



Natural occurrence of *Tobacco streak virus* (ilar virus) on Bt cotton hybrids

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Abstract : Cotton is an important fibre crop. Cotton streak disease was newly recognized in India, identified to be caused by the Tobacco streak virus (TSV). The virus was recognized on 26 coded Bt entries at Cotton Research Station, Mehboob Bagh, Parbhani. Incidence of TSV was noted for the first time in Maharashtra. Disease observations were recorded from July-06 to November-06 at an interval of 15 days. Data revealed that viral disease incidence was recorded at increasing rate up to the end of September 06 and further incidence was noted in decline rate from October to November 2006. Maximum disease incidence was recorded in the month of September with in the range of 36.59 to 83.88 per cent. Lowest incidence was noticed on entry 6108 and highest on entry 6126.

Key Words : *Tobacco streak virus*, Cotton

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INTRODUCTION

Cotton (*Gossypium* spp.) is the most extensively cultivated commercial crop and the most important of all fibre crops of the world. Cotton belongs to the genus *Gossypium* of the family Malvaceae and has seven different species, but the cotton varieties grown in India belong to four distinct spp. namely, *G. arboreum*, *G. herbaceum*, *G. hirsutum* and *G. barbadense*.

Cotton is sub-tropical crop, but its cultivation is carried on successfully in many parts of the world away from such tropics. Heavy humid or cloudy weather and poor light or sunshine are harmful as they reduce the yield and promote the attack of pests and disease and lower the quality of the produce. Cotton is grown on variety of soil, black cotton soil in Maharashtra and Madhya Pradesh is common. Sowing season varies considerably from one part of country to another.

Cotton crop suffers from major diseases which are economically very important viz., cotton wilt (*Fusarium oxysporium*, *Fusarium varinfectum*), anthracnose

(*Colletotrichum indicum*), grey mildew (*Ramularia areola*), black arm or bacterial blight (*Xanthomonas malvacearum*). Now-a-days one of the viral diseases, tobacco streak virus (TSV) is also cited in southern Maharashtra region. Reddy *et al.* (2002) first reported the occurrence of tobacco streak virus on peanut in India.

MATERIALS AND METHODS

Per cent incidence of cotton streak virus on different Bt cotton hybrids under natural condition at Cotton Research Station, Mehboob Bagh, Parbhani were recorded during the year 2006- 2007. Gross plot size 5.4 x 6.0 (six rows with 10 dibbles) and net plot size 3.6 x 4.8 (four rows with 8 dibbles) were used. 90 x 60 cm spacing was followed. Fertilizer dose 100:50:50 NPK was applied. Date of sowing was 1.07.2006.

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

Symptomatology :

A serious disease with putative virus etiology was found to occur in the transgenic cotton growing region of Southern Maharashtra. Symptoms comprised of chlorotic and necrotic spots and leaf distortion (Fig.1). A generalized leaf and stem necrosis extending to mid-veins and petioles resulting in stunting was observed in early stage of crop development.

Detection :

The virus was identified as *Tobacco streak virus* (ilar virus) based on the reaction to virus specific antibody in ELISA. This virus has also been recorded to infect other hosts like sunflower, groundnut and soybean and was found to be transmitted by thrips. Incidentally thrips population was unusually high in virus infected fields. Virus is also reported to be transmitted by other arthropods and insects of the order Thysanoptera.



Fig. 1: Symptoms of disease on cotton leaf

Incidence of cotton streak virus :

Observations on cotton streak virus, a new viral disease

Table 1: Per cent incidence of cotton streak virus (Tobacco streak virus, ilar virus) on different Bt cotton hybrids under natural condition at CRS, Mehboob Bagh, Parbhani

Entry No.	Period								Yield in kg/ha
	30.07.06	15.08.06	30.08.06	15.09.06	30.09.06	15.10.06	30.10.06	15.11.06	
6101	32.77 (19.25)	57.93 (35.54)	56.10 (34.92)	61.38 (38.64)	65.21 (42.04)	58.00 (36.26)	58.19 (37.28)	40.49 (24.26)	604
6102	34.29 (20.13)	47.46 (28.45)	44.73 (26.62)	46.00 (27.46)	53.33 (32.29)	56.75 (34.72)	56.66 (39.58)	8.68 (4.98)	827
6103	31.48 (18.55)	44.86 (27.17)	50.22 (31.02)	53.83 (33.29)	57.41 (36.40)	63.16 (41.66)	50.30 (32.32)	18.74 (10.81)	947
6104	45.86 (27.63)	62.66 (38.83)	58.64 (36.50)	63.62 (40.70)	68.84 (44.35)	73.58 (49.35)	60.59 (38.75)	28.66 (16.65)	641
6105	42.64 (26.04)	47.11 (29.10)	54.61 (34.36)	65.10 (42.15)	68.61 (46.49)	68.54 (44.30)	53.99 (35.17)	12.23 (7.02)	589
6106	36.40 (21.40)	38.52 (22.68)	45.22 (27.00)	50.67 (30.60)	54.60 (33.38)	60.05 (37.31)	68.03 (46.12)	34.46 (20.43)	393
6107	32.40 (19.08)	41.22 (24.64)	46.37 (28.11)	53.74 (33.31)	56.01 (34.80)	60.83 (38.39)	56.68 (36.08)	24.14 (13.98)	955
6108	17.29 (9.97)	20.25 (11.69)	31.55 (18.61)	30.03 (17.56)	36.59 (21.77)	39.56 (23.55)	44.67 (26.94)	27.82 (16.29)	904
6109	25.20 (14.64)	52.40 (32.12)	50.03 (30.63)	53.51 (33.39)	58.21 (37.25)	61.24 (39.26)	59.44 (36.78)	30.72 (17.98)	841
6110	27.71 (12.65)	35.74 (21.37)	33.90 (20.00)	48.37 (30.26)	42.91 (25.71)	45.83 (27.64)	46.09 (28.03)	23.89 (13.81)	933
6111	48.12 (29.68)	34.68 (20.36)	68.76 (44.62)	62.70 (39.39)	74.06 (48.57)	72.92 (47.17)	63.21 (41.64)	37.29 (21.90)	635
6112	33.26 (19.84)	30.37 (18.25)	41.07 (25.06)	43.29 (26.85)	48.88 (30.90)	45.95 (28.14)	48.21 (30.84)	12.25 (7.08)	841
6113	45.15 (27.11)	53.88 (33.63)	76.06 (49.74)	83.33 (56.51)	79.69 (54.83)	78.48 (56.87)	75.30 (51.58)	45.15 (26.86)	402
6114	48.92 (39.07)	47.16 (30.83)	50.88 (31.86)	55.93 (36.58)	52.54 (33.09)	42.00 (25.38)	69.30 (44.05)	62.99 (40.16)	949
6115	36.59 (21.48)	37.64 (22.12)	52.48 (32.01)	58.93 (36.32)	63.30 (39.85)	73.46 (47.64)	60.96 (39.76)	30.77 (17.93)	842
6116	38.29 (22.93)	36.89 (22.20)	47.15 (28.85)	52.60 (32.71)	52.42 (32.59)	53.93 (33.49)	44.28 (27.33)	18.44 (10.68)	816
6117	47.49 (28.45)	53.57 (33.37)	70.15 (45.38)	81.66 (56.54)	75.10 (49.85)	80.32 (54.15)	62.21 (43.70)	29.33 (17.24)	538
6118	62.04 (38.35)	61.80 (41.96)	85.99 (60.71)	86.80 (60.93)	88.21 (62.70)	86.13 (59.84)	71.68 (49.14)	37.34 (22.20)	378
6119	61.11 (46.48)	54.36 (34.58)	66.58 (42.12)	62.44 (39.43)	71.19 (45.74)	67.45 (43.59)	58.80 (38.02)	43.41 (26.88)	531
6120	40.71 (24.11)	42.56 (25.36)	60.60 (37.61)	71.44 (48.17)	68.74 (44.03)	70.26 (45.64)	61.36 (40.27)	25.26 (14.83)	997
6121	29.56 (17.55)	44.35 (26.73)	70.10 (46.09)	71.88 (47.69)	74.55(49.77)	75.57 (50.21)	60.23 (42.55)	12.57 (7.22)	276
6122	33.76 (19.77)	44.50 (26.43)	50.08 (30.05)	49.60 (29.81)	57.98 (35.46)	62.71 (38.87)	47.40 (28.97)	25.60 (14.86)	1066
6123	27.76 (16.21)	41.51 (24.58)	46.60 (27.86)	50.36 (30.34)	48.60 (29.13)	60.18 (37.78)	51.69 (32.90)	25.14 (14.58)	786
6124	36.56 (21.54)	35.46 (20.93)	52.24 (31.75)	57.01 (35.07)	60.11 (37.31)	66.55 (42.19)	57.17 (36.33)	23.76 (13.75)	679
6125	39.63 (23.86)	38.38 (23.01)	50.93 (31.37)	54.98 (34.53)	58.61 (37.08)	62.66 (40.66)	76.21 (51.69)	25.45 (14.90)	818
6126	51.11 (31.59)	55.55 (36.96)	81.10 (55.67)	82.22 (56.60)	83.88 (57.98)	81.11 (54.22)	68.88 (45.31)	37.22 (22.14)	608
S.E.±	7.35	7.22	6.24	7.00	6.92	6.81	6.40	4.52	CD116.1
C.D. 5%	20..35	19.98	17.27	19.37	19.17	18.86	17.72	12.53	CV10.05

identified as tobacco streak viral disease of ilar group were recorded on 26 coded *Bt* entries at CRS, Nanded and data are presented in Table 1.

Disease observations were recorded from July 06 to November 06 at an interval of 15 days. Data revealed that viral disease incidence was recorded at increasing rate up to the end of September 06 and further incidence was noted in decline rate from October to November 2007.

Maximum disease incidence was recorded in 5th (30.09.06) observation in the range of 36.59 to 88.21. Lowest incidence was noticed on entry 6108 and highest on entry 6118.

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