

RESULTS OF FOLIAR APPLICATION OF IRON AND
ZINC TO COTTON PLANTS

Hughes and Ganz Farm, Queen Creek, Maricopa County
James Nafzinger, Manager
Charles Farr, Agricultural Agent

Variety	Lint (Lbs. Per Acre)	Percent Lint	Length (UHM)	Strength (Pressley 1/8") <u>1/</u>	Micronaire
138 Iron Chelate	1143	37.4	1.09	94.5	4.3
Zinc	1127	37.8	1.06	100.7	4.5
138 + Zinc	1095	37.4	1.10	94.5	4.5

1/ Converted to 1,000 pounds per square inch.

Elevation: 1200 Feet
Soil Type: Sandy Loam
Previous Crops: Two years potatoes, maize, and cotton
Irrigation: May 10, 1967, every three weeks rest of season, pump,
row method, good quality
Fertilization: 120 pounds nitrogen
Weed Control: None
Insect Control: None
Defoliation: None
Planting Date: April 1, 1967
Planting Pattern: Solid
Harvest: October 30, 1967
Crop Condition: Rank, lodging, no insect or disease injury

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EXPERIMENTAL WILT HARVEST AID EVALUATED
IN SEVERAL COUNTIES

Pima County County Agent--James Armstrong

Esso Research Corporation provided 180 gallons of Wiltz 65 for testing in Pima County cotton fields. J. B. White of White Farms, Marana, and J. Peter Hershberger, Arizona Portland Cement Farm, Marana, cooperated in the evaluation of this harvest aid chemical.

In the Hershberger test, the best solvent available was kerosene and it performed very well. Three hours after application considerable leaf wilt was visible. Due to reduced daytime temperature actual picking was not started until six hours after application and another pick was made 24 hours after application for comparison with the check. The results obtained were:

Variety: 4-42

Elevation: 2000 Feet

	6 Hours After Application	24 Hours After Application	Check 14 days after Defoliation
Number of bales harvested	2	4	6
Grade Designa- tion	2 bales Middling	2 bales Middling 1 bale Strict Low Middling 1 bale Middling Light Spot	4 bales Middling 2 bales Middling Light Spot
Staple Length	2 bales 1-1/16"	4 bales 1-1/16"	5 bales 1-1/16" 1 bale 1-3/32"
Micronaire	4.1 and 4.3	4.4, 4.4, 4.7 and 4.5	4.3, 4.5, 4.4, 4.4, 4.2, and 4.2
Defoliant	Wiltz 65	Wiltz 65	Sodium Chlorate
Application Date	10/23/67 9 A.M.	10/23/67 9 A.M.	10/10/67
Harvest Date	10/23/67 3 P.M.	10/24/67 9 A.M.	10/24/67
Temperature at Maximum	65° 85°	65° 85°	75° 80 - 95°
Price Per Pound	.3970	.3970	.3701 .3855

There was some confusion in the solvent to be used with the Wiltz 65. Actually the wrong solvent was used in the White Farms application, thus the quick wilting characteristic was not achieved. However, on this test partial defoliation and wilting was achieved in 48 hours. A test picking was made 48 hours after application on part of the field and another picking was made 72 hours after application.

The ginning results indicated that all the cotton from both pickings was spotted. Thus picking was delayed until another defoliant could be applied.

No conclusive evidence was obtained from this demonstration, but indications are that it would have been successful if the proper solvent had been obtained and applied.

Method of application was aerial at the rate of 8 gallons per acre (2 gallons Wiltz 65, 2 gallons Kerosene and 4 gallons water) at 40 pounds per square inch pressure in the Hershberger test. Two gallons of Aromin 95 were used instead of Kerosene in the White Test.

Yuma County

County Agent-in-Charge--James Hazlitt
and County Agent--Donald Howell

Full coverage of our rank cotton in Yuma County was difficult to obtain. However, in some cases defoliation was as good as with defoliant normally used.

Farmers who tried Wiltz 65 were Earl Hughes of Gadsden, Jim McElhaney of Wellton, Jim Dunn of the Gila Valley, and Bruce Church Ranch of Parker. Ninety-one acres were treated with Wiltz 65 in these tests. Jim Dunn picked some cotton about five hours after application and some more 24 hours later. McElhaney picked a small amount 24 hours later and Bruce Church picked some five hours and 24 hours later. Picking was difficult in all cases because of greenness. Earl Hughes did not attempt to pick any Wiltz 65 treated cotton since his plants were quite rank and defoliation was poor. Hughes said he thought that "Paraquat" and "Def" were doing a much better job. McElhaney compared Wiltz 65 with Anhydrous Ammonia used as a defoliant and finished defoliating the Wiltz 65 treated cotton with Anhydrous.

Jim Dunn was able to pick some of his treated cotton easily, several weeks after the application of Wiltz 65. The Bruce Church test was applied on cotton that was not quite as rank and was a little more successful than the other trials, however, it still was not adequately effective. Grades of cotton from the treated areas have shown no improvement over other cotton defoliant.

Most of the growers agreed that coverage of the rank cotton growth in Yuma County seemed to be the biggest reason for the partial success of the chemical. There is also some possibility, they felt, that there was a light reaction caused by shading on the bottom of the plants which prevented defoliation of the lower parts of plants.

Maricopa County

County Agent--Charles Farr

Maricopa County tests using eleven different formulations or treatment levels of Wiltz 65 were conducted at three different locations. Results were variable indicating more work is needed concerning rates and time and method of application. Wiltz 65, a weak organic acid, causes rapid degradation of chlorophyll. This harvest aid chemical may be available for commercial use in 1968.

Pinal County

County Agent--Samuel Stedman

Pinal cotton growers are always on the lookout for a new defoliant. Many problems have developed with old standby defoliant. Plant maturity, high nitrogen level in plants have all caused problems with defoliant.

A new wilt-harvest chemical was introduced into the Rio Grande Valley of Texas. A new defoliant-dessicant is manufactured by Esso Company of New Jersey.

Two demonstrations were set up--one in Eloy, the other in Coolidge. The new material called "Wiltz 65" can be applied to cotton and the cotton can be harvested within hours after application. The Wiltz material causes severe dehydration of the leaves, thus causing a removal of the chlorophyll in the leaf. The new material failed to do the job of defoliating cotton. It failed to compare with standard defoliant we are now using.

One problem was getting sufficient coverage on the leaf, another problem was the tops of the plants would have severe leaf burn and the leaf would dry too rapidly while the lower leaves remained lush and green. This situation

removed the possibility of harvesting the cotton a few hours after application of the material, thus making it no better than many of the defoliant already being used.

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HARVEST SCHEDULING

Marshall M. Machado, Research Associate in Agricultural Engineering

Plot experiments and Extension Service recommendations have suggested the timing of operations for defoliant application and harvest usually as a percent bolls-open. Application of these recommendations indicates the need for a good method of accurately determining crop maturity.

A method of determining the crop maturity rate and a yield prediction method would permit evaluation of alternative harvest schedules. Such an evaluation several weeks prior to actual harvest would permit the cotton grower to make and to act upon selected harvest schedules.

To establish a method of determining crop maturity and to use the crop maturity curve for making yield predictions were objectives of this study. Samples were taken from the buffer rows of Marana Field A-3 on Deltapine 5540 cotton for the 1966 and 1967 crops. A sample consisted of 13'-1" of one 40" row.

Percent bolls-open figures were computed weekly by dividing the number of bolls-open by the total number of bolls in the sample. A cumulative crop maturity curve was developed from this data. The crop maturity curve was approximately linear in the range used for making the yield predictions, 6 to 40 days after 20% bolls-open. Predicted yield was computed by multiplying the expected number of bolls-open on the pick date by the average boll weight.

Statistical interpretation of the data showed that yield predictions made for the period from 6 to 40 days after 20% bolls-open have a potential accuracy of within 10% of the actual yield. Harvest schedules developed at 20% bolls-open allow optimization of return and scheduling the sequence of fields to be harvested.

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A COMPUTER PROGRAM FOR COTTON

H. N. Stapleton, Agricultural Engineer

During the past year we have been able to develop a program for the digital computer which "simulates" the cotton plant. When completely developed,