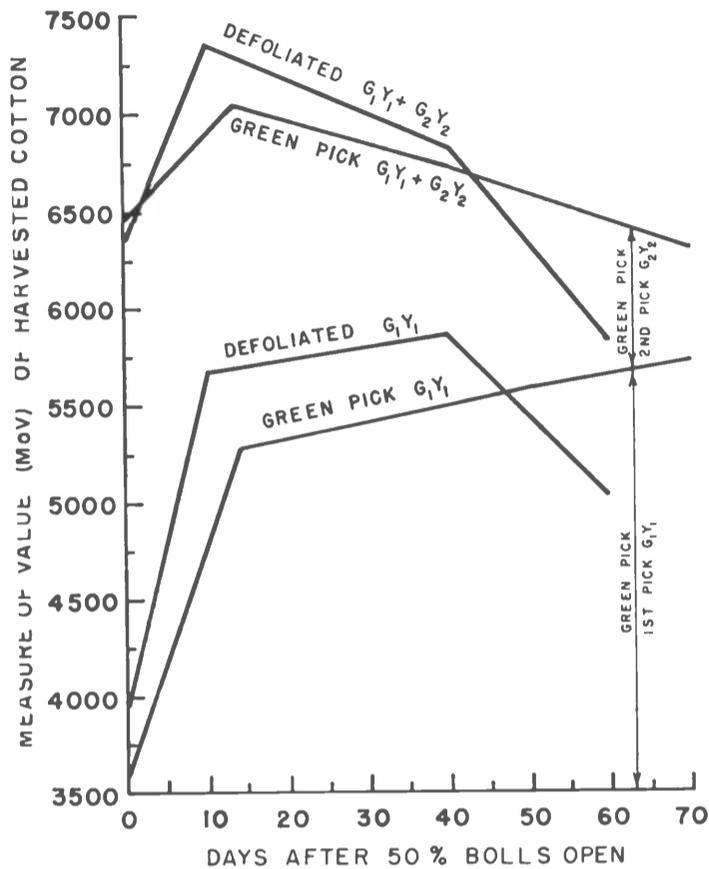# Cotton Harvest-Defoliation Scheduling

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Since 1961, harvest-defoliation tests with Delta Pine Smooth leaf cotton have been conducted at the U of A Cotton Research Center. Four seasons of field experiments produced data from six Green Pick, three Frost Defoliated, and sixteen Chemically Defoliated tests.

Statistical analysis showed in each year significant reduction in total harvested yield with time, but no significant relationship between total yield and the harvest schedule.

When to Harvest?

Certain significant stages in cotton plant development are distinguishable by observation or measurement. The same stage of plant development may fall on a different calendar date in successive or different years. The stage of fifty-percent bolls was

found to be a convenient and critical Time Zero for defining the beginning of the harvest-season plant response, and for relating all of the harvest operation to crop plant development.

Analysis of the data showed that by decision or default, when the crop is at 50 percent bolls open, the grower determines:

1. **The tentative harvest schedule;**
2. **The proportion of high-grade cotton which will be harvested;**
3. **The tentative gross value of the crop.**

For the four seasons of tests, this harvest Time Zero ranged from September 9 to October 4.

When Yield and Grade-index values for all of the years were adjusted to their appropriate Time Zero, a consistent pattern developed. Grade-index showed a constant loss of $1/8$ percentage point per day. The crop-harvester interaction showed less total harvested cotton as picking was delayed.

A Figure of Merit

Combining the numerical values for Yield and Grade permitted the development of a figure of merit. A figure of merit is a derived or specified value by which numerical comparisons of alternatives may be made. A figure of merit provides a clear-cut significant figure because it can be converted to dollars.

Yield and Grade-index can be made to provide such a figure of merit. Termed Measure of Value (MoV) it can be symbolized by

$$MoV = G_1Y_1 + G_2Y_2$$

with the subscripts 1 and 2 referring to 1st picking and 2nd picking of the crop. If there were but one picking, only the subscript one term would apply. If there should be three pickings, a term with subscript three would be added.

G stands for grade-index, and Y stands for harvested yield as a percentage of the gross field yield. Thus the sum of the products of grade-index times percent of gross yield produces a figure of merit useful for management decisions, and which at any time can be converted to dollars by the substitution of price per pound times pounds of harvested yield.

In the analysis, MoV for the crop was plotted against days elapsed between the 50 percent bolls open stage and the day of first picking. The MoV for the crop is that which would be expected to result from a first picking on the day plotted plus a second picking after the crop was fully mature.

The curves in our figure show the interrelationship of grade-index, yield, and the advance of the season with Green Pick and Defoliation, and the increment contributed to crop value by each of the pickings. Emphasized are:

1. **The importance of the 50% bolls open Time Zero.**
2. **The peaking of crop value from early picking.**
3. **The decreasing effectiveness of defoliation as a harvest aid as the season advances.**
4. **The usefulness of a figure of merit like MoV in numerical comparison of alternatives, including breakeven on defoliation costs and 2nd pick machine costs of harvest.**

Timing is one of the elements in optimizing machine cropping practices. In harvesting operations, timing is achieved by a schedule designed from performance values for the crop, the machine, the weather, and acreage. Numerical performance values can be determined and used in prediction. They provide input for planning and decision making for cost control and improvement of returns.

Investigaciones recientes realizadas en estaciones agrícolas experimentales muy distantes indican que existen factores no identificados presentes en la alfalfa deshidratada que estimulan las funciones del rumen y contribuyen al bienestar del ganado vacuno y del lanar. En Texas se encontró que la adición de harina de alfalfa deshidratada a la ración del ganado vacuno incrementa el aumento de peso en 15.4% con una disminución del 15.2% en los requisitos alimenticios por unidad de aumento.

La difusion de ciertos enfermedades exóticas amenaza a la ganadería mundial en una escala verdaderamente inquietante. Representan un verdadero peligro brotes repentinos de la peste equina africana, de lengua azul, de listeriosis, de enterotoxemia, de dermatosis nodular, de paratuberculosis y de peste porcina.