

Research Paper :

Effect of different soil amendments on wilt complex disease incidence and growth parameters of chickpea (*Cicer arietinum* L.)

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SUMMARY

Chickpea (*Cicer arietinum* L.) is most important pulse crop grown in India, which suffers economic losses due to wilt complex. *Fusarium oxysporium* f.sp. *ceceri*, *Rhizoctonia bataticola* and *Sclerotium rolfsii* were isolated from wilted chickpea plant. These isolated pathogens were mass multiplied on the jawar grain. Four oilseed cakes viz., linseed cake, groundnut cake, neem seed cake and cotton seed cake were studied @ 100, 50, 25 and 10% conc. on the germination of chickpea seeds. Application of neem seed cake at 2.5% showed 90% emergence, followed by 5% dose, which gave 71.57% emergence, while shoot and root length was highest with neem seed cake at 5%. Also the effect of amendment of above mentioned oilseed cake before and after inoculation with respective pathogen @ 2.5%, 5% and 10% w/w with sterilized soil to evaluate mortality of chickpea at 30, 60, 90 and 120. The neem seed cake at 5% dose in pre-amended and post-amended soil showed maximum disease reduction, 83.34 % and 81.25 %, respectively.

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Chickpea (*Cicer arietinum* L.) is most important pulse crop in India, grown for dal making, culinary and for table purposes. It constitutes the main source of protein and several amino acids. It is a very cheap pulse and hence it is also referred as 'Poor man's meat'. The yield of chickpea can be reduced considerably due to many diseases. Chickpea is grown in diversified area and hence it succumbs to many fungal, bacterial and viral diseases in different geographical regions. Among all these diseases, wilt, collar rot, root rot are important diseases and causes 10-12% grain yield losses. Among organisms, *Fusarium* wilt and *Rhizoctonia* root rot together cause yield losses up to 70% in the field. Padwick (1948) stated that wilt is the worst disease in chickpea crop. Similarly, Jani *et al.* (1999) reported that wilt is the most destructive disease, resulting in considerable crop loss in Gujarat.

There is much said about the role of organic amendments in modification of physical, chemical and biological environment of soil through addition of decomposable organic matter. It improves the structure, texture, aeration and water holding capacity of soil and improves the development of root system. The biological environment also changes, due to intense microbial activities in the soil which is helpful for developing more antagonistic micro-

organisms. The disease incidence is affected by various mechanisms operative in soil, host and pathogen. Considering the importance of these factors, the studies were carried out at the Department of Plant Pathology, College of Agriculture Nagpur (2006-07) with a view to clarify the role of some oilseed cakes as a source of organic amendments, in reducing the severity and ultimately the losses caused by wilt causing organisms. With this present study also aimed to study the effect of different oil seed cakes on germination, mortality and some growth parameters of chickpea.

MATERIALS AND METHODS

Isolation, identification and preparation of mass culture of wilt causing pathogen:

The diseased samples were collected showing wilting symptoms *i.e.* drooping leaves, yellow coloured etc. from 13 different fields of Nagpur district, M.S. India. The individual diseased samples were brought to the laboratory for disease diagnosis. The collected disease samples of wilted chickpea plant were used for isolation of *Fusarium oxysporum* f.sp. *cicer*, *Rhizoctonia bataticola* and *Sclerotium rolfsii*. The wilted portion of diseased sample from individual sample was surface sterilized with 0.1% HgCl₂ followed by 2-3 times washing

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