E-ISSN: 2618-0618
P-ISSN: 2618-060X

www.agronomyjournals.com
2024; SP-7(9): 850-851
Received: 08-06-2024
Accepted: 13-07-2024

M Jitendra
Department of Agronomy, Agricultural College, Bapatla, ANGRAU, Andhra Pradesh, India

Dr. K Srinivasulu
Professor, Department of Agronomy, Agricultural College, Bapatla, ANGRAU, Andhra Pradesh, India

Dr. PVN Prasad
Professor, Department of Agronomy, Agricultural College, Bapatla, ANGRAU, Andhra Pradesh, India

Dr. M RaviBabu
Assistant Professor, Department of Crop Physiology, Agricultural College, Bapatla, ANGRAU, Andhra Pradesh, India

Corresponding Author:
M Jitendra
Department of Agronomy, Agricultural College, Bapatla, ANGRAU, Andhra Pradesh, India

Influence of different weed management practices on yield and nutrient dynamics in groundnut

M Jitendra, Dr. K Srinivasulu, Dr. PVN Prasad and Dr. M RaviBabu

DOI: https://doi.org/10.33545/2618060X.2024.v7.i9Sl.1613

Abstract
A field experiment was conducted during *rabi* season, 2020–21 on a sandy loamy soil at the agricultural college farm, Bapatla to evaluate different post emergence herbicides on the yield and nutrient uptake under different post emergence herbicide treatments in groundnut. The experiment was laid out in randomized block design with nine treatments and three replications. Hand weeding twice at 20 and 40 DAS was recorded the lower density and dry matter of weeds followed by Alachlor @ 1.5 kg a.i ha^{-1}as PE *fb* hand weeding at 30 DAS. Hand weeding twice at 20 and 40 DAS, recorded the lowest uptake of N, P and K by weeds and the highest uptake of N, P and K by groundnut crop.

Keywords: Groundnut, hand weeding, nutrient uptake, yield etc.

Introduction
Groundnut is also know as king of oilseeds, which contains both oil and protien about 45 to 53% and 26% respectively. Weeds compete with crop plants for nutrients, moisture, space and light and reduce not only the crop yields but also quality of produce. So, timely weed management is needed for getting higher yield. In groundnut, initial 30 days are crucial because its intial slow growth of with less number of branches, allows severe infestation of weeds which reduces the yield to an extent of 33% (DWR, 2015) [1]. However, weed management by hand weeding has become unfeasible due to a lack of labour and increasing wages. Herbicides are the best alternative for weed control in such conditions. So present study was conducted to know the extent of nutrient loss by the crop and weed under different management practices.

Materials and Methods
A field experiment was conducted during *Rabi* 2020-21 in sandy loam textured soil college farm of Agricultural College, Bapatla, Andhra Pradesh. The soil was low in organic carbon (0.25%), available nitrogen (188 kg ha^{-1}), available potassium (211.5 kg ha^{-1}), and available phosphorus (21.7 kg ha^{-1}). Healthy and sound groundnut kernel of "DHARANI" was sown on 15 October, 2020 at spacing of 22.5 x 10 cm by using seed rate of 150 kg/ha. The crop was harvested on 30th January 2021. Nine weed management practices consisted of preemergence (PE) application of Weedy check, Hand weeding at 20DAS and 40DAS, Alachlor @ 1.5 kg a.i ha^{-1}as PE *fb* hand weeding at 30 DAS, Imazethapyr @ 50 g a.i ha^{-1} as PoE, Quizalofop ethyl @ 50 g a.i ha^{-1} as PoE, Alachlor@ 1.5 kg a.i ha^{-1}as PE *fb* hand weeding at 30DAS, Propaquizafop @ 50g + imazethapyr @ 75 ga.i ha^{-1} as PoE at 20 DAS, Acifluorfen @ 160g + clodinafop propargyl @ 80 g a.i ha^{-1} as PoE at 20DAS, Fomesafen @ 110g + fluazifop-p-butyl @ 110 g a.i ha^{-1} as PoE at 20 DAS (Table 01). The experiment was laid out in randomized block design with three replications. Pre-and post-emergence herbicides were applied at one and 20 DAS by using battery operated knapsack sprayer fitted with flat-fan nozzle with spray fluid of 500 L/ha. The crop was supplied with recommended fertilizer dose of fertilizers with 30 kg N, 40 kg P_2O_5 and 50 kg K_2O per ha through urea, single super phosphate and murate of potash, respectively to all the plots as basal, Top dressing of 10 kg of N was applied in form of urea at 25 DAS. The unweeded check plots were allowed to remain infested with weeds till harvesting of the crop. The data was recorded as per standard procedures and analyzed using ANOVA and the

significance was tested by Fisher's least significance difference (p=0.05), Gomez and Gomez (1984) [3]. The nutrient content in soil were analyzed as suggested by Subbiah and Asija (1956) [8] for N, Olsen's method for P and neutral normal ammonium acetate method for K (Jackson 1973) [4].

Results and Discussion

The predominant weed species observed in the experimental field were *Cynodon dactylon*, *Digitaria sanguinalis* and *Panicum repens*, sedge *Cyperus rotundus* and broad-leaved weeds like *Trichodesma indica*, *Cleome viscosa*, *Indigiofera hirsuta* and *Phyllanthus niruri*. All the weed management practices significantly influenced the weed growth, and nutrient uptake. The lowest weed density and weed dry weight of weeds were recorded with two hand weedings at 20 and 40 DAS and alachlor @ 1.5 kg a.i. ha^{-1}as PE *fb* hand weeding at 30 DAS. Both the weed management practices were performed better throughout the crop growth period and significantly superior in reducing density and dry weight of all the category weeds and comparable with fomesafen @ 110 g + fluazifop-p- butyl @ 110 g a.i ha^{-1} at 20 DAS. The data revealed that, higher N, P and K uptake was recorded with the treatment where hand weeding at 20 and 40 DAS followed by alachlor @ 1.5 kg a.i ha^{-1} as PE *fb* hand weeding at 30 DAS and propaquizafop @ 50 g + imazethapyr @ 75 g a.i ha^{-1} as PoE at 20 DAS, this was due to treatments involving inter cultivation (hand weeding) practice and post-emergence herbicides in combination showed higher dry matter production resulting higher nutrient uptake by the crop. This might be due to less weed competition in these plots throughout the crop growth period. These results were in accordance with the findings of Divyamani *et al.* (2018) [2] and Naveen *et al.* (2019) [5]. Whereas the lowest nutrient removal by weeds is with fomesafen @ 110 g + fluazifop-butyl @ 110 g a.i. ha^{-1} as PoE at 20 DAS and Propaquizafop @ 50g + imazethapyr @ 75 ga.i ha^{-1} as PoE at 20 DAS, among the post emergence herbicides studied. Nutrient removal by weeds is in the reverse order as that of nutrient uptake by crop. There is a positive correlation between nutrient uptake by crops and yield. Similarly, there is a negative correlation between nutrient removal by weeds and yield. Hencethe podl yield will be higher whenever the nutrient uptake by crop is higher and nutrient removal by weeds is lower. Weeds deplete the soil nutrients rapidly than the crop, hence, the soil with higher population of weeds will have lower soil fertility levels when compared to an exhaustive crop. Poor soil nutrient status was recorded with unweeded control due to high weed density and dry weight. Srinivasarao *et al.* (2011) [7] and Naveen *et al.* (2019) [5].

Table 1: Effect of different herbicides molecules on yield and Nutrient uptake of groundnut.

Treatments	Total weed density (No. m^{-2})	Total weed dry weight (g. m^{-2})	Uptake (kg ha^{-1}) (by weeds) NPK			Uptake (kg ha^{-1}) (by crop) NPK			Pod yield (kg ha^{-1})
T_1: Weedy check	9.96 (98.67)	8.61 (73.67)	50.54	23.34	42.83	37.59	11.53	34.79	1171
T_2: Hand weeding at 20 and 40 DAS	4.26 (17.67)	2.96 (8.24)	4.78	2.55	3.83	95.74	28.92	88.97	2287
T_3: Alachlor @ 1.5 kg a.i ha^{-1} as PE	7.65 (58.00)	6.44 (40.93)	30.66	17.10	20.01	78.98	23.31	78.39	1470
T_4: Imazethapyr @ 50 g a.i ha^{-1} as PoE	7.38 (54.00)	5.44 (29.09)	23.55	12.30	17.25	77.47	21.73	75.19	1609
T_5: Quizalofop ethyl @ 50 g a.i ha^{-1} as PoE	7.93 (62.33)	6.15 (37.30)	24.83	16.57	19.48	77.90	23.20	73.85	1681
T_6: Alachlor @ 1.5 kg a.i ha^{-1} as PE *fb* hand weeding at 30 DAS	5.26 (22.67)	3.86 (14.38)	6.60	4.45	4.42	86.62	26.23	84.00	1998
T_7: Propaquizafop @ 50 g + imazethapyr @ 75 g a.i ha^{-1} as PoE at 20 DAS	6.39 (40.33)	4.39 (18.79)	10.88	8.33	8.45	83.67	24.48	83.76	1986
T_8: Acifluorfen @ 160 g + clodinafop propargyl @ 80 g a.i ha^{-1} as PoE at 20 DAS	6.70 (44.33)	5.03 (24.83)	14.35	10.56	14.99	79.64	15.19	73.06	1667
T_9: Fomesafen @ 110 g + fluazifop-butyl @ 110 g a.i. ha^{-1} as PoE at 20 DAS	5.70 (32.00)	4.23 (17.43)	10.75	6.56	8.17	80.96	17.50	76.39	1785
S.Em±	0.63	0.71	1.47	1.05	1.29	2.72	1.69	3.07	122.08
CD (P=0.05)	1.89	2.13	3.41	3.15	3.88	8.15	5.06	9.20	366.02
CV (%)	13.01	12.95	12.95	12.76	14.52	6.19	13.30	7.13	12.17

Conclusion

According to the results of the study, Hand weeding at 20 and 40 DAS was found to be superior over other treatments. Among the post emergence herbicides studied, higher N, P and K uptake was recorded with the fomesafen @ 110 g + fluazifop-butyl @ 110 g a.i. ha^{-1} as PoE at 20 DAS but the yield was reduced due to its phytotoxic effect. Application of propaquizafop @ 50 g + imazethapyr @ 75 g a.i ha^{-1} as PoE at 20 DAS yielded equivalent pod yield to hand weeding at 20 and 40 DAS among the post-emergence herbicides. As chemical weed control alone doesn't contribute to long term sustainability, the herbicide compatibility in integrated weed management should be tested in further studies.

References

1. Directorate of Weed Research (DWR), Indian Council of Agricultural Research (ICAR). Jabalpur, Madhya Pradesh; 2015. Available from: www.dwr.org.in
2. Divyamani B, Reddi RY, Subramanyam D. Yield and nutrient uptake in rabi groundnut as influenced by different weed management practices. J Pharmacogn Phytochem. 2018;7(5):3166-3168.
3. Gomez KA, Gomez AA. Statistical procedure for agricultural research. 2nd ed. New York: John Wiley & Sons; c1984. p. 680.
4. Jackson ML. Soil chemical analysis. New Delhi: Prentice-Hall of India Pvt. Ltd.; c1973. p. 134-204.
5. Naveen B, Subramanyam D, Nagavani AV, Umamahesh V. Weed management in groundnut with new herbicide molecules. Indian J Weed Sci. 2019;51(3):306-307.
6. Olsen SR, Cole CV, Watanabe FS, Dean LA. Estimation of available phosphorus in soils by extraction with sodium bicarbonate. Washington, D.C.: United States Department of Agriculture, Circular No. 939; c1954. p. 18-19.
7. Srinivasarao S, Madhavi M, Reddy RC. Integrated approaches for weed control in rabi groundnut. J Res ANGRAU. 2011;39(1&2):60-63.
8. Subbiah BV, Asija GL. A rapid procedure for determination of available nitrogen in soil. Curr Sci. 1956;25:259-260.