

IMPACT OF ECOLOGY AND HOST PLANT SHIFTS OF *ELDANA SACCHARINA* (LEPIDOPTERA: PYRALIDAE) ON ITS BIOLOGICAL CONTROL IN GRAMINACEOUS CROPS

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Biological control of *Eldana saccharina* Walker, although considered one of the better control options in sugarcane and other graminaceous crops in Africa, has been difficult to implement. In addition to the cryptic nature of *E. saccharina* in these crops, which protects it from a number of more conventional control measures, such as pesticide application, there are a number of other factors complicating establishment of biological control agents for *E. saccharina*:

- It is indigenous to Africa, where it occurs in numerous wetland sedges and large grasses. Classical biological control strategies can therefore not be implemented.
- Although described from sugarcane in Sierra Leone over 100 years ago, *E. saccharina* is regarded as a recent invader of sugarcane, especially in southern Africa. Here it first reached pest status for a period in 1939, and only since 1970 has been of major concern to the South African sugar industry. It is thus unlikely that indigenous natural enemies have had time to colonise the 'new' habitat.
- Previous workers have found very few natural enemies, particularly parasitoids, in graminaceous crops. The impression has thus been created that *E. saccharina* has very few parasitoids. However, if successful natural enemies were present in the crops being investigated, this borer would not be a pest. In addition, the only work done to investigate the ecology and natural enemy complex of *E. saccharina* in its indigenous host plants has been completed in the past few years by the Entomology Department of the Experiment

Station. These studies have already provided an impressive list of parasitoids attacking *E. saccharina*, and also insight into the types of parasitoids suitable for its control in crop plants.

This paper postulates that *E. saccharina* made the transition from its indigenous hosts to crop hosts, because of:

- encroachment of the crop into the indigenous host plant habitat of the insect
- the crop belonging to one of the indigenous host plant families (Graminae) normally attacked by the insect
- the crop providing the necessary oviposition conditions to protect the insect eggs
- the crop being marginally more nutritious than indigenous grass hosts, thus providing better growing conditions for insect larvae.

Also suggested is that the parasitoids of *E. saccharina* found in the indigenous hosts have more difficulty in making the transition because of:

- decreased crop temporal heterogeneity
- decreased within-crop heterogeneity
- different host locations in the different plants
- increased host boring areas in the crop host
- specialised parasitoid foraging ability and oviposition behaviour.

Keywords: *Eldana saccharina*, biological control