YELLOW LEAF DISEASE (YLD) OF ARECANUT - PRESENT STATUS IN KARNATAKA

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INTRODUCTION

Arecanut is an important commercial crop cultivated in India with an annual production of 0.61 million tonnes from an area of 0.45 million hectares. Karnataka, Kerala, Assam, Maharashtra, West Bengal and Tamil Nadu are the major producers in the country. Arecanut is affected by many pests, diseases and nutritional disorders. Among the diseases, the Yellow Leaf Disease (YLD) is a debilitating disease affecting the productivity of the palm. The earliest mention of YLD is found in the publication on diseases of coconut palm (Varghese, 1934). The disease was first observed after a heavy flood in 1914 from Central Kerala (Nambiar and Srinivasan, 1951). Dastagir (1963, 1965) reported it from Malnad areas of Karnataka. The disease affects palms of all age groups. The symptoms of YLD are well pronounced immediately after the cessation of south west monsoon rain.

Characteristic yellowing starts at the tip of the leaflets of two or three fronds of the outer most whorls (Rawther, 1976). The yellowing gradually extends to the middle of the lamina showing a clear cut demarcation of yellow and green parallel bands on both sides of the midrib of leaflets. As the disease progresses, yellowing extends to the whole lamina, leaving only the leaf stalk green. Further, the crown size gets reduced; the leaf tips become necrotic and dry up during summer. Other symptoms are reduction in internodal length, tapering of stem and non-production of inflorescence, ultimately leading to death of the affected palm. (Nayar and Seliskar, 1978).

A comprehensive survey conducted in Kerala during 1976 showed that 233 million palms, constituting 36% of the total palms were affected with maximum incidence observed in Idukki (97%) followed by Kottayam (94.3%). The survey in Karnataka during the same period showed that 28.4% area in Koppa and Sringeri Taluks was affected by YLD (Anonymous, 1977; Rawther *et al.*, 1982).

The Department of Horticulture, Karnataka reported in 2014 that YLD is present in four Taluks (Sringeri, Koppa, Narasimharajapura and Mudigere) of Chikmagalur districts, Sullia Taluk of Dakshina Kannada district and Madikeri Taluk of Kodagu district (Fig.1). It covers around 7 % of arecanut area in the state. To estimate the extent of YLD in the above mentioned Taluks, a field survey was conducted during November-December, 2014.

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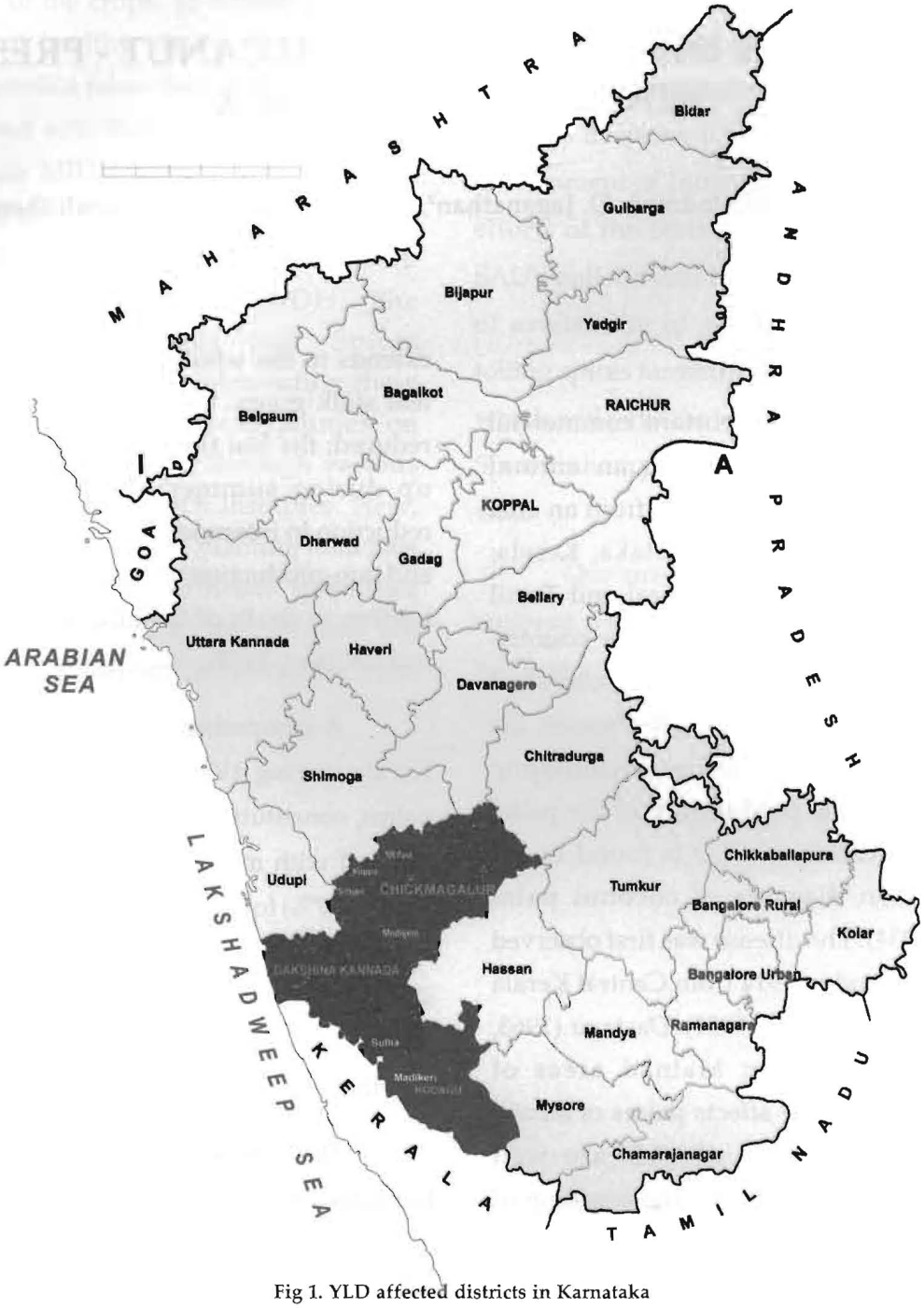

Fig 1. YLD affected districts in Karnataka

METHODOLOGY

To cover maximum gardens with limited time and resources, purposive sampling method was used to estimate the percentage of palms affected by YLD in six Taluks in Karnataka. The geographical location of the areas selected for the field survey is depicted in Fig.1.

The list of villages/ panchayaths affected with YLD was obtained from the Taluk horticultural offices. The survey was conducted in all the YLD affected villages/panchayaths in four Taluks of Chikmagalur district, one each in Dakshina Kannada (Sullia taluk) and Kodagu (Madikeri taluk) districts. Arecanut gardens on

both sides of the roads passing through the major arecanut growing areas of YLD affected village/panchayaths were selected for taking observations. From each selected garden, observations were recorded on the area of the garden, average age of the garden, Latitude, Longitude, MSL of the location and intercrops. From each garden, 30 palms were selected at random and the number of palms affected by YLD was noted. Village/Panchayath-wise percentage incidence of YLD (intensity) was worked out by taking weighted average of the selected gardens in each village/panchayath. The average YLD intensity in a Hobli was computed by taking weighted average of the average intensity of the village/panchayath. Similarly, the taluk average was obtained by taking weighted average of intensity in Hoblis in the taluk with area under arecanut as weight.

RESULTS AND DISCUSSION

The details of the number of panchayaths/villages where YLD is present along with area under arecanut in the four Taluks of Chikmagalur district, one taluk each in Dakshina Kannada (Sullia taluk) and Kodagu (Madikeri taluk) district of Karnataka are given in Table 1.

Sringeri Taluk

Sringeri taluk in Chikmagalur district is one of the major growing area of tender arecanut in Karnataka with 2703 ha of arecanut. The YLD was reported from Sringeri about five decades back and as of now disease is reported from all the 10 panchayaths. YLD is present in both Kigga and Kasaba hobli's of Sringeri taluk. Out of the total 10 panchayaths in Sringeri taluk, nine panchayaths were surveyed excluding sringeri panchayath where the area under arecanut is very less.

A total of 185 gardens were surveyed in Sringeri taluk, of which YLD is present in 114 (62%) gardens. The average intensity (percentage of palms affected) of the disease in Sringeri taluk was estimated as 25%. In Kasaba hobli, out of 117 gardens surveyed, YLD is

Table 1 : Incidence of YLD in selected Hoblis of YLD affected districts in Karnataka

Taluk	Hobli	Area under arecanut (Ha)	No. of gardens surveyed	No. of gardens diseased	%	Intensity (% of palms affected)
Sringeri	Kasaba	1478	117	89	76	34
	Kigga	1225	68	25	37	13
	Total	**2703**	**185**	**114**	**62**	**25**
Koppa	Hariharapura	1574	37	23	62	38
	Kasaba	1537	49	39	80	42
	Meguda	1672	53	44	83	53
	Total	**4783**	**139**	**106**	**77**	**45**
NRpura	Balehanoor	2030	62	43	69	18
Mudigere	Kalasa	2184	64	41	64	16
Sullia	Sullia	1889	189	99	53	30
Madikeri	Sampaje	1401	69	50	73	50
Total		**14990**	**523**	**339**	**65**	**32**

present in 89 (76%) gardens with an average intensity of 34%. Out of 68 gardens surveyed in Kigga hobli, YLD is present in 25 gardens (37%) with an average intensity of 13%. In Sringeri taluk, 80% of the arecanut gardens are with intercrops. The major intercrops grown in arecanut gardens are banana, pepper and coffee.

Koppa taluk

Koppa taluk in Chikmagalur district is another major arecanut growing region in Karnataka with an area of 4783 ha of arecanut. From Koppa also, YLD was reported five decades back and presently prevalent in all the panchayaths of the taluk. The Hobli wise summary of the survey result is given in Table 1. YLD is present in all the three hoblisviz, Hariharapura, Kasaba and Meguda. Out of the total 20 panchayaths in Koppa taluk, survey was conducted in 13 villages selected at random.

A total of 139 gardens were surveyed in Koppa taluk, of which YLD is present in 106 (77%) gardens. The average intensity of the disease in Koppa taluk was estimated as 45%. In Hariharapura hobli, out of 37 gardens surveyed, YLD is present in 23 (62%) gardens with an average intensity of 38%. Out of 49 gardens surveyed in Kasaba hobli, YLD is present in 39 (80%) with an average intensity of 42%. In Meguda hobli, out of 53 gardens surveyed YLD is present in 44 (83%) gardens with an average intensity of 53%. In Koppa taluk also, 80% of the arecanut gardens are with inter crops. The major intercrops grown in arecanut gardens are banana, pepper and coffee.

Narasimharajapura taluk

In Narasimharajapura taluk, YLD is present in Balehannur hobli,which is adjacent to the YLD infested Koppa taluk. The fact that many of the gardens in border areas are newly infested clearly indicates the importance of quarantine measures in proximity of the affected gardens. The survey was conducted in eight panchayaths in Balehannur hobli where YLD is present and the area under arecanut in these eight panchayaths is 2030 ha.

A total of 62 gardens were surveyed in Balehannur hobli, of which YLD is present in 43 (69%) gardens. The average intensity of the disease in Balehannur hobli of Narasimharajapura taluk is estimated as 18%. Here, 74% of the arecanut gardens are with intercrops like banana, pepper and coffee.

Mudigere taluk

In Mudigere taluk YLD is present in Kalasahobli, which is adjacent to the Koppa and Sringeri taluk. The survey was conducted in six panchayaths in Balehannur hobli where YLD is present and the area under arecanut in these six panchayaths is 2184 ha. A total of 64 gardens were surveyed in Balehannur hobli, of which YLD is present in 41 (64%) gardens. The average intensity (percentage of palms affected by YLD) of the disease in Kalasa hobli of Mudigere taluk is estimated as 16%. In Kalasa hobli 83% of the arecanut gardens are with intercrops. The major intercrops grown in arecanut gardens are banana, pepper and coffee.

Sullia Taluk

In Sullia taluk of Dakshina Kannada district, YLD is present in six villages in Sullia hobli. The survey was conducted in these six villages covering an area of 1889 ha of arecanut. A total of 189 gardens were surveyed in six villages of Sullia hobli of which YLD is present

in 99 (53%) gardens. The average intensity of the disease in the six villages of Sullia hobli is estimated as 30%. Here, 67% of the arecanut gardens are with intercrops. The major intercrops grown are banana, pepper and cocoa.

Madikeri Taluk

In Madikeri taluk of Kodagu district, YLD is present in four villages in Sampaje hobli. The survey was conducted in these four villages

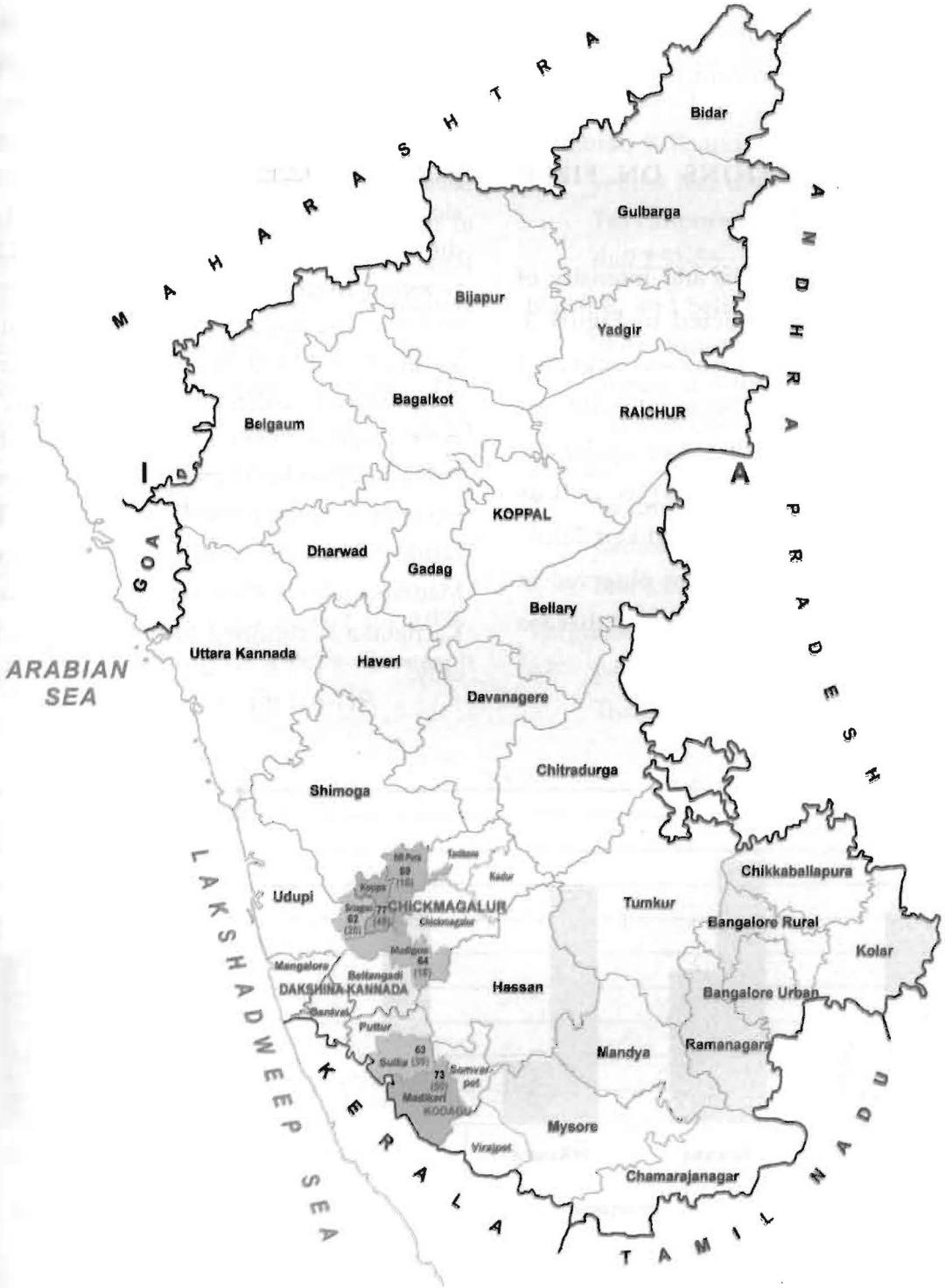

Fig.2 : Incidence and severity of YLD in affected districts of Karnataka

in Sampaje hobli with 1401 ha area under arecanut. A total of 69 gardens were surveyed in four villages of Sampaje hobli of which YLD is present in 50 (72%) gardens. The average intensity of the disease in these villages is estimated as 50%. In Sampaje hobli 64% of the arecanut gardens are with intercrops. The major intercrops grown in arecanut gardens are banana, pepper and cocoa.

SALIENT OBSERVATIONS ON FIELD PATTERN OF YLD

Taluk wise incidence and intensity of YLD in Karnataka is depicted in Figure.3. Overall incidence in these taluks was estimated as 65%, while the overall disease intensity was found to be 32%. As it was discussed earlier, the highest disease incidence (73%) as well as disease intensity (50%) was in Madikeri Taluk. The lowest disease incidence was observed in Sullia Taluk (53%), while the lowest disease intensity was in Mudigere Taluk (16%).

YLD of arecanut is present under all types of cropping systems and no relation could be established between the incidence of YLD and the intercrops grown or/the age of the palm. In the initial stages of the disease, the symptoms are expressed immediately after the cessation of south west monsoon.The argument that the disease is prevalent only in heavy rainfall areas could be validated in the study. In the initial stages, the symptom appears in one or two palms in a garden and it spreads to other palms slowly. An important symptom noticed in the diseased palms is decaying of roots. YLD was reported from Karnataka about 50 years back and now the disease is present in six taluks in an area of 14490 hectares. The estimated percentage of gardens affected in these six taluks is 65% with an average intensity (percentage of palms affected by YLD) of 32%. The percentage intensity is maximum in Meguda hobli in Koppa taluk (53%) followed by Sampaje hobli of Madikeri taluk (50%). The YLD of arecanut in Karnataka is confined to the above six taluks only.

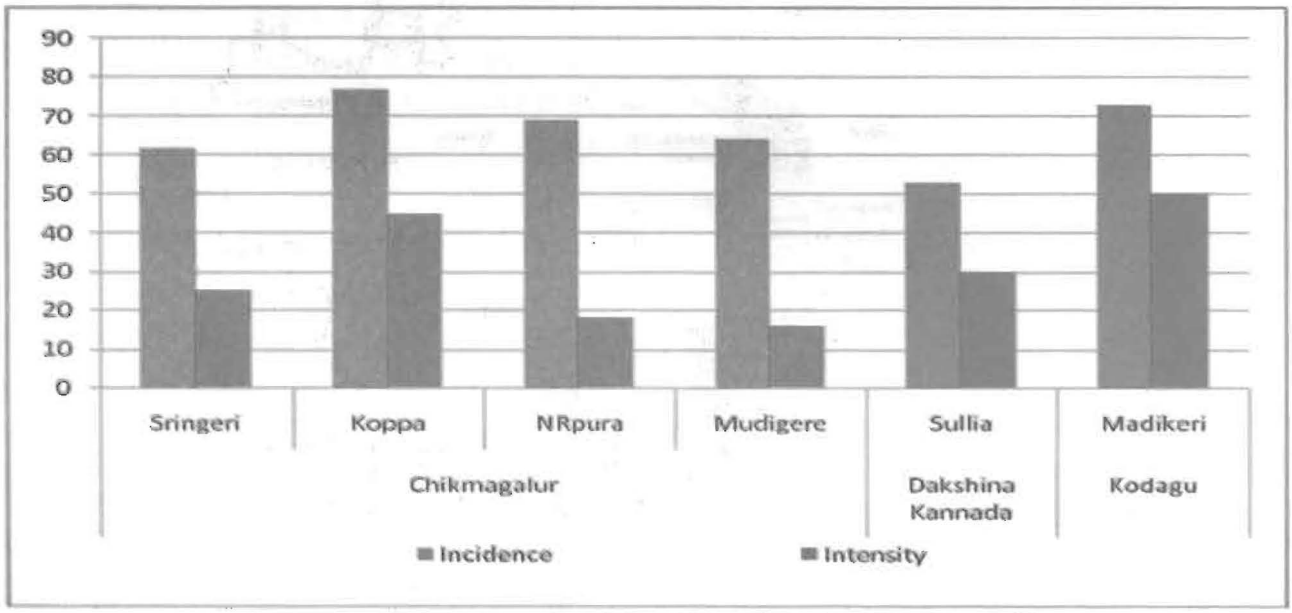

Fig. 3 : Taluk wise incidence and intensity of YLD in Karnataka

CONCLUSION

Yellow Leaf Disease (YLD) of arecanut is present in three districts viz, Chikmagalur, Dakshina Kannada and Kodagu in Karnataka. The disease is present in Sringeri, Koppa, Narasimharajapura and Mudigere taluks in Chikmagalur district, Sullia taluk in Dakshina Kannada and Madikeri taluk in Kodagu. The field survey conducted during Novemebr - December, 2014, revealed that YLD is present in 65% of the arecanut gardens in the disease affected areas in these taluks and also it is estimated that it is present in 32% of the total arecanut palms in the affected area.The highest disease incidence (73%) as well as disease intensity (50%) was in Madikeri taluk. The lowest disease incidence was observed in Sullia taluk (53%), while the lowest disease intensity was in Mudigere taluk (16%).

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