



## EFFECT OF CULTIVARS AND WEED MANAGEMENT ON GROWTH AND YIELD OF GROUNDNUT (*ARACHIS HYPOGAEA*)

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### ABSTRACT

#### **Keywords:**

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A field experiment was conducted during *kharif* season of 2010 to study the effect of cultivars and weed management on growth and yield of groundnut. The experiment comprising 16 treatment combinations, replicated four times was laid out in split-plot design with combination of four cultivars (TG-37A, Malika, HNG-10 and Local) and 4 weed control treatments (Weedy check, Weed free, Pendimethalin 1.0 kg/ ha and Pendimethalin/ 1.0 kg ha with one hand weeding at 35 DAS). Highest dry matter and haulm yield produced by Malika cultivar. Yield attributes *viz* pods /plant, kernel/ pod, pod and biological yield was significantly higher in HNG-10 and highest growth, yield attributing character and yield were found in weed free followed by Pendimethalin 1.0 kg/ ha with one hand weeding at 35.

### INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an annual legume crop, It is world's largest source of edible oil and ranks 13<sup>th</sup> among the food crops as well as 4<sup>th</sup> most important oil seeds crops of the world (Ramanathan, 2001). The kernel contains up to 50% of a non drying oil, 40-50% fat, 20-28% protein and 10-20% carbohydrate (Mehta, 2002). Among the various production constraints, heavy infestation of weeds is one of the major concern, specially at early stage of crop growth, when the crop has extremely slow growth rate, eventually provides rapid and vigorous growth of weeds due to proper fertilization of crop, enough soil moisture, wider spacing and the favourable climatic conditions after the sowing of crops which results in heavy drain of available nutrients and moisture often smoother the tender crop. Competitive stress of weeds causes reduction in pod yield by about 17-84 %. In view of slow growth habit of the crop, mechanical control of weeds becomes difficult due to continuous rains and increasing cost and scarcity of labour. Thus the appropriate choice for weed control in groundnut crop would be combination of cultural and herbicidal control to boost-up the productivity. For stepping up food production, the country involves more intensive cropping resulting in the problem of suitable cultivars for normal as well as late sown conditions, which may fit in the cropping systems.

### MATERIALS AND METHODS

A field experiment was conducted at Agronomy farm, College of Agriculture, Swami Keshwanand Rajasthan Agricultural University; Bikaner during *kharif* season of 2010. The soil was sandy loam in texture, low in organic carbon (0.08%) and available N (86.4 kg/ ha), medium in P<sub>2</sub>O<sub>5</sub> (21.9 kg/ ha) and high in K (234.00 kg/ha) contents with a pH of 8.5. There were 16 treatments consisting of 4 treatments of cultivar (TG-37A, Malika, HNG-10 and Local) and 4 treatments of weed control (weedy check, weed free, pendimethalin 1 kg/ ha, and pendimethalin 1 kg/ha with one hand weeding at 35 DAS). The treatments were laid out in split-plot design replicated four times. Crops were sown on 4 July, 2010 in lines spaced 30 cm by "kera" method in open furrow. A uniform basal dose of N (30 kg/ha) and P<sub>2</sub>O<sub>5</sub> (60 kg/ha) were drilled before sowing. Oil content in kernel was determined by Soxhlet apparatus using petroleum ether (60-80°C).

### RESULTS AND DISCUSSION

#### *cultivar*

Experimental results (Table 1 and 2) showed that plant dry matter production was significantly higher in Malika cultivar at 60 DAS and at harvest, however days to maturity were earliest in TG-37A cultivar, this may be because of the fact that TG-37A is a short duration cultivar and mature around 105-110 days but at harvest Malika produced higher dry matter, because Malika cultivar is a

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long duration bunch type variety and has profuse growth which takes around 135-140 days to mature. The yield attributing characters like pods/plant<sup>1</sup> and kernel/ pod were significantly higher in HNG-10 cultivar. This may be due to the higher nodulation and its spreading nature and also its medium duration maturity also pointed out by Anonymous (2005). Seed index was significantly higher in Malika cultivar due to its bigger seed size and more weight of kernel. Significantly higher pod yield were obtained in HNG-10 cultivar. This may be due to better growth characters particularly nodulation and yield attributing characters like pod/plant and kernel/ pod led to significantly higher pod and biological yield. However, haulm yield was significantly higher in Malika cultivar.

#### Weed control

Experimental results (Table 1 and 2) showed that plant dry matter observed significantly with pendimethalin at 1 kg/ ha + HW at 35 DAS at both stages. These findings support Girijesh and Dhakar (1999). weed free treatment

increased the maximum nodules/plant, days to maturity might be due to weed free environment provided by application of aforesaid treatment during crop span helped the better utilization of crop growth factor Nimije (1992) also reported similar results. Yield attributing character viz; number of pods/plant and kernel/ pod might be due to weed free environment followed by Pendimethalin 1 kg/ ha + HW at 35 DAS and less yield attributing characters recorded in weedy check may be explained by crop weed competition for light, space, nutrients and moisture in the form of weeds these findings support Madhu et al. (2006). Pendimethalin at 1 kg/ ha + HW at 35 DAS treatment had more prominent influence on pod, haulm and biological yield. This higher pod yield obtained by these treatments may be attributed to cumulative effect of reduce crop-weed competition as evidenced by lower weed density and their dry matter accumulation. Similar results had been reported by Madhu et al. (2006), Solanki et al. (2005).

**Table 1 Effect of cultivars and weed management on dry matter and growth attributes of groundnut at different stages.**

Treatment	Dry matter production (g /plant)		Nodules/plant at 45 DAS (No.)	Days to maturity	Pods/ Plant (No.)	Karnel /pod (No.)	Seed index (%)
	60 DAS	At harvest					
<i>Cultivars</i>							
TG-37A	20.82	70.50	100	105	29.23	1.74	38.94
Malika	26.38	82.71	102	138	21.56	1.64	64.56
HNG-10	25.99	79.75	114	128	34.30	2.33	44.00
Local	21.88	80.17	94	123	32.49	2.14	35.56
CD (P=0.05)	1.64	5.70	6.0	0.9	5.64	0.06	0.89
<i>Weed control</i>							
Control	18.35	67.33	87	125	24.75	1.54	45.22
Weed free	28.10	86.29	112	122	33.17	2.27	46.41
Pendimethalin 1.0 kg/ ha	25.81	82.48	102	124	28.54	1.94	45.75
Pendimethalin +HW at 35 DAS	22.81	82.02	108	123	31.13	2.08	45.69
CD (P=0.05)	1.91	4.72	9.0	0.7	5.22	0.16	NS

No. = Number, DAS= Days after sowing, NS= Non significant

**Table 2 Effect of cultivars and weed management on yield and yield attributes of groundnut**

Treatment	Pod yield (kg /ha)	Kernal yield (kg /ha)	Haulm yield (kg/ ha)	Biological yield (kg/ ha)	Harvest index (%)
<i>Cultivars</i>					
TG-37A	2898	2022	3268	6166	37.88
Malika	2070	1555	4973	7044	33.35
HNG-10	3230	2146	4218	7448	37.44
Local	2914	1992	3914	6828	35.31
CD (P=0.05)	198	149	333	344	2.83
<i>Weed control</i>					
Control	2256	1564	3460	5717	35.10
Weed free	3114	2166	4526	7640	37.44
Pendimethalin 1.0 kg/ ha	2768	1914	4143	6911	35.56
Pendimethalin 1.0 kg /ha+HW at 35 DAS	2971	2071	4244	7218	35.88
CD (P=0.05)	207	141	252	313	NS

NS= Non significant

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