INT. J. BIOL. BIOTECH., 5 (3-4): 255-257, 2008.

SHORT COMMUNICATION

ATTACK OF MEALY BUG ON SUNFLOWER AND ITS CONTROL

M. Jalaluddin, Sumaira Eid Muhammad and Maria Hamid

Department of Agriculture, University of Karachi, Karachi-75270, Pakistan
Correspd: <mjalaluddinku@hotmail.com.com>

ABSTRACT

Attack of mealy bug *(Planococcoides citri*) on sunflower is described from Karachi and its control measures are suggested.

Key-words: mealy bug, sunflower,

Eighteen species of mealy bugs have been reported of which *Planococcoides citri* having one segment covered with white mealy material is the most common (Harris, 1981). An attack by mealy bugs with these characteristic features was observed on Sunflower during May, June and July2008 in Karachi (Pakistan). Other plants like ladyfinger, China rose, cotton, brinjal and custard apple were also found infested with the mealy bugs in Karachi. The incidence of attack by mealy bugs from Karachi has not yet been reported. In 2007 there was report of 40% loss in the production of cotton from Sindh and Punjab in Pakistan. Cotton had to be imported to feed the agriculture based textile industry which is the main source of foreign exchange for Pakistan (Anonymous, 2007). There are reports of mealy bug attack on fruit trees from FANA (Federally Administered Northern Areas) such as plum, apricot, peach etc.

Sunflower (*Helianthus annuus* L.) is an edible oil yielding plant. Pakistan is deficient in edible and sunflower cultivation has become popular because of its economic return for farmers as well as consumers because of its being free from cholesterol. Mealy bugs are soft bodied insects that suck plant juices. The bugs appear as white fuzzy blobs on infested plants. Immature males and females look alike but they are very different as adults. Adult males have a pair of wings and fly. It is the adult female mealy bugs which are found on infested plants as mealy bugs and lay eggs in the axils of leaves which hatch after two weeks. The young female mealy bugs crawl and climb on other plants and attack near growing tips. They nestle where leaves join stems and along leaf veins. The crawling mealy bugs select a feeding site usually on the under surface of leaves and insert its mouthpart (stylet) and begin feeding on plant sap. While eating a sticky substance is excreted called honeydew. The honeydew falls below on upper surface of leaves lying underneath the affected leaves. The honeydew adheres to leaves and provides a growth medium for sooty mould. Sooty moulds are fungi of members of Capnodiales. These fungi produce black fungal colonies on the honeydew drops making leaves black in appearance. The blackening of leaves inhibit infected portions of plants from photosynthesizing. The damage and destruction of plants are caused by both by sap sucking mealy bugs and sooty moulds inhibiting photosynthesis. The recurring incidence of mealy bugs and sooty moulds on mango plants has been described by Hamid & Jalaluddin (2006). Ujjan & Shahzad (2007) have reported *Metarhizium anosipliae* var. *acridium* strain to be pathogenic on pink *Hibiscus* mealy bug (*Maconellicoccus hirsutus*) affecting cotton crop. The pathogenicity of *Metarhizium* sp., can be exploited as an agent of biological control for the pink *Hibiscus* mealy bug. There is no report of any research work so far on the attack of mealy bugs on sunflower. Further researches may reveal of the existence of a biocontrol agent for the sunflower mealy bugs.

While working on the Mycorrhizal association with sunflower, we came across the attack of mealy bugs on sunflower seedlings in May 2008. On account of the economic importance of sunflower as a good source of edible oil in Pakistan, we considered it necessary to make a study to find out a cheap and effective method to control mealy bugs.

At the outset the mealy bug attack appeared are white blobs on leaves of sunflower seedlings which multiplied rapidly (Fig. 1a). The blobs were brought in the laboratory and on examination it was found that the blobs were full of insects. The insects were oval bodied and measured 3-4 mm in length (Fig. 2). The mealy bug attack spread rapidly attacking nearby sunflower plants. On infested sunflower, sooty mould grew on honeydew excreted by the mealy bugs (Fig. 3b). There was a widespread incidence of mealy bugs all around attacking the sunflower plants growing in pots (Fig. 4c) and plots causing death of plants in the months of June and July 2008. The mealy bugs crawled on mature sunflower plants and attacked sunflower heads of the affected plants (Fig. 5d) which had attained

maturity and were ready for harvesting.

Fig. 1. Many a mealy bugs on Sunflower leaf

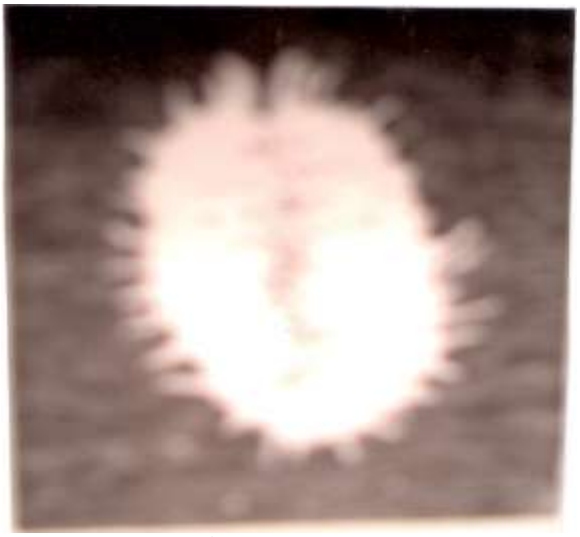

Fig. 2. The body of a mealy bug (an insect)

Fig. 3. Sooty mould causing blackening head of a Sunflower plant

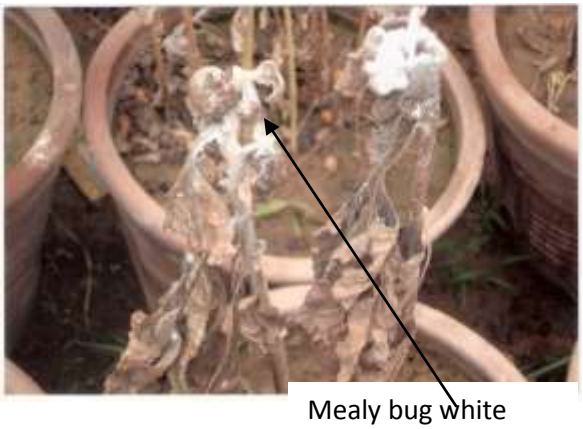

Fig. 4. Severely infested Sunflower plants by the attack of mealy bugs (Seen as white patches on Sunflower plants)

Fig. 5. Mealy bugs infesting a Sunflower head.

Fig. 6. Nylon net removed after 25 days showing Sunflower seedlings without mealy bug attack.

Sunflower seedlings growing in pots and kept under barbed wire net could not be found to check the entry of

the mealy bugs and from attacking the plants, therefore a method had to be devised to stop the entry of mealy bugs in a net where sunflower seedlings could be grown without its being attacked by mealy bugs. Therefore a special net made up of nylon having perforations of 2 mm in size and 2 metre long and 2 metre broad in size were installed in the field like mosquito net. Before putting the pots on the surface of the soil was thoroughly drenched with 1% formalin to kill the mealy bugs present in the soil. Thick plastic sheets measuring 2 x 2 meter was placed on the sterilized soil. A series of pots filled with sterilized soil were sown with sunflower seeds. The soil in pots was made moist with sterilized water. A series of such pots sown with sunflower seeds were laid out on plastic sheets and were covered by the nylon net. The nylon net was sprayed from outside around the net by 0.1% Melathion (insecticide) to keep the mealy bugs away. The seeds in soil pots were allowed to germinate and grown for 20 days inside the nylon net in July 2008. The prevailing temperature in July 2008 fluctuated between 30-40°C and relative humidity was recorded between 50% to 60% by the Meteorological office Karachi during the period of growth of sunflower seedlings.

The nylon net which covered the soil pots was removed after 20 days to observe the health of sunflower seedlings. The seedlings were found to be free from mealy bugs and were found to grow normally (Fig 6). The other series of soil pots in which sunflower seeds were sown and were not covered by nylon net suffered from mealy bug attack. It was therefore concluded that covering the soil pots into the nylon net with the aforesaid precautions can control the attack of mealy bugs on sunflower seedlings when it is most vulnerable to the attack.

This research work was carried out on the sidelines of the research project on Mycorrhizal Biotechnology funded by the HEC of Pakistan granted to the senior author. We are thankful for the financial assistance to the HEC for this research work.

REFERENCE

Anonymous, (2007). Mealy bugs attack cotton crop. Dawn Bureau Report, Dawn (Daily), July 28, 2007.

Hamid, M. and M. Jalaluddin (2006). Recurring incidence of sooty mould of mango in Karachi and its control. *Int. J. Biol. Biotech.* 3(2): 561-562.

Harris, K.F. (1991). Arthropod and nematode vectors of plant viruses. *Ann. Rev. Phytopathol.* 19: 391-426.

Ujjan, A.A. and S. Shahzad (2007). Pathogenicity of *Metarhizium anosipliae* var. *acridium* strains on pink hibiscus mealy bug (*Maconellicoccus hirsutus*) affecting cotton crop. *Pak. J. Bot.*, 39(3): 967-973.

(*Accepted for publication October 2008*)