MANAGEMENT OF SUGARCANE WHITE FLY (ALEUROLOBUS BARODENSIS MASK.) IN NORTH COASTAL DISTRICTS OF ANDHRA PRADESH, INDIA

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ABSTRACT:
The sugarcane whitefly, Aleurolobus barodensis Mask in recent years has assumed serious proportions on sugarcane not only in Andhra Pradesh but also in many parts of the sugarcane growing areas in India. It is one of the serious sucking pests on sugarcane ratoon crop under water-logged as well as drought conditions and also in alkaline soils under low manuring and where the ratoons are left uncared for. The nymphs of whiteflies suck the sap from the undersurface of the leaves and the severe whitefly infestation may result in reduction in cane yield as well as sugar recovery. As the information on new insecticides is meager, the present investigation on the efficacy certain management practices including insecticides against whitefly in sugarcane was carried out from 2009 to 2011 at Regional Agricultural Research Station, Anakapalle Andhra Pradesh, India. The results revealed that the removal of infested leaves + spraying of imidacloprid @ 0.3ml/lt along with 2% urea significantly reduced the whitefly population (6 nymphs & puparia/10sq.mt) compared to untreated control (177 nymphs & puparia/10sq mt) by recording highest per cent mortality of whitefly over control (96.60 %) and also recorded highest per cent sucrose (19.60%) and cane yield (84.47t/ha) as compared to untreated control (17.1% ; 72.15t/ha). The next best treatments were removal infested leaves + neem based pesticide, Azadirachtin @ 4 g a.i/ha (0.0004%) at 5 ml/lt (81.83%) and removal infested leaves + dimethoate @2ml/lt (80.86%) which were on par with each other.

KEY WORDS: Sugarcane, whitefly, Aleurolobus barodensis Mask, imidacloprid, neem ased pesticide, detrashing and management.

Introduction
The sugarcane whitefly, Aleurolobus barodensis Mask in recent years has assumed serious proportions on sugarcane not only in Andhra Pradesh but also in Bihar, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Tamil Nadu and Uttar Pradesh. The nymphs of whiteflies suck the sap from the undersurface of the leaves. As a result, the leaves turn yellow and pinkish in severe cases of infestation and gradually dry up (Gupta and Avasthy,1954). Heavily infested leaves are covered by the sooty mould, (Capnodium sp.,) which adversely affects photosynthesis. High infestation causes stunted crop growth and reduces juice quality. There is a loss of 30-40 per cent in sucrose in whitefly affected cane (Singh et al., 1956). Severe whitefly infestation may result in reduction in cane yield up to 24 % and loss in sugar up to 2.9 units (Khanna,1948). The plant and ratoon crops are similarly affected by this pest under nitrogen deficiency condition (Mathur, 1941). Waterlogging coupled with low levels of nitrogen causes severe outbreak of this
pest (Gupta, 1953). Leaching of nitrogen due to heavy rains also results in heavy pest build-up (Girdhari lal, 1958). Earlier, before the advent of organic insecticides clipping of leaves infested with whitefly was considered as an effective measure for suppressing the population of the pest. In case of severe infestation however, this practice becomes uneconomical and therefore cannot be advocated. Several insecticidal recommendations have been advocated in the past by various workers for the control of this pest at different places (Siddiqi and Saxena, 1960; Sandhu and Singh, 1964; Ananthanarayana et al., 1984).

Material and Method
The experiment was conducted for three consecutive years from 2008-2010 in simple Randomised Block Design with seven treatments including untreated control replicated three times. The crop was raised according to the recommended agronomic practices by using 93 A 145. The plot size was 6m X 0.8m X 6 rows. Planting was done with three budded setts. For the control of whitefly all the treatments were imposed immediately after noticing the pest for two times at 15 days interval. The data on whitefly populations were subjected to statistical analysis. The per cent reduction of whitefly populations over control as obtained from Abbott’s formula

\[
\text{Per cent reduction} = \left[1 - \frac{(\text{Pretreatment population in treatment})}{(\text{Post treatment population in check})} \right] \times 100
\]

Preparation of cages
Cages were prepared from an empty tin of oil of 15 litre capacity (33 X 22.5 X 33 cm). On both sides stainless steel wire net of 40 mesh size was fitted. In these cages, heavily infested leaves bearing healthy and bigger size puparia (parasitized and unparasitised) was kept by making small pieces of leaves. Sufficient numbers of pieces of leaves were kept in the cage for proper aeration. The pieces of leaves were replaced every 15 days. The emerging parasite, if any, were escaped from mesh wire net, while whitefly adults due to bigger size were died in the cage itself. For pretreatment count of whitefly, four spots in each treatment were randomly selected and marked. Three rows each of three metre length were taken per spot and the observation on incidence of whitefly (nymph and puparia) was recorded before treatment and 7 days after treatments. Total number of nymphs and puparia were recorded per 5 X 2 cm (10 sq.cm) from 20 leaves from proximal, middle and distal regions of the leaves. The average per sq. cm was calculated. Data on cane yield were also recorded at harvest and all the data were subjected to statistical analysis.

Results and Discussion
Data presented in the table 1 indicated that all the treatments significantly reduced the whitefly population over control. The average number of whitefly nymphs & puparia per 10 sq.cm per plant were varied from 6 in 177 in different treatments. The lowest number of whitefly population with highest per cent mortality of whitefly (96.60 %) was recorded in T3 where removal of infested leaves followed by spraying of imidacloropid at 0.005% along with 2% urea
was done compared to all other treatments. Earlier workers reported that clipping and disposing off affected leaves help preventing its spread. (Singh et al., 1956, Anonymous, 1965 and Ananthanarayana et al., 1984). Adequate manuring of plant and ratoon crops with not less than 100kg N/ha is recommended by Gupta and Avasthy (1954). The next best treatment was T4 which recorded 34 nymphs per 10 sq.cm/plant 80.79 per cent mortality in which removal of infested leaves followed by spraying of neem based pesticide Azadirachtin @ 4ga.i/ha (0.0004%) at 5ml/lt was done and it was on par with T5 in which removal of infested leaves followed by spraying of dimethoate @2ml/lt was done (80.22%). The plot treated with imidacloprid17.8SL @ 0.30 ml/lt recorded significantly highest sucrose (19.60%) and cane yield of 84.47t/ha which was closely followed by that of Azadirachtin @ 4ga.i/ha (0.0004%) at 5ml/lt (19.00% and 81.83 t/ha) and dimethoate 35EC@ 2ml /lt (18.80%; 80.86 t/ha). The results are in agreement with the findings of Narasimha Rao et al, 2011 who reported that removal of infested leaves followed by spraying of imidacloprid 17.8SL @0.25ml/lt reduced the incidence of whitefly to an extent of 93.75% and registered significantly highest sucrose (17.68%) and cane yield (93.75t/ha).

Table 1  Impact of different treatments on whitefly, Aleurolobus barodensis Mask. in sugar cane

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Treatment</th>
<th>Average number of nymphs &amp; puparia per 10 sq.cm (No.)</th>
<th>Per cent mortality of whitefly over control</th>
<th>Juice Sucrose (%)</th>
<th>Cane yield (t/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Destruction of puparia by removing infested leaves</td>
<td>123, 74</td>
<td>59.19</td>
<td>17.60</td>
<td>77.50</td>
</tr>
<tr>
<td>2</td>
<td>Removal of infested leaves + installation of cages @ 15 /ha</td>
<td>117, 39</td>
<td>77.97</td>
<td>18.20</td>
<td>80.38</td>
</tr>
<tr>
<td>3</td>
<td>Removal of infested leaves + application of imidacloprid 17.8%SL @ 0.3 ml /lt along with 2% urea</td>
<td>120, 6</td>
<td>96.61</td>
<td>19.60</td>
<td>84.47</td>
</tr>
<tr>
<td>4</td>
<td>Removal of infested leaves + application of neem based pesticide (Azadirachtin 4 g a.i./ha i.e., 0.0004%) @ 5ml/lt</td>
<td>131, 34</td>
<td>80.79</td>
<td>19.00</td>
<td>81.83</td>
</tr>
<tr>
<td>5</td>
<td>Removal of infested leaves + spraying of dimethoate @ 2 ml/lt</td>
<td>126, 35</td>
<td>80.22</td>
<td>18.80</td>
<td>80.86</td>
</tr>
<tr>
<td>6</td>
<td>Removal of infested leaves + spraying of malathion 50 EC at 2 ml/lt.</td>
<td>119, 47</td>
<td>73.45</td>
<td>18.80</td>
<td>80.25</td>
</tr>
<tr>
<td>7</td>
<td>Untreated control</td>
<td>122, 177</td>
<td>--</td>
<td>17.10</td>
<td>72.15</td>
</tr>
</tbody>
</table>

C.D (p=0.05) NS 12.50 1.57 2.85
C.V (%) 13.09 4.30 15.5
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