

## ABSTRACT

Studies were conducted on the field biology and economic importance of the *H. hampei* at two coffee plantations in the Lowlands (elevation 530 to 605m) and two in the Blue Mountains (Mtns.) [1450m] using *C. arabica* vars *typica*; *caturra*; *geisha*. Changes in the pest biology were influenced by location, variety and year. Data on the spatial distribution of *H. hampei* confirm that populations were highly aggregated.

For all locations, there was significant variation in the levels of perforation and infestation in fruit of different ages, with perforation of mature fruit up to five times higher than in green. The rate of perforation was twice as fast in the Lowlands as in the Blue Mtns. and the order of varietal susceptibility: *typica*  $\geq$  *caturra* > *geisha*. Abandonment of perforated fruit was highest in abscised fruit (Lowland = 56% to 73%; Blue Mtns. = 46% to 53%).

Population density in infested berries was in the order of Aenon Town > Mountain Hill in the Lowland, Silver Oaks > Pretty Chilly in the Blue Mtns. and in drying > ripe > green fruit. Mortality of embryonic and immature stages was never > 2%, whereas significant seasonal and location differences were recorded in adult mortality.

Loss by abscission of unperforated fruit was lower in the Blue Mtns. than in the Lowland. In both areas, loss of perforated fruit was  $\leq$  9%. Total loss due to *H. hampei* in untreated plots varied from 18% to 44% at Aenon Town, 1% to 26% at Mountain Hill, 42% to 65% at Silver Oaks and 4% to 42% at Pretty Chilly.

A high positive correlation was found between fruit perforation and bean damage in harvested berries. Beans in the light fraction were more severely damaged than those in the normal fraction and total losses due to *H. hampei* was estimated at approximately US\$1.4m in 1980 and US\$1m in 1981.

All rates of endosulfan used (200, 350, 500, 650 g.a.i/ha) caused from 68% to 88% adult mortality. The initial deposit on berries in top or mid sections of trees varied significantly with different application equipment and operators. The incorporation in the thiodan mixture of 2% or 3% mineral oil increased the amount of initial deposit retained and pest mortality.

Based upon these data, models were developed to explain the relationships between pest biology, infestation and levels of economic loss as well as the effect of application efficiency and crop agronomy upon the quantum of initial pesticide deposit and ultimately the level of control. Partial budget analyses were used to determine Action Thresholds for all study sites after establishing that inflicted losses at Aenon Town and Blue Mountain would always be sufficiently severe to justify chemical control.