SURVEYING *ELDANA SACCHARINA* (LEPIDOPTERA: PYRALIDAE) IN A SMALL SCALE GROWER SECTOR OF THE SOUTH AFRICAN SUGAR INDUSTRY

M J WAY[1], F R GOEBEL[2] and W A GILLESPIE[1]

[1]*South African Sugar Association Experiment Station and* [2]*Centre de Cooperation International en Recherché Agronomique pour le Developpement, P/Bag X02, Mount Edgecombe, 4300, South Africa*

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In 2002, an Integrated Pest Management (IPM) project between the South African Sugar Experiment Station (SASEX) and Centre de Cooperation International en Recherché Agronomique pour le Developpement (CIRAD) was initiated in one of the small scale sectors of the South African sugar industry. The aims are to study the current pest status of stem borers in these communities in relation to farming practices, and to collect information on any relevant environmental, socio-economic and agronomic conditions. During May 2002, preliminary surveys were completed in 55 fields at Sezela (30.22S 30.39E), in 12-month old sugarcane varieties NCo376 and N12 on small scale farms at Mission Section (MS) and 35 in comparable fields in the commercial sector (CS), which is in close proximity to Mission Section.

Despite generally low borer populations, the numbers of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) larvae were significantly lower at MS than at CS. An average of 0.2 larvae/100 stalks were recovered at MS, compared with 3.2 larvae/100 stalks at CS (Table 1). Larvae were less widespread in the small scale area, where 20.7% of the fields contained individuals, compared with 74.3% of the fields surveyed in the commercial sector nearby. All but one of the lowest infestations were recorded at MS, and *vice versa*. There were also significantly lower levels of damage at MS than at CS ($t = -4.89$, $P<0.0001$). Only 7.1% of the stalks at MS were damaged, whereas 14.9% stalks at CS were damaged. The intensity of damage in the stalk, assessed as % internodes bored, followed the same trend. In this study, % internodes bored and % stalk length red (results not shown) were strongly correlated ($r=0.89$). These differences in infestations between small scale and commercial farms are consistent with past perceptions (Atkinson and Carnegie, 1989).

Atkinson and Nuss (1989) reported on the association between lower *E. saccharina* populations and lower nitrogen levels. Similar associations were reported from the Americas for the stalk borer *Diatraea saccharalis* (R.), by Lopez *et al.* (1983). In 2002, on average, significantly less nitrogen was applied at MS (83.3 kg N/ha) compared with the amount used in the CS (119 kg N/ha) ($F=10.36$; $P=0.0017$). Recommendations by Eweg *et al*. (2003) are that small scale cane growers should increase fertiliser applications to boost their yields. Given the association between nitrogen and *E. saccharina*, emphasis should be placed on taking soil samples to help maintain the favourable pest situation.

Advantages of high habitat diversity include increased predator activity and usually concomitant pest mortality (Draper and Conlong, 2000).

From digitised maps, it was estimated that 40-50% of the land area at MS is planted to sugarcane, with the remainder supporting a wide range of vegetation. Further fragmentation exists in the size of the cane fields at MS (Table 1), which are significantly smaller than those of the CS ($t = –9,54$; $P<0.0001$).

Table 1. Comparison of the Mission Section and the Commercial Sector of sugarcane growers in the Sezela region of the South African sugar industry.

Parameter	Mission Section		Commercial Sector	
	Average	Standard deviation	Average	Standard deviation
Larvae in 100 stalks	0.2	0.51	3.2	5.39
Percentage stalks damaged	7.1	5.53	14.9	9.86
Percentage internodes bored	0.7	0.7	2.2	1.8
Field size (ha)	1.6	1.2	10.5	7.0
Number of ratoons	6.1	3.2	7.5	2.0
Nitrogen applied (kg/ha)	83.3	60.18	119.0	35.62

Further factors that influence *E. saccharina* to be considered in the IPM studies are the role of soil types, which may affect crop stress, the extent of carry-over, and the number of ratoons (Paxton, 1982). At MS, a range of both favourable and less favourable soil types were identified. There are on average 7.5 ratoons per crop at MS, compared with 6.1 ratoons in the area of the CS that was covered in these preliminary surveys.

This study showed that local Extension is faced with the challenge of transferring the knowledge and technology gained from these types of surveys to the growers (Pike *et al.,* 2000), including pest management strategies. This issue is currently of particular relevance in the small scale regions because of the rapidly changing agricultural and socio-economic conditions (Eweg *et al*., 2003). Roads are being upgraded, housing developments are being established, electricity is being installed, and levels of knowledge concerning sugarcane husbandry are improving. In the long term, it is considered advisable to monitor the effect of these changes on pest populations. It is encouraging that these growers are very supportive of any work conducted in their areas, including learning more about potential insect pests of the sugarcane crop.

There are many combinations of factors that interact in sugarcane fields and influence pest populations. It is hoped that information collected from studies such as this, which cover a range of topics, will contribute to an increase in yields and thereby ensure that growers continue to farm sugarcane (Eweg *et al*., 2003). In addition, any knowledge gained from studying insect pests in small scale areas may also assist with pest management strategies in the commercial sectors.

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