Biological and Histological Studies in the Progeny of Gamma Irradiated Cotton Leafworm, (Spodoptera)

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The present work is a biological and histological study to observe the effects of J substerilizing doses of gamma radiation (10, 15 and 20 krad) on the cotton leaf worm, Spodoptera littoralis (Boi.Btl), to induce inherited sterility. Special attention was given to the effects of reproductive b101oand inherited sterility throughout three generations and the histological changes in the gonads of the adults. The results obtained can be summarized as follows:

1. Effect of GSD8 Irradiation on Reproduction of PI: The greatest reduction in the number of eggs laid per female occurred in the second generation among the three tested doses applied to PI males. Also, the reduction in fecundity increased as the dose applied to PI males was increased.

2. There was an adverse relationship between the dose applied to PI males and the percent egg hatch among the parents and their following three generations. Also, the greatest reduction in egg hatch occurred in the second and third generations. However, the generation demonstrated a high degree of recovery from the reduction treatment.

3. The average number of spermatopores per male was not affected at any dose level tested among PI males.

4. The inherited detrimental effects had their greatest expression in PI and F2 generations, the higher the dose applied to PI males, the lower was the number of larvae survived to adulthood. However, generation 11 demonstrated a high degree of recovery from the reduction treatment.

5. The mean developmental time for both males and females of the generations was positively correlated with the dose given to PI males.

6. The average PIJ pal weight for both males and females of PI and F2 generations was significantly reduced at any dose level tested compared with the untreated control.

7. The sex ratio among the progeny of irradiated males seemed about normal. It was nearly 1:1, which was normally obtained in the control treatment.

8. Effect of Substerilizing Doses on the Kinetics of Parent Males and their Fl, F2, and F3 Progeny: Males irradiated by low doses of 10, 15, and 20 krad were generally competitive. However, males irradiated by 10 krad were not as competitive as untreated males.

9. Males irradiated by 15 and 20 krad were less competitive than untreated males.

10. The lengths of the testes of the first and second generations were significantly affected by doses of 15 and 20 krad. The third generation was not greatly affected.

11. Damage in the testis and ovaries was the highest among PI males and was DiiJ:1m1zed in the two other generations.