

contains a recessive lethal mutation, dark body color. Laboratory tests of this strain showed no significant differences between dark moths and normal moths in developmental times, mating ability, or competitiveness.

Field releases of dark males were made at rates up to 900 per week on a 700 acre cotton farm. Released males were recaptured in pheromone traps up to 3 nights after time of release. Following cessation of release, progeny of the released moths were captured in light traps and as larvae in the field.

These results show that if rearing facilities were available, this dark strain could be used as a suppression measure for cabbage looper populations.

Genetic markers in the pink bollworm--Genetic linkage and interaction tests have been carried out for 7 markers in the pink bollworm. No linkage has been demonstrated for any of the markers but interesting eye color interactions have been found. Strains now in culture are: rust eye, garnet eye, dark eye, spectacle eye, orange eye, white eye, sooty body color, and black body color. Strains are also being maintained in selection for temperature sensitive lethal mutations and non-diapausing mutations.

PHYSIOLOGY

B.J. Cook, R.T. Staten, E. Miller and W.D. Shelton

Chemical attractants of the pink bollworm--An olfactory maze and a wind tunnel bioassay system were set up to determine the effectiveness of various attractant chemicals on both male and female pink bollworm moths. In addition, an air delivery system and various electrophysiological devices were assembled to measure antennal responses to attractant chemicals.

Results--The olfactory maze was used to test the attractive properties of the cotton plant (in various stages of development) to both male and female pink bollworm moths. Results to date indicate that the moth is not attracted to the cotton plant by an odor gradient established by simple diffusion.

However, the male moth showed a sensitivity to a 10 ng source of gossypure in the wind tunnel, and the antennae of the male gave an electrical response when exposed to a 500 ng source of the sex pheromone placed 50 mm away.

INSECT STERILITY

H.M. Flint and B. Wright

Mating competitiveness of labeled irradiated male pink bollworm moths in the laboratory--The results of mating competitiveness of irradiated (20 Krad) and unirradiated males indicated that P³² did not affect the mating frequency of the labeled males. The percentage of untreated females with labeled spermatophores was similar when either unirradiated or irradiated males bore the P³² label, indicating equal competitiveness of both types of males.

Production of F₁ progeny by irradiated pink bollworms--Irradiation of both parents with doses ranging from 10-17.5 Krad resulted in the production of F₁ progeny at all dose levels. Lengthening of the time from egg to adult, sex ratio distortion

in favor of the male, and malformed F₁ adults were observed in the progeny. These results indicate possible F₁ progeny in the field from crosses of parents irradiated with 17.5 Krad although these progeny are sterile.

Mating and dispersal of released pink bollworm males--Moths were labeled with p³² for field studies. Laboratory reared moths did not disperse as far as native moths in one test and were found predominantly within a few hundred feet of the release point in other tests. In tests where individual males were located in the field after release, all males were found in the soil within 6 inches of the plant stalks early in the season before a plant canopy was formed. After a canopy was formed about 50% of the males were located in the soil within 6 in. of the plant stalks, the remainder were in the lower 10 in. of the plant canopy and most of these were located in old blooms in the process of drying out.

Mating by released labeled males in the field was found by autoradiography of native females. However, evaluation of competitiveness of released males was not possible to determine accurately since native moth populations were highly variable. Irradiation (20 Krad) appeared to have little effect on mating of released males in the field.

PATHOLOGY

P.V. Vail, F.D. Steward, D.L. Jay, A.J. Martinez and C.L. Romine

Total increase in titer of alfalfa looper nuclear polyhedrosis virus in a tissue culture cell line--A study was conducted to determine the total increase in titer of the alfalfa looper nuclear polyhedrosis virus in Hink's cabbage looper cell line. In addition, the rate of replication was also studied. After flasks containing cells were inoculated with virus, titer increase was measured at 0, 6, 12, 16, 24, 48, 72, and 96 hours afterward. The contents of the flasks were then fed to neonate cabbage looper larvae for each time period and the dilution causing 20% mortality determined. Six, twelve, and sixteen hours after inoculation no measurable increase in virus titer occurred; 24 hours after inoculation, titer had increased 80 fold over the original inoculum. By 96 hours, virus titer had increased by three million over the original inoculum. These studies showed that virus titer increases rapidly in the cell lines and reaches a peak about 96 hours after inoculation.

Comparative susceptibility of *Heliothis virescens* and *Heliothis zea* to the *Autographa californica* nuclear polyhedrosis virus--Previous tests conducted in cooperation with the Brownsville, Texas, laboratory showed that *H. virescens* was more susceptible to this virus than to the nuclear polyhedrosis virus (NPV) isolated from *H. zea*. Assays at our laboratory confirmed these findings and have also shown that *Heliothis zea* is much less susceptible to the virus compared to *H. virescens*. The lower susceptibility is manifested in both higher LD₅₀ and LT₅₀ values. In addition, the symptoms in *H. zea* are not typical of NPV infections and the number of Polyhedra in cadavers appears to be much lower. Detailed histopathological and cytological studies of the virus in the two hosts has been initiated.

Field tests with *Autographa californica* nuclear polyhedrosis virus for control of *Pectinophora gossypiella*--The *A. californica* NPV, which infects most of the lepidopterous pests of cotton, was tested under field conditions at Parker, Arizona during the summer of 1973. Twelve applications at a rate of 1.0 X 10¹² polyhedra/acre were made between July and September. Samples of bolls did not indicate that the virus gave sufficient control and field collected larvae showed a low incidence of disease. This is the first record of a spray application of a nuclear polyhedrosis