

Effect of *Azospirillum* inoculation and organic manure on *Brassica juncea* (L.) Czern and Coss

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SUMMARY

The aim of this study was to evaluate the efficiency of biofertilizer *Azospirillum* and oil cake of neem on plant growths and yield parameters of *Brassica juncea* (L.) Czern and Coss. cv. Pusa Bold. Growth and yield was recorded on the basis of plant height, fresh and dry weights of shoot and root and seed yield per plant. *Azospirillum* and neem cake were applied separately and in combination of *Azospirillum* and neem cake both. Application of *Azospirillum*, neem cake and their combination recorded higher plant growth and yield in *Brassica juncea* (L.) Czern and Coss. Neem cake resulted in higher growth and yield in comparison to *Azospirillum* inoculation alone. However, the combination of both treatments proved best in improving plant growth and yield in comparison to *Azospirillum* inoculation and neem cake separately.

Key words : Baby corn, Cob yield, Combining ability, Earliness, Line x tester

Ever increasing fertilizer costs and the increasing demand for food have emphasized the need for full exploitation of biological nitrogen fixation (Reddy *et al.*, 1997). The repeated and excessive application of costly inorganic fertilizers has proved harmful to the plants and environment. Further, the biological equilibrium, soil health and nutrient dynamics also get affected. Application of biofertilizers in recent years has emerged as promising components to nutrient supply system (Pradhan, 1994). *Azospirillum* is known to provide plant nutrients to crops and can supplement the expensive inorganic fertilizers (Navala *et al.*, 2004).

Global consumers are increasingly looking forward to organic food that is considered safe and hazard-free. The demand for organic food is steadily increasing both in developed and developing countries, with annual average growth rate of 20-25%. Worldwide, over 130 countries produce certified organic products in commercial quantities (Kumar, 2008). Organic manures have been time tested materials for improving the fertility and micro nutrients and improve soils physical and biological condition in sustainable crop production. The dependence on the use of inorganic fertilizers can be minimized or avoided by adopting integrated approach through use of organic matter (Gupta and Sharma, 2004).

Application of organic manures has various

advantages like water holding capacity and organic carbon content apart from supplying good quality of nutrients (Krogh and Dahisgard, 1981). The non-edible oil cake of neem is used as organic manure. It is good, cheap and environment friendly and has shown promising results in inhibiting nitrification in soil, reducing nitrogen losses and increasing fertilizer efficiency.

The present study was aimed to determine the potential of plant growth promoting *Azospirillum* and neem cake alone and in combination of both on growth and yield of *Brassica juncea* (L.) Czern and Coss.

MATERIALS AND METHODS

The details of the treatments are given below-

T ₀	:	Control
T ₁	:	Neem cake
T ₂	:	<i>Azospirillum</i>
T ₃	:	Neem cake + <i>Azospirillum</i>

For the application of *Azospirillum* 2.5 g jaggery was dissolved in 50 ml water (Mahale *et al.*; 2003). Culture of bacterium @ 250 mg/10 g seeds was mixed with jaggery solution. 10 g seeds of *Brassica juncea* (L.) Czern and Coss. cv. Pusa Bold were dipped in the bacterial culture for one hour for coating the bacteria on them. Seeds were then dried under shade for thirty minutes before sowing.

Neem cake was applied directly in soil before 15 days of sowing for quick decomposition adding required amount of water. This organic manure applied in such a way that it should supply 1g nitrogen/kg soil. Neem cake contains 5.6 per cent nitrogen; therefore 17.85 g neem cake was added for 1 kg soil (Chopra and Kanwar, 2005).

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