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CHICKPEA STUNT DISEASE IN BIHAR – A NEW REPORT

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ABSTRACT

Stunt disease of chickpea (*Cicer arietinum* L.) a new problem was observed during 2007-08 and 2008-09 crop seasons at Pulses Research Centre, Mokama, Bihar and its nearby farmer's fields. CpSd is caused by a phloem limited luteovirus named as Bean (Pea) leaf roll virus and transmitted by black aphid (*Aphis craccivora*). Diseased plants were easily identified in the field by yellow, orange or brown coloration of leaflets. Leaflets became small, thick and stiffer than normal and showed stunted growth of plant. Phloem browning is the most characteristic symptom of chickpea stunt disease. The incidence of stunt disease was recorded 1-10 per cent in genotype GCP105 graded as resistant. Disease incidence was 11-20 per cent in PBG 108, BG2088 and PG051 showed disease score graded as moderately resistant while BG 256 and BGD 1047 showed 21-30 per cent incidence and graded as moderately susceptible.

Key words : Chickpea, CpSd, phloem browning, black aphid.

Chickpea (*Cicer arietinum* L.) is an important cool-season grain legume of high nutritive value (Millan *et al.,* 2006). It is an important Rabi pulse crop of India. The crop has great nutrient significance particularly for protein requirement of vegetarian population and maintaining and restoring soil fertility. In addition to being an important item of human food and animal feed, chickpea also plays an important role in sustaining 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. Several biotic and abiotic factors are responsible for 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 and aptly called as 'Pulse bowl" of Bihar.

The area under chickpea is gradually declining day by day mainly in the northern states of the country. In Bihar, several abiotic and biotic stresses are responsible for lower production of chickpea. Among biotic stresses—A new problem of chickpea stunt disease was observed at research farm PRC, Mokama and its nearby farmer's field at considerable incidence during consecutive years 2007-08 to 2008-09. Chickpea stunt disease is caused by a phloem limited luteovirus named as Bean (Pea) leaf roll virus (Nene *et al*., 1976). Stunt disease of chickpea is transmitted by the vector black aphid (*Aphis craccivora*) (Reddy *et al* 2004).

Diseased plants were easily spotted in the field by their yellow, orange or brown discoloration and stunted growth than normal. Stunting of plant was found most conspicuous during early growth stage of plant. Late infection stunting was not obvious but discoloration of plants was observed. The leaflet and stem of stunted plants became small, thicker and stiffer than unaffected plants. The colour of leaflets became yellow, orange of brown along with reddish brown tip and margin. A transverse cut at collar region revealed a brown ring of phloem. Phloem browning was the most characteristic symptom of chickpea stunt disease (Harrison *et al*., 1999). The pod set was very sparse in stunted plants and caused heavy yield loss.

MATERIALS AND METHODS

The field experiment was carried out during Rabi season 2007-08 and 2008-09 at Pulses Research Centre, Mokama and also surveyed nearby farmers fields and recorded the incidence of chickpea stunt disease. Six genotypes namely BG 256, BG2088, PG051, GCP105, PBG 108 and BGD 1047 were selected for conducting experiment to find out the incidence of the disease. Stunting of plant was recorded in early stage as well as in later stages. A transverse cut at collar region revealed a brown ring of phloem clearly revealed the presence of chickpea stunt disease.

The disease incidence was calculated by the following formula :

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 stunt disease was observed in the experiment as well as in farmer's fields.

Table-2 : Incidence of chickpea stunt disease.

Disease scale	Disease incidence (%)	Genotype
1	1.10	GCP105
3	11-20	PBG 108, BG2088 and PG051
5	21-30	BG 256, BGD 1047
7	31-50	Nil
9	51-100	Nil

The incidence of chickpea stunt disease was recorded 1-10 per cent in genotype GCP 105, 11-20 per cent in PBG 108, BG 2088 and PG 051 and maximum incidence (21-30%) was recorded in BG256 and BGD1047 (Table-2) in both consecutive years 2007-08 and 2008-09.

Present investigation showed the considerable incidence of chickpea stunt disease as a new report and emerging problem in chickpea cultivation in Bihar.

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