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Title: EFFECT OF ORGANIC AND INORGANIC SOURCES OF NUTRIENTS IN RELATION TO PRODUCTION OF BROCCOLI (Brassica Oleracea VAR. Italica) CV. FIESTA

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Abstract: Sprouting broccoli (*Brassica oleracea* var *italica*) is one of the most nutritious Cole crops. Although broccoli is not so popular yet in Jharkhand, it is slowly gaining popularity during the last few years among the consumers. Nutrient management is one of the most important practices for profitable cultivation of broccoli. Recommendations on fertilizer application in broccoli have been made from different parts of the country with varying doses of different nutrients depending upon the soil fertility status under different regions. Integrated nutrient management having chemical fertilizers applied along with organic sources of nutrients is an effective method for economization of production cost as well as maintenance of soil fertility. However, no work has been reported so far on integrated management strategies in Broccoli for the eastern plateau and hill agro climatic zone, particularly for the state of Jharkhand. Being a newly introduced crop of Jharkhand, there is an urgent need for standardization of integrated nutrient management packages having locally available organic sources integrated with chemical fertilizers. Keeping this in view, the research project was conducted to see the effect of organic and inorganic manures & their combinations on growth, yield attributes and quality as well as economics of broccoli. The investigation was carried out during winter season in the consecutive years 2008-09 and 2009-10 at vegetable section of horticulture garden under the Faculty of Agriculture, Birsa Agricultural University, Kanke, Ranchi (Jharkhand). The experiment consisted of 19 treatments i.e., four inorganic combinations 200:100:100 kg NPK, 150:75:75 kg NPK, 100:50:50 kg NPK and 50:25:25 kg NPK ha⁻¹, 12 organic and inorganic combinations by substituting 25% N of above inorganic combinations through FYM, Vermicompost and Karanj cake along with recommended dose 100:50:50 kg NPK + 200 q FYM ha⁻¹ and two controls N0 P100 K100 and N0P0K0. The experiment was laid out in Randomized Block Design with three replications. Data were recorded on different vegetative growth parameters, reproductive characters, quality characters, nutrient uptake, soil fertility and economics of different treatments. With respect to plant growth parameters, application of 50 Kg N through vermicompost + 150:100:100 kg NPK ha⁻¹ through inorganic sources (T9) and application of 100:50:50 Kg NPK ha⁻¹ along with 200 q FYM ha⁻¹ (Recommended dose) (T17) proved their superiority in respect of plant height, number of leaves, leaf length, leaf width, stalk length and plant spread. All the treatments with nitrogen had significantly higher values of plant growth parameters than T18 and T19 (treatments without nitrogen). Among the reproductive characters, treatments on application of 200 : 100 : 100 kg NPK ha⁻¹ through inorganic sources (T1), application of 50 Kg N through vermicompost + 150:100:100 kg NPK ha⁻¹ through inorganic sources (T9), application of 50 Kg N through karanj cake +150:100:100 kg NPK ha⁻¹ through inorganic sources (T13), and application of 100:50:50 Kg NPK ha⁻¹ along with 200 q FYM ha⁻¹ (Recommended dose) (T17) resulted in minimum duration for 50% curd maturity and maximum curd length, curd width, curd volume, curd weight, fresh weight of whole plant with curd, shoot weight and root weight. Application of 50 Kg N through vermicompost + 150:100:100 kg NPK ha⁻¹ through inorganic sources (T9) resulted in maximum yield of curd. Among the quality parameters the treatment (T9) resulted in the maximum content of reducing sugar and total sugar. Application of 200:100:100 kg NPK ha⁻¹ through inorganic sources (T1) resulted in maximum content of total soluble solids, total soluble carbohydrate and total soluble protein in the curd. Application of 12.5 Kg N through FYM + 37.5:25:25 kg NPK ha⁻¹ through inorganic sources resulted in maximum content of total phenol in the curd. With respect to nutrient uptake, application of 100:50:50 kg NPK ha⁻¹ resulted un maximum uptake of nitrogen, whereas, maximum uptake of phosphorus was recorded with application of 50 Kg N through vermicompost + 150:100:100kg NPK ha⁻¹ through inorganic sources. The maximum potassium uptake was recorded in case of application of 100:50:50 kg NPK ha⁻¹ through inorganic sources. None of the treatments resulted in significant change in the content of available nitrogen, phosphorus and potassium whereas all the treatments except T1, T2, T3, T18 and T19 resulted in significant increase in content of organic carbon in the soil. Application of 150:75:75 kg NPK ha⁻¹ through inorganic sources (T2) resulted in maximum benefit cost ratio (2.25) whereas application of 50 Kg N through vermicompost + 150:100:100kg NPK ha⁻¹ through inorganic sources (T9) resulted in maximum net profit (Rs. 72469/- per ha).

Description: EFFECT OF ORGANIC AND INORGANIC SOURCES OF NUTRIENTS IN RELATION TO PRODUCTION OF BROCCOLI (*Brassica Oleracea* VAR. *Italica*) CV. FIESTA

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