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EFFICIENT USE OF FERTILIZERS IN GROUNDNUT THROUGH CHEMICAL WEED CONTROL

Groundnut crop requires a weed free condition of about 50 days from sowing for obtaining good yield. TOK-E-25 a selective herbicide containing 2, 4-dichloro 4-nitrophenyl either as an active ingredient used as emulsion spray at pre-emergence effectively keep the crop free of weeds (both annual grasses and broad leaf weeds) upto 45—50 days from sowing and without any deliterious effect (Balanarasaiah *et al.*, 1969 and Prabakar Setfy and Hosamani, 1975). Possibility of reducing the dose of fertiizers by checking weeds and there by assuring efficient utilization of the same was studied and results are presented here.

Field trial was carried out during *summer* 1976 at the University of Agricultural Scinces, Bangalore, on red sandy loam soil under irrigated condition. Seven treatments were laid out as detailed in Table-2 in a randomised block design with three replications. Groundnut seeds of TMV-2 variety was dibbled using a seed rate of 100 kg kernel per ha following a spacing of 15 cm in rows kept 30 cm apart. The plot size was 3x3 M. The recommended dose of fertilizer was 25N, $75P_2O_5$ and 37.5 K_2O kg per ha (100% fertilizer). The nitrogen, phosphorus and potash were applied in the form of ammonium sulphate, single super phosphate and muriate of potash respectively. The TOK-E-25 at the rate of 2.5 litres a. i. per ha was sprayed on the day after sowing. Irrigation was given as and when needed. At the time of harvest 10 random plants were separately uprooted for taking detailed biometric observations. Dry weight of weeds were recorded in an area of one square meter at the time of harvest. The cost benefit of using weedicide to reduce fertilizer dose was worked out and discussed in this paper.

The pod yield obtained in different treatments differed significantly (Table 1). The treatment which received the 100% fertilizer and weedicide has recorded the highest pod yield of 4177 kg per ha as compared to other levels of fertilizers with weedicide (4133 to 1622 kg per ha). However, there was no significant difference between 100% and 80% fertilizer levels with weedicide (4177 to 4133 kg per ha). While the treatment which received the 100% fertilizer alone has recorded considerably low yield of 1956 kg per ha as compared to 100% fertilizer and weedicide (4177 kg per ha). The higher pod yield with 100% fertilizer and weedicide is mainly due to the significant difference in pod weight per plant (14.5 to 27.0 g). This in turn was a consequence of more pod number per plant (21.3 to 34.1). In addition, there was better performance through Kernel weight per plant (12.0 to 20.7 g), per cent pod filling (59 to 74), per cent two

Table 1

Effect of fertilizer levels in conjunction with TOK. E-25 on yield and its components in groundnut.

Treatments	Pod yield kg/ha	Pod weight/ plant, g	Pod number/ plant	Kernel weight/ plant, g	Pod fill %	Two seeded pods %	100 kernel weight, g	Branches/ plant	Plant height cm	Dry weight plant, g	100 dry weight of seeds/ sample, g
100% fertilizer + TOK. E-25	4177	27.6	34.1	20.7	74	85	39.5	6.4	62.7	26.2	200
80% fertilizer + TOK. E-25	4133	28.8	33.5	23.3	70	84	38.3	6.4	61.7	25.7	200
60% fertilizer + TOK. E-25	3363	25.5	31.9	22.4	87	82	37.8	5.5	60.9	23.5	200
40% fertilizer + TOK. E-25	2831	19.8	29.3	16.6	86	81	34	5.5	58.6	23.4	183
20% fertilizer + TOK. E-25	1077	7.2	21.8	13.8	65	79	32.5	5.4	60.0	19.5	145
No fertilizer + TOK. E-25	622	14.3	26.3	12.0	59	79	34.5	5.0	58.8	18.6	130
100% fertilizer alone	1956	19.6	28.8	15.2	65	79	38.8	5.3	67.9	20.4	166
C.D. at 5%	886	5.4	3.8	4.0	8.4	2.9	4.6	N.S.	N.S.	3.8	50.0

Note: 100% Fertilzer : 25N, 75 P_2O_5 and 37.5 K_2O kg/ha.

Table 2

Economics of fertilizer levels and weedicide application to irrigated groundnut

Treatment	Cost of cultivation Rs/ha	Gross income, Rs/ha pods at, Rs. 200/q.	Net profit Rs/ha	Net profit per rupee spent Rs.
100% fertilizer + TOK. E—25	788.00	8354.00	7566.00	9.60
80% fertilizer + TOK. E—25	752.00	8266.00	7514.00	1000
60% fertilizer + TOK. E—25	716.00	7266.00	6550CO	9.10
40% fertilizer + TOK. E—25	681.00	5822.00	5141.00	7.55
20% fertilizer + TOK. E—25	645.60	4154.00	350S.40	5.43
No fertilizer + TOK. E—25	610.00	3244.00	2634.CO	4.32
100% fertilizer alone	644.00	3912.00	3268.00	5.08

Note: (a) Cost of cultivation of treatments 1 through 5 includes ploughing and levelling, fertilizers, sowing, seed, weedicide, irrigation, harvesting and bagging.

(b) Cost in treatment 6 includes: treatment 1 minus cost of fertililizers.

(c) Cost in treatment 7 includes: treatment 1 minus cost of weedicide.

seeded pods (79 to 85) and 100 Kernel weight (32.5 to 39.5 g). Besides, there was increased dry weight per plant (18.6 to 26.2 g) as compared to other treatments. This increased dry weight was due to the marginal increase in branches per plant (5.0 to 6.4) and better utilization of added fertilizers through effective control of weeds as indicated by dry weight of weeds (200 to 2066 g/M^2). The considerable low yield with 100% fertilizer alone (1956 kg per ha) as compared to 100% fertilizers and weedicide (4177 kg per ha) may be that at higher level of fertilizers with no weed control, there was an explosion in weed population and thus substantial amount of nutrients will be robbed by these weeds as compared to weeds emerging later.

The cost benefit of using weedicide to workout the possibiiity of reducing the fertilizer dose through controlling weeds was made (Table 2) and it indicated that the highest net profit of Rs. 7566/ha was obtained with the treatment which received 100% fertilizer and weedicide. It was this treatment which had given

the highest pod yield (4177 kg/ha). While, the treatment which received no fertilizer but received only weedicide has recorded the lowest net profit of Rs. 2643/ ha. The remaining treatments ranged between these two treatments (Rs. 3268 to Rs. 7514).

A different picture emerged when the net profit per rupee spent was considered. The treatment which received 80% fertilizer and weedicide gave Rs. 10 per rupee spent and it was highest as compared to other treatments (Rs. 4.32 no fertilizer + weedicide to Rs. 9.60 with 100% fertilizer + weedicide) The important feature of using weedicide was that the treatment with only 20% fertilizer and weedicide has provided a net profit of Rs. 5.43 per rupee spent on cultivation of groundnut as compared to 100% fertilizer alone without weedicide (Rs. 5.08). Thus the effective weed control by chemical during early growth period of ground nut crop significantly increased the pod yield since the applied fertilizer was more effectively used and in turn higher monetary benefit could be obtained.

സംഗ്രഹം

നിലക്കടലയ്ക്കു വളം ചേക്കുന്നതിന്നോടൊപ്പം ടോക്ക്-ഇ-25 എന്ന കളനാശിനിയും ഉപയോഗിച്ചാൽ വളത്തിന്റെ അളവു ആദായത്തിൽ കുറവു വരാത്ത വിധത്തിൽ പരിമിതപ്പെടുത്താൻ സാധിക്കുമോയെന്നറിയാൻ ബാംഗ്ലൂ A കാർഷിക സവ്കലാശാലയിൽ ഒരു പരീക്ഷണം 1976-ൽ നടത്തുകയുണ്ടായി. മുഴുവൻ അളവിൽ വളം മാത്രം ചേർത്തപ്പോൾ മുടക്കു മുതലിന്റെ 5.08 ലാഭം ഉണ്ടായി. എന്നാൽ 20% വളവും കളനാശിനിയും ഉപയോഗിച്ചപ്പോൾ 5.43 ഇരട്ടിലാഭം കിട്ടി. മുഴുവൻ വളത്തോടൊപ്പം കളനാശിനി ഉപയോഗിച്ചതിൽ 10 ഇരട്ടി ലാഭം ഉണ്ടായതായും കണ്ടു.

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