

RESEARCH ARTICLE

Effect of necrosis disease on yield and yield attributes of sunflower

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ARTICLE INFO

Received : 12.06.2012
Revised : 15.07.2012
Accepted : 13.09.2012

Key Words :

Sunflower necrosis disease,
Yield, Yield parameters,
Disease severity

ABSTRACT

Sunflower crop is affected by necrosis disease caused by *Tobacco streak virus*, which is of recent origin. As a result of infection by sunflower necrosis disease, yield components like plant height, head diameter, number of seeds / head, 100 seed weight and seed yield /plant of the cv. Morden were adversely affected. Significant reduction in yield and yield parameters were observed in the plants affected at different severity levels of the disease (<10 per cent, 11-50 per cent and > 50 per cent) compared to healthy ones. Maximum reduction over control in seed yield was recorded at > 50 per cent severity level (63.78 per cent reduction) than < 10 per cent severity level (31.86 per cent reduction). The necrosis disease also influenced the yield contributing factors such as reduction in the size of flower head, seed setting, and test weight. The results indicated that with the increase in severity of the disease, there was corresponding decrease in yield and yield parameters of sunflower cv. Morden.

How to view point the article : Bhat, Bharati N. and Reddy, Raja Ram (2012). Effect of necrosis disease on yield and yield attributes of sunflower. *Internat. J. Plant Protec.*, 5(2) : 361-363.

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INTRODUCTION

Sunflower (*Helianthus annuus* L.) is an important edible oilseed crop in the country next to groundnut and soybean which accounts for nearly 5 per cent of the current oilseed production. In India, the crop is cultivated in an area of 1.48 million hectares with production of 0.9 million tonnes (DOR Annual Report, 2010). The major sunflower growing states are Karnataka, Andhra Pradesh, Maharashtra and Tamil Nadu.

In India, only the association of a *Poty* and *Tospo* virus has been recorded on sunflower plants, until the emergence of a new disease called sunflower necrosis disease (SND) in recent years, which has hampered sunflower cultivation. Sunflower necrosis disease was noticed in an epidemic form consecutively for the three years (1997-99), with the incidence ranging from 10 to 80 per cent and yield loss up to 90 per cent in most of the sunflower growing regions of southern India (DOR Annual Report, 2001).

The causal agent of SND was identified as Tobacco streak virus of *Ilar* virus group (Ravi *et al.*, 2001; Bhat *et al.*, 2002a). Natural occurrence of TSV infection has also been

recorded from other hosts, such as cotton, sunhemp, mungbean (Bhat *et al.*, 2002b) and groundnut (Reddy *et al.*, 2002).

The disease has significant impact on sunflower crop as early infection either kills the plant or causes severe stunting with malformed head or heads filled with chaffy seeds (Ravi *et al.*, 2001). Early infected plants remain stunted and develop malformed heads with poor or no seed setting, resulting in complete loss of the crop (Jain *et al.*, 2003). Keeping this in view, detailed study was made on the effect of SND on yield and yield attributes in sunflower cv. Morden.

MATERIALS AND METHODS

To study, the effect of SND infection on yield and yield parameters under natural conditions, the seeds of sunflower cv. Morden were sown during 2009-10 *Kharif* season in the plots measuring 4.2 m x 3.0 m in three replications with spacing of 60 cm x 30 cm. All the recommended package of practices were followed and the plots were irrigated whenever necessary. The infected plants at different severity levels were tagged.