



Research Paper

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Effect of *Azospirillum sp.* and *Pseudomonas striata* on the yield of black pepper (*Piper nigrum L.*) in arecanut (*Areca catechu L.*) mixed cropping system

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ABSTRACT : The experiments were conducted on bio-fertilizers viz., *Azospirillum brasiliense*. and *Pseudomonas striata* separately in black pepper at farmer's field in Sirsi taluka, Uttara Kannada district, Karnataka, during 2006 to 2010. The objective was to derive information on role of bio-fertilizers on the yield of black pepper in mixed cultivation system and to develop an appropriate nutrient package to improve the productivity of the crop. The results revealed from five years (2006 to 2010) data that the fresh berry yield of the vines differed significantly as influenced by various treatments. The application of 100% N along with *Azospirillum* @ 50 g with 10 kg FYM per vine and in another trail 100% P along with *Pseudomonas striata* @ 50 g with 10 kg FYM per vine recorded the highest fresh berry yield (6.83 kg and 6.81 kg/vine respectively) compared to RDF alone (6.12 kg and 6.25 kg, respectively). These treatments also resulted in obtaining maximum B:C ratio (3.29 : 1 and 3.30 : 1, respectively).

KEY WORDS : Bio-fertilizer, Black pepper, Inorganic fertilizer, *Azospirillum brasiliense*., *Pseudomonas striata*

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Black pepper (*Piper nigrum L.*) king of spice and native to Western Ghats is cultivated in arecanut gardens as mixed cropping system in Uttara Kannada district of Karnataka which is situated in Central Western Ghats. The vines are trained on the stems of arecanut as standards to generate additional income and effective utilization of natural resources like soil, water, sunlight, nutrients etc. Apart from usage as spice, black pepper berries are used in culinary and preparation of ayurvedic medicines.

Due to use of poor yielding local cultivars, non availability of superior varieties, non adoption of appropriate agronomic practices, losses due to the incidence of diseases, pests and droughts etc. are some of the prominent factors contributing to the low productivity of black pepper (*Piper nigrum L.*) in India (Radhakrishnan *et al.*, 2002). In Karnataka, the crop is cultivated in Uttara Kannada, Shimoga and Dakshina Kannada districts. There is generally high loss of nutrients due to leaching, erosion and runoff water as the region receives very high rainfall in the monsoon season (2000

to 2500mm annually). According to Shanmugavelu *et al.* (2002) there will be always competition among crops for nutrients, water and sunlight when they are cultivated in multiple/mixed crop system.

The information available on agronomic packages especially nutrient dosage for black pepper under mixed cultivation system is scanty. Similarly, little efforts has been made yet on the use of bio-fertilizers in black pepper cultivation. The present study was undertaken to develop an appropriate bio-fertilizer dosage for the crop for increasing yield, reducing cost of cultivation cost and maximizing net returns.

RESEARCH METHODS

The experiments were conducted in a farmer's field on use of biofertilizers viz., *Azospirillum brasiliense*. with 100 % N and *Pseudomonas striata* with 100% P in black pepper at Korlakatta village at Sirsi (Karnataka) during 2005-06 to 2009-10. The experimental site was located at an altitude of 619 m.