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Response of hybrid cotton (DHH-11) to *in situ* green manuring and nitrogen levels in northern transitional tract of Karnataka

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ABSTRACT

A field experiment was conducted during *kharif* 2002, at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad to study "Response of hybrid cotton to *in situ* green manuring and nitrogen levels in Northern Transitional tract of Karnataka" under rainfed condition on black clay loam soil. Experiment was laid out in a randomized complete block design with factorial concept. There were 12 treatment combination of four green manuring crops (Lucerne, Sunhemp, Dhaincha and Horse gram) and 3 nitrogen levels (100%,75% and 50% RDN) with a control treatment (sole cotton with RDF alone). Lucerne green manuring recorded significantly higher seed cotton yield (1549 kg /ha) with ginning percentage of 37.7 over all other green manuring crops. Application of 100 per cent of RDN recorded significantly higher seed cotton yield (1535 kg/ha) over 75 per cent (1343 kg/ha) and 50 per cent RDN (1225 kg/ha). Interaction effect between green manuring crop and nitrogen levels was significant. Lucerne green manuring with 100 per cent RDN recorded significantly higher seed cotton yield (1869 kg/ha) over all other treatment combinations. The sole cotton with RDF recorded significantly lower seed cotton yield (1180 kg/ha) than all other green manure crops with 100% RDN. Lucerne green manuring recorded significantly higher dry matter yield and nitrogen uptake (92.7 kg/ha) than other green manuring crops. Lucerne green manuring with 100 per cent RDN recorded maximum net returns of Rs. 22,3611 ha and B:C ratio of 2.37.

Key words : Hybrid cotton, Green manures, Nitrogen

INTRODUCTION

India has a unique place among the cotton growing countries of the world. All the four lint bearing *Gossypium* spp are grown commercially under diverse ecosystem over 91.65 lakh ha and with production of 188.78 lakh bales in India. India ranks 4th in world cotton production with an estimated 60 million people being involved in its cultivation. Cotton is a important commercial crop of Karnataka and cultivated on an area of 4.78 lakh ha with production of 6.77 lakhs bales (Anon., 2003).

Cotton crop is the 4th largest consumer of fertilizers in the country. Commercial fertilizer do increase productivity but their increasing costs, associated environmental hazards and lack of sustainability in yield is raising concern in cotton production. This has renewed the interest in the use of organic sources like FYM, compost, green manures and crop residues.

The traditional source of FYM is become scare as it is being used as a source of fuel. Under this circumstance green manuring has been recognized as the most efficient agronomic practice for stimulating various biological transformations in the soil leading to improved soil fertility. Hybrid cotton is widely grown in black soil of transitional tract of Dharwad. There is a decline in yield level due to improper use of chemical fertilizers and lack of organic matter addition to soil. Hybrid cotton being widely spaced crop, there is a lot of scope to grow green manuring crops as intercrops without much effect on main crop.

Hence, a field experiment was carried out on vertisols during *kharif* 2002, at Main Agricultural Research Station, Dharwad to study "Response of hybrid cotton (DHH-11) to *in situ* green manuring and nitrogen levels".

MATERIALS AND METHODS

A field experiment was conducted at main agricultural research station, University of Agricultural Sciences, Dharwad during *kharif* 2002. Experiment was laid out in a randomized complete block design with factorial concept. There were 12 treatment combinations comprising of four green manuring crops (lucerne, sunhemp, dhaincha and horse gram) and 3 nitrogen levels (100%,75% and 50% RDN) with a control treatment (sole cotton with RDF alone). The soil was clay loam and have neutral pH, low in available nitrogen, medium in organic carbon and phosphorus content and higher in available potassium. The rainfall received during cropping period was only 180.30 mm which was insufficient to raise a good crop. Sowing of both cotton and green manuring crops was done on 28 June, 2002. Cotton was sown by hand dibbling in the rows marked at 90 cm apart with an intra row spacing of 60 cm. Green maJ.1.uring crops were sown at 1:2 row proportion in shallow furrows between the rows marked for sowing of hybrid cotton uniformly using a recommended seed rate. A recommended fertilizer dose of 150 : 75 : 75 kg N, P_2O_5 and K_2O / ha were applied for both cotton and green manuring crops in respective area basis. The cutting of all the green manuring crops except lucerne was done

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