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Present status of different modes of transmission of Sunflower Necrosis Virus (SNV) on sunflower, weeds and crop plants

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ABSTRACT

An investigation was carried out to know the various methods of spread of the sunflower necrosis virus (SNV) through sap, seed, insect vector and pollen during *kharif* 2006 at the AICRP (Sunflower), Zonal Agricultural Research Station, GKVK, Bangalore. The necrosis virus was successfully transmitted through sap and the per cent transmission ranged from 43.33 to 56.66 on sunflower genotypes. Whereas, the vector, *Thrips palmi* Karny Successfully transmitted SND to sunflower test plants at acquisition access period of 3 days and inoculation access period of 5 days. The symptoms produced were mild mosaic followed by dark green, chlorosis and vein thickening, puckering and stunted growth of plants. SNV was efficiently transmitted to cowpea, groundnut, cucumber and horsegram with the per cent transmission of 15, 10, 5 and 5 by sap and while 10, 5, 5 and 5 by thrips transmission, respectively. They exhibited the symptoms as mosaic and chlorosis followed by necrotic spots on emerging leaves and reduction in leaf size with stunted growth by both sap and thrips transmission methods.

Key words : Necrosis Virus Disease, Transmission, Sunflower, Thrips, Weeds.

Sunflower is one of the major oilseed crops and has occupied a large area under cultivation in Karnataka. It is reported to be susceptible to several diseases. Recently the sunflower necrosis virus (S.N.V.) disease on sunflower causing severe yield losses has been reported from Bangalore (Anonymous, 1997) Because of its fast spreading nature and severity. It has threatened the sunflower cultivation in Karnataka, Andhra Pradesh, Tamil Nadu and Maharastra causing total loss of the crop (Anonymous, 2000).

The sunflower necrosis disease comprised as chlorotic and necrosis of a leaf lamina and distortion of leaf. The necrosis extending to midveins, petioles and flower bracts eventually results in killing of plants. It causes greater loss in yield because of its severity and fast spreading nature. The knowledge on the source of inoculum and mode of transmission in the field are still lacking. Keeping the above points in view, an attempt was made to evaluate the host-range of the virus among crop plants and weeds.

MATERIALS AND METHODS

The studies on the mechanical sap inoculation of the sunflower necrosis virus using 0.05 phosphate buffer and thrips transmission of virus was carried out under insect proof glass house located at the AICRP (Sunflower), Zonal Agricultural Research Station, GKVK, Bangalore.

Young leaves from the necrosis infected sunflower plants were collected and the sample was macerated in pestle and mortar by adding chilled phosphate buffer (1 ml/g of leaf tissue) and extract was filtered. The celite was added to the extract and the resultant extract was used as standard inoculum for sap transmission.

Sap transmission of virus:

Sunflower plants were raised in polythene bags and maintained in insect proof glass house. A small piece of sterilized absorbent cotton wool soaked in standard inoculum was gently rubbed on the upper surface of leaves of the test plants. During inoculation, the leaves were supported from below with left-hand palm to avoid any injury and to assume uniform pressure and spread of inoculum. The inoculated leaves were washed ten minutes after inoculation with a jet of sterile water from squeeze bottle to remove excess inoculum. Each set of plants inoculated thus was labelled separately and kept in insect proof glass house. These plants were maintained for symptoms expression up to 30-40 days.

Thrips transmission of virus:

Test plants raised in insect proof nylon mesh cages were used in transmission experiments. The healthy colony of *Thrips palmi* Karny was raised from adults collected in the field and maintained on sunflower plants by weekly transfer of active nymphs. Young sunflower leaves, showing clear symptoms were kept in the Petri plate. Along the rim of Petri plate, a thin layer of water was poured and about 20-30 nymphs were released on to such leaves showing characteristic symptoms of the disease using fine moist camel hairbrush. The nymphs