton productions' profitability. As I write this, cotton bolls are starting to open. The weather is hot and dry across much of the cotton belt. The USDA projects the percentage of the U. S. cotton crop rated excellent slipped to less than 50% of U. S. acres. Another article monitors the Asian financial crisis and how this has hurt the demand for raw cotton compared to 1997-98 levels.

This is not the time for mediocre management of your cotton crop. Information must be integrated from many sources so the appropriate management decisions can be made. However, terminology is sometimes confusing. Fertilizer, for example, is viewed by some as an expense. Others view fertilizer as an investment that is essential for optimum cotton production. Below are several examples of research that show how investment in crop nutrition pays dividends.

Alabama
Researchers in Alabama designed an experiment to determine the timing of applications and different fertilizer rates on cotton yield over time. The results of this study are listed in Table 1. The response to applied potassium is apparent as lint yield is greater in the K applied than the no K treatments. At higher rates, there is different response among years.

Table 1. The Influence Of Potassium Rate, And Year On Cotton Yield.

K- Annually	1987	1988	1989	Average
0	990	573	856	773
60	997	653	1102	917
120	1140	637	1172	983
180	1121	624	1227	990

Production varies from year to year in all agriculture. Some years are good; some are adverse. A positive response was observed comparing the no potassium with the 60 lb/A rate. Over time, it appears wise to apply 120 lb/A or more K annually at a cost of $14.50. 70-80 lb/A average lint yield increase at $0.70/lb increases income by at least $49.

Part two of this experiment (Table 2) shows the benefit of applications of adequate fertilizer each year. The plots from the rate study in Table 1 were split. Annual applications were made on half and no additional applications were made to the other half of the plots.

Table 2. Comparing Cotton Yields (Lb Lint/A) Under Annual Potassium Applications, And Residual Potassium.

K-Treatment	1991	1992	1993	1994	1995	1996	Average
Annual	705	1396	1011	1575	817	1133	1106
Residual	645	1235	906	1337	705	975	964
In-season Rain	36.66	33.59	30.71	33.84	27.24	34.24	29.92
Yield Difference	60	*161	105	*238	112	*158	142

* years with above average yield differences.

Annual applications produced more lint than the plots utilizing the residual potassium. In years of adverse weather the difference may be smaller. In 1991 the difference is 60 lbs lint/A with higher rainfall. In a year such as 1994, the difference is striking. The increase of 238 lb lint/A at $0.70 per pound of lint equals an additional $167 per acre. That income will

cover the cost of 120 lb/A potash at $14.50 from the above example.

California
A test was conducted by a number of extension specialists in the San Joaquin Valley. In this test they applied 0 or 400 lb K_2O/A. The K_2O was side-dressed at squaring. Table 4 is a partial listing of the results. Average positive response to the potash application was + 174 lb lint/A.

Table 4. The Effects Of Fertilizer K On Acala Cotton (Maxxa) Lint Yields.

Lint Yield lb/A		Change Due To K lb lint/A
Control	400 lb K_2O/A	
1143	1438	295
1567	1815	248
762	1131	369
1419	1664	245

The cost of 400 lbs of KCl on this cotton should be about $50. The average increase in returns is $121.00 from the 174 lb average yield increase. In-season applications of potash ***does not cost – it pays.***

Balanced Fertility
In addition to potassium requirement discussed above one must allow for other nutrients to provide efficient crop production. Shortage of one nutrient can result in missed profit.

Calcium, magnesium and sulfur are referred to as secondary nutrients. They are no less important than N, P, and K. They are usually required in smaller supply. The accumulation of Ca, Mg, and S by cotton plants is shown below (Table 3). This table shows that stems and leaves are a major pool of these nutrients. That is where the energy is transferred to make yield.

Table 3. Accumulation Of Ca, Mg, And S By Mature Cotton Plants On Two Soils.

Plant Part	Ca	Mg	S
Stems	10.9	2.7	2.6
Leaves	37.3	6.1	7.5
Burs	7.8	2.3	4.2
Seed	1.6	5.0	3.9
Total Uptake	57.3	16.1	18.2

It can be seen that in this crop 57.3 lbs of calcium, 16.1 lb of magnesium, and 18.2 lbs of sulfur were contained in the crop. Under these conditions, researchers found that 7.6 lbs of Ca, 2.1 lb of Mg, and 2.4 lb of S are needed for each 100 lb of lint cotton.

Summary
The above cotton data indicate several facts, among them:

- Cotton required balanced nutrition, not just N, P, and K.
- Fertilizer is an asset that will help deliver yield and profit.

If your soil test indicates a need for potassium, magnesium or sulfur, a blend with K-Mag is often a good choice. K-Mag is a naturally-occurring, highly soluble source of these necessary nutrients in a readily available form.

Remember the results above. It is not possible to support yields at high levels without available nutrients where the plant can use them.