

Survey for the Occurrence of *Corynespora* Leaf Spot of Cotton in Guntur District of Andhra Pradesh

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ABSTRACT

Corynespora leaf spot of cotton is caused by *Corynespora cassiicola*. The disease attacks leaves, stems, squares and bolls. Leaf lesions are round to irregular in shape, reddish brown in color and are frequently surrounded by a dull green or yellowish green halo. An intensive disease survey on *Corynespora* leaf spot of cotton was undertaken at different growth stages in major cotton growing villages of Guntur district viz., Lam, Badepuram, Pedaparimi, Tadikonda, Mothadaka, Lemalle, Endroyi, Neerukonda, Parimi and Nidumukkala during *Kharif* 2021-22. The highest mean Per cent Disease Index (PDI) of *Corynespora* leaf spot was recorded in Endroyi village (26.25) whereas the lowest mean PDI in Neerukonda village (15.58).

Keywords: *Corynespora* leaf spot, cotton and survey.

Cotton (*Gossypium* spp.) belongs to the botanical family Malvaceae, is an important fiber crop cultivated worldwide and it is one of the most important commercial crops of India. It plays a dominant role in the economy as of textile industry. Fulmer *et al.* (2012) reported target spot caused by *Corynespora cassiicola* on cotton for the first time in Georgia and from different parts of the world (Jones, 1961; Fulmer *et al.*, 2012, Price *et al.*, 2015 Austin and Kira, 2018). It affects leaves, stems, squares and bolls and severely affected leaves drop prematurely (Sinclair, 1982). In India, it was first reported from the Junagadh district of Gujarat in cotton Hybrid-4 and Hybrid-6 during 1984-1985 (Parakhia *et al.*, 1989). In Andhra Pradesh *Corynespora* leaf spot has dominated *Alternaria* leaf spot in recent years and emerged as major leaf spot in cotton (ICAR - AICRP 2020). In view of the increasing occurrence

of this disease roving survey was conducted to observe the intensity of disease.

MATERIAL AND METHODS

An intensive disease survey on cotton *Corynespora* leaf spot was undertaken at different growth stages *i.e.*, squaring stage, boll initiation stage, boll maturity stage in major cotton growing villages of Guntur district viz., Lam, Badepuram, Pedaparimi, Tadikonda, Mothadaka, Lemalle, Endroyi, Neerukonda, Parimi and Nidumukkala during *kharif* 2021-22. For recording disease severity, random sampling technique was adopted to select the field in each village and in each field, 10 plants in the central rows, leaving border rows were selected randomly and tagged to record the occurrence of *Corynespora* leaf spot. Severity of the disease was recorded three times during the crop period using 0-4 scale given by Sheo Raj (1988):

Descriptive scale for *Corynespora* leaf spot of cotton (Sheo Raj, 1988)

Scale	Percent of leaf area infected
0	No infection
1	Few spots of less than 2 mm size, leaf area covering less than 5%
2	Spots of 3 mm size, covering 6-20% of leaf area
3	Spots of 3-5 mm size, irregular in shape coalesce and covering 21-40% of leaf area.
4	Spots covering more than 40% of leaf area

Depending on the scores collected, per cent disease index (PDI) was calculated by using the formula of Wheeler (1969):

$$\text{PDI} = \frac{\text{Sum of numerical ratings}}{\text{Total number of leaves scored} \times \text{maximum rating}} \times 100$$

Table 1. Prevalence of *Corynespora* leaf spot caused by *C. cassiicola* in major cotton growing areas of Guntur district

S. No	Village	Coordinates	Mean Percent Disease Index (PDI)				BG II Cotton Hybrid
			Square initiation stage	Boll initiation stage	Boll maturity stage	Village mean	
1	Lam	16.405266N	11.25	17	21.25	16.5	RCH 659
		80.422103E					
2	Badepuram	16410163N	21.5	24.5	29	25	Jaadoo
		80.423398E					
3	Pedaparimi	16.484347N	12	17.75	24.5	18.08	Siri
		80.45952E					
4	Tadikonda	16.41667N	14.5	20	26	20.17	Jaadoo
		80.45417E					
5	Mothadaka	16.463669N	12	21	24	19	Siri
		80.410615E					
6	Lemalle	16.498204N	12.25	14.5	24.5	17.1	Akira
		80.385256E					
7	Endroyi	16.507404N	18	28.75	32	26.25	Akira
		80.380865E					
8	Neerukonda	16.4630422N	8.5	18	20.25	15.58	Ujjwal
		80.4993153E					
9	Parimi	16.27487N	12.5	21.5	28.25	20.75	Jaadoo
		80.27182E					
10	Nidumukkala	16.432929N	10.75	19.25	22.75	17.17	Jaadoo
		80.409496E					
	District Mean		13.33	20.23	25.25		

Table 2. Prevalence of *Corynespora* leaf spot caused by *C. cassiicola* at different growth stages in cotton growing areas of Guntur district

Growth stage	Disease range (PDI)	Mean PDI
Square initiation stage	8.50 – 21.50	13.33
Boll initiation stage	14.50 – 28.75	20.63
Boll maturity stage	20.25 – 32.00	25.95

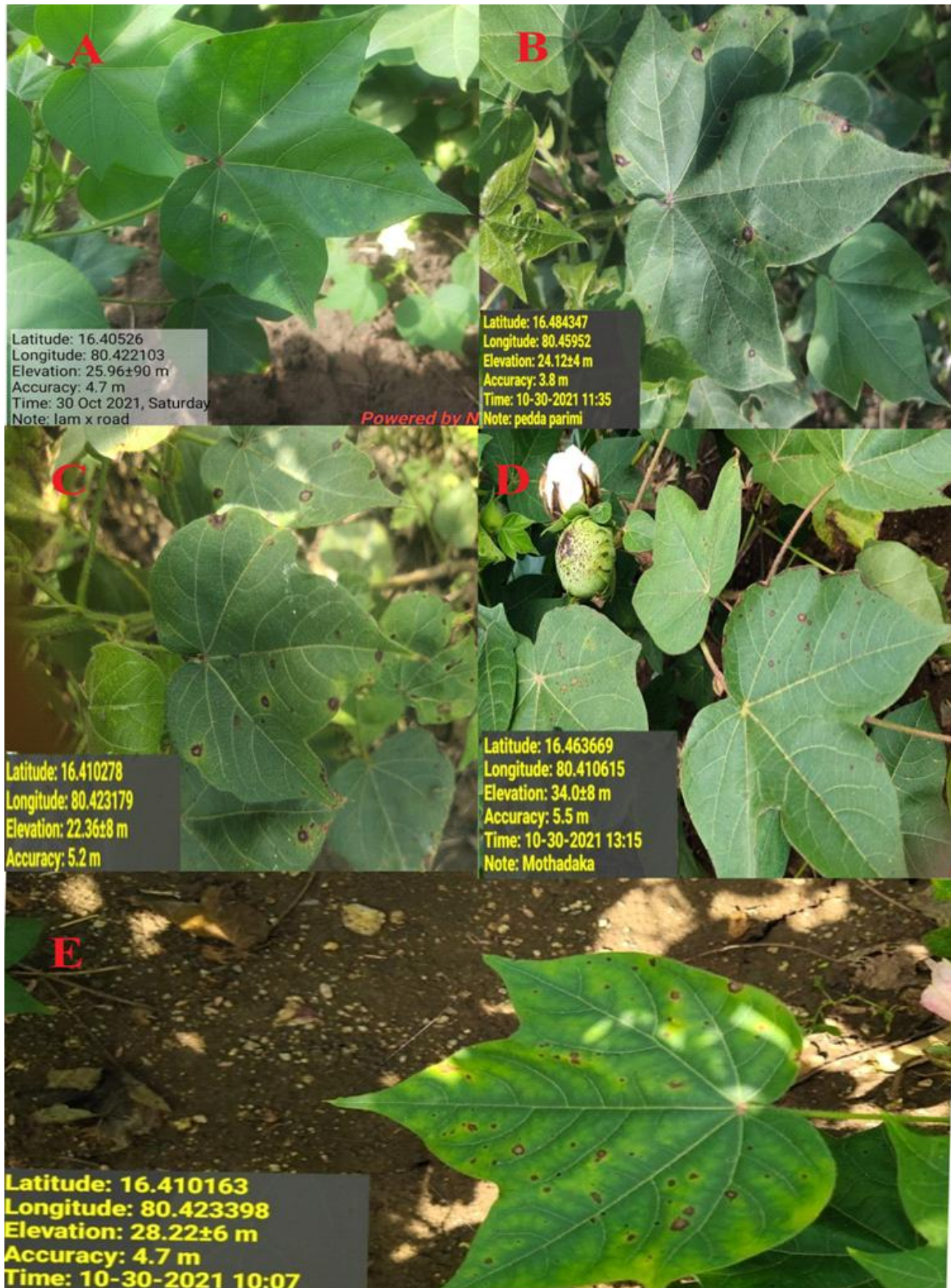


Fig 1a. Symptoms of *Corynespora* target spot on cotton under fields of Guntur district A-Lam, B-Pedaparimi, C-Tadikonda, D-Mothadaka, E- Badepuram.

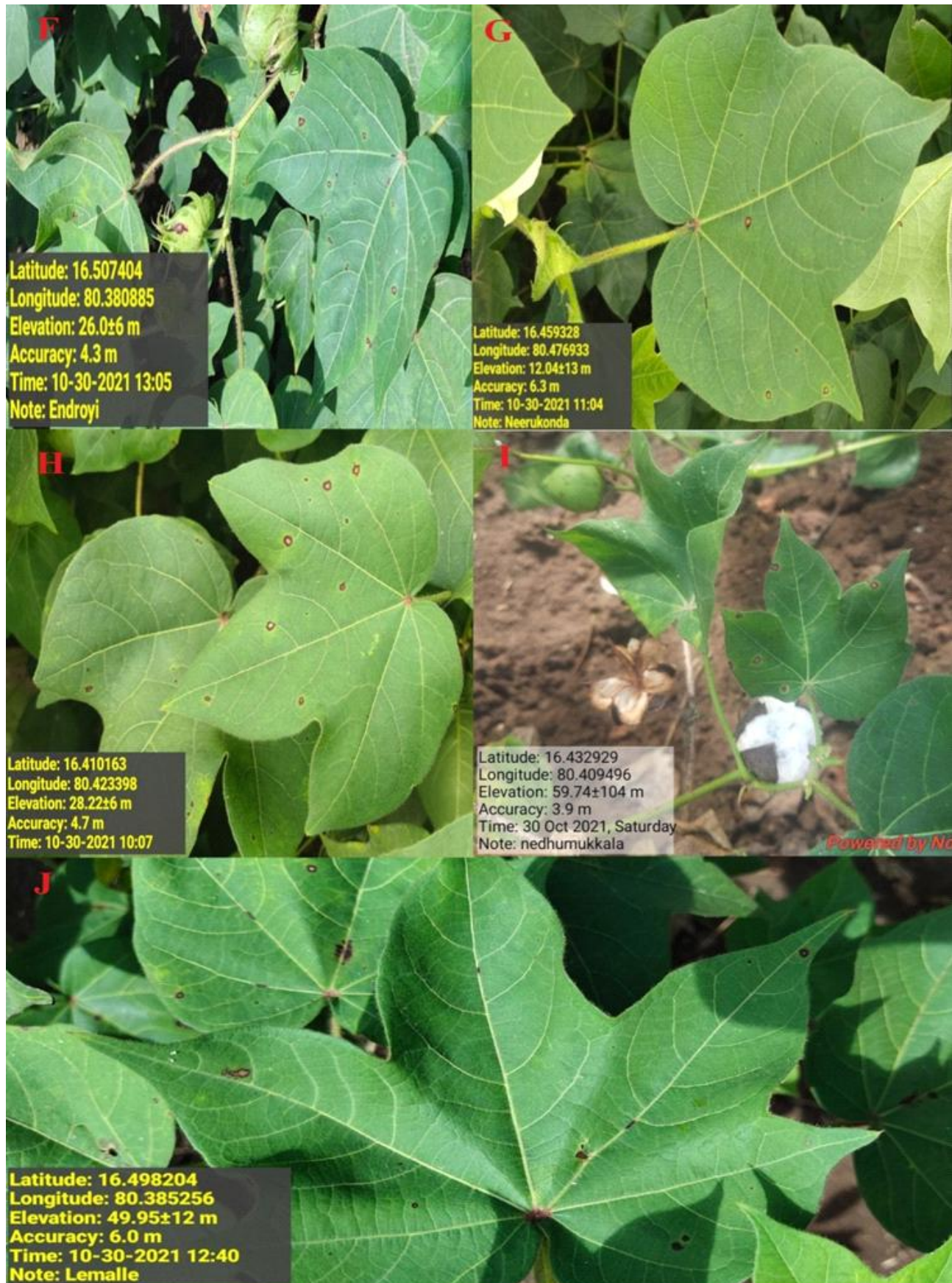


Fig 1b. Symptoms of *Corynespora* target spot on cotton under fields of Guntur district F-Endroyi, G-Neerukonda, H-Parimi, I-Nedhumukkala, J- Lemalle.



Fig 2a. Pure culture of isolated *Corynespora cassiicola*

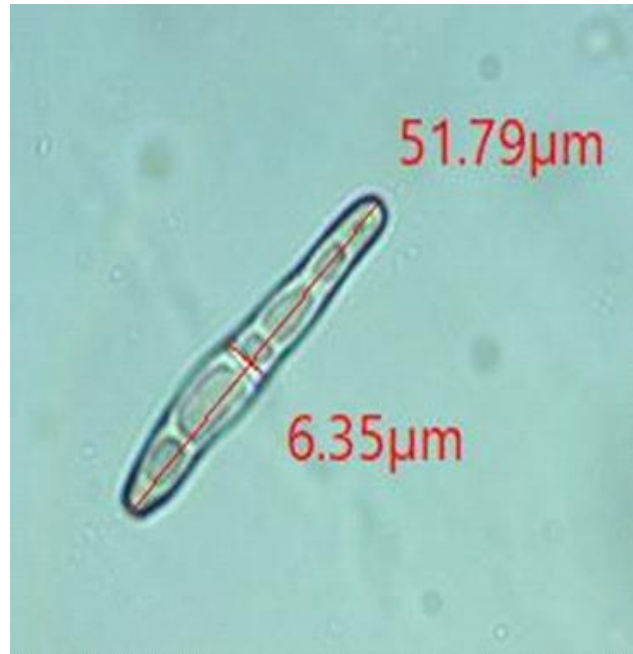


Fig 2b. Microscopic view of *Corynespora cassiicola* conidia

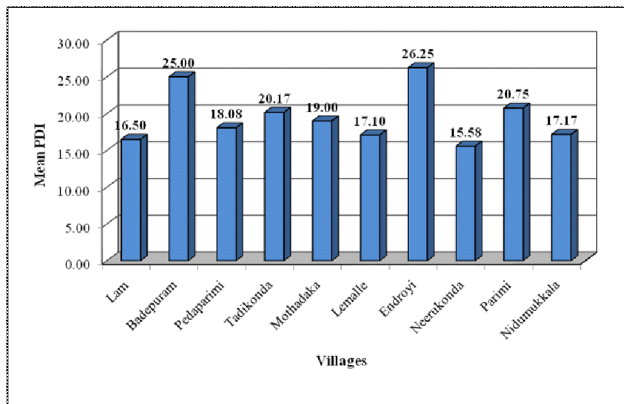


Fig 3. Per cent Disease Index of Cotton *Corynespora* leaf spot in different villages

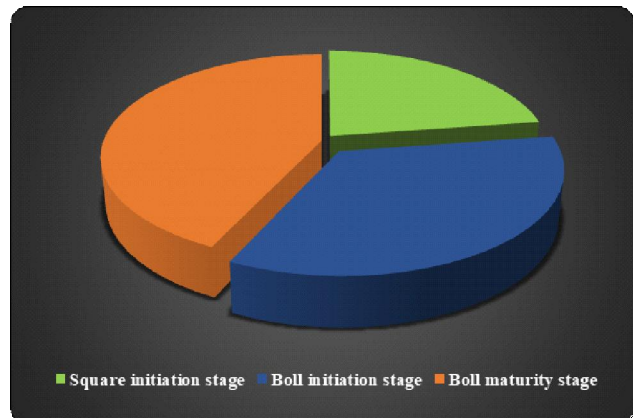


Fig 4. Prevalence of cotton *Corynespora* leaf spot at different growth stages

RESULTS AND DISCUSSION

Target spot severity prevailed in all the ten villages of Guntur district surveyed (Fig. 1a and 1b). Per cent disease index (PDI) ranged from 8.5 (Neerukonda) to 21.5 (Badepuram) at square initiation stage. At boll initiation stage among the ten villages surveyed, PDI was recorded to be high in Endroyi village (28.75) while the least PDI was recorded in Lemalle village (14.5). At boll maturity

stage the per cent disease index (PDI) ranged from 20.25 (Neerukonda) to 32.0 (Endroyi) in Guntur district. Among the different villages surveyed in Guntur district, the mean highest PDI was recorded in Endroyi village (26.25) while the lowest was recorded in Neerukonda village (15.58) (Table 1 and Fig 3). In Guntur district on an average 13.33 PDI of *Corynespora* leaf spot at square initiation stage, 20.63 at boll initiation stage and 25.95 at boll maturity stage

was observed. (Table 2 and Fig 4). When the pathogen was pure cultured and grown on PDA, the culture was grey to light olive green in initial stage and turned to dark grey during later stages. The mycelium was fibrous in nature (Fig. 2a). Microscopic examination revealed 5 to 8 pseudosepta containing hyaline conidia. Based on symptoms and pathogen characters it can be concluded that the disease in surveyed area is associated with *C. cassiicola* (Fig. 2a and 2b). Further it may be observed that in hybrids Ujjwal BG II (14.42%) RCH 659 BG II (16.50%), the PDI was comparatively lower than Akira BG II (20.17% to 31.08%) , Jaadoo BG II (17.17% to 23.75%) and Siri BG II (18.17%) (Table 1).

Divyamani *et al.* (2019) reported the severity of *Corynespora* leaf spot to vary from five to 33% at field level. Yamuna *et al.* (2019) observed 3.0 to 5.0 per cent disease index of *Corynespora* leaf spot at boll maturity and boll bursting stages, respectively, when the disease was assessed at RARS, Lam, Guntur, Andhra Pradesh. during *kharif*, 2018. *Corynespora* leaf spot was recorded to the tune of 40.0 PDI during the survey from August 2019 to January 2020, in cotton growing mandals of Guntur, Krishna and Prakasam districts in Andhra Pradesh (ICAR-AICRP on Cotton, 2020) and up to 29.75 PDI during July to December 2021 (ICAR-AICRP on Cotton, 2021). Siva Prasad (2022) conducted a survey for the prevalence of target spot in cotton during *kharif*, 2019-2020 in major cotton growing districts of Andhra Pradesh and reported that highest PDI was recorded in Guntur district (50.9).

CONCLUSION

Based on the present study, it can be concluded that *Corynespora* leaf spot of cotton prevailed in all the surveyed villages of Guntur district. Observations revealed an increasing trend in PDI of

Corynespora leaf spot from square initiation stage to boll maturity stage in Guntur district.

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