

Occurrence of Spotted Wilt Virus Disease on Tomato (*Lycopersicon esculentum* Mill.)

Abstract

Tomato crop in India is confronted with a number of biotic and environment stress due to crop yield remained for lower than the potential. Tomato spotted wilt virus has attained the second biggest threat to tomato production after necrosis virus. Tomato spotted wilt virus was study in the present investigation, with respect to its symptomatology, transmission, host-range and physical-properties. The virus causing thickening of the veins of young leaves. The lamina is usually curled down ward or upward. The older part turn brown until the entire leaves are killed or dropped. Severly infected plants are killed causing heavy damage to the crop.

Keywords: Disease, Spotted Wilt Virus, Tomato.

Introduction

Tomato (*Lycopersicon esculentum* Mill.) is an important annual fruit vegetable belongs to family Solanaceae. Tomatoes are cultivated throughout the world for its edible fruits. The tomato crop is subjected in nature to several biotic agents like fungi, viruses, bacteria, mycoplasma and nematodes. Which inhibit its growth, reduce yield and thus degrade its potential to mankind. Out of all the diseases, viral diseases cause maximum damage to the crop. There are about 36 viruses and their strains, 4 mycoplasma (Martyn 1968) and one viroid (potato spindle tuber) which affect tomato and induce one or the other disease alone and in combination. Spotted wilt virus is the important virus that causes the wilt disease in tomato resulting the crop loss. The tomato fields were visited during 2000-2002 in Agra and its adjoining areas. The disease characterised by the thickening of the vein with few chlorotic spots. Downward curling of leaves was observed as. The disease advanced the leaves develop bronzing symptoms with brown necrotic spots. Due to severe necrosis, some time young growing buds are killed. The symptoms resembled those reported for tomato spotted wilt virus (Best 1968), which is widespread on groundnut in Andhra Pradesh (Ghanekar et al; 1979). The sporadic occurrence of this disease was first reported from Nilgiris (Todd et al;). Many of the earlier workers reported spotted wilt disease on tomato (Rao et al; 1982, Sastry 1982). Singh and Gupta (1994) have observed tomato spotted wilt virus on pea in Uttar Pradesh. Therefore the present study were conducted on the symptomatology, transmission.

Material & Method

The culture of the virus was obtained from naturally infected plant of tomato and was maintained in an insect proof polythene case by mechanical inoculation on tomato. The standard virus inoculum was prepared by crushing the young leaves (5.0gms.) in 1ml of phosphate buffer (pH-7.0) in ordinary mortar with the help of pestle for about 10-15 minutes and then further diluted 5ml. The suspension obtained was filtered through cheese cloth and then used for inoculation purpose. Carborundum powder (600 mesh) was uniformly dusted on the upper surface of the leaves and then inoculum was applied on the surface with the help of fore finger. The excess of inoculum on the leaf surface was wiped off by a moist sterilized cotton pad. For the transmission of the virus by grafting, the cleft graft and leaf graft method, as developed by Bos (1967) were followed. 30 days old healthy seedling of tomato were taken as stock. There top were cut just above the required node and a vertical incision (2.0-2.5 cm in length) was made. Apical shoot of the disease plants of tomato were used as scion. Test plants, inoculated mechanically were observed 9 days after inoculation and those showing symptoms on inoculated plants.



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Aim of the Study

Tomato spotted wilt virus disease caused severe loss in the yield of crop . In India very little work has been done on the spotted wilt virus disease of tomato (*Lycopersicon esculentum Mill.*).The present investigation has been taken up.

Result**Symptoms**

Under polythene cage conditions, the tomato spotted wilt virus produced first symptom within 9 days after inoculations . The first sign of symptom appeared young leaves as thickening of veins with few chlorotic spots . Downward curling of leaves was also observed. As the disease advanced the leaves developed characteristic bronzing symptoms with brown necrotic spots .Due to severe necrosis ,sometimes the young growing buds are killed This leads to die back the branch .Infected Plants remain dwarf ,flowering is also inhibited .However ,plants infected at lateron stage produce few flowers and few fruits .Fruits such plants were small,distorted with pale red , yellow or bleached area and sometimes showed distinct concentric ring on them.

Host-Rang

Mechanical sap inoculation method was used in these studies .*Vincarosea L. Stellaria media L., Chenopodium album L., C. Amaranticolor Coste & Reyn., Spinaceaoleracea L., Pisumsativum L., Viciafaba L., Daturastramonium L., Nicotiana tobacum.*

Physical-Properties

The virus was infective upto 1: 10000.The thermal inactivation point of the virus was 45-50°C.the longevity of the virus was found to be 1-2 hrs at room temperature (10-28 0C) Thrips Transmission

Nymph of *scirtothrips dorsalis* exposed to infected tomato plants, transmitted the disease 4 out 20 plants tested .

Remarking An Analisation**Seed Transmission**

The seeds were collected from disease tomato plants .The plants raised from disease seeds ,and observed regularly from date of germination till the maturity .The virus was not transmitted through seeds collected from the spotted wilt virus infected tomato plants.

Discussion and Conclusion

Symptoms observed on tomato such as severe necrosis and bronzing were very similar to those of TSWV (Best 1968 ;Todd et al;1975 ; Das and Ray chauthaury 1953;Rao et al ;1980).The virus necrosis on many host plants tested .The result of host rang were similar to those reported for TSWV , causing bud necrosis disease of groundnut (Ghanerkar et al ;1975)

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