Table 1.

Pink Bollworms in Green Bolls - DPL
August 6-7, 1980 Poston,AZ

| Treatment | No. Fields | Mean % |
|---|---|---|
| Pheromone | 5 | 2 + 2 |
| Insecticide | 6 | 4 + 2 |
| Pheromone | 4 (edge fields) | 16 + 9 |
| Other fields | 5 | 26 + 12 |

Table 2.

Pink Bollworms in Open Bolls - DPL
September 3, 1980 Poston, AZ

| Treatment | No. Fields | Mean % |
|---|---|---|
| Pheromone | 7 | 1 + 2 |
| Insecticide | 4 | 3 + 4 |
| Pheromone | 3 (edge fields) | 14 + 5 |

Table 3.

Pink Bollworms in Open Bolls - Pima
October 1, 1980 Salome/Aguila

| Treatment | Mean % |
|---|---|
| Pheromone | 2 + 1 |
| Pheromone | 2 + 1 |
| Insecticide | 7 + 5 |
| Insecticide | 12 + 4 |
| Insecticide | 14 + 6 |

## Small Computer Model to Predict Cotton Potential Lint and Weekly Losses from Pink Bollworm Infestation

K. E. Fry and T. J. Henneberry, USDA, SEA-AR

### Summary

A microcomputer model was written in language BASIC to estimate the potential inhibition of lint development in a cotton crop at weekly intervals because of pink bollworm (PBW) infestations. Flower counts were used to predict potential lint, which was then reduced because of PBW damage. By the use of this model, the weekly projected lint losses may aid in assessing the net cost of PBW control.

The model started with weekly flower counts which were used to determine the weekly populations of very young bolls. A boll-shed routine removed increasing percentages of bolls as the boll set of the three earlier weeks increased. An upper (60%) and lower (10-30%) limit was placed on the shedding rates. From the remaining green bolls, the potential lint yield was calculated for DPL-61 at 4.2 g seed cotton per boll and 38% lint yield. Thus, 100 bolls per square meter gave about 2.9 bales/A.

In the model, the green bolls were initially infested by PBW on the third week from flowering, which is usually the week of boll sampling in the field. If the cut-boll sampling method was used, the observed percentage infestation or average PBW per boll was adjusted upward to equal the actual PBW per boll after two weeks of incubation. For two additional weeks in the model, the PBW per boll were increased to simulate the effects of continual infestation in the field of the same weekly boll populations. Over the same time period, these bolls exhibited changing susceptibilities to PBW. When early infestations of PBW were observed, the model reduced the numbers of susceptible green bolls and a corresponding number of PBW because of boll rot.

After calculating the potential lint for each week and the final PBW per mature boll for the same week, the lint yield was reduced by 27% for each PBW per boll. The weekly calculations were summed or averaged for the growing season. The model was based on 15 field-data sets of flower counts and PBW infestation samplings which include early and late infestation patterns. A paired t-test showed that the observed and simulated lint production were not significantly different.

## Early Season Habitats of Pink Bollworm

Western Cotton Resarch Laboratory
Entomology Unit
Phoenix, AZ

Hollis M. Flint and John R. Merkle

### Summary

During April and May, 1980, we studied the habitats of pink bollworms in an area of mixed agriculture and desert near Phoenix. Our objectives were to monitor the movement of males between available habitats, light trap females to determine mating status, and measure mating between laboratory female moths and native males in mating stations in cotton and desert habitats. The habitats and approximate areas in hectares were: planted cotton, 215; alfalfa, 43; sugar beets, 19; and lower Sonoran desert, 80+ (surrounded 2 sides of the study area). Cotton was ca. 2 leaf stage at the beginning of study, alfalfa and sugar beets provided full ground cover. The predominant desert plants were creosotebush, bursage, and Palo Verde.

Native males were captured in a network of 17 gossyplure baited Lingren live traps, marked with florescent dyes according to the habitat they were captured in, released at the sites of their capture, and their recapture observed in the network of traps. Totals of 531, 627, 613, and 997 males were marked in desert, sugar beet, alfalfa, and cotton habitats, respectively. Of these, 4.3-8.9% were recaptured in the network of traps: 55-83% of those recaptured were recaptured in the habitat where they were marked. Those recaptured outside their original habitat were usually found in the cotton although movement between all habitats was obtained. The results of this study indicated that males were almost evenly distributed among the available habitats early in the season (definitely not based on where they emerged) and did not begin to concentrate in cotton until the middle of May (1st pin head squares in the older cotton fields). Movement from non-cotton habitats was primarily to cotton in what we visualize as sampling behavior that would result in a build-up of moths in the cotton when favorable conditions are present.

Female moths were captured throughout the study period in 12V-battery operated light traps, 1 in each of the 4 habitats. Females were dissected to determine their mating status. The trapping resulted in the capture of the following numbers of females (% mated): desert 10 (90%), beets 19 (79%), alfalfa 5 (80%), and cotton 4 (100%), ca 3-fold greater numbers of males were taken. No females were taken in light traps in cotton until 5/11, females were taken in the other 3 habitats during the first week of trapping, 4/17-24, and the percentages mated were consistent throughout the study. The greatest numbers of females were taken in the light trap in sugar beets, in fact, 50% of all females captured until 5/11 were taken in the sugar beets. Eighty-seven percent of mated females had mated once.

During the period 5/14-28 we placed 5 replicates of 10 mating stations each in cotton (pin head squares) and desert habitats. These stations (1 gal. ice cream cartons) contained 3-4 day old virgin female moths of the WCRL laboratory strain and cover provided from the habitat at their location (2-3 cotton leaves, sprigs of creosote bush). Females were dissected to determine mating status following their night of exposure.

An average of 50% of females in mating stations in the desert were mated compared to 53% in the cotton. About 70% of the females placed in the stations were recovered and all of the mated females had mated once. By the time of these mating tests the catches of males in gossyplure baited traps in cotton were ca. 6-10 fold greater than in the desert. Nonetheless, females obtained native mates in the desert using creosote bushes as cover.

The results of this study show that pink bollworms are widely distributed among available habitats early in the season, females are mostly mated even in April and early May, and mating probably occurs throughout the available habitats. It is likely that females are already mated before moving into cotton when plant development provides cover, food and fruiting forms.