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Relative Contribution of Production Inputs in Groundnut (*Arachis hypogaea* L.)

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Groundnut is one of the important rainfed *kharif* crop of North-Eastern hilly part of Madhya Pradesh. Its average yield (805 kg/ha) is however, low dur to poor management. Among different management factors during *kharif* season, fertilizer, weed control and plant protection measures play a vital role in maximising production. The present experiment was, therefore, undertaken to determine the response of groundnut to major production inputs and identify the priority ones.

A field experiment was conducted during *kharif* 1992 at Indira Gandhi Krishi Vishwa Vidyalaya, Zonal Agricultural Research Station, Ambikapur (M.P.). The soil of the experimental plot was Sandy Loam, with available N, P and K, 170, 13 and 270 kg/ha, respectively, with pH 5.9. The experiment was laid out in randomised block design replicated thrice. Treatments comprised absolute control (without fertilizer, weed control and plant protection), F (basal application of recommended dose of fertilizer i.e. 20:60:20 NPK kg/ha); W (weed control i.e. two hand weedings at 20 and 35 days after sowing); ID (insect and disease control including seed treatment with bavistin @3 g/kg of seed). Besides these treatments, different combinations of F, W and ID, were also made (Table 1). Insecticidal spray was not done as there were no incidence of defoliator pests and aphids at economic injury level, however, incidence of tikka disease caused by *Cercospora* spp. appeared and two sprays of Dithane M — 45 @ 0.2 per cent at 15 days interval was made to manage the crop against this disease as per treatments. Groundnut (cv. JL 24) was sown on 5 July, 1992 at 30 x 15 cm spacing. Weed density at 60 DAS and weed dry matter were collected from a quadrate of 0.25 m^2 placed randomly at three places in each plot at 90th day crop stage. Crop was raised under rainfed conditions. Total rainfall received during crop season was 965.9 mm and was fairly distributed.

The weed flora associated comprised mainly of *Echinochloa* spp., *Ageratum conyzoides, Eclipta alba, Celosia argentea. Panicum* spp. and *Cyperus rotundus.*

Among production inputs, weed control alone recorded significantly higher pod yields (1615 kg/ha) as compared to plant protection (425 kg/ha), fertilizer application (223 kg/ha)

TABLE 1

Effect of production inputs on yield attributes, pod yield and economics in groundnut.

Treatment	Weed density* (No/m^2)	Weed dry weight (g/m^2)	No. of filled pods per plant	Weight of pods/plant (g)	Pod yield (Kg/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	Benefit-cost ratio
O-O-O	17.66	236	5.6	4.9	410	3333	-1283	0.61
F-O-O	17.56	456	3.1	2.7	223	3830	-2715	0.29
O-W-O	4.41	60	13.2	11.8	1615	4698	3377	1.72
O-O-ID	17.56	261	5.2	4.3	425	3433	-1308	0.62
F-W-O	4.44	63	15.1	11.6	2265	5195	6130	2.18
F-O-ID	17.68	436	3.3	3.6	321	3930	-2325	0.59
O-W-ID	4.53	59	13.8	11.0	1778	4798	1090	1.85
F-W-ID	4.42	63	16.2	11.5	2358	5295	6495	2.23
C.D. (P=0.05)	1.90	71	0.4	0.7	496	—	—	—

*Transformed (Square root x + 0.5) values of weeds are presented. F: Fertilizer.
W : Weed control. ID : Insect and disease control. O : Missing the input.

and absolute control (410 kg/ha). Singh and Bajpai (1991) reported a six fold increase in pod yield of groundnut by two hand weedings as compared to unweeded treatment. Application of fertilizer without weed control favoured the luxuriant weed growth and resulted marked increase in crop weed competition and weed dry matter production. Although weed population in absolute control, fertilizer alone, plant protection measures alone and fertilizer with plant protection were at par but weed dry weights were significantly higher under the application of fertilizer alone and fertilizer with plant protection. Alone fertilizer application or plant protection measures did not increase pods/plant and weight of pods/plant. Combining .weed control either with fertilizer or plant protection measures increased pod yield by 40 and 10 per cent over weed control alone, respectively.

Combination of all the production inputs under study recorded highest pod yield of 2358 kg/ha which was also higher than the pod yield obtained due to combined effect of fertilizer with weed control (2265 kg/ha). Thus results clearly indicate that all the inputs had contributed to increase groundnut yields in variable magnitude even though among single factors weed control contributed highest to increase pod yields of groundnut. Combination of fertilizer with weed control was also proved important factor for higher productivity. Beneficial effect of fertilizer application under weed control condition have been reported by Singh *et al.* (1994). The contribution from plant protection measures was marginal. Highest net return (Rs. 6495/ha) and cost benefit ratio (1:2.23) was obtained when all the three inputs were applied together.

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