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Survey for the Incidence of Banana Bunchy Top Disease in Parts of Northern Karnataka

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Abstract

Viruses are considered as serious threat to banana production and productivity. Viral diseases spread rapidly through infected suckers and secondarily by vectors. As on date of four viral diseases, viz., bunchy top, streak, bract mosaic and infectious chlorosis have been reported in India. Among the four BBTV is the major virus, which is present in the entire banana growing regions of India. Roving survey was undertaken in Belgaum, Dharwad and Haveri districts. The incidence ranged from 0.02% to 11.11%. Incidence was highest in Belgaum district followed by Dharwad (0.69%) and Haveri (0.56%) district. Among different cultivars, in these districts G-9 was found to be more susceptible with incidence of 11.11% followed by Rajpuri (4.16%).
Key words : Banana, Bunchy top disease, BBTV, Survey.

Banana (*Musa* spp.) is one of the most important tropical fruit crops of the world. It is an important economically profitable plantation crop of India after mango, having high export potential. It is the fourth important global agricultural commodity in terms of gross value of the produce after rice, wheat and milk. Viruses are considered as serious threat to banana production and productivity. Viral diseases spread rapidly through infected suckers, and secondarily by vectors. As on date of four viral diseases, viz., bunchy top, streak, bract mosaic and infectious chlorosis have been reported in India. Among the four, Banana Bunchy Top Virus (BBTV) is the major virus, which is present in the entire banana growing regions of India. Banana bunchy top was first reported from Fiji in 1819 (1) and in India for the first time from Kerala in 1940 (2). The disease is prevailing in almost all banana growing areas of the country. The losses are 100% in yield as in this case no bunch formed, Hence looking to the economic importance of the disease the roving survey was undertaken in three districts namely Belgaum, Haveri and Dharwad.

Methods

A roving survey was undertaken in different villages of Belgaum, Dharwad and Haveri districts. The disease incidence was recorded at randomly selected banana orchards from different villages of these districts. The disease was diagnosed in field based on symptoms present on the plants. The percent disease was recorded in all the surveyed locations in the field by counting numbers of plants infected using the formula given below.

$$\text{Percent disease incidence} = \frac{\text{No. of plants infected}}{\text{Total no. of plants observed}} \times 100$$

Observations were also recorded on type of symptoms, total area, stage of the crop, variety grown and type of insects feeding.

Results and Discussion

Roving survey to know the incidence of BBTV disease was carried out in three districts viz., Belgaum, Haveri and Dharwad. A total of 39 villages, 14 from Belgaum, 9 from Dharwad and 16 from Haveri were surveyed. The data on survey in Belgaum districts presented in Table 1 revealed presence of BBTD in seven out of 14 villages surveyed. The incidence ranged from 0.09 to 11.11%. The highest incidence of 11.11% was recorded in Itagi village followed by 6.94% in Kadaravalli village both belonging to Bailhongal

Table 1. Survey for the incidence of banana bunchy top disease in parts of northern Karnataka. Ap-C = Aphid colony, NF = Non flowering, NL= Narrowing of leaf lamina, DGSL = Dark green streak on leaf lamina, TL= Thickening of leaf lamina, VC = Vein clearing, MC = Marginal chlorosis, D = Death of plant. – = Absent.

	District	Taluk	Place	Area (acre)	No.of diseased plants	Disease incidence (%)	Variety planted	Stage of crop (months old)	Vector found	Symptoms observed
1	Belgaum	Bailhongal	M. K. Hubli	5	0	0	Robusta	16	–	
			Kadaravalli	2	250	6.94	G-9	5	Ap-C	SG, DGSL, NL, TL, D
			Itage	2	400	11.11	G-9	18	Ap-C	SG, DGSL, NF, D
			Kittur	3	50	0.92	G-9	5	Ap-C	SG, VC
			Sondargi	2.5	0	0	Shrimanti	8	–	–
		Khanapur	Khanapur	1.5	0	0	G-9	15	–	–
			Ramapur	2	0	0	Robusta	9	–	–
		Belgaum	Kuruvi-nakaoppa	2	80	2.2	Robusta	5	Ap-C	SG, DGSL, MC
			HireBagevadi	3	5	0.09	Robusta	12	Ap-C	SG, DGSL
			Sutagatti	1.5	0	0	G-9	5	–	–
		Soundatti	Hooli	3	0	0	Robusta	5	–	–
			Soundatti	2.5	0	0	Local	24	–	–
			Munavalli	1	50	2.7	Robusta	16	Ap-C	SG, DGSL
			Gokak	2	150	4.16	Rajapuri	12	Ap-C	SG, DGSL, VC
2	Dharwad	Dharwad	UAS Campus	1	0	0	Robusta	12	–	–
			Nuggikeri	3	5	0.09	G-9	8	–	SG, DGSL, VC, MC
		Hubli	Aralikatti	2	15	0.41	Robusta	11	–	SG
			Chabbi	1.5	12	0.44	Robusta	16	Ap-C	BF, NF, NL, TL
			Noolvi	1	5	0.27	G-9	4	–	SG, DGSL
			Hubli	5	2	0.02	Robusta	15	–	SG
		Khalgatgi	Gambyapur	4	250	3.47	Robusta	8	Ap-C	SG
			Hirehonnalli	2	55	1.52	Robusta	14	Ap-C	SG
			Dastikoppa	3.5	55	0.07	Robusta	9	–	SG
3	Haveri	Haveri	Ekkari	1	0	0	Robusta	15	–	–
			Hosaritti	4	40	0.5	Robusta	5	–	SG, DGSL
			Chennur	4	55	0.76	G-9	4	Ap-C	SG, NL, TL & BF
			Akkur	10	0	0	Robusta	5	–	–
			Guttala	2	0	0	G-9	14	–	–
		Savanur	Savanur	2	88	2.44	Robusta	12	Ap-C	SG, BF
			Dombar-muttar	0.5	5	0.5	G-9	10	–	SG, BF, DGSL
			Hattimattur	3	0	0	Robusta	15	–	–
		Shiggaon	Shiggaon	2	0	0	Robusta	5	–	–
			Dundasi	3	8	0.14	G-9	11	–	SG, BF, DGSL,VC and TL
		Hirekerur	Rattihalli	2	75	2.08	Robusta	10	–	SG, BF, and NL
			Masoor	1.5	41	1.51	Robusta	6	–	SG, BF, NL and DGSL
			Koda	3	10	0.18	Robusta	9	–	SG, BF
		Ranebennur	Haranahalli	2	0	0	Local	8	–	–
			Makanoor	0.75	8	0.61	Robusta	12	–	SG, BF, NL, and VC
			Kavalettu	1.5	7	0.25	Robusta	10	–	SG, BF

taluk. The lowest incidence of 0.09% was found in Hirebagewadi village of Belgaum taluk. Sundargi in Bailahongal taluk, Khanapur in Khanapur taluk, Sutagatti in Belgaum taluk, Hooli and Soundatti in Soundatti taluk were free from disease.

In Dharwad taluk except Dharwad UAS Campus the disease was present in all the villages surveyed. The disease ranged from a minimum of 0.02% in Hubli with Robusta variety to maximum of 3.47% at Gambyapur village of Khalghatgi Taluk with same variety. Overall incidence of the disease in district was low. In Haveri disease BBTV incidence was re-

Table 2. Banana varietals reaction to incidence.

	Cultivars	No. of fields	Range	Average PDI
1	Robusta	24	0.02 to 3.47	0.77
2	G-9	11	0.09 to 11.11	1.88
3	Shrimanti	1	0	0
4	Local Munavalli	2	0	0
5	Rajapuri	1	4.16	4.16

corded in 10 villages out of 16 villages surveyed (Table 1). The highest incidence of 2.44% was noticed in an orchard with Robusta variety at Savanur in Savanur taluk followed by 2.08% at Rattihalli of Hirekerur taluk again with Robusta variety. A least incidence of 0.14% was recorded in Dundasi village of Shiggon taluk with G-9 cultivar. Like Dharwad the overall incidence was low in Haveri districts also. In general the disease incidence ranged from 0.02 to 11.11%. Incidence of BBTV was high in Belgaum district followed by Dharwad (0.69%) and Haveri (0.56%) districts (Table 1).

Similar results of banana bunchy top disease incidence of 26.4% was recorded in Thadiyan Kudisai in Dindigal district and least in Coimbataore, Namakkal, Theni, Tanjore and Erode districts which ranged form 0.86 to 2.2%; there was no incidence of bunchy top in Trichy district (3). Also incidence of bunchy top ranging from 10 to 40% in villages of lower Pulney hills and maximum of 80% in Agamalai area was recorded (4); 20—80% incidence of banana mosaic in cv Poovan was recorded from Trichy district in Tamilnadu (5). In banana growing areas of Maharashtra recorded 5.2 to 21.2% incidence of banana infections chlorosis caused by cucumovirus, 0.62 to 2.25% incidence of banana streak by *Badna virus* (6); 84.5%of BSV in trichy district of Tamil Nadu and more that 70% in Tuticorin, Cuddalore, Karur and Erode districts was recorded (7). Incidence of banana bract mosaic virus up to 90% in banana plantations in and around Dharwad district (8).

Among different cultivars grown in different districts on average the disease incidence was more in orchards with Rajapuri cultivar (4.16%) followed by G-9 (1.88%) and Robusta (0.77%) but cultivar G-9 was most susceptible with a maximum incidence 11.11% (Table 2). The 0—60% bract mosaic virus infection was recorded in Nendran cultivar in Trichy district and banana streak virus infection in Poovan variety (9). Banana bunchy top disease incidence was observed on all the popular varieties of banana in Tamilnadu. (10).

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