

## Effect of placement of fertilizers and organic manure under drip irrigation on soil health and economics of brinjal (*Solanum melongena* L.)

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### ABSTRACT

A field experiment was conducted during *Rabi* season of 2005 - 2006 at the Department of Agronomy Farm, College of Agriculture, Dapoli to study the effect of different treatments on soil health and economics of *Rabi* brinjal. The results indicated that the available  $P_2O_5$  ( $Kg\ ha^{-1}$ ) and organic carbon in soil were significantly higher under treatment RD through soluble fertilizer and urea (fertigation). Available nitrogen, phosphorus ( $Kg\ ha^{-1}$ ) and Organic carbon in soil were significantly higher in the treatment band placement of poultry manure along the rows. The highest gross and net income and B:C ratio were recorded by the treatment combination RDCF, below dripper and poultry manure placement below hill.

**Key words :** Brinjal, Nitrogen,  $P_2O_5$ , RD, fertigation, gross income, Net income, B:C ratio, Dripper and poultry manure

### INTRODUCTION

Brinjal or egg plant (*Solanum melongena* L.) belongs to family Solanaceae, is one of the most common, popular vegetable crop grown in India and other parts of the world. It has high nutritive value which can be compared with tomato. It contains 92.7 per cent moisture, 4.0 per cent carbohydrates, 1.4 per cent proteins, 0.3 per cent fats, 0.3 per cent minerals and 1.3 per cent fibre (Aykroyd, 1963). Adoption of modern irrigation technology like drip irrigation which save water upto 40-70 per cent as well as increasing the crop production to the extent of 20 to 100 per cent (Reddy and Reddy 2003). Placement of manure and fertilizers is of prime importance in drip irrigation where limited quantity of water is applied at spot unlike surface irrigation methods. In surface irrigation fertilizers applied at spot can be distributed in root zone after dissolving it in irrigation water. Therefore, it is necessary to apply the fertilizer and manures where water is applied in drip irrigation *i.e.* below dripper.

### MATERIALS AND METHODS

The present investigation was under taken with a view to study the effect of placement of fertilizers and manure under drip irrigation on soil health and economics of brinjal (*Solanum melongena* L.). The trial was conducted at the Department of Agronomy Farm, College of Agriculture, Dapoli during the *Rabi*-hot weather season, 2005-2006. The soil of the experiment field was clay loam in texture and medium acidic in reaction. It was medium in available nitrogen ( $326.30\ kg\ ha^{-1}$ ), low in available phosphorus ( $13.76\ kg\ ha^{-1}$ ) and moderately high in potassium ( $249.80\ kg\ ha^{-1}$ ). The experiment was laid out in Split Plot Design (Panse and Sukhatme, 1967) with

twenty treatments replicated thrice. The gross and net plot sizes were  $5.10 \times 3.60\ m^2$  and  $4.50 \times 2.40\ m^2$ , respectively. Two seedlings were transplanted at each spot, at 3-5 cm depth. The transplanting was done at the spacing  $90 \times 30 \times 30\ cm$  as to maintain the uniform plant population per hectare in all the plots. All the recommended management practices were followed. Chemical fertilizer were applied band placement along the rows, excavating a small pit of 10 cm depth below dripper, mixed fertilizer *i.e.* sulphala (15:15:15) after dissolving in sufficient quantity of water, briquettes, soluble fertilizer (Aquafert 19:19:19) through drip system *i.e.* fertigation and poultry manure @  $5\ tonnes\ ha^{-1}$  was applied, by excavating a small bands (shallow furrow) to the depth of 5 cm.

### RESULTS AND DISCUSSION

It is revealed from the data presented in Table 1 that the available nitrogen and potassium in soil did not differ significantly due to placement of fertilizers. While the treatment RD through soluble fertilizer/urea (fertigation) recorded significantly superior value of available phosphorus over the treatment RDCF, band placement along the rows and RDCF below dripper, however, the former treatment was at par with the treatment RD through mixed fertilizer and urea below dripper and RD through NPK briquettes below dripper. Similar results were reported by Londhe (1982).

Further it was also reported that the treatment poultry manure band placement along the rows recorded significantly superior available nitrogen and phosphorus in soil over the rest of the treatments under study. It may be due to low yield and less uptake of nutrients by brinjal plant under these treatments, which retained more applied nutrients in the crop root zone. While the available

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