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Roving Survey on Banana Diseases in Mysuru District

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A B S T R A C T

The roving suvey was conducted during 2016 to December 2017 and January 2018 at different places of Mysuru district on cultivars of Budubale, Ney Poovan, Grand Naine Nanjanagudu Rasabale and Nendran. Sigatoka leaf spot disease appeared in low to moderate form. The disease appeared severe form in Echagahally on Nanjanagudu Rasabale (56.76%). Freckle leaf spot appeared in low to moderate form. Incidence of *Fusarium* wilt ranged from 0.0 to 6.0% in Sept-October 2016, 0.0-2.86% in February 2017, 0.0-25.86% in August-September 2017 and 0.0-10.00% in December 2017- Jan 2018.The bacterial rhizome rot incidence ranged from 0.0 to 21.49% in 2016, 0.0-8.75% in the month of September-October 2016, 0.0-10.00% in the month of February 2017, 0.0-21.05% in the month of August-September 2017 and 0.0-12.79% in the month of December 2017-January 2018.

Introduction

Banana is one of the important tropical fruit crop. It is widely distributed fruit crop of India. The crop has a wide host range of adoptability as observed by its presence from sea level to a height of 1524.39cm and from tropical to subtropical conditions. India is also the home of multitudes of varieties. The varieties were grown with regional preference. Banana is having great socio – economic significance in India and it supports livelihood of millions of people with an annual production of 31.08m tonnes from 8.59 lakh ha. In Karnataka, banana is grown in 1.01 lakh ha area with total production of 2.4 m. tonnes. In India, banana crop is affected by many diseases. Among these, Panama disease (*Fusarium* wilt), Sigatoka leaf spot and rhizome rot are economically important.

Materials and Methods

Roving survey was conducted during 2016, September-October 2016, February 2017, August-September 2017 and December 2017 –January 2018 at different places of Mysuru district on cultivars of Budubale (ABB), Ney Poovan (AB), Grand Naine (AAA), Nendran (AAA) and Nanjanagudu Rasabale (Rasthali, AAB). Observations were recorded with respect to intensity of Sigatoka leaf spot. A 0-6 scale was used for scoring the Sigatoka leaf disease index (Gauhl *et al*., 1993). Where 0=No symptoms, 1=Less than 1 percent of

lamina with symptoms (only streaks and / or up to 10 spots), 2=1 to 5 per cent of lamina with symptoms, 3=6 to 15 per cent of lamina with symptoms, 4=16 to 33 per cent of lamina with symptoms, 5=34 to 50 per cent of lamina with symptoms and 6=51 to 100 per cent of lamina with symptoms. The freckle leaf spot intensity was recorded. Incidence of *Fusarium* wilt, rhizome rot and CMV were recorded.

Results and Discussion

Survey results revealed that Sigatoka leaf spot disease occurrence was low to moderate form and the highest intensity (27.39%) was recorded in Harohally. Freckle leaf spot appeared in low to moderate form and freckle leaf spot intensity was highest (19.74%)in Pura, H.D Kote Tq. Bacterial rhizome rot incidence ranged from 0.0-21.49%.BBTV incidence was recorded in Yelwala (2.67%). BBMV incidence was recorded in Devarasanahally (1.43%) (Table 1).

In the month of September –October 2016, the Sigatoka leaf spot intensity ranged from 2.00-19.65% and it was highest (19.65%) in Kugulur on Grand Naine. Freckle leaf spot was recorded in Kugulur on Grand Naine (6.00%). BBTV was noticed in Kugulur (1.00%). *Fusarium* wilt incidence ranged from 0.0-6.00%.The highest incidence of *Fusarium* wilt was recorded in Kalavadi, Mysore on Budubale (6.00%) and Kugulur (0.44%).The incidence of bacterial rhizome rot was highest (8.75%) in Kadakola followed by Kalawadi (4.00%) and Kugulur (2.44%). Survey was conducted in the month of November, results revealed that, the intensity of Sigatoka leaf spot was 31.04% and 4.71% of rhizome rot (Table 2).

In the month of February 2017, Sigatoka leaf spot intensity ranged from 1.20-15.71%.The intensity of Sigatoka leaf spot was highest (15.71%) in Halededi, Nanjanagudu Tq followed by Kamralli (5.89%) on Ney Poovan. The highest freckle leaf spot intensity was recorded in Halededi on Grand Naine (12.50%) followed by Nagavala on Grand Naine (3.62%). Traces of intensity were recorded in Nagavala. Shindehalli and Hallada Manuganahalli on NeyPoovan (Table 3). Incidence of *Fusarium* wilt ranged from 0.0-2.86%.CMV was recorded in Tandavapura. The bacterial rhizome rot incidence was highest (10.00%) in Alanahalli followed by Shindehalli (08.00%) and Tandavapura (7.66%).

During the month of August-September 2017, the Sigatoka leaf spot disease appeared low to moderate form. The highest Sigatoka leaf spot index (40.17%) was recorded in Devarasanahalli on Nanjanagudu Rasabale followed by Beechanahalli canal (38.20%) on Nanjanagudu Rasabale. The incidence of *Fusarium* wilt ranged from 0.0-25.86%. Incidence of *Fusarium* wilt was highest (25.86%) in Hullolli on Nanjanagudu Rasabale followed by Devarasanahalli (23.08%), Beechanahalli (17.86% on Nanjanagudu Rasabale and 7.20% on Ney Poovan). Incidence of rhizome rot ranged from 0.0-21.05%.

The highest incidence of rhizome rot (21.05%) was recorded in Hullolli on Nanjanagudu Rasabale followed by Madapur (20.84%), Beechanahalli canal (10.0%) and Devarasanahalli (4.00%) (Table 4). The cultivars ‘Rasthali’ (syn. ‘Malbhog’, ‘Nanjangod Rasabale’, ‘Amrithapani’, Martaman’, AAB, Silk), ‘Karpuravalli’ (syn. ‘Kanthali’, ABB, Pisang Awak), ‘Monthan’ (ABB) and ‘Virupakshi’ (syn. ‘Hill Banana’, AAB, Pome) are severely affected by wilt (Thangavelu *et al.*, 2001).

In Karnataka, cultivation of the local cultivar ‘Nanjangod Rasabale’ has been reduced from 500 ha to less than 50 ha (Narendrappa and

Gowda, 1995) due to severe incidence of *Fusarium* wilt.

In Bihar, more than 55% of the area under susceptible cultivars was severely infected, and yield reduction in these areas was estimated at 50-70%. In Tamil Nadu, it is becoming a major threat, with disease severity as high as 80-90% (Sivamani, 1987).

Table.1 Roving survey on banana diseases in Mysuru (2016)

Place	Cultivar	Sigatoka leaf spot index	Freckle leaf spot index	*Fusarium* Wilt (%)	BBTV (%)	BBMV (%)	Rhizome rot (%)
Yelwala, Hunsur Tq	Grand Naine	6.55	16.62	0.0	2.67	0.0	1.60
Harohalli, Mysuru	Ney Poovan	2.12	9.04	0.0	0.0	0.0	21.49
	Grand Naine	27.39	1.72	0.0	0.0	0.0	0.0
Kadakola, Nanjanagudu Tq	Ney Poovan	1.98	0.0	0.0	0.0	0.0	5.05
Devarasahally, Nanjanagudu Tq	Ney Poovan	2.83	Traces	0.0	0.0	1.43	0.0
Pura, H.D.Kote Tq	Ney Poovan	5.99	0.0	0.0	0.0	0.0	2.73
	Nendran	5.60	19.74	0.0	0.0	0.0	0.0

Table.2 Roving survey on banana diseases in Mysuru district (September-October 2016)

Place	Cultivar	Sigatoka leaf spot Index (*M.musicola*)	Freckle leaf spot index (*Phyllostictina musarum*)	BBTV (%)	*Fusarium* wilt (%)	Bacterial Rhizome rot (%) (*Erwinia* spp.)
Kalavadi, Mysuru Tq	Budubale (ABB)	2.00	0.00	0.00	6.00	0.00
	Ney Poovan (AB)	3.00	0.00	0.00	0.00	4.00
	Grand Naine	10.13	0.00	0.00	0.00	0.00
Kuguluru, Nanjanagudu Tq	N.Rasabale (AAB)	10.73	0.00	1.00	0.44	2.44
	Grand Naine (AAA)	19.65	6.00	0.00	0.00	0.00
Kadakola, Nanjanagudu Tq	Ney Poovan (AB)	8.05	0.00	0.00	0.00	8.75
Nov.2017 Manuganahall, H.D.Kote Tq	Grand Naine (AAA)	31.04	0.00	0.00	0.00	4.71

Table.3 Roving survey on banana diseases in Mysuru district (February 2017)

Place	Cultivar	Sigatoka leaf spot Index (*M.musicola*)	Freckle leaf spot index (*Phyllostictina musarum*)	*Fusarium* wilt (%)	CMV (%)	Bacterial Rhizome rot (%) (*Erwinia* spp.)
Nagavala, Mysuru Tq	Grand Naine(AAB)	5.68	3.62	0.00	0.00	0.00
	Ney Poovan (AB)	2.69	Traces	0.13	0.00	0.25
Kamaralli, Mysuru Tq	Ney Poovan (AB)	5.89	0.00	0.00	0.00	4.00
Shindehalli, H.D.Kote Tq.	Ney Poovan (AB)	4.72	Traces	2.86	0.00	8.00
Alanahalli, H.D.Kote Tq.	NeyPoovan (AB)	3.84	0.00	0.00	0.00	10.00
Hallada Manuganahalli ,H.D.Kote Tq	Ney Poovan (AB)	1.47	Traces	1.00	0.00	1.00
Tandavapura, Nanjanagudu Tq	Ney Poovan (AB)	1.20	0.00	0.00	0.06	7.66
Haledidi, Nanjanagudu Tq	Grand Naine(AAB	15.71	12.50	0.00	0.00	0.00

Table.4 Survey on banana diseases in Mysuru district-August-September 2017

Place	Cultivar	Sigatoka leaf spot index (*Mycosphaerella musicola*)	Freckle leaf spot index (*Phyllostictina musarum*)	*Fusarium* wilt (%)	BBTV (%)	Rhizome rot(%) *Erwinia* spp
Hullolli	Rasthali (N.Rasabale AAB)	7.68	0.00	25.86	0.00	21.05
	Ney Poovan	3.64	0.00	0.00	0.00	5.00
	Rasthali (N.Rasabale AAB)	1.81	0.00	5.56	0.00	0.00
Madapura	Rasthali (RasabaleAAB)	6.37	0.00	1.00	0.00	20.84
Hadaginalu	Ney Poovan(AB)	7.83	0.00	0.00	0.00	0.00
Devarasanahalli	Ney Poovan(AB)	10.18	0.00	1.52	0.00	4.00
	Rasthali (N.Rasabale AAB)	40.17	0.00	23.08	0.00	0.00
	Veg.type	29.17	0.00	0.00	0.00	0.00
Beechanahalli (canal)	Ney Poovan(AB)	6.75	0.00	7.20	0.00	5.26
	Rasthali (N.Rasabale AAB)	38.20	0.00	17.86	0.00	10.00

Table.5 Survey on banana diseases in Mysuru district-December2017-January 2018

Place	Cultivar	Sigatoka leaf spot index (*Mycosphaerella musicola*)	Freckle leaf spot index (*Phyllostictina musarum*)	*Fusarium* wilt (%)	BBTV (%)	Rhizome rot (%) *Erwinia* spp
Echagahalli, Nanjanagudu Tq	Rasthali (N.Rasabale AAB)	56.76	0.00	1.00	0.00	0.00
	Ney Poovan(AB)	6.61	0.00	0.00	0.00	1.00
	Grand Naine(AAA)	45.04	0.00	0.00	0.00	0.00
Sinduvallipura Nanjanagudu Tq	Ney Poovan(AB)	8.42	0.00	0.00	0.00	6.21
Yelachagere Nanjanagudu Tq	Ney Poovan(AB)	12.56	0.00	7.50	0.00	0.00
Tandavapura Nanjanagudu Tq	Ney Poovan(AB)	6.03	traces	0.00	0.00	12.79
Kogaluru Nanjanagudu Tq	Ney Poovan(AB)	2.20	0.00	0.00	2.25	1.25
	Grand Naine					5.00
Mobballi	Ney Poovan(AB)	5.01	0.00	3.13	0.00	4.00
Heggadahalli	Ney Poovan(AB)	9.05	0.00	10.00	0.00	2.00
	Grand Naine(AAA)	30.00	0.00	0.00	0.00	0.00
Kembala (Mysuru)	Ney Poovan(AB)	1.61	0.00	6.00	0.00	1.00
Rayanakere (Mysuru)	Ney Poovan(AB)	4.62	0.00	7.00	0.00	0.00

In the months of December 2017–January 2018,the Sigatoka leaf spot disease appeared in low to moderate form. The Sigatoka leaf spot index was highest in Echagahalli (56.76% on Nanjanagudu Rasabale and 45.04% on Grand Naine) followed by Heggadahalli on Grand Naine (30.0%) and Yelachagere (12.56%). The freckle leaf spot disease appeared traces in Tandavapura Incidence of *Fusarium* wilt ranged from 0.0-10.0%.The highest incidence of *Fusarium* wilt (10.0%) was recorded in Heggadahalli followed by Yelachagere (7.50%), Rayanakere (7.00%), Kembala (6.00%), Mobballi (3.13%) and Echagahalli (1.00%).The incidence of BBTV recorded in Kugulur (2.25%). Incidence of rhizome rot ranged from 0.0-12.79%. The highest incidence was recorded in Tandavapura (12.79%) followed by Sinduvallipura (6.21%), Kuguluru (5.00%) and Mobballi (4.00%) (Table 5). Sigatoka leaf spot was reported for the first time in India (Jones, 2000). Survey was conducted during revealed that almost all the commercial cultivars in Kerala were affected by Sigatoka leaf spot (Estelitta *et al.,* 1996). The prevalence of freckle leaf spot was reported at Coimbatore,

Trichy, Periyar and North Arcot districts of Tamilnadu during 1995-96 (Anon.1997). A roving survey was conducted to assess the severity of tip-over disease of Banana in the farmer's field of north eastern Karnataka. The highest disease incidence (20.35 %) was recorded at Muddaballi village of Koppal district. The least incidence (1.15%) was recorded in Ankammanahal village of Sandur taluk of Bellary district. Taluk wise mean incidence revealed that, highest disease incidence of 17.92 per cent was recorded in Koppal followed by Shimoga (12.0%), Gangavati (8.07%), Holalkere (7.8%) and Sagar (6.30%) taluks. The minimum incidence of 1.75 per cent was recorded in Sandur, Hospet (4.69%), Hiriyur (5.7%) taluks. District-wise, highest tip over incidence of 12.99 was recorded from Koppal followed by Shimoga (9.15%) and Chitrdurga (6.75%). Lowest incidence of 3.22 per cent was recorded in Ballari district of Karnataka. Nagaraj *et al.*, (2012) reported the incidence of tip over ranged from 30-35 per cent in the districts of Bangalore and Kolar of Karnataka state.

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