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Correlation Studies Among Weed Parameters, Yield Attributes and Nutrient Uptake in *Kharif* Groundnut

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The pod yield of groundnut is generally influenced by yield components viz., number of filled pods, pod weight and 100 kernels weight. Weed compete with plants in several ways and affect the yield components and consequently the pod yield. Information on association of growth and yield attributes and weed competition effect on pod yield in groundnut under different weed control treatments is lacking for middle Gujarat Agro-climatic conditions. Keeping these objectives in mind, a field study was undertaken at Anand during *kharif* season 1992 on sandy loam soil to study the correlation between pod yield and its attributes and associated weeds. The soil had 7.7 pH, 0.034% total N, 44.4 kg available P_2O_5 ha^{-1} and 247 kg K_2O ha^{-1}. Sixteen different weed control treatments viz., alachlor 1.0 kg ha^{-1} PE (T_1) and its conjuction with IC at 45 DAS (T_2), fluchloralin 1.0 kg ha^{-1} PE (T_3) and its conjuction with IC at 45 DAS (T_4), pedimethalin 1.0 kg ha^{-1} PE (T_5) and its conjuction with IC at 45 DAS (T_6), Metolachlor 1.0 kg ha^{-1} PE (T_7) and its conjuction with IC at 45 DAS (T_8), oxyfluorfan 0.24 kg ha^{-1} PE (T_9) and its conjuction with IC at 45 DAS (T_{10}), fluazifop-p-butyl 0.25 kg ha^{-1} PO (T_{11}),

TABLE 1

Correlation between pod yield and yield attributes of groundnut.

Characters	*Pod yield (kg ha^{-1})*	*Braches $plant^{-1}$*	*Matured pods $plants^{-1}$*	*100 kernels weight (g)*
Pod yield (kg ha^{-1})	1.00			
Branches $plant^{-1}$	0.90*	1.00		
Matured pods $plant^{-1}$	0.89*	0.84*	1.00	
100 kernels weight (g)	0.94*	0.85*	0.86*	1.00
Plant height (cm)	-0.35	-0.42	-0.22	-0.49*

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Nodules plant^{-1}	-0.76*	0.63*	0.80*	0.82*
N_2 uptake (kg ha^{-1})	0.98*	0.94*	0.91*	0.93*
P_2O_5 uptake (kg ha^{-1})	0.99*	0.91*	0.88*	0.95*
K^2O uptake (kg ha^{-1})	0.98*	0.94*	0.89*	0.93*
Dry weight of plant (g)	0.59*	0.69*	0.52*	0.61*

* Significant at 5% level of probability.

cycloxydim 0.15 kg ha^{-1} PO (T_{12}), bentazon 1.0 kg ha^{-1} PO (T_{13}), conventional method (2 HW + 2 IC) at 25 and 45 DAS (T_{14}), thrice hand weeding at 25, 45 and 60 DAS (T_{15}), and weedy check (T_{16}) relegated in randomized block design replicated four times. The crop was sown at 45 x 10 cm spacing by using 100 kg seeds ha^{-1} on 13 July, 1992 and harvested on 13 November, 1992. It was fertilized with 12.5 kg N and 25 kg P_2O_5 ha^{-1}. Pre-emergence application of the herbicides was done a day after sowing the crop, while post-emergence herbicides were applied at 25 DAS using 500 litres of water.

TABLE 2

Correlation among weed parameters, pod yield and yield attributes.

Character	*Pod yield (kg/ha^{-1})*	*Branches plant^{-1}*	*Mature pods plant^{-1}*	*100 kernels weight (g)*	*Shelling (%)*
Total weeds at 25 DAS	-0.12	-0.36	-0.14	-0.14	-0.28
Total weeds at 45 DAS	-0.33	-0.27	-0.17	-0.34	-0.39
Total weeds at 60 DAS	-0.82*	-0.88*	-0.79*	-0.85*	-0.89*
Dry weight of total weeds at 25 DAS	-0.15	-0.38	-0.14	-0.14	-0.28
Dry weight of total weeds at 45 DAS	-049*	-0.44*	-0.50*	-0.63*	-.62*
Dry weight of total weeds at 60 DAS	-0.82*	-0.86*	-0.74*	-0.85*	-0.89*
N uptake (kg ha-1) by weeds at harvest	-0.78*	-0.75*	-0.64*	-0.84*	-0.86*
P_2O_5 uptake (kg ha^{-1}) by weeds at harvest	-0.74*	-0.73*	-0.63*	-0.77*	-0.80*
K_2O uptake (kg ha^{-1}) by weeds at harvest	-0.77*	-0.75*	-0.63*	-0.83*	-0.86*

*Significant at 5% level of probability.

Data presented in Table 1 revealed that number of branches plant^{-1}, filled pods plant^{-1}, 100 kernels weight, number of nodules plant^{-1}, N, P and K uptake by the crop and dry weight of plant had significant positive correlation with pod yield. However, uptake of nutrients and 100 kernels weight had strong positive correlation in production of pods. Negatively non-significant correlation was observed between plant height and pod yield indicated invesre relationship between these two parameters. Naidu *et al.*, (1983) in their studies also observed similar results.

Results (Table 2) further showed that weed parameters viz., total weeds at 60 DAS, dry weight of total weeds at 45 and 60 DAS and nutrients uptake by weeds were negatively and significantly correlated with pod yield and most of the yield attributing characters. Among these, total weeds and its dry matter at 60 DAS and nutrients removal by weeds had significantly strong negative correlation with pod yield and yield attributing characters. Weed compete with crop during early growth stage i.e. upto 25 days after sowing had also negatively non-significant correlation with pod yield and yield attributes. These results showed that weed compete with groundnut upto 60 DAS due to acute crop-weed competition and heavily drained off nutrients which are most important for increasing pod yield. Rathi and Sharma (1987) at Jodhpur also report similar results. These results indicate that critical period during which crop suffers the most from adverse effect of weeds was upto 60 DAS from sowing. Hence, weed growth should be effectively checked for improving N, P and K nutrition of the crop.

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