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Survey for occurrence of rice sheath blight disease in major rice growing areas of Andhra Pradesh, India

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Abstract
A survey for occurrence and distribution of rice sheath blight disease was conducted in major paddy growing areas of Andhra Pradesh during *Kharif* 2019.-20. Farmers' fields were selected at random in different mandals of West Godavari, East Godavari, Nellore, Y.S.R. Kadapa and Chittoor districts. The per cent disease incidence (PDI) ranged from 11.31 to 45.66 per cent. Maximum PDI (45.66) was recorded at Penumanchili village of West Godavari district, while minimum (11.31) was observed at Koppolu village of Y.S.R. Kadapa district. The disease was observed from maximum tillering stage to grain hardening stage.

Keywords: Survey, occurrence, rice, sheath, blight, growing

Introduction
Rice is the most important food crop in the world, feeding more people than any other crop. It is the staple food across Asia. Rice being a tropical plant, it can flourish in hot and humid climate. It can be grown in assured irrigated areas and in rain fed areas where assured annual rainfall is received. Hence, it can be grown in both *Kharif* & *Rabi* seasons. Rice is attacked by a number of fungal, bacterial and viral diseases. The major diseases have become more aggressive and spread to new areas. Rice sheath blight disease is regarded as an internationally important disease. Sheath blight is a soil borne disease caused by the fungus *Rhizoctonia solani* Kuhn AG1-IA. This disease causes significant grain yield and quality losses. The yield losses due to the sheath blight disease range from 25 to 51.6 per cent (Rajan, 1987) [1].
Studies on the occurrence of disease in an area can offer an idea on current status of the disease in the various growing zones which is essential to take decision regarding management of the disease. (Gangopadhyay and Chakrabarti 1982) [2]. In India, it was first reported in Punjab, and later in Uttar Pradesh. Further, the disease was reported in Tamil Nadu, Kerala, Andhra Pradesh and Kashmir (Reddy and Reddy, 1986) [3]. Disease was spread widely in terms of both occurrence and intensity over the past twelve years. It has become more prevalent on the improved varieties *viz.*, BPT 5204, JGL1798, JGL 384, Swarna, MTU1010, MTU1061 and MTU1075 (Prakasam *et al.*, 2013) [4]. Therefore, the present survey was led in major rice growing regions of Andhra Pradesh to know the incidence of sheath blight in various agro-ecosystems, cropping systems, rice varieties and agronomic practices in the condition that is a prerequisite to make a decision on disease management practices.

Material and Methods
A roving survey for the occurrence and distribution of rice sheath blight disease was conducted in major paddy growing areas of Andhra Pradesh during *Kharif* 2019.-20. Farmers' fields were selected at random in different mandals of West Godavari, East Godavari, Nellore, Y.S.R. Kadapa and Chittoor districts. In each district two mandals and from each mandal three villages were selected at random. In each village five fields were randomly selected. From each field, five one square meter areas were selected at random on diagonal line of the field for estimation of sheath blight incidence.

Data was recorded for sheath blight disease incidence and was expressed in percentage.

$$\text{Per cent disease incidence} = \frac{\text{Number of infected plants}}{\text{Total number of plants observed}} \times 100$$

Rice plants showing typical sheath blight disease symptoms were collected from the fields of different mandals in West Godavari, East Godavari, Nellore, Y.S.R. Kadapa and Chittoor districts and pathogen was isolated from samples by tissue segment method (Rangaswami and Mahadevan, 1999) [5]. Leaf sheaths showing typical symptoms were washed in tap water and made into leaf bits of 3-8 mm size. Leaf bits were surface sterilized with 1% sodium hypochloride for one minute and then rinsed with sterile distilled water thrice to remove the traces of sodium hypochloride. These leaf bits were then transferred to potato dextrose agar medium in petriplates and incubated at 28 ± 2 °C. When the growth of the fungus from the leaf bits was seen on the PDA surface, the culture was purified by single hyphal tip method and pure culture was maintained on PDA by regular sub culturing at frequent intervals. Koch's postulates were proved for all isolates in pot culture studies during *kharif* -2019 by using typha bit inoculation method (Bhaktavatsalam *et al.*, 1978) [6].

Results and Discussion

The survey data is presented in the table 1. The data indicated that among all the locations the per cent disease incidence ranged from 11.31 to 45.66 percent. Highest per cent disease incidence was observed at Penumanchili village (45.66%) followed by Alamuru (44.14%). Moderate disease was recorded at Vubalanka (29.30%), Jagannadapuram (29.03%), Koderu (27.25%), Madhavaram (27.05%), Ravulapalem (26.33%), Madiki (26.19%), Achanta (25.76%), Gopalapuram (25.68%), Tadepalligudem (25.49%) and Modukuru (25.08%). Lower disease incidence was recorded at Akkurthi (14.72%), pellakur (13.72%), Kothuru (13.41%), Padikalva (13.27%), Chembedu (13.21%), Kakupalli (12.46%), Ambapuram (12.41%), Valluru (12.30%), Ammapalem (12.27%), Lachampalle (12.0%), Pangur (11.97%), Yerpedu(11.83%), Dammanapalle (11.76%), Amancherla (11.73%), Srikalahasti (11.70%), Kandadu (11.70%), and Siddavaram (11.51%). Lowest disease incidence was recorded at Koppolu (11.31%). Highest disease incidence was recorded in West Godavari district and lowest in YSR Kadapa district.

Table 1: Survey for the occurrence and distribution of sheath blight of rice in major rice growing areas of Andhra Pradesh during *Kharif*, 2019-2020

S. No	District	Mandal	Village	Latitude, Longitude	Soil Type	Cropping Pattern	Present Crop variety	Farming Situation	% disease incidence
1	West Godavari	Achanta	Penumanchili	N16^{0}34'58.27404" E81^{0}49'1.70976"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	**45.66**
			Achanta	N16^{0}35'33.86076" E81^{0}48'32.25996"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	25.76
			Koderu	N16^{0}36'17.82612" E81^{0}50'24.08964"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	27.25
		Tadepalli gudem	Jagannadapuram	N16^{0}42'32.796" E81^{0}27'48.9672"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	29.03
			Madhavaram	N16^{0}53'26.1888" E81^{0}35'34.9548"	Clay loam	Paddy+Paddy+Pulse	MTU 1010	Irrigated	27.05
			Tadepalligudem	N16^{0}48'26.1072" E81^{0}31'53.7708"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	25.49
2	East Godavari	Ravulapalem	Ravulapalem	N16^{0}44'16.7982" E81^{0}50'1.7394"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	26.33
			Vubalanka	N16^{0}46'40.188" E81^{0}49'24.708"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	29.30
			Gopalapuram	N16^{0}42'22.482" E81^{0}48'58.7412"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	25.68
		Alamuru	Alamuru	N16^{0}47'25.2924" E81^{0}52'38.05572"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	44.14
			Modukuru	N16^{0}50'19.6584" E81^{0}52'27.1164"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	25.08
			Madiki	N16^{0}51'15.2784" E81^{0}49'55.1964"	Clay loam	Paddy+Paddy+Pulse	MTU 7029	Irrigated	26.19
3	Nellore	Nellore	Kakupalli	N14^{0}23'25.9116" E80^{0}1'36.9984"	Clay loam	Paddy+Paddy+Paddy	MTU1010	Irrigated	12.46
			Ambapuram	N14^{0}24'58.518" E79^{0}55'19.4484"	Clay loam	Paddy+Paddy+Paddy	NLR 34449	Irrigated	12.41
			Amancherla	N14^{0}24'48.1212" E79^{0}51'17.5752"	Clay loam	Paddy+Paddy+Paddy	BPT5204	Irrigated	11.73
		Pellakur	Kothuru	N13^{0}49'50.99232" E79^{0}48'4.09284"	Clay loam	Paddy+Paddy+Paddy	NLR34449	Irrigated	13.41
			pellakur	N13^{0}49'49.944" E79^{0}48'34.74"	Clay loam	Paddy+Paddy+Paddy	NLR34449	Irrigated	13.72
			Chembedu	N13^{0}48'45.1836" E79^{0}49'26.6592"	Clay loam	Paddy+Paddy+Paddy	NLR34449	Irrigated	13.21
4.	YSR Kadapa	Valluru	Padikalva	N14^{0}31'20.064" E78^{0}38'46.5252"	Clay loam	Paddy+ sesamum	NLR34449	Irrigated	13.27
			Valluru	N14^{0}33'33.4548" E78^{0}43'20.8812"	Clay loam	Paddy+ sesamum	NLR34449	Irrigated	12.30
			Koppolu	N14^{0}33'22.374" E78^{0}42'38.7828"	Clay loam	Paddy+ Groundnut	NLR34449	Irrigated	11.31
		Porumammila	Lachampalle	N15^{0}6'41.1624"	Clay	Paddy+Groundnut	NLR34449	Irrigated	12.0

				E79^{0}0’38.9556”	loam				
			Dammanapalle	N15^{0}1’47.7768” E78^{0}59’37.9032”	Clay loam	Paddy+Groundnut	NLR34449	Irrigated	11.76
			Siddavaram	N14^{0}57’37.9692” E79^{0}2’51.2016”	Clay loam	Paddy+Sunflower	NLR34449	Irrigated	11.51
5.	Chittoor	Srikalahasthi	Srikalahasti	N13^{0}45’9.774” E79^{0}42’24.0192”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	11.70
			Akkurthi	N13^{0}47’49.5672” E79^{0}40’7.6944”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	14.72
			Ammapalem	N13^{0}43’11.6328” E79^{0}40’39.2664”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	12.27
		Yerpedu	Yerpedu	N13^{0}42’4.734” E79^{0}35’33.54”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	11.83
			Kandadu	N13^{0}38’26.2104” E79^{0}37’37.38”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	11.70
			Pangur	N13^{0}45’53.6796” E79^{0}35’59.8488”	Clay loam	Paddy+Paddy	MTU1010	Irrigated	11.97

Conclusion

The variation in disease incidence may be related to differences in variety grown, time of planting, soil type, fertilizer dosage and weather conditions relative humidity, low temperature and water stagnation due to continuous rain on these locations during the period of survey.

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