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A STUDY OF VARIOUS PESTS IN SUGARCANE CROP OF INDIA

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ABSTRACT

The History gives some evidence of Indian Agriculture from Vedic Times. Today India is the second agriculture based country in the world. It is the first largest exporting country of agricultural outputs.

According to the ANNUAL REPORT 2016-17 by Ministry of Agriculture & Farmers Welfare, Government of India, 54.6% of the population is engaged in agriculture and allied activities and it contributes 17% to the country's Gross Value Added. Insect and pest problems in agriculture are a considerable factor in the century due to ecosystem and technological changes. In monetary term, the Indian agriculture currently suffers almost an annual loss of about Rs 8,.6 million due to insect pests.

Sugarcane is one of the major crops cultivated in both the tropical and subtropical region of the country. There are various pests associated with sugarcane. In this paper the researcher has covered a brief of various Pests their effects and management methods.

KEYWORDS: Sugarcane Production Countries, Sugarcane Production Indian state wise, Major Pests, Impact of Pests on Production.

I. INTRODUCTION:

Sugarcane, or sugar cane, is one of the several species of tall perennial true grasses of the genus Saccharum, tribe Andropogoneae, native to the warm temperate to tropical regions of South Asia and Melanesia and used for sugar production.

Sucrose, extracted and purified in specialized mill factories, is used as raw material in human food industries or is fermented to produce ethanol. Ethanol is produced on a large scale by the Brazilian and Indian sugarcane industry. Sugarcane is the world's largest crop by production quantity [W1].

Sugarcane supports one of the largest agro-processing industries of India and more than 6 million farmers are engaged in its cultivation. Besides, about half a million skilled and semi-skilled workers, mostly from rural areas are also engaged in the sugar industry. By 2030 AD, India will require nearly 33 million tonnes of white sugar for domestic consumption alone.

A. Top ten sugarcane production countries:

Table 1: Top ten Sugarcane Producing Countries (2015).

Country	Thousand metric tons, TMT
Brazil	739267
India	**341200**
China	125536
Thailand	100096
Pakistan	63750
Mexico	61182
Colombia	34876
Indonesia	33700
Philippines	31874
United States	27906
World Total	1877105

Source: Food and Agricultural Organization of United Nations: Economic and Social Department: The Statistical Division. [1]

From the above table it can be observed India comes at second position having almost 20% of worldwide sugarcane production leaded by Brazil with almost 40%. China comes at third position with almost 7% of worldwide Production.

B. Top Ten Sugarcane Producing States of India:

The states of India are classified to two regions depending upon the environmental ecosystem.

a. Tropical Region (T)
b. Subtropical Region (ST)

In India 341200 TMT sugarcane is produced every year. Uttar Pradesh is the largest Sugarcane producing state in India followed by Maharashtra and Karnataka and rests other states.

Table 2: Top ten sugarcane producing states of India.

Rank	State Name	Production- (TMT) 2012.
1	Uttar Pradesh	132427.68
2	Maharashtra	69648.07
3	Karnataka	35732
4	Tamil Nadu	33919.17
5	Andhra Pradesh	15567
6	Bihar	12741.42
7	Gujarat	12690
8	Haryana	7437
9	Uttarakhand	6784.82
10	Punjab	5919

Source: Department of Agriculture and Cooperation (Horticulture Division)[w2]



Source: http://www.mapsofindia.com [w3].

Fig 1: Map of India Showing Top Ten Sugarcane Producing State of India (2012-13).

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II. COMMON PESTS IN SUGARCANE:

Matching with long diversity of conditions under which sugarcane is grown there is wide spectrum of pests which have come to acquire a place of priority for control on regional or inter-regional basis due to the agro-climatic management conditions associated with the area [w4].

About a dozen of the more than 200 species of insect and non-insect pests are observed in Sugarcane crop in different parts of the India which are economically important.

Borers and Sucking pests are the major aerial pests where as Termites and white grubs are mainly founded in sub-tererranean region. Shoot borers are found throughout the country. In order to non-insect pest category rats are largely found in drip irrigated farm, while yellow mite is frequently observed in tropical region farm. Drought in extreme summer is favorable for the growth of Shoot borer, termites, black bug and mite.

The Sugarcane crop gat affected by pests in two distinct stages on in crop age one is up to 4 months, pest like Early Shoot, Top, Root ,Stalk Borers attack the crop during this stage.

The second stage is after 4 months onwards, Pyrilla, Woolly Aphid, White Fly, Scale Insect, Mealy Bug, White Grub and Mite attacks during this stage of the crop.

Pests of sugarcane crop in India are classified on the basis of their nature like Borers, Sucking Pests, Subterranean pests and Non-Insect Pests as well as geographical distributions i.e. Tropical and subtropical appearance.

The following table gives a brief of common pests found in the country.

Table 2: Common Pests of Sugarcane in India

Sr. No	Category	Pest	Scientific Name	Geographical Distribution
1	Borers	Early Shoot Borer	Chilo infuscatellus	T, ST
2.		Internode Borer	Chilo Sacchariphagus Indicus	T
3		Top Borer	Scirpophaga excerptalis	T, ST
4		Stalk Borer	Chilo Auricilius	ST
5		Root Borer	Emmalocera depressella	T, ST
6		Gurdaspur Borer	Acigona steniellus	ST
7		Plassey Borer	Chilo Tumidicostalis	ST
	Sucking Pest			
8	A. Foliage Feeders	Pyrilla	Pyrilla Perpusilla	T, ST
9		Woolly Aphid	Ceratovacuna Lanihgera	T
10		WhiteFly	Aleurolobus Barodensis	T, ST
11		Black Bug	Cavelerius Sweeti	ST
12	B. Cane Colonizers	Scale Insect	Melanaspis Glomerata	T,ST
13		Mealy Bug	Saccharicoccus Sacchari	T, ST
14	Subterranean Pest	Termite	Odontotermes obesus	T, ST
15		White Grub	Holotrichia serrata/consanguinea	T/ST
16	Non-Insect Pest	Rat	Bandicota Bengalensis	T, ST
17		Mite	Oligonychus Sacchari	T, ST

 # T- Tropical, ST- Sub-tropical

Source: Sugarcane Pests and Their Management ,J. Srikanth, K. P. Salin, R. Jayanti, Sugarcane Breeding Institute (ICAR) Coimbatore, ISBN 978-81-904359-4-9 Page no:02.[2]

III. LOSS IN SUGARCANE PRODUCTION DUE PESTS:

Food plants of the world are damaged by more than 10,000 species of insects, 30,000 species of weeds, 100,000 diseases (caused by fungi, viruses, bacteria and other microorganisms) and 1000 species of nematodes (Hall, 1995; Dhaliwal et al., 2007).

However, less than 10 percent of the total identified pest species are generally considered as major pests. The severity of pest problems has been changing with the developments in agricultural technology and modifications of farming practice.

Sr. No.	Name of Pest	(%) reduction in cane yield	(%) reduction in sugar recovery
1	Early shoot borer	22 to 33	2 .0-3.0
2	Internode borer	up to 34.88	1.7-3.07
3	Top shoot borer	21-37	0.2-4.1
4	Stalk borer	up to 33	1.7-3.07
5	Gurdaspur borer	5-15	1.5-2.5
6	Root borer	up to 35	0.1-0.8
7	Scale insect	up to 32.60	0.3-2.90
8	Black bug	up to 86	16-20
9	Pyrilla	up to 35	0.1-2.8
10	White Fly	up to 31.60	1.0-1.5
11	White grub (H)	up to 80	1.4-1.8
12	Whiter grub (L)	up to 100	5.0-6.0

Source: Sugarcane Pests and Their Management ,J. Srikanth, K. P. Salin, R. Jayanti, Sugarcane Breeding Institute (ICAR) Coimbatore, ISBN 978-81-904359-4-9

From the above table it can be observed that impact of pests in sugarcane crop may lead to the complete loss of the crop.

So proper avoidance and management of pest must be done by the farmers to reduce its impact.

IV. PEST MANAGEMENT METHODS OR PRACTICES IN SUGARCANE:

With respect to sugarcane cane Crop production following are the Pest management Methods which can be adopted.

a. ***Cultural Method:*** The practices like manipulation of date of planting , Trash mulching, Detrashing, Earthing-up etc are considered as cultural method of pest management in sugarcane crop.

b. ***Physical or Mechanical Method:*** Collection and destruction of adult beetles at the time of emergence, egg masses of top borer, cane harboring for Gurdaspur borer etc. would reduce the pest population in short term and long term. Although the mechanical practices are constraints by non availability of human resource and operational economic.

c. ***Varietal Management Method:*** Some Pest resistant varieties are available, the proper verity of the crop should be planned for cultivation.

d. ***Biological Method:*** The biological methods include the principles like develop the native natural enemies of targeted pest or colonizing pests in the invaded areas. This method is mostly recommended by entomologist now a days.

d. ***Chemical Method:*** Chemical practices are largely used by the farmers to control Pests. Insecticides or pesticides prevent the rapid buildup of pest population to economic injury levels. Despite the minimal usage there is a need to select appropriate insecticide and formulation and adopt proper method and time of application for different seasons and situations.

V. CONCLUSION:

The main aim of the research paper was to collect the relevant contribution in the field of pests in sugarcane farm. All important information like sugarcane production, state wise production , major pests and their impact, management practices and methods are clearly described in the paper with the appropriate reference. Thus this paper is very useful for farmers and research students to get detail about relevant topic.

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