Long Staple Variety Comparison

Evco Farms, Art Pacheco, Marana

<table>
<thead>
<tr>
<th>Variety</th>
<th>Seed Cotton Per Plot</th>
<th>Second Pick</th>
<th>Total Seed Cotton</th>
<th>Lint/1 Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-34</td>
<td>Rep 1: 855&lt;br&gt;Rep 2: 750&lt;br&gt;Rep 3: 870&lt;br&gt;Rep 4: 815</td>
<td>410</td>
<td>3700</td>
<td>781 a</td>
</tr>
<tr>
<td></td>
<td>S-5 660&lt;br&gt;695&lt;br&gt;685&lt;br&gt;625</td>
<td>320</td>
<td>2985</td>
<td>631 b</td>
</tr>
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/1 Values followed by the same letter not significantly different at .05 level by Student - Newman - Keul's test.

The data presented here supports earlier comparisons indicating that a yield increase for P-34 over S-5 is in the range of 10-20%. If P-34 provides similar quality to that of S-5 then an increase in returns of similar magnitude can be anticipated.

Field observations have suggested that P-34 is about two weeks earlier maturing than S-5 and to obtain best quality harvesting should occur two weeks earlier than for S-5. Delays in harvesting P-34 tend to contribute in lower quality.

SOIL AND PLANT NUTRIENT STATUS IN ARIZONA COTTON

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Summary

Soil and cotton tissue from cotton fields in the major cotton production areas of Arizona were analyzed for plant nutrients and results are reported. Population distributions for soil nitrate and phosphorus and tissue nitrogen, phosphorus, magnesium and iron are given. Correlations between soil tests for nitrate-nitrogen (NO₃-N) and petiole NO₃-N were poor but correlations between CO₂ extractable (McGeorge, 1940) phosphate and total leaf P were significant.

Guidelines for interpreting cotton tissue and soil test results have been established for only a few nutrients. As an aid in planning future plant nutrition studies, a field survey of soil and tissue levels of several nutrients was conducted in 1982. One hundred and ten fields in five major production areas of Arizona were sampled at about first flower and again at peak flower. Soil, petiole, and leaf samples were collected at first flower and petiole and leaf samples only were collected at peak flower. Due to differences in planting dates fields had to be sampled at different, calendar dates in order to approximate uniform physiological development. Soil samples were analyzed for soluble NO₃-N and CO₂ (McGeorge, 1940) extractable P. Petioles were analyzed for soluble NO₃-N and leaf blades were analyzed for total content of P and micronutrients.

Results of NO₃-N analysis for first flower and peak flower are given in Figures 1 and 2, respectively. Neither population displays a notably normal distribution. Also the means and standard deviations indicate that less meaningful conclusions influencing crop management can be drawn from the peak flowering period because of a high coefficient of variation.

A histogram of soil NO₃-N is given in Figure 3. Again the population is not normally distributed. Correlation analysis of soil NO₃-N and petiole NO₃-N from the first sampling showed 95% significant negative (r = 0.184) correlation. Similar correlation analysis between soluble NO₃-N extracted from soil samples collected at first flowering and soluble NO₃-N of peak flowering petioles showed a significant 99% positive (R = 0.337) correlation. Although these correlations are significant only a very small amount of petiole variability can be accounted for with soil variability.

Population frequency histograms for total leaf blade phosphorus from first flower and CO₂ extractable PO₄-P are given in Figures 4 and 5. Leaf blade P displays a more normal distribution than soil PO₄-P but a 99% significant positive correlation was found for the first flower sampling (r = 0.502) and the peak flower sampling (r = 0.280) and soil PO₄-P.
Analysis was performed for more elements than reported here. When looking across all combinations of correlations between two elements, the strongest identifiable trend was between total leaf iron and aluminum. Correlation coefficients were highly significant with $r = 0.890$ at first flower and $r = 0.928$ at peak flower. Across a wide range of pH values, from strongly acid to highly alkaline, this would not be uncommon due to the similar influences of pH on Fe and Al solubility. All soils in this study were alkaline and regression analysis of soil pH and leaf content of Fe and Al produced no significant correlations.

![Figure 1. Population distribution of nitrate-nitrogen concentrations in petioles collected at first flower.](image1)

![Figure 2. Population distribution of nitrate-nitrogen concentrations in petioles collected at peak flower.](image2)
Figure 3. Population distribution of nitrate-nitrogen extracted from soil samples collected at first flower.

Figure 4. Population distribution of total phosphorus in leaf blades collected at first flower.
NITROGEN APPLICATIONS AND PETIOLE ANALYSIS
C. R. Farr

The determination of nitrogen needs of cotton is greatly aided by the use of soil and tissue analysis. These should be used in conjunction with other management knowledge to grow a successful crop through maturity. Such management tools cannot predict the total amount of nitrogen needed for the year nor can they predict maximum yields. Therefore petiole analysis may give adequate or inadequate values according to research guidelines but nitrogen waste may not be apparent.

Some past tests on farms found 82 pounds of nitrogen producing as much cotton as 164 pounds of nitrogen and a 1980 test found no difference in yields between 100, 135 and 170 pounds of nitrogen. However the water supply was not monitored for nitrogen inputs in these fields.

In 1982 one grower chose to compare application timing as follows:

<table>
<thead>
<tr>
<th>TREATMENT NO.</th>
<th>1st SIDEDRESS</th>
<th>2nd SIDEDRESS</th>
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<tbody>
<tr>
<td></td>
<td>6-10</td>
<td>7-12</td>
</tr>
<tr>
<td>1</td>
<td>10 gal UN32</td>
<td>20 gal UN32</td>
</tr>
<tr>
<td>2</td>
<td>20 gal UN32</td>
<td>10 gal UN32</td>
</tr>
<tr>
<td>3</td>
<td>30 gal UN32</td>
<td>none (15 gal mistakenly applied)</td>
</tr>
<tr>
<td>+ N-Serve</td>
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Field practice 15 gal UN32 15 gal UN32

At the second location (Moore Ranches) 100, 150 and 200 lbs of nitrogen were compared with no nitrogen in split applications on May 22 and June 25.

Petiole analysis of field practice nitrogen at Riggs location was adequate until Aug. 4 sampling deficiency but final yield was not significantly less than the 186 pound treatment.

At the Moore location where the soil at planting contained 11 ppm nitrate-nitrogen there was no significant difference between no nitrogen and 200 pounds of nitrogen. Analysis of the first and second foot of soil revealed 166 pounds of nitrate-nitrogen and available organic nitrogen.