

A Brief Overview of Juicy Suckers of Sugarcane

Pradeep Raja Godugu¹, Archana Anokhe² and Priyanshu Pawar³

¹Division of Plant Pathology, ICAR- Indian Agricultural Research Institute, Jharkhand

²Scientist, Division of Entomology, ICAR- Indian Agricultural Research Institute, New Delhi

³Ph.D Scholar, Jawahar Lal Nehru Krishi Vishwavidyalaya Jabalpur, Madhya Pradesh

SUMMARY

Sugarcane is a long-duration crop of 10 to 12 months, and therefore it is liable to be attacked by a number of pests. According to an estimate, insect pests decrease sugarcane production by 20-25%. Sugarcane is infected by more than 300 insects, of which nearly one dozen cause heavy losses to the quality and quantity of the crop. Sugarcane in India is cultivated broadly with two distinct Agro-climatic regions known as tropical and subtropical regions. The scenario of insect pests varies in sugarcane's subtropical and tropical belts. Top shoot borer and stalk borer are found chiefly in subtropical areas, whereas internode borer and early shoot borer are prevalent in tropical regions. But the sucking pests are commonplace in both the tropical and subtropical areas. Many problems damage the crop throughout the season, from germination to the harvest. The losses in sugarcane from insect attacks affect yield and sugar recovery.

INTRODUCTION

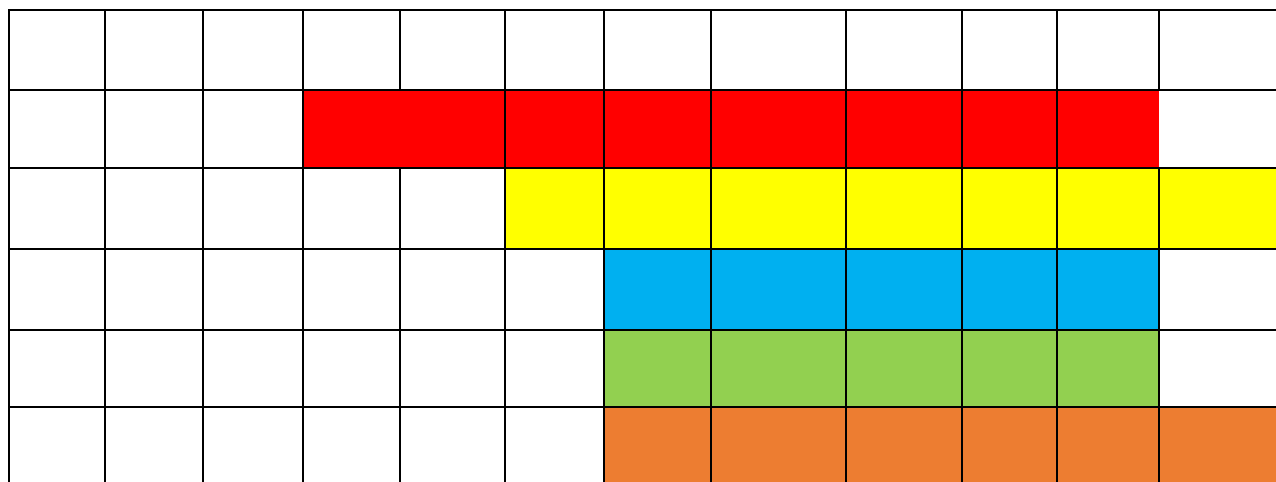
Sugarcane is a species of (often hybrid) tall, perennial grass (in the genus *Saccharum*, tribe Andropogoneae) used for sugar production. The plants are 2–6 m (6–20 ft) tall with stout, jointed, fibrous stalks that are rich in sucrose, which accumulates in the stalk internodes. Sugarcane belongs to the grass family, Poaceae, an economically important flowering family that includes maize, wheat, rice, sorghum, and many forage crops. It is native to the warm temperate and tropical regions of India, Southeast Asia, and New Guinea. Grown in tropical and subtropical regions, sugarcane is the world's largest crop by production quantity, totaling 1.9 billion tonnes in 2020, with Brazil accounting for 40% of the world's total. About 70% of the sugar produced comes from *Saccharum officinarum* and its hybrids. Sugarcane (a hybrids of saccharine) is a strategically important crop that has a profound economic impact on social and governmental issues in many countries worldwide (James 2004). As an important commercial crop of Indian agriculture, sugarcane provides raw material to the sugar industry, the second largest agro-based industry after textiles. Sugarcane also supports two crucial rural and cottage industries: jaggery and kandasari (unrefined raw white sugar). Sugarcane area, production, and productivity have steadily increased over the decades alongside the growth of the sugar industry. But recently, in India for a few years, the production has declined i.e., in 2018-19, the production is 400.15 million tonnes, in 2019-20 the production is 375 million tonnes in 2020- 21 the production is 397.657 million tonnes in 2021- 22 the production is 340 million tonnes. Due to the insect pests and diseases considerable losses occurred in sugarcane crops. The hostile climate characterized by seasonal extremities in the subtropical regions supports average crop growth but high insect pest abundance. In contrast, the moderate climate in tropical regions favors good crop growth but low pests level. Insect pests attack sugarcane from planting to harvest mainly the sucking pests.

Crop calendar of Sugarcane: -

In India, the planting season of sugarcane in subtropical regions is September to October (Autumn) and February to March (spring) whereas in the tropical regions, it is July to August (Adsali) and January to February (Eksali). Adsali planting is mainly followed in the states like Maharashtra, Karnataka, and Andhra Pradesh. Eksali planting is mainly followed in the states like Punjab, Haryana, U.P, Bihar, etc.

Pest profile of Sugarcane-Sucking Pests: -

The sucking pests normally attack the sugarcane crop throughout the crop stages i.e. from germination to the harvesting stage. The peak infestation stage of the leaf hopper varies from April to November i.e. from grand growth to the ripening stage. The infestation of scale insects is seen from June to December. The infestation of white flies is seen from July to November mostly at the ripening stage mostly. The infestation of woolly aphids is seen from July to November. The infestation of the mealybug is seen from July to December. All these sucking pests suck the sap from grand growth and peak sucking of the sap is seen in the ripening stage.



Nutritional Status of Sugarcane:

The sap extracted from sugarcane plant per 100ml

Calories	242
Protein	0.16gm
Total fat	0.40gm
Total fibre	0.56gm
Free sugar	12.85gm
Potassium	150mg
Sodium	1.16mg
Magnesium	13.03mg

Health Benefits of Sugarcane Juice

- Helps in digestion
- Cures acne
- Keeps the kidneys healthy
- Keeps nails and hair stronger
- Protects the liver
- Prevents the cardiac problems
- Heals the wounds
- Improves bone and muscle health
- Eliminates the toxins
- Helps in weight loss

Source: Data based on NIN (National Institute of Nutrition)-Indian Food Composition (2017)

Sugarcane pests of economic importance: -

The sugarcane crop (*Saccharum officinarum*) is attacked by a wide range of insect pests all through its plant stages (Williams, 1931; Box, 1953; Williams *et al.*, 1969). A catalog of all recorded insects associated with the sugarcane crop lists over 1500 species worldwide (Box, 1953; Long and Hensley, 1972). Though the majority of these are minor pests, a few major pests exist and cause significant damage to all parts of the crop (i.e. root, stalks, and foliage) (Williams *et al.* 1969; Hall, 1988).

Sucking Pests of Sugarcane:

1)Sugarcane leaf Hopper: *Pyrilla perpusilla* Walker (Lophopidae, Hemiptera)

Symptoms: Both nymphs and adults suck the cell sap from the lower side of sugarcane leaves. Due to continuous desapping the top leaves dry up and lateral buds germinate. The hoppers exude a sweet sticky fluid known as honeydew which promotes the growth of fungus and as a result, the leaves are completely covered by sooty mould. The losses in the cane yield due to pyrilla have been estimated to be around 30% with about a 1.6%unit loss in sugar.

2) Scale insect: *Melanaspis glomerata* Green (Diaspididae, Hemiptera)

Symptoms: The leaves of infested cane show signs of tip drying and unhealthy pale green color and severe infestation causes yellowing. The intense amount of desapping leads to the non-opening of leaves, which also turns yellow and finally dries up. Infested crops lose their vigor, cane shrivels, growth is stunted and internodal length is reduced drastically. Finally, the cane dries up. Such canes when split open appears brownish red..

3) Whitefly: *Aleurolobus barodensis* Mask (Aleyrodidae, Hemiptera)***Neomaskellia bergii* Sign (Aleyrodidae, Hemiptera)**

Symptoms: The sap drainage by nymphs results in the leaf gradually turning yellow and pinkish in color and ultimately the leaf dries up. The nymph excretes a large quantity of honeydew which accumulate on the affected leaves and the leaves appear black due to the development of sooty mould interfering with photosynthesis. The infestation reduces the cane growth and reduces the sugar content.

4) Woolly aphid: *Ceratovacuna lanigera* Zehnter (Aphididae, Hemiptera)

Symptoms: Both nymphs and adults are found on the lower surface of sugarcane leaves and suck the cell sap and excrete honeydew which is dropped on the upper surface of the lower leaves. Honeydew encourages the growth of the fungus *Capnodium sps* which results in a black coating called sooty mould on the upper surface of leaves that affects photosynthesis

5) Mealy bug: *Saccharicoccus sacchari* Green (Pseudococcidae, Hemiptera)

Symptoms: Both the nymphs and adults suck the sap below the leaf sheath on the nodes and the cane is stunted. Sooty mould develops on the honeydew giving a blackish appearance on sugarcane which is attacked by the Black ants. The attacked crop looks pale and sick because of the leaves and this can be spotted by seeing from a distance. Severe infestation causes drying up of the leaves.

IPM for sucking pests:**Cultural methods:**

- Collecting and destroying egg masses
- Selection of tolerant varieties
- Avoid excess use of nitrogenous fertilizers
- Destruction of the trash after harvest for the control of white fry and leaf hopper
- Avoid ratooning in low-lying areas for the control of whitefly
- Earthing up to destroy the infested material for the control of woolly aphid
- Planting of varieties having a close leaf sheath for the control of scales and mealy bug
- Stripping for the control of scales and Mealybug
- Wider row spacing for the control of woolly aphid
- Resistant varieties like CO 439, CO 443, CO 453, CO692, and CO7706 for the control of scale insect
- Resistant varieties like CO 439, CO 443, CO720, and CO7704 for the control of mealybug

Mechanical control:

Setting up light traps for the control of leaf Hopper and white flies.

Chemical control:

- Spray any one of the following on the 150th and 210th day (1000 l spray fluid)
- Mix any of the following granular insecticides with sand to make up A total quantity of 50 kg and apply in the leaf whorls on the 20th day of sowing
- Phorate 10% CG10 kg/ha
- Carbaryl 4% G 20 kg/ha.
- Carbaryl 50 WP 1 kg/ha on the 20th day of sowing (500 l of spray Fluid/ha).
- Dimethoate 30% EC 660 ml/ha
- Diazinon 0.04%

- Dimethoate (or) 0.02%,
- Phosphomidon @ 250 ml in 450-500 litres water/ha

CONCLUSION

The five hemipteran species reported to infest sugarcane are considered the greatest threats to the crop's production, following lepidopteran stem borers and soil-dwelling coleopterons due to their potential for sporadic outbreaks and isolated impacts. The perennial sugarcane habitat promotes natural biological control and provides a conducive environment for applied biological control. The first strategy in the biological control of sugarcane pests should be the sustenance of the natural birth control component by avoiding system disruption. Sporadic pest outbreaks that occur in the crop, apparently due to localized disturbances whose causes are often difficult to decipher, are sometimes associated with a decline in the activity of the major natural enemy.

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