STUDY OF CHEMICAL FERTILIZER AND FYM ON THE GROWTH AND YIELD OF KARCHOOR: A LESS KNOWN MEDICINAL PLANT

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Abstract: Chemical fertilizers (125: 80 : 80 kg/ha) and FYM were given to the Karchoor at NBPGR, R/S Bhawali Nanital. The FYM 150 q/ha was found to the best dose for maximum rhizome yield/plant, rhizome diameter, fresh herbage yield/plant, herbage yield/plot, plant height and plant spread. Therefore, above said FYM dose which is beneficial for the rhizome yield through high herbage production for application in Karchoor in rain fed sub temperate hills conditions of UttaraKhand.

Key words: Chemical fertilizer, FYM and Karchoor.

INTRODUCTION

Karchoor (*Curcuma zedoaria* (Christm) Rosc.) is less known and important popular plant in Indian system of medicinal and Homeopathy (ISM & H). It is biennial herb attained 1.8 m; rhizome large, pale yellow or whitish inside, roots ending ellipsoid tubers, aromatic leaves large. The flowers are bright red, corolla lobes whitish or pale yellow and fruits are capsule, ovoid at trigonous smooth. Karchoor has been identified as potential medicinal plant is being maintained in the field Gene Bank Herbal Garden (GBHG), Negi *et al.,* 1988.

Karchoor are used in antiseptic, diuretic, stimulant and carminative. The crushed rhizome mixed with water is used as a bath water in jaundice trouble. It is effective in blood purification and cold cough. The dry rhizome is used to prepare 'Herbal Abeer' used in the festival of Holi (Hooker, 1887 ; Kirtikar and Basu, 1935 ; Jain, 1991; Jain and Prakash, 1995; Velyudhan *et. al.,* 1996 a, 1996 b). The essential oil per centage of fresh Karchoor rhizome is 0.43%. It various major constituents monoterpinoids 50.4% (cis-3 hexanol 0.14%, ά-pinene 8.96%, camphene 2.23%, sabinene 0.84%, β-pinene 4.53%, myrecene 0.87%, cineole 1:8 21.55% trans β-ocimene 0.39%, linalool 2.49%, camphor 3.93%, terpine-4-ol 0.29% ά-terpineol 0.76% and unidentified 3.49%) and sesquiterpenoids 49.6% (β-elemence 0.29%, β-caryophyllene 1.57%, unidentified hydrocarbons 3.23%, β-selinene 2.30%, caryphyllene oxide 1.86% sesquiterpens alcohol or ketone 21.70%, unidentified 18.65%) Negi *et al.,* 2002.

MATERIALS AND METHODS

The field experiment was conducted at the National Bureau of plant Genetic Resources, Regional Station Bhowali during 2004. The experimental area was situated at an altitude of 1600 m above msl with a Karchoor planting material procured from Thiruvananthapuram, Calicut and Trissure of state of Kerala. This was conducted in a randomized block design with three replications. The treatments given to the plants included one doses of chemical fertilizer (150 : 80 : 80 kg/ha) another dose FYM (150 q/ha) along with control having no FYM and NPK. The rhizome were planting at spacing of 1.40 x 2.8 m^2 by applying fully dose of FYM time of last ploughing and dose of PK and one third dose of Nitrogen as basal. Two third dose of Nitrogen was applied in the form of top dressing at 60 and 90 days after planting. The data were recorded on plant height (cm), plant spread (cm^2) at different interval such as 60, 90, 120 and 150 days after planting (DAP) on fresh weight of herbage per plant (g), rhizome diameter (cm), rhizome yield plant per (g) and rhizome yield per plot (kg).

RESULTS AND DISCUSSION

Analysis of variance indicated that the treatment of Chemical fertilizers, FYM and control differed significantly for most of the traits except plant spread and plant height at 60 days after planting. Such type of Chemical fertilizer and FYM responsiveness in Karchoor (*Curcuma zedoaria*) is quit, similar to that in Hadi (*Curcuma longa*) (Dubey and Yadav 2001, Meenakshi *et al.,* 2001 and Singh and Prasad 2006). Maximum rhizome per plot (3.29 kg) was obtained with application of 150 q/ha FYM follow that with 125 kg P + 80 kg K/ha (3.03 kg) and control (0:0:0) (2.54 kg). These results on rhizome yield indicated that the crop was responding well to increasing rate of FYM that optimum level of NPK is evident from the favourable effects on rhizome yield and yield determining characters by increased doses of FYM (Table-1).

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Table 1. Effect of Chemical Fertilizer and FYM on Plant growth and yield of Karchoor at different stage

Diameter	Plant Height (cm) (DAP)				Plant Spread (cm^2) (DAP)				Stem Diameter (cm)				Weight of rhizome plant (g)*	Fresh rhizome (Kg)*	Rhizome diameter (cm)*	Fresh herbage yield/plant (g)*	Weight of rhizome plant (g)*
	60	90	120	150	60	90	120	150	60	90	120	150					
Chemical N:P:K Fertilizers125:80:80 (Kg/ha)	52.50	71.33	90.60	99.67	1359.62	2540.58	2783.92	3515.08	1.83	2.11	2.53	2..82	334.25	11.56	11.56	50.00	3.025
FYM (150q/ha)	59.42	78.33	103.91	111.58	1757.34	2714.75	2943.33	3853.67	2.11	2.22	2.48	3.05	348.25	12.32	12..32	81.51	3.289
Control (0:0:0)	46.08	59.50	73.41	32.83	1070.67	1683.67	2086.00	2579.88	1.63	1.71	2.19	2.24	216.75	10.68	10.68	27.50	2.540
S.E.M. ±	3.86	5.50	8.84	24.54	199.29	319.03	263.57	381.37	0.14	0.16	0.11	0.24	41.75	0.47	0.47	15.68	0.220
CD at 5 %	NS	NS	17.18	16.80	350.70	397.83	355.01	890.75	NS	NS	NS	0.32	NS	NS	NS	17.43	NS

* At harvest stage

Highest fresh weight and dry weight of herbage per plant and per plot were obtained with FYM level of 150 q/ha. The same treatment also resulted plant height, Plant spread, and stem diameter at different age Favorable responses of plant growth characters of FYM. Additional advantages in vegetative growth of the plants by application of FYM 150 q/ha was accompanied with rhizome yield per plant. It was probably due to increased herbage area on which photo synthetic were synthesized. The latter was directly responsible for sink and smaller size. On the basis of above observations it is concluded that the FYM level 150 kg/ha was found to be the best treatment in Karchoor for maximum rhizome yield per plant. Fresh and plot, plant height and plant spread, at different intervals. Therefore it is recommended for application in commercial cultivation of Karchoor in rain fed in mid hills of UttaraKhand.

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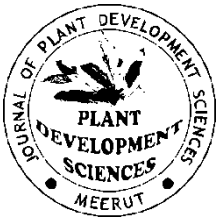

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