

CHEMICAL TERMINATION OF COTTON FRUITING

D.L. Kittock and H. Fred Arle

Elimination of late season cotton bolls that do not mature would remove the food supply for pink bollworm at the time they go into diapause for overwintering. We have been using growth regulators for three years to prevent late season boll formation. In 1973 we established six tests to evaluate our four best treatments.

Seed cotton yields, number of immature (green) bolls remaining on the plant at harvest, and defruiting efficiency index are shown for six tests in Table 1. Seed cotton yields are expressed as percent reduction from the check for the four treatments. Negative values indicate greater yield than the check. Green bolls are expressed as percent of the check. Defruiting efficiency index is simply the sum of the percentages for yield reduction and green bolls. This index more accurately measures the effectiveness of a treatment than does yield or green bolls alone.

The tests at Brawley and Yuma were intentionally treated too early for best evaluation of treatment effectiveness. The two tests at Phoenix were treated at about the right time for best evaluation, and the tests at Marana and Safford were treated later than desirable.

There was considerable variation in response among treatments in the six tests. The 2,4-D + CCC mixture had the best (lowest) six-test average defruiting efficiency index followed by 2,4-D + chlorflurenol, 2,4-D alone, and last chlorflurenol alone.

Any of the first three treatments could be considered satisfactory for prevention of late bolls with minimum yield reduction, though 2,4-D alone has a tendency for recovery as is indicated in the Brawley test. Chlorflurenol alone would have scored much higher if it had been applied earlier than the other treatments. This again is shown in the Brawley test. However, the bulk of our evidence suggests that yield loss would be too high with chlorflurenol used alone.

In each of the three years we have tested chemical termination we have had one test with heavy pink bollworm infestation where we could check the population of pink bollworms late in the fall. In each case pink bollworms were reduced nearly as much as green bolls were reduced. If the 95% reduction in the fall carries over into the spring (not adequately tested), then we should get a 30-day to possibly a 60-day delay (also untested) in buildup the following year.

Participation of all growers to prevent reinfestation from untreated fields would be required for chemical termination to be effective.

Table 1.

Preliminary evaluation of six chemical termination tests on cotton in Southwest U.S. in 1973, showing effect of four chemical termination treatments on seed cotton yield, number of green bolls on plants after harvest, and defruiting efficiency index (yield reduction plus green bolls).

| Treatment | Rate, lbs/A | Seed cotton, yield reduction, % of check | | | | | |
|------------------------------------|-------------|--|-------------------------------|-----------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | | Brawley DPL 16 -100 8-22 | Yuma DPL 16 100 8-22 | Phoenix DPL 16 1200 8-27 | Phoenix Pima S-4 1200 8-27 | Marana Pima S-4 2000 8-31 | Safford Pima S-4 2900 8-29 |
| Check (lbs/A) | | 3,700 a | 3,900 a | 3,900 a | 2,700 a | 2,700 a | 2,000 a |
| 2,4-D | 0.033 | 16 b | 28 c | 7 a | -4 a | -8 a | -1 a |
| Chlorflurenol | 1.0 | 0 a | 15 b | 8 a | 12 a | -3 a | -9 a |
| 2,4-D+CCC | 0.025+0.50 | 17 b | 21 bc | 7 a | 1 a | 2 a | -6 a |
| 2,4-D+chlorflurenol | 0.025+0.50 | 14 b | 19 bc | 8 a | -13 a | 2 a | 7 a |
| <u>Green bolls, % of check</u> | | | | | | | |
| Check (No./A) | | 84,000 a | 57,000 a | 12,000 a | 53,000 a | 138,000 a | 204,000 a |
| 2,4-D | | 4 b | 1 b | 3 b | 12 b | 12 b | 42 b |
| Chlorflurenol | | 2 b | 10 b | 30 b | 66 a | 75 a | 49 b |
| 2,4-D+CCC | | 1 b | 0 b | 1 b | 1 b | 8 b | 22 b |
| 2,4-D+chlorflurenol | | 0 b | 0 b | 3 b | 9 b | 12 b | 37 b |
| <u>Defruiting efficiency index</u> | | | | | | | |
| Check | | 100 | 100 | 100 | 100 | 100 | 100 |
| 2,4-D | | 20 | 30 | 10 | 8 | 4 | 41 |
| Chlorflurenol | | 2 | 25 | 38 | 78 | 72 | 40 |
| 2,4-D+CCC | | 18 | 21 | 8 | 2 | 10 | 15 |
| 2,4-D+Chlorflurenol | | 14 | 20 | 11 | -4 | 14 | 44 |