

RESEARCH ARTICLE

Studies on seed transmission of tobacco streak virus causing sunflower necrosis disease

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ABSTRACT

Sunflower necrosis disease caused by *Tobacco streak virus* poses potential threat to the cultivation of sunflower in India. The early infection kills entire plant and the disease appears as necrosis of leaves, petiole, stem, bracts and malformation of head. TSV has wide host range and it is transmitted by vector through infective pollen. In the present study, transmission of TSV by seed was ruled out, since no seed transmission was recorded with the seeds of sunflower cultivars (Morden, DRSF-108, KBSH-1, KBSH- 41, KBSH- 44, KBSH- 53, Sunbred- 275, DRSH-1, ASF-107 and RSF-101) collected from necrosis infected plants in grow-out test. However, reduction in germination percentage from seeds of diseased plants was noticed as compared to healthy seeds.

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INTRODUCTION

Sunflower (*Helianthus annuus* L.) is an important edible oilseed crop in the country next to groundnut and soybean. The crop was introduced into India during 1969, which accounts for nearly 5 per cent of the current oil seed production. Sunflower oil is used for culinary purposes, in the preparation of vanaspati and in the manufacture of soaps and cosmetics. Sunflower oil is a rich source of linoleic acid (64 per cent) and good for heart patients. The crop has shown distinct superiority over other oilseed crops owing to its wider adaptability to different agro-climatic conditions.

Seed transmission was very well proved in different isolates worldwide since seed transmission of *Tobacco streak virus* (TSV) has been documented both in seeds of naturally infected and artificially sap inoculated plants belonging to different families. Seed transmission of TSV was successful in tomato up to 10 per cent (Sdoode and Teakle, 1988); in Beans up to 26.4 per cent (Walter *et al.*, 1992) and in *P. hysterophorus* up to 6.8- 48 per cent (Sharman *et al.*, 2009).

However, seed transmission was not reported in naturally or experimentally infected groundnut, sunflower, *Parthenium*

or several other annual crops infected with TSV in India (Prasada Rao *et al.*, 2003 and 2009; Reddy *et al.*, 2007).

Virus spread through seeds is of great concern as a route for the introduction of viruses into new areas, where they may spread and become established if suitable vectors and hosts are available. Hence, an attempt was done to check the seed transmission of TSV in sunflower using seeds collected from sunflower necrosis disease (SND) infected plants.

MATERIALS AND METHODS

Naturally infected plants of the popular sunflower cvs. Morden, DRSF-108, KBSH-1, KBSH-41, KBSH-44, KBSH-53, Sunbred-275, DRSH-1, ASF-107 and RSF-101 infected with SND were tagged in the field. All the plants were tested for TSV infection by Direct antigen-coated enzyme linked immunosorbent assay (DAC-ELISA) using polyclonal antiserum of TSV and the seeds from TSV positive plants were collected at maturity and stored for two months after drying. The seeds thus, collected were used in grow-out tests to assess the seed transmission. Similarly, seeds from artificially inoculated sunflower plants were also tested for