

Studies on sequence crops in management of chickpea wilt

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ABSTRACT

Present investigation was carried out at Pulses Research Unit, Dr.PDKV, Akola (M.S.) during *kharif* and *rabi* season in wilt sick plot, in which fungi population was observed more in rhizosphere of sunflower, soybean, and groundnut as compared with sorghum, mung and udid. There was a gradual increase in the propagules of *Fusarium oxysporum* f.sp. *ciceri* from sowing to harvesting of chickpea. In correlation study the inoculum range of 10.11 to 14.00 per cent was recorded and there was positive but non-significant correlation between the inoculum available and the wilt incidence in chickpea.

Key words : *Fusarium oxysporum ciceri*, Wilt, Sequence crops, Correlation, Chickpea wilt.

INTRODUCTION

Among the pulses, chickpea (*Cicer arietinum* L.) is one of the most important legume crop of India. More than seventy pathogens have been reported on chickpea. *Fusarium oxysporum* f.sp. *ciceri* and *Rhizoctonia bataticola* are important (Zote and Dhutraj, 1996). The disease also causes the enormous losses in yield (Mathur *et al.*, 1960; Singh and Dahiya, 1973; Jani *et al.*, 1999; Singh *et al.*, 1974; Nene *et al.*, 1996), and can be devastating, as it is soil borne as well as seed borne and survives on stubbles in the form of chlamydospores for over 8-20 years in soil. If the crop grown year after year, the inoculum of the pathogen built in the soil. It is very difficult to manage the disease either by way of adoption of prophylactic or curative measures. It is preferred to manage soil borne pathogens by using cultural practices rather than the cultural means. Hence, sequence cropping is a good example of a farm management practice carried out for diverse reason that results in an effective mechanism for diminishing the risks of losses due to plant diseases. Plant density affects the disease incidence. Thus raising crop in sequence is effective in lowering populations of soil borne diseases. Hence, the present study was undertaken to find suitable crop rotation sequence for management of wilt disease of chickpea.

MATERIALS AND METHODS

Field trial was laid out in Randomised Block Design (RBD) with three replications and seven treatments that is crops in rotations at Pulses Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *kharif* and *rabi* season. During *kharif* season six crops were sown in chickpea wilt sick plot and one plot was kept fallow as control. After harvesting of *kharif* crops

chickpea was sown in *rabi* season. The plot size was 4.00 x 2.70 sq.m. The varieties used were Mung – AKM-8802, Udid – TAU-1, Soybean – JS-335, Groundnut – TAG-24, Sorghum – CSH-9, Sunflower – Modern, Chickpea – Chaffa-816.

Soil samples were collected from rhizosphere of different crops from sick plot. Isolation of rhizosphere mycoflora or pathogen from soil was done by using the dilution method of Dhingra and Sinclair (1995). After four days of incubation, number of distinct colonies were counted using colony counter. The fungal colonies were calculated per gram of soil by using the formula of Mc.Kinny (1923):

$$\frac{\text{Colonies average of three replication}}{\text{Amount plated (ml.)} \times \text{dilution}}$$

Distinguished colonies were picked up and subcultured on an appropriate medium. Fungi were identified on the basis of morphological characters *i.e.* type of spores and spore attachment.

At the start of *rabi* season, after germination, chickpea plant population was counted. During study period wilted plants were counted periodically at 30 days interval. The per cent disease incidence was calculated by using the formula:

$$\text{Per cent wilt incidence} = \frac{\text{Number of wilted plants} \times 100}{\text{Total no. of plants}}$$

RESULTS AND DISCUSSION

The data presented in Table 1(A) and 1(B) represent mycoflora ($\times 10^4$) observed in rhizosphere of different crops grown during *kharif* season in wilt sick plot before chickpea. *Fusarium oxysporum* f. sp. *ciceri*

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