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EFFECT OF BULKY AND CONCENTRATED ORGANIC AND BIO-MULCHES ON PHYSICO CHEMICAL PROPERTIES OF SOIL IN BABY CORN FIELD

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ABSTRACT

The experiment was conducted to Influence of organic and bio-mulches on physico-chemical properties of soil in baby corn cultivation field at Annamalai Nagar. The experiment was laid out in a randomized block design with eight treatments in three replications. According to the treatment schedule, mulching was practiced after 15 days of crop germination. The mulch materials used were sugarcane trash at 10 cm thickness (12 t ha^{-1}), coir pith at 2 cm thickness (10 t ha^{-1}). Sawdust 2 cm thickness (10 t ha^{-1}) and crop residues at 10 cm thickness (10 t ha^{-1}). For the bio-mulches, seeds of fenugreek and coriander were sown and cuttings of mint were planted 20 DAS of main crop. Among the organic and bio mulches were identified. The mulch materials used was sugarcane trash at 10 cm thickness (12 t ha^{-1}) which recorded the maximum level of water holding capacity of soil, ph and organic carbon of baby corn field.

Key Words: Baby Corn, Organic and Bio- Mulches, Water Holding Capacity, Ph and Organic Carbon

INTRODUCTION

Baby corn is the dehusked maize ear, harvested within 2-3 days of silking, i.e. prior to fertilization. It is a genotype of *Zea mays* L. Baby corn cultivation provides tremendous

avenues for diversification, value addition and revenue generation. After successful venture in many South-East Asian countries, it is gaining fast popularity in Indian market too, particularly in metropolitan cities. Good quality and higher green-fodder yield for its cultivation adds enormously to total economic returns besides higher profit per unit area, compared with green maize. Baby corn is used in a variety of traditional and continental dishes besides being canned. It has high nutritive value comparable to many vegetables Babycorn, being a relatively new introduction in our country requires the development of suitable production technology in realizing higher yield and monetary returns before it could be popularized among the growers. Depending on agro climatic conditions, 3-4 crops of baby corn are taken in a *year* recording high returns.

Mulching is one of the ways for recycling the organic waste materials. Mulching is not only an effective way to recycle organic waste material but also helps to minimize evaporation of water, control weed infestation, reduce runoff and soil loss, increase soil moisture status, control soil temperature fluctuation and improve physical, chemical and biological properties of soil.

MATERIALS AND METHODS

Investigation was carried out to assess the use of organic mulches in the cultivation of baby corn at orchard, Department of Horticulture during 2001 and 2002. Investigation was carried out to assess the use of organic and bio mulches in the cultivation of baby corn at orchard, Department of Horticulture during 2001- 2002. The experiment was conducted with four organic mulches viz., sugarcane trash mulch at 10 cm thickness, water hyacinth residue at 5 cm thickness, sawdust at 2 cm thickness and coir pith at 2 cm thickness and cultivation of three bio-mulches viz., coriander, mint and fenugreek which were treated viz., T_0 -control, T_1-Dried water hyacinth at 10 cm thickness, T_2-Sugarcane trash at 10 cm thickness, T_3-coir pith at 2 cm thickness T_4-Sawdust at 2 cm thickness, T_5-Mint was sown 20 DAS main crop T_6-coriander was sown 15 DAS main crop and T_7-Fenugreek was sown 15 DAS main crop. There were eight treatments replicated thrice in Randomized block design (RBD).

The experimental field was ploughed to a fine tilth. During last ploughing, basal dose of 75 kg of N, 60 kg of P and 20 kg per hectare along with FYM incorporated and the field

was levelled. Irrigation channels and beds of size 4 x 3 m^2 were formed. Seeds of $CoBC^{-1}$ baby corn, obtained from Horticultural Research Station Bhavanisagar was used for experimentation. The germination percentage was found to be 71-60. Hence, three seeds were sown per hill leaving 60 cm between rows and 30 cm between plants. On the 25^{th} day, the plants were top dressed with 75 kg of N and 25 kg K ha'^{1} and earthed up. Irrigation was done at periodic intervals to maintain the plants healthy.

According to the treatment schedule, mulching was practiced after 15 days of crop germination. The mulch materials used were sugarcane trash at 10 cm thickness (12 t ha^{-1}), coir pith at 2 cm thickness (10 t ha^{-1}). Sawdust 2 cm thickness (10 t ha^{-1}) and crop residue at 10 cm thickness (10 t ha^{-1}). For the bio-mulches, seeds of fenugreek and coriander were sown and cuttings of mint were planted 20 DAS of main crop. The most important component in baby corn production technology is the avoidance of pollination by the way of detasselling. If the silk is pollinated, the kernels and the cobs become hard. Removal of tassels or detasselling is known to improve the quality of young cob by directing the products of photosynthesis away from growth and maintenance of the tassels. Hence, detasselling was done.

Periodical harvest was done once in two days after 2 or 3 days of silking. The cobs were removed one by one as a single plant is capable of yielding up to 3 cobs. The total duration of harvest extended over a period of ten days. Cobs were stored at low temperature immediately after harvest to prevent deterioration in quality. The observations were recorded and subjected for statistical analysis (Panse and Sukhatme, 1967).

RESULTS AND DISCUSSION

The highest value (24.6 per cent) for water holding capacity was recorded where the treatments were imposed with bulky and concentrated organic manures. The lowest value for water holding capacity was recorded in control (24.0 per cent) (Table.1). Regarding the physico chemical properties, numerically higher values for organic carbon, water holding capacity and lower values for Bulk density were registered under Sugarcane trash at 10 cm thickness. But the values among all the treatments were statistically not significant since it

was tried for one season. If the practice is continued for few more years there must be a change in the physico chemical properties. Application of mulches, irrespective of sources and rates recorded significantly higher organic carbon and this might be due to increased yield of roots and plant residues and external application of organic manures as reported by Gupta, U.S. and R.K.Gupta. (1983) and Yadav*et al.*, (2000). The differences in the organic carbon content with the application of different sources of nutrients might be due to the result of differential rate of oxidation of organic matter by microbes (Trehan, 1997). The decrease in soil pH after organic matter addition might be because of the production of CO_2 and organic acids during decomposition of organic mulches. Consequently, if there is decrease in soil pH directly it is related with increase in EC. This is in accordance with Shelkeet al. (2001). The decreased bulk density might be due to incorporation of organic manures with lower bulk density (Meerabai., 2001).

The soil physico-chemical properties of baby corn under different treatments imposed with Sugarcane trash at 10 cm thickness followed by coir pith at 2 cm thickness are recognized for valuable returns and were forwarded for further studies in baby corn

CONCLUSION

Among the treatments comprising organic and bio mulches under different treatments imposed with Sugarcane trash at 10 cm thickness followed by coir pith at 2 cm thickness are recognized values for water holding capacity of soil organic carbon and bulk density were observed in the treatment combinations in baby corn cultivation field.

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Table.1.Effect of bulky and concentrated organic and bio-mulches on physico chemical properties of soil in baby corn field

Treatments	soil carbon (%)	Bulk density (mg m^{-3})	water holding capacity (%)
control	0.42	1.56	24.0
Dried water hyacinth at 10 cm thickness	0.42	1.55	24.2
Sugarcane trash at 10 cm thickness	0.46	1.52	24.6
coir pith at 2 cm thickness	0.46	1.51	24. 6
Sawdust at 2 cm thickness	0.46	1.50	24.6
Mint was sown 20 DAS main crop	0.45	1.50	24.4
coriander was sown 15 DAS main crop	0.45	1.51	24.4
Fenugreek was sown 15 DAS main crop	0.45	1.50	24.4
SED	-	-	-
CD (P=0.05)	NS	NS	NS