needed. A fairly high proportion of respondents(40.00 to 46.66 per cent) of all the three groups preferred inclusion of new subject areas like diseases of fishes and their control and a new preferred inclusion of soil and water analysis in the training programme.

These two areas were not included in the training programme.Eventhough fish diseases were not a major problem in the study area, yet diseases problem was faced by some of the respondents. So, these respondents felt the need to have some knowledge on fish diseases and their control measures.Of the respondents who preferred inclusion of new subject areas in the training programme, some (16.60 to 46.15 per cent) wanted to have knowledge on soil and water analysis. Perhaps these respondents may be more inquisitive to know about new things.

More than fifths (43.33 to 46.66 per cent) of the respondents of 1979 and 1981 groups and nearly three fourths (70.00 per cent) of the respondents of 1980 group preferred to have more intensive training on some subjects already dealt in the existing training. All such respondents wanted more intensive training in induced fish breeding, which is a new technique developed for breeding fishes in captivities. As the training was of prelminary nature, this subject was not dealt in detail in the training. So, the respondents wanted more intensive training in this subject. however, the FFDA used to give a separate intensive training on induced fish breeding to the experienced progressive fish farmers.

A few respondents of 1980 and 1981 groups (10.00 and 20.00 per cent respectively) wanted to increase the then daily allowance of Rs.5/- per trainee. Now the FFDA had increased the daily allowance to Rs. 10/- per trainee considering the increasing trend in the cost of living.

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WEED CONTROL IN SPANISH BUNCH GROUNDNUT UNDER IRRIGATED CONDITIONS

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ABSTRACT

Experiments indicated that pre-emergence application of either fluchloralin (0.75 kg a.i/ha) or pendimethalin (1.okg a.i/ha) followed by one hand weeding were effective in controlling predominant annual grass weeds **Echinocloa colonum, Dactyloctenium aegyptium** and **Panicum ripens** and for achieving pod yields in groundnut irrigated by canal water on red sandy loam soils of Tamil Nadu.

KEY WORDS: Herbicides, Groundnut

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Weed problem is very severe In the initial stages of growth of groundnutgroundnut crop is also slow in the early stages. Complete ground cover for spanish bunch groundnut is attained at 50-60 days after sowing. It is generally estimated that the yield of groundnut is reduced by 25 to 50% due to competition by weeds (Sankara Reddi, 1982). Kulandaivelu *et al.* (1978) after screening the herbicides for weed control in groundnut reported that in fluchloralin lowest dry weight of weeds was recorded but it affected the stand of crop under irrigation. Application of alachlor at 1.5 kg a.i/ha was effective in controling weeds and gave maximum yield of bunch groundut under irrigated conditions (Kulandaivelu and Sankaran, 1976). Groundnut is grown in Tamil Nadu under-irrigation with canal water on red sandy loam soils. Field experiments were conducted on interated weed control methods in irrigated spanish bunch groundnut.

MATERIALS AND METHODS

Two experiments were conducted on red sandy soils at the Agricultural Research Station, Bhavaninagar during monsoon season of 1982. The efficiency of different weed control methods in relation to farmers practice of moist and dry sowing was studied in the first experiment and comparative efficiency of herbicides in controlling dominant weeds (grasses) in the second experiment. The test variety of groundnut was POL 2. The first experiment was conducted in split plot design with three replications. The main plot treatments were T1 - pre-plant herbicide application before stale seed bed preparation, T2 - pre-plant herbicide application after stale seed bed preparation; T3 - pre-emergence application in dry sowing assigned to main plots and sub-plots consisted of W1 - fluchloralin (1.0 kg a.i/ha), W2 - fluchloralin (1.5 kg a.i/ha) W3 - fluchloralin (0.75 kg a.i/ha) followed by one hand weeding at 35 DAS, W4 - pandimethalin (1.0 kg a.i/ha) followed by one hand weeding at 35 DAS, W5 - farmer's practice of two hand weedings at 15 and 35 DAS and W6 - unweeded check. The second experiment was conducted in randomised block design with four replications. The treatments were T1, T2 and T3; pre-emergence application of oxyfluorfen at 0.1, 0.15 and 0.2 kg a.i/ha respectively, T4, T5 and T6; terbutryn at 0.4, 0.6 and 0.8 kg a.i/ha respectively, T7 - fluchloralin at 0.75 kg a.i/ha, T8 - hand weeding at 15 and 35 DAS and T9 -unweeded check.

A uniform fertiliser dose of 15 N, 30 P2o5 and 45 K2o kg/ha were applied to the crop in the form of urea, single superphosphate and muriate of potash respectively. Groundnut seeds were sown on 30th June, 1982 and harvested on 23rd October , 1982 for both the experiments. The spacing adopted was 22x15 cm. Recommended cultural and irrigation practices were followed. Weed counts were taken at 15 DAS at random in the crop at two places in 0.25 m^2 (50x50 cm) areas marked and weed dry weight for grasses, sedges and broad leaves were recorded separately.

RESULTS AND DISCUSSION

Experiment -1

The predominant weed flora in groundnut at 15 DAS were *Digitaria Sangunallis, E. Colonum, Panicum repens, Dactyloctenium aegyptium and Cyanodon dactylon* in grasses, *Cyperus rotundus* in sedges, *Boerhaavia diffusa, Amaranthus viridis, Phyllanthus niruri, Phyllanthus madraspatensis, Euphorbia hirta, Portulaca oleraceae, Corchorus olitorius, T. portulacastrum, Tridax*

Treatments	Weed No./m^2 at 15 DAS				Plant height (cm)	No. of branches per plant	No. of matured pods/plant	Mean Pod Yield (kg/ha)
	Total	Grasses	Dicot	Sedge				
Main plot								
T	72	56	4.6	10.2	44.6	5.7	19.9	3098
T_1	66	50	4.0	10.6	34.7	5.2	18.0	3144
T_2	72	58	4.6	8.6	39.9	5.2	17.1	3008
T_3	2.08	2.60	0.18	1.32	3.26	0.20	0.79	61.8
S.E	-	-	-	-	-	-	-	-
CD 5%								
Sub-Plot								
W_1	12.6	1.4	2.6	8.6	41.6	5.4	18	2962
W_2	11.4	1.4	2.0	8.0	31.8	5.4	20	3447
W_3	16.6	1.4	2.0	13.4	39.3	5.5	17	3508
W_4	12.0	1.4	1.4	9.4	37.2	5.5	21	3602
W_5	180.0	160.0	10.0	10.0	39.2	5.2	18	3121
W_6	188.0	163.4	8.2	10.6	43.8	4.6	13	1818
SE	7.05	14.32	0.66	0.44	0.98	0.29	1.00	62.41
C.D 5%	20.36	41.36	1.89	1.26	2.84	0.84	2.89	100.24

Table 2. Effect of treatments on weed and groundnut (Var POL 2)

Treatments	Weed No/m^2 at 15 DAS				Weed weight $0.25m^2$ (g)	No. of branches/ plant	Plant height (cm)	Plant DMP (g)	No. of matured pods/plant	Pod yield kg/hr
	Total	Grass	Sedge	Dicot						
T_1	68.3	54.6	12.6	-	29.5	.8	42.5	128	16	2750
T_2	38.6	31.4	7.4	-	26.4	6.3	42.8	123	15	2651
T_3	30.0	26.0	3.4	-	23.7	5.5	42.5	118	15	2651
T_4	165.4	156.0	8.6	0.6	24.7	6.3	41.0	120	13	2182
T_5	136.4	84.0	10.4	0.6	23.4	5.9	41.5	123	15	2651
T_6	104.6	77.4	10.0	1.4	14.7	6.1	41.5	128	16	2841
T_7	13.0	8.0	1.4	3.4	1.2	5.4	41.6	135	18	3508
T_8	192.6	177.4	12.6	12.6	1.1	5.2	41.3	132	18	3386
T_9	183.4	168.0	11.4	6.0	35.2	4.6	42.8	115	13	1826
SE	10.05	12.58	1.52	N.A	1.54	0.34	0.51	1.79	0.66	129.1
C.D 5%	29.34	36.72	4.43	-	4.49	0.98	1.49	5.23	1.93	376.9

procumbens, Oldenlaudia umbellata, Digera arvensis, Acanthospemum hispidium and Lochnera pusilla in broad leaved weeds. Total weed population (Table 1) was not influenced by herbicide application in moist and dry sowing. Annual grassses were the dominant weeds. Herbicides applied to both moist and dry sowing were effective in controlling the weeds.

Among herbicides, pendimethalin and fluchloralin in both higher and lower doses controlled the major grass weeds effectively (87%) as compared to farmer's practice, of weedlng and unweeded control. But in later stages, weeds emerged in lower doses which were also controlled by following one late hand weeding. Pre-emergence application of herbicides followed by one late hand weeding provided required weed free condition for the crop resulted in more number of branches, filled pods and higher pod yields in those treatments. In farmer's practice of weeding, by giving hand weeding at 15 DAS, soil was disturbed and the bottom weed seeds were exposed to light resulting in further germination of weed seeds and competed with the crop in the early stages. This reduced the yield attributes and pod yield significantly. Pre-emergence application of pendimethalin at 1.0 kg a.i/ha followed by one hand weeding at 35 DAS recorded the highest pod yield (3682 kg/ha) as compared to 3121 kg/ha in farmer's practice and 1818 kg/ha in unweeded control. It was found that herbicides pendimethalin and fluchloralin were effective for control of weeds and higher pod yields under farmer's practice of both moist and dry sowings of irrigated groundnut.

Experiment - 2

The weed flora observed were similar to that in the first experiment. Among weeds, annual grass weeds were the dominant weeds than sedges and broad leaves. These were effectively controlled by pre-emergence application of fluchloralin 0.75 kg a.i/ha (8.0/) and oxyfluorfen 0.2 a.i kg/ha (26.0/m) and this resulted in lowest weed dry matter in the above treatments. However, oxyfluorfen and terbutryn were not effective on annual grass weeds but could control annual broad leaved weeds which were noticed in low intensity.

Among herbicides (Table 2), pre-emergence application of fluchloralin at 0.75 kg a.i/ha was effective in controlling annual grass weeds which constituted 90% of total weed population and this recorded higher groundnut pod yield of 3508 kg/ha as compared to 3386 kg/ha in farmer's practice of hand weeding twice and 1826 kg/ha in unweeded control. The increased pod yield with fluchloralin 0.75 kg a.i/ha might be due to more number of yield attributes as a result of higher dry matter production of crop due to effective weed control in this treatment.

The studies indicated that pre-emergence application of either fluchloralin (0.75 kg a.i/ha) or pendimethalin (1.0kg a.i/ha) followed by one hand weeding were effective in controlling predominant annual grass weeds, *Echonochloa colonum, Dactyloctenium aegypyium* and *Panicium repens* and for achieving higher pod yields in groundnut irrigated by canal water on red sandy loam soils of Tamil Nadu.

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COMBING ABILITY AND INHERITANCE STUDIES IN COWPEA (*Vigna unguiclata (L.) Walp.*)

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ABSTRACT

In a six parent diallel cross in cowpea, the combining ability studies revealed hat both the additive and non-additive gene effects were important for plant height, ranches plant, clusters plant, pods plant, pod length, seeds pod, 100 seed weight nd yield plant. The cultivars Co4, EC 164370 and EC 170777 were the best general ombiners on the basis of their gca effects. Components of variance analysis revealed hat non-dditive effects were preponderant for the characters except pod length. liparental mating system was suggested for the improvement of cowpea.

KEY WORDS: Cowpea, diallel, combining ability, gene action.

Cowpea (*Vigna unguiculata* (L) Walp.) is one of the important pulse crops of India. The information on the genetics and combining ability studies on this crop are very little. The present study, was therefore, carried out to know the pattern of inheritance of different characters and combining ability of parents and crosses for different characters from the diallel analysis.

MATERIALS AND METHODS

Six genotypes of cowpea viz. TVu 3661, EC 170767. EC 160370, EC 170777 (IITA, Ibadan, Nigeria), Co 4 and NPRC 2 (Tamil Nadu) were selected for the present study. All possible crosses (excluding reciprocals) were attempted during summer 1986. The resultant 15 F1 s along with their six parents were grown in a randomized block design with three replications during Kharif 1986 at the National Pulses Research Centre, Pudukkottai, Tamil Nadu. The seeds were sown in single rows of 4.5 m long, 45 cm apart with plant to plant spacing of 15 cm. Observations were recorded on five random and competitive plants for plant height, number of primary branches / plant, number of clusters/plant, number of pods/plant, pod length, number of seeds/pod, 100 seed weight and seed yield/plant. The combining ability analysis was done following Griffings' (1956) model I method II and components of variance using Hayman (1954).

RESULTS AND DISCUSSION

The data on analysis of variance for all the charcters are given in Table 1. The analysis of variance for combining ability revealed that both general