

## MEALY BUG, NEW PEST OF COTTON CROP IN HARYANA: A SURVEY

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Mealy bug, which has assumed a status of serious pest of cotton in Punjab has appeared in the adjoining districts of Haryana with infestation ranged between 5.0 to 44.0 per cent at various locations. Among the different blocks, the maximum infestation was recorded in Dabwall block (10.00-44.00%) followed by in Badaguda (27.27-31.00) and Sirsa (5.00-33.57%). Profenophos, quinalphos and acephate are commonly used to manage the pest. The pest is surviving in stacks of cotton stalks, bark of tree etc., thus, providing ample probability for its reappearance in the coming season.

**KEYWORDS:** Cotton, Haryana, mealy bug, survey

Mealy bug (*Maconellicoccus hirsutus* Green) was first reported from India on mulberry (Green, 1908) and later on it spread to Egypt in 1912 causing damage to *Albizia labbek* (Leguminosae), mulberry (Moraceae), *Hibiscus* spp. (Malvaceae) and many more plants but cotton was not severely attacked being an annual crop as sufficient time was not available to the mealy bug to damage the crop (Hall, 1921). Afterwards the pest spread to countries like Hawaii, Grenada, St. Lucia, USA, South Africa etc.

Misra (1920) reported *M. hirsutus* attacking cotton crop in Bihar and later on Dhawan *et al.* (1980) reported this pest on *desi* cotton (*Gossypium arboreum*) from Punjab. It was recorded from Wagad and Kachch region in 2000 (Muralidharan & Badaya, 2005) and severe attack of mealy bug was again observed on cotton in Gujarat during 2006-07 (Anonymous, 2007). *Phenacoccus solenopsis* Tinsley, another mealy bug species, was reported on *Solenum muricatum* from USA (1892), Central America (1992) and Chile (2002); on tomato from Brazil (2005); on cotton from Pakistan during 2005 and cotton growing areas of Punjab during 2007-08 from where it apparently spread to adjoining areas of Haryana. Two species of mealy bugs occurring in cotton in north India are *Maconellicoccus hirsutus* Green and *Phenacoccus solenopsis* Tinsley. Out of which *P. solenopsis* was abundant and has been reported first time in cotton.

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A survey was conducted by Central Institute for Cotton Research, Regional Station, Sirsa in three major cotton growing districts. i.e. Sirsa, Fatehabad and Hisar of Haryana to find out the mealy bug damage on cotton during 2007. In addition, the observations on the per cent infestation and severity of mealy bug incidence were recorded in 19 villages in different blocks of Sirsa district. At each village (location) 10 infested spots were observed from boarder to inner side of the field to record number of mealy bug infested plants. These infested plants were further analysed to find out the severity of damage as per the following rating scale:

Severity	Grade	Mealy bugs
Nil	0	No mealy bug
Low	I	About 1-10 mealy bugs scattered over the plant
Mild	II	One branch/apical portion of stem infested heavily with mealy bug
Heavy	III	Two or more branches infested heavily with mealy bug, up to 50 % plants affected
Very Heavy	IV	Complete plant affected

The farmers having infested fields were interviewed to know the number of sprays applied for the control of this pest. Simultaneously, numbers of host plants from field, fruit, and vegetable,

Table 1. Hosts of mealy bug recorded in Haryana.

Category	Scientific name	Family
Field Crops	<i>Gossypium Spp.</i>	Malvaceae
	<i>Vigna radiata</i>	Leguminosae
	<i>Cyamopsis tetragonoloba</i>	Leguminosae
	<i>Sorghum bicolor</i>	Graminae
Vegetable crops	<i>Abelmoschus esculentus</i>	Malvaceae
	<i>Solanum melongena</i>	Solanaceae
	<i>Capsicum annum</i>	Solanaceae
	<i>Solanum tuberosum</i>	Solanaceae
	<i>Lycopersicon esculentum</i>	Solanaceae
	<i>Citrullus vulgaris</i>	Cucurbitaceae
	<i>Cucumis melo</i>	Cucurbitaceae
	<i>Momordica charantia</i>	Cucurbitaceae
	<i>Luffa acutangula</i>	Cucurbitaceae
Fruit crop	<i>Psidium guava</i>	Myrtaceae
	<i>Vitis vinifera</i>	Vitaceae
	<i>Zizyphus spp.</i>	Rhamnaceae
	<i>Punica granatum</i>	Punicaceae
	<i>Carica papaya</i>	Caricaceae
Ornamental crop plants	<i>Tagetes patula</i>	Compositae
	<i>Hibiscus rosasinensis</i>	Malvaceae
	<i>Althaea sp.</i>	Malvaceae
Weed plants	<i>Parthenium sp.</i> ✓	Heliantheae
	<i>Xanthium sp.</i> ✓	Asreraceae
	<i>Tribulus terrestris</i> ✓	Zygophyllaceae
	<i>Trianthema monogyna</i> ✓	Alzoaceae
	<i>Abutilon indicum</i> ✓	Malvaceae
	<i>Sida sp.</i> ✓	Malvaceae
	<i>Acrchne racemosa</i> ✓	Graminae
	<i>Eleucine kegyptracum</i> ✓	Graminae
	<i>Datura fastuosa</i> ✓	Solanaceae
	<i>Physalis minima</i>	Solanaceae
	<i>Solanum nigrum</i>	Solanaceae
	<i>Digera arvensis</i>	Amaranthaceae
	<i>Achranthus aspera</i>	Amaranthaceae
Plantation crops	<i>Azadirachta indica</i>	Millaceae
	<i>Ficus religiosa</i>	Moraceae
	<i>Ficus indica</i>	Moraceae
	<i>Acacia spp</i>	Mimoseae
	<i>Eucalyptus citriodora</i>	Myrtaceae
	<i>Populus deltoides</i>	Salicaceae

Table 2. Survey for the incidence of mealy bug on cotton during 2007-08

Name of Block	Villages	Infestation (%)	Grading*					Intervention/ Control
			Healthy	Infested Plants				
				0	I	II	III	
Odhan	Tappi	13.50	86.50	-	13.50	-	-	One spot sprays
	Chormar	16.50	83.50	-	8.67	7.60	-	Quinalphos
	Kingre	27.33	72.66	12.00	9.50	5.17	-	Profenobhos / Quinalphos
	Malikpura	7.00	93.00	-	7.00	-	-	Profenobhos / Quinalphos
	Pipli	11.60	88.40	0.50	11.00	-	-	Profenobhos / Quinalphos
Dabwali	Dabwali	40.00	60.00	-	20.00	19.00	1.0	Profenobhos / Quinalphos
	Bawant khora	10.00	90.00	5.00	5.00	-	-	Quinalphos
	Maujgarh	44.00	69.27	12.00	5.54	11.82	-	Profenobhos / Quinalphos / Acephate
Sirsa	Bhawdin Kalan	31.00	69.00	10.00	10.50	10.00	-	One - Two spot Sprays
	Panihari	22.00	78.00	9.69	8.92	4.07	-	Profenobhos/ Acephate
	Khareka	5.00	95.00	3.00	1.66	1.33	-	Profenobhos / Quinalphos
	Darbi	30.00	70.00	9.00	14.00	7.00	-	Profenobhos / Quinalphos
	Mushahibwala	33.57	66.42	12.88	14.28	6.28	-	Profenobhos / Monocrotophos
	Bharokan	29.00	71.00	7.50	16.00	5.50	0.5	Acephate
	Baruwali	32.00	68.00	4.00	18.00	10.00	-	Profenobhos / Quinalphos
Kalanwali	Jagmalwali	11.33	88.67	0.67	10.67	-	-	Profenobhos / Quinalphos
Badaguda	Alikan	27.27	72.72	14.55	9.54	3.27	-	Profenobhos/ Acephate
	Burj Bhanu	31.00	69.00	21.00	19.00	9.89	-	Acephate
	Dhaban	30.83	69.17	13.00	15.00	2.80	-	Profenobhos / Quinalphos

\* Grading is based on the infested plants

\*\* Sampling was done from 10 infested spots of each location

ornamental and plantation crops were also recorded. *M. hirsuta* and *P. solenopsis* were recorded for first time and found predominant.

The survey revealed that mealy bug affected around 4800 ha area in Sirsa, Fatehabad and Hisar in 115 villages of Dabwali, Odhan, Sirsa, Kalanwali and Badaguda blocks of Sirsa, 8 villages in Fatehabad and 7 villages in Hisar district.

The infestation was more on border rows of the field compared to interior side. At few locations the whole field was found infested. The per cent mealy bug plants infested ranged between 7.00 to 27.33 in Odhan, 5.00 to 33.57 in Sirsa, 27.27 to

31.00 in Badaguda, 10.00 to 44.00 in Dabwali and 11.33 in Kalanwali blocks of Sirsa district. The per cent infestation was comparatively more in Dabwali and Badaguda blocks (Table 2).

The intensity of mealy bug damage in all the blocks was restricted to low to medium grade. Heavy infestation was recorded at two locations each in Odhan (5.17-7.60%) and Dabwali (11.82-19.00%), seven locations in Sirsa (1.33-10.0%) and three locations in Badaguda (2.80-9.89%). At two locations (one each in Dabwali and Sirsa) the growth of cotton plant was found stunted due to the attack of the pest.

Besides cotton, the pest was recorded on four field crops, nine vegetable crops, six fruit crops, three ornamental plants, 13 weed plants and six plantation crops from different families (Table 1) where it survived and multiplied. It was observed that the maximum population of mealy bug on weeds was recorded on congress grass followed by kangri buti (*Sida* sp.), Gutpatna (*Xanthium* sp.) and Peeli buti (*Abutilon indicum*). Among other hosts i.e. field, fruit and vegetable crops the pest preferred the member of family malvaceae (okra, cotton, hibiscus, hollyhock, *Abutilon*, *Sida* sp.). Members of the gramineae family were comparatively less preferred as per visual observation. It was also noted that the pest first appeared on weeds and later migrated to border rows of cotton plants. Another off-season survey conducted on mealy bug showed that the pest was surviving in cotton stacks and barks of trees.

At most of the locations, the farmers had applied 1-2 spot sprays of profenophos,

monocrotophos, quinalphos, and acephate for the management of the bugs. Only at few locations the mixture of monocrotophos + DDVP was used by the farmers.

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