The pink bollworm overwinters as a larva. Some of the larvae spend the winter in cottonseed while the remainder, 43 per cent or more, spend the winter within a silken cocoon in the soil.

Very few pink bollworm larvae went into diapause, or the overwintering resting stage, before September 15. Therefore, in order to take advantage of an early fall plow-up to suppress spring pink bollworm populations, it would be necessary to plow-up all the cotton by September 15. Such an early plow-up would be impractical because cotton yields would be reduced drastically.

Records show that heavy populations of pink bollworms emerged from bolls during October. This explains the heavy infestations found on late maturing cotton in Graham County. Practically all the late maturing cotton in Graham County was of long staple variety, Pima S-2.

Moisture was found to be a very important factor in reducing winter survival. In years of excessive rainfall during the winter, spring emergence of the pink bollworm from buried bolls was drastically reduced. When the winter rainfall was light, burial of bolls gave little or no suppression of the spring emergence of adults. In those years when burial of bolls gave suppression of spring adult emergence, December 1 burial was much more effective than a delayed (March 1) burial.

Addition of water at 10-day intervals, equivalent to 3 irrigations, to bolls buried in cage tests was found to be very effective in suppressing spring emergence of pink bollworms.

Planting of barley, following cotton, is an excellent method of reducing pink bollworm moth emergence, providing enough water is used to insure a good barley crop.

Low Volume Airplane Application of Insecticides

(George P. Wene)

A pint of technical malathion per acre was applied successfully by aircraft for the control of lygus bugs in 1964 tests. It was equal in effectiveness to the standard recommended dose of 1-quart of emulsifiable malathion applied in 5-gallons of water per acre.

To apply the technical malathion only 5 nozzles, with D-4 orifices, were equally spaced on the boom of a Pawnee airplane. A pressure of 50 pounds was maintained on the spray pump. In applying the spray the plane was flown at 90 miles per hour at a height of 30 feet, with the swath width averaging 70 feet.

Bollworm Studies

(George P. Wene)

Virus Disease A bollworm virus disease was used for the first time in 1964 to control bollworms on a commercial basis. The virus was applied at the per acre rate of 100 diseased worms in 5 gallons of water. The plot was 10 acres in size and was adjacent to an untreated check plot. The virus was applied

6 times at 8-day intervals. The seasonal average populations per 100 plants were as follows: untreated, 18.0; bollworm virus, 13.0; and 5-lbs. toxaphene plus 0.4 lb. methyl parathion 11.8. The bollworm virus was slower in killing bollworms and, as a result, more squares were destroyed. This was reflected in the yield which showed a gain of 0.44 bale per acre in the virus plot and a 0.56 bale per acre increase in the toxaphene-methyl parathion plot. The check plot yielded 1.34 bales per acre and part of this high yield may have been due to the partial control of bollworms obtained by the virus spreading over from the treated plot.

Insecticides A toxaphene-DDT mixture was found to be still the best control for bollworms. Satisfactory control was obtained with spray formulations. An organic phosphate, Shell-9129 was equally as effective when applied at 4-day intervals. However, when applied at an 8-day interval, this insecticide flared-up the bollworm infestations.

Two other insecticides, Chemagro's 44646 and Upjohn's Banol, show promise in controlling bollworms in 1964 and will be investigated further.

Sevin failed to control bollworms.

Light Traps

(George P. Wene)

Three experiments were conducted to evaluate light traps for the control of cotton insects. Each of the fields was surrounded with the number of light traps recommended by the manufacturer. Check fields (untreated) were located within a half mile of the light trap fields. All fields were examined at weekly intervals. The light traps apparently reduced the bollworm populations from 10 to 8 per cent but did not control lygus bugs or stink bugs. Stink bugs took one third of the crop in one of the light trap fields.

Lygus Bug Injury to Presquaring Cotton

(George P. Wene)

A report of recent investigations is published in University of Arizona Experiment Station Technical Bulletin 166: 1-25. December, 1964. The following conclusions are reported from this work:

Lygus bugs can kill cotton seedlings within two or three days after the seedlings emerge from the ground. At this stage of growth, lygus bugs feed on the cotyledons.

After the cotyledons have hardened, lygus bugs feed only on the growing points of the seedling plants. Such feeding results in deformed plants and retards squaring for a period of two to four weeks. Lygus bugs may injure both Deltapine Smooth Leaf and Pima S-2 varieties in the seedling stage.

Lygus bug injury to cotton plants in the seedling stage may be reflected in lower yields during a normal growing season. Conditions favoring the maturity of a large late-season crop of bolls may offset most of this early loss.