

Original Research Article

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Survey for the Assessment of Groundnut Collar Rot Disease Incidence in Major Groundnut Growing Areas of Jodhpur, Rajasthan, India

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ABSTRACT

Keywords

Survey, Groundnut, Collar rot, Disease incidence

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A survey was conducted in major groundnut growing areas of different tehsil of Jodhpur district, Rajasthan during *kharif* 2019 to assess the distribution and the incidence of collar rot diseases. The highest incidences of collar rot were observed in Phalodi (15.31 %). Whereas, least collar rot incidence was observed (10.0%) in Tewari. The overall average disease incidence of the Jodhpur district was (12.43%) based on 125 fields surveyed in cropping season 2019.

Introduction

Groundnut (*Arachis hypogaea* L.) is an important and most widely grown food legume crop of both tropics and sub-tropics of the world, belonging the family leguminosae and sixth most important oilseed crop in the world. Groundnut kernels contain 48-50% of edible oil and 26-28% protein, along with rich dietary fibre, minerals and vitamins (Ntare *et al.*, 2008). China is the largest producer as well as consumer of groundnut in the world with 16.62 mt followed by India (6.7 mt), Nigeria (3.02 mt) and United States (2.57 mt) annually. India is first position in term of area and second in production. The Major

groundnut growing states of India are Gujarat, Andhra Pradesh, Rajasthan, Tamil Nadu and Punjab.

The groundnut was cultivated in 4.8 m ha area with 6.7 mt production having 1395 kg/ha productivity. (Directorate of Economics and Statistics, Department of Agricultural, Cooperation and Welfare 2018-19).

In Rajasthan the area, production and productivity of groundnut was 0.73 m ha, 1.56 mt and 2131 kg/ha, respectively. The major groundnut growing districts in Rajasthan are Bikaner, Jaipur, Sikar, Churu, Dausa, Udaipur and Nagaur.

(Commissionerate of Agriculture, Rajasthan – Jaipur, 2019). The crop suffers from more than 50 pathogens including fungi, bacteria, viruses and nematodes (Grover, 1981) However, only a few are economically important in India, such as early and late leaf spot (*Cercospora arachidicola* & *C. personata*), collar rot (*Aspergillus niger* van Tieghem), rust (*Puccinia arichidis*), stem rot (*Sclerotium rolfsii* Sacc.), afla root (*Aspergillus flavus*), root rot (*Macrophomina phaseolina*) diseases.

Nematode diseases like root knot and viral diseases like peanut bud necrosis, peanut stem necrosis, groundnut mottle and clump (Ghewande *et al.*, 1986).

Aspergillus niger van Tieghem causing collar rot disease on groundnut seedlings was first reported by Jochem (1926) and in India it was reported by Jain and Nema (1952) as *Aspergillus* blight.

The annual yield losses due to collar rot alone are approximately 5 %, the disease has a potential to damage the crop with 40% losses (Bakhetia, 1983). Losses due to pre-emergence phase of the disease are up to 15%, whereas post-emergence phase accounts to 2% losses (Rasheed *et al.*, 2004).

In India, the losses may account to 40 to 50 % in terms of seedling mortality due to *A. niger* (Ghewande *et al.*, 2002). Many seed dressing fungicides are effective against collar rot of groundnut (Gangopadhyay and Bhatia, 1996; Karthikeyan, 1996). *Trichoderma* spp. also used as biological control agent against most of soil-borne plant pathogenic fungi (Kucuk and Kivank, 2003).

Materials and Methods

Weekly survey of ground nut collar rot was carried out at five Tahsil *viz.* Balesar, Tewari,

Lohawat, Phalodi and Osian of Jodhpur district to study the incidence of collar rots, from second week of July to fourth week of October during *Kharif* 2019 (Table 1). At each Tahsil five villages situated in different geographical directions and five fields per village were selected.

The each village/field selected for disease incidence, an area of 1×1m² was marked diagonally across the field at five spots on each farmer's field and percent disease incidence (PDI) was calculated by counting the diseased and the total number plant per spot.

The plant showing collar rot symptoms was considered as a diseased plant. During survey, personal discussions were also held with the cultivators regarding occurrence and severity of the disease, agronomic practices and field history.

The per cent disease incidence was calculated by using the following formula:

$$\text{Percent disease incidence} = \frac{\text{Number of infected plant}}{\text{Total number of plant}} \times 100$$

Results and Discussion

The average collar rot incidence in different Tahsil of Jodhpur district varied from (10.0 to 15.31%). In Phalodi disease incidence was maximum (15.31%) followed by Osian (13.43%), Lohawat (12.90%) followed by Balesar (10.55%) and least collar rot incidence was observed (10.0%) in Tewari.

However, the disease incidence was recorded (10.0 to 15.31%) in Tahsil of Jodhpur district, respectively (Table 1 and Fig. 1–3). The overall average disease incidence of the Jodhpur district was (12.43%) based on 125 fields surveyed in cropping season 2019.

Table.1 Incidence of groundnut collar rot disease, Jodhpur, Rajasthan in *Kharif* 2019

Sample No.	Isolate No.	Districts	Tahsil	Village	% Disease Incidence	Average
1.	JU-01	Jodhpur	Balesar	Sukhmadla	12.71	10.55
				Lorta	11.45	
				Belwa	11.45	
				Dewasu	10.57	
				Bastawa	6.59	
2.	JU-02	Jodhpur	Tewari	Mathania	6.42	10.0
				Gewada	10.78	
				Indroka	8.51	
				Narwa	12.69	
				Manaklav	11.57	
3.	JU-03	Jodhpur	Lohawat	Pilawa	16.92	12.90
				Sadri	13.91	
				Dechu	10.84	
				Kushlawa	5.93	
				Sagra	16.92	
4.	JU-04	Jodhpur	Phalodi	Mukeri	21.92	15.31
				Mandala kala	16.15	
				Sawrij	15.96	
				Aeka Sageri	11.86	
				Bengti	10.67	
5.	JU-05	Jodhpur	Osian	Bhikamkhor	9.87	13.43
				Hanuman Sagar	10.87	
				Harlaya	18.43	
				Padasala	13.34	
				Bhad	14.65	

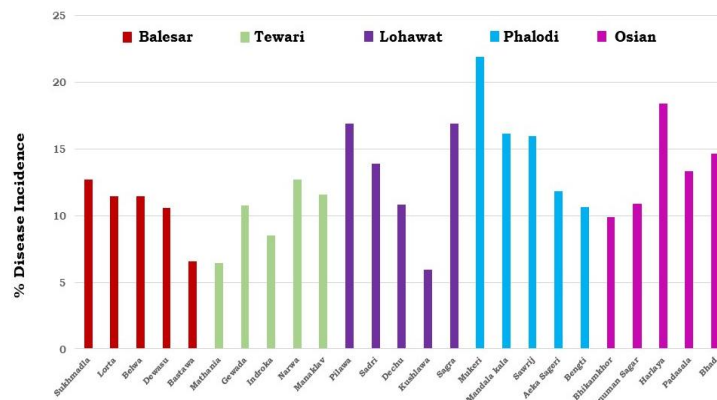
Fig.1 View of groundnut collar rot infected field



Fig.2 View during the survey program



Fig.3 Incidence of groundnut collar rot disease, Jodhpur, Rajasthan



In conclusion the field surveys were made on the status of collar rot in the major groundnut growing areas of Jodhpur district of Rajasthan the average collar rot incidence in different tehsil of district varied from 10.0 to 15.31 per cent.

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