

ABSTRACT

Available literature on the biology, migratory and host selection behaviour, and on various field trials on the chemical control of Hypothenemus hampei (Ferr.) has been extensively and critically reviewed.

An island-wide survey in Jamaica in 1982 revealed that during the previous three years, the pest had dispersed all over Jamaica, including the Blue Mountain range, up to 1 600 m high. Levels of infestation in 390 farms surveyed, ranged from 0 to 100%. Mean infestation was 9.45% before spraying with Thiodan EC 35 (endosulfan) began. Eight weeks after the last of the 3-spray cycle, the mean infestation level was 9.56%. No insect parasite or predator of H. hampei was found, but the fungus, Beauveria bassiana inflicted 6-40% mortality on the adult borer.

The spatial distribution of attacked berries and all life stages obeyed Taylor's Power Law. Migrating females of the residual field populations showed a tendency to clumping ($b = 1.52$) when attacking the new crop of berries in the field in April. Extreme clumping ($b = 2.59$) occurred in June but by August, the population was almost randomly distributed ($b = 1.08$). In the early crop, trees in the sun were more heavily attacked than shaded ones and those at the perimeter of the field, more than those towards the centre. In the mature crop however, these differences were insignificant.

Within the trees, those cardinal aspects in which branches of adjacent trees abutted had significantly lower levels of berry perforation and borer population. Lowest levels of berry perforation and borer population occurred in the bottom third of the tree crown while the highest levels were found in the upper crown levels. The pattern of within-tree distribution was significantly altered by crop phenology. Berry clusters on the outer sections of limbs had highest levels of infestation but there was no correlation between cluster size and incidence of perforation. Migrant females showed a preference for attacking green berries even when ripe ones predominated.

Laboratory bioassays of Actellic, aldicarb, aldrin, azodrin, Basudin, Belmark, Bidrin, Bimarit, Carbicron, chlordane, Chlorfenvinphos, chlorpyrifos, Ciodrin, Decis, dieldrin, dimethoate, Dimilin, Dursban, fenitrothion, Folimat, gardona, kelthane, lindane, Malathion, methomyl, methoxychlor, nexagan, nexion, Perfekthion, Phosdrin, sevin, supona, Tiovel, Thiodan EC3 and Thiodan EC 35 on the egg, larval and adult borers in the pulp and endosperm of green and the endosperm of ripe and dry berries were conducted.

With the exception of Thiodan EC 35, the most toxic insecticide, the general order of toxicity of the different groups of insecticides after 26 hours was: organophosphates > synthetic pyrethroids > chlorinated hydrocarbons > carbamates. However, after 3 or 7 days, the order changed to chlorinated

hydrocarbons > organophosphates > pyrethroids > carbamates. Significant differences were noted in the toxicity of various formulations of the insecticides. Significant differences also existed in the toxicity of the insecticides to adult borers in the pulp and endosperm of green, ripe and dry berries. The relative susceptibility of the various stages was larva > adult > egg in the green berries and egg > larva > adult in the ripe berries. All the formulations showed an increased toxicity at 7 or 28 days after treatment, except for the synthetic pyrethroids which experienced a reduction in toxicity in the same period.

A possible strategy for effective management of the pest is discussed.