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OCCURRENCE OF DRY ROOT ROT DISEASE OF CHICKPEA IN BIHAR

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ABSTRACT

Dry root rot caused by *Rhizoctonia bataticola* is a very destructive disease of chickpea. The incidence of the disease was observed regularly from 2007-08 to 2009-10 Rabi crop seasons at Pulses Research Centre, Mokama, Bihar and its nearby farmer's fields. It is one of the most common, widely distributed and destructive root and stem rot disease. The pathogen is a diverse; soil and seed borne pathogen causing stem and root rot symptoms in chickpea. Seedling blight, root rot and stem rot are the salient symptoms of dry root rot disease. Irregular and deep necrotic lesions in hypocotyls and root surfaces were observed and pith became hollow are the confirm symptoms. The incidence of the disease was found in considerable extent. The incidence of dry root rot was observed 1-10 per cent in genotype JG 315, 11-20 per cent in PG186, BG372 and BG 256 while JG 62 showed 21-30 per cent incidence.

Key words : Chickpea, dry root rot, Rhizoctonia bataticola, carbendazim.

Chickpea (*Cicer arietinum* L.) is grown mainly in the Indian subcontinent. Chickpea is an important cool-season grain legume of high nutritive value (Millan *et al.,* 2006). The crop has great nutrient significance particularly for protein requirement of vegetarian population and maintaining and restoring soil fertility. Chickpea plays an important role in maintaining soil productivity by fixing up to 141 kg N per ha (Rupela, 1987). In Bihar, chickpea area and production is lower than the nation average and shrinking day by day. Several biotic and abiotic factors are responsible for poor production of chickpea. Pulses Research Centre, Mokama is situated at MSL 144.6 m in Patna district and its tal area is famous for pulse production.

Dry root rot is one of the most common, widely distributed and destructive root and stem rot disease. Butler (1925) identified a similar sclerotial-bearing fungus and compared with isolates of Taubenhaus and named as *Rhizoctonia bataticola* (Taub.). It is a thermophilic fungus. Generally, dry root rot pathogen appears to be non-specific in nature and causes disease in sesame, maize, sorghum, soybean, sunflower and other economically important crops. It is responsible for huge losses every year in India (Sinclaire and Gray, 1972). Seedling blight, root rot and stem rot are the salient symptoms of dry root rot of soybean (Sinclair, 1982). Irregular and deep necrotic lesions in hypocotyls and root surfaces were observed in chickpea (Singh and Mehrotra, 1982). The pathogen is a diverse; soil and seed borne pathogen causing stem and root rot symptoms in chickpea. Seedling blight, root rot and stem rot are the salient symptoms of dry root rot disease. Irregular and deep necrotic lesions in hypocotyls and root surfaces were observed and pith became hollow are confirm symptoms.

The area under chickpea is gradually declining day by day in the tal area of Bihar. In Several abiotic and biotic factors are responsible for poor production of chickpea in the state. Among biotic stresses, a new and emerging problem of chickpea dry root rot disease was observed at research farm PRC, Mokama and its nearby farmer's field at regular incidence during consecutive years 2007-08 to 2009-10.

MATERIALS AND METHODS

The field experiment was carried out during Rabi season 2008-09 and 2009-10 at Pulses Research Centre, Mokama and also surveyed nearby farmers fields and recorded the incidence of chickpea stunt disease. Five genotypes namely JG 315, JG62, BG 256, BG372 and PG 186 were selected for conducting experiment to find out the incidence of the disease. Incidence of diseases was recorded from seedling stage to maturity stages. A longitudinal cut of stem showed pith hollow clearly revealed the presence of chickpea dry root rot disease.

The disease incidence was calculated by the following formula :

$$\text{Disease incidence (\%)} = \frac{\text{Number of diseased plant}}{\text{Total number of plant}} \times 100$$

Disease scale was measured by following the method given by AICRP on chickpea.

Table-1 : Disease grading scale.

Disease scale	Disease Incidence (%)	Disease Reaction
1	1-10	Resistant
3	11-20	Moderately Resistant
5	21-30	Moderately Susceptible
7	31-50	Susceptible
9	51-100	Highly Susceptible

RESULTS AND DISCUSSION

The incidence of chickpea dry root rot disease was observed in the experiment as well as in farmer's fields.

Table-2 : Incidence of chickpea dry root rot disease.

Disease scale	Disease incidence (%)	Genotype
1	1-10	JG315
3	11-20	PG186, BG372, BG 256
5	21-30	JG62
7	31-50	Nil
9	51-100	Nil

The incidence of chickpea dry root rot disease was recorded 1-10 per cent in genotype JG315 graded as resistant, 11-20 per cent in PG 186, BG 372 and BG256 and maximum incidence (21-30%) was recorded in JG62 (Table-2).

Present investigation showed the occurrence of chickpea dry root rot disease as an emerging threat in chickpea cultivation in Bihar.

REFRENCES

1. Millan,T. Clark, H.J. Siddique, K.H.M., Buhariwalla, H.K., Gaur, P.M., Kumar, J., Gil, J. and Winter, P. (2006). Chickpea molecular breeding: New tools and Concept, *Euphytica*, 14: 81-103.
2. Rupela, O.P. (1987). Nodulation and nitrogen fixation in chickpea (in) *The Chickpea*,. Pp.191-206.
3. Butler, E.J. (1925). Identification of the fungi. *Technical and Scientific Service Bulletin* (*Botanical Section*), 49: 64-65.
4. Sinclaire, J.B. and Gary, L.E. (1972). Three fungi that can reduce yields. *Dillinois Research*, 14: 5.
5. Sinclair, J.B. (1982). Compendium of soybean diseases 2nd edition *American Phytopathology Society: St. Paul*, pp. 104.
6. Singh, P.J. and Mehrotra, R.S. (1982). Penetration and invasion of gram roots by *Rhizoctonia bataticola. Indian Phytopathology*, 35: 336-338.