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Survey for the assessment of incidence of stem rot and collar rot diseases of groundnut in major groundnut growing areas of Andhra Pradesh and Telangana States

V. Divya Rani[1], Hari Sudini[2], P. Narayan Reddy[1], G. Uma Devi[1] and K. Vijay Krishna Kumar[3]

[1]Professor Jayashankar Telangana State Agricultural University, Hyderabad, TG, India
[2]International Crops Research Institute for Semi-Arid Tropics, Patancheru, Hyderabad, India
[3]Acharya N G Ranga Agricultural University, Andhra Pradesh, India

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ABSTRACT

A survey was conducted in major groundnut growing areas of Andhra Pradesh during kharif 2012 and in Telangana during rabi 2012-13 respectively to assess the distribution and the incidence of collar rot and stem rot diseases. Groundnut cultivar Kadiri-6 (K-6) is the prominent cultivar in all the districts surveyed. The highest incidences of stem rot and collar rot were observed in Chittoor district of Andhra Pradesh. Whereas, lowest incidences of stem rot and collar rot were observed in Mahaboobnagar and Warangal districts respectively.

Key words: Survey, Stem rot, Collar rot, Disease incidence

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop [1]. A large number of diseases attacks groundnut in India [2], [3]. In India Gujarat, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu are the highest producers of groundnut. Groundnut is an important food and cash crop in these states. However, the yield of groundnut is reducing day by day because of various biotic and abiotic factors. Among the biotic factors diseases are the most important constraints for the yield reduction. The majority are caused by fungi and several of them are yield reducers in certain regions and seasons [4]. Among these soil borne diseases caused by fungi play a major role in the disease reduction. Several surveys indicated that soil borne diseases are the major cause for poor yields in these states.

MATERIALS AND METHODS

Survey was conducted in major groundnut growing areas of Anantapur and Chittoor districts of Andhra Pradesh during *kharif* 2012. In Anantapur district, survey was conducted in groundnut fields where the crop was grown particularly under rain fed conditions. Whereas, in Chittoor, survey was conducted in both rainfed and irrigated groundnut fields. The survey periods were *rabi* 2012-‘13 in Mahaboobnagar and Warangal districts of Telangana state. In both these districts, groundnut crop was grown under irrigated conditions. From each district, four predominant groundnut growing mandals, from each mandal four villages (three fields in each village) were chosen for disease assessment.

The per cent disease incidence in these areas was calculated using following formula

$$\text{Per cent Disease Incidence} = \frac{\text{Number of infected plants}}{\text{Total number of plants}} \times 100$$

RESULTS AND DISCUSSION

Stem rot (*Sclerotium rolfsii*)
The stem rot incidence ranged from 4% (Lingala mandal of Mahaboobnagar district) to 12.8% (Ramachandrapur mandal of Chittoor district). (Table 1)

The disease incidence was high in Chittoor (10.06%) district followed by Anantapur (8.75%), Mahaboobnagar (7.75%) and Warangal (7.42%). In Anantapur stem rot incidence ranged from 6% (Singanamala mandal) to 11.1% (Mudigubba mandal) in 24 villages spread over in six mandals of the district. The stem rot incidence ranged from 8.96 per cent in Chandragiri mandal to 12.8 per cent in Ramachandrapuram mandal in 16 villages spread over in four mandals of the Chittoor district. Similarly in Mahaboobnagar the disease incidence ranged from 4 % (Lingala mandal) to 10 % (Balmoor mandal) in 20 villages of five surveyed mandals, wherein, Warangal district the stem rot disease ranged from 5% (Torrur) to 9.1 % (Sangem mandal) in 16 villages across the four mandals.

Collar rot (*Aspergillus niger*)
The collar rot incidence varied from 1 per cent (Parvatagiri mandal of Warangal) to 23.71 per cent (Tirupati mandal of Chittoor). Collar rot incidence was highest in Chittoor district (16.82%) followed by Anantapur (6.43%), Mahaboobnagar (6.25%) and Warangal (2.62%) district. In Anantapur district the collar rot disease incidence ranged from 5.6 per cent (Singanamala) to 8 per cent (Nallacheruvu). In Chittoor district the disease incidence ranged from 10.6 per cent (Ramachandrapuram) to 23 per cent (Tirupati), wherein Mahaboobnagar district the disease incidence ranged from 3 per cent (Achampet) to 7 per cent (Balmoor), whereas, in Warangal incidence ranged from 1 per cent (Parvathagiri) to 5 per cent (Sangem).

Soilborne diseases in groundnut often cause significant yield losses. This is true in groundnut crop growing areas of Andhra Pradesh and Telangana where severe pod losses were reported earlier [7]. Comprehensive knowledge on the incidence and severity of collar rot and stem rot diseases is essential in devising area-wise control measures to these hitherto difficult to manage diseases. The results of the present study indicated that the disease incidence of collar rot and stem rot was high (16.82% and 10.06%) in Chittoor district of Andhra Pradesh because groundnut is grown as sole crop under irrigated conditions. However comparatively low incidence of both stem rot and collar rot in the surveyed areas of Telangana is attributable to the cropping systems in practice. In majority of the surveyed Telangana area, crop rotation of groundnut (*rabi*) with maize and rice (as a preceding crop in *kharif*) is in practice.

Further flare-ups of these diseases are more in ensuing crop season, because of the soilborne nature of these diseases. Similarly in Anantapur district monocropping of groundnut is in practice over a large area resulting in high incidence of stem rot and collar ort reaching to alarming levels. Therefore, in areas where groundnut monocropping is practiced, comprehensive strategies are to be implemented in managing these soil borne diseases.

In previous survey carried out by [7] of ICRISAT during *kharif* 1999, it was observed that collar rot and stem rot diseases were most prevalent in A.P (inclusive Telangana), Karnataka and Tamil Nadu. It was observed that stem rot disease incidence was up to 27 per cent (Kurnool), 25 per cent (Kadapa) 15 per cent (Anantapur), 18 per cent (Mahaboobnagar) and 10 per cent (Chittoor) at near crop maturity stage. Similarly, collar rot disease was observed up to maturity stage but the disease was more prevalent in the seedling stage and the disease was up to 9 per cent (Mahaboobnagar and Chittoor), 10 per cent (Kurnool) and 8 per cent (Anantapur and Kadapa). Collar rot incidence in Chittoor district of AP during *kharif* 2012 caused up to 20 per cent yield losses. The disease incidence was 11.2 per cent in Srikalahasti mandal, 9 per cent in Renigunta mandal, 7.4 per cent in Ramachandrapuram mandal and 6.5 per cent in Chandragiri mandal [6]. The collar rot disease is a serious problem in sandy loam and medium black soils of Punjab, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Rajasthan, Orissa, Madhya Pradesh, Karnataka, Maharashtra, Gujarat and Haryana. Further, it was also observed that this disease is more prevalent during rainy season than in post-rainy season [5].

Table 1. Collar rot and Stem rot disease incidence in major groundnut growing areas of Andhra Pradesh and Telangana

District	Location /Mandal	Per cent disease incidence	
		Collar rot	Stem rot
Chittoor	Tirupati	23.71*	9*
	Chandragiri	20.5	8.96
	Ramachandrapuram	10.6	12.8
	Vadamalapet	12.5	9.5
	Mean	**16.82**	**10.06**
Anantapur	Kadiri	6	7.3
	Nallacheruvu	8	10
	Nallamada	6	8.1
	Mudigubba	7	11.1
	B.K. Samudram	6	10
	Singanamala	5.6	6
	Mean	**6.43**	**8.75**
Mahaboobnagar	Achampet	3	6
	Addakal	6	7
	Ieja	5	8
	Balmoor	7	10
	Lingala	4	4
	Mean	**5**	**7**
Warangal	Zafargadh	2.5	7.1
	Torrur	2	5
	Parvathagiri	1	8.5
	Sangem	5	9.1
	Mean	**2.62**	**7.42**

** Data is the mean of four villages*

CONCLUSION

Survey results indicated that, stem rot as well as collar rot incidence was high in Chittoor district (10.06% and 16.82%) followed by Anantapur (8.75% and 6.43%), Mahaboobnagar (7.75% and 6.25%%) and Warangal (7.42% and 2.42%). It was observed that the stem rot incidence was slightly high in Anantapur, Mahaboobnagar and Warangal whereas, collar rot incidence was poor.

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