of the recommended dose and lowest with the application of 2, 4-D at five times of the recommended dose. In general, all the pesticides at recommended and double of the recommended dose resulted in more uptake of nitrogen by grain straw as compared to control.

One significant point emerges from the above findings is that major fractions of adsorbed pesticides are accumulated in the roots. The presence of these chemicals in the root of crop species may affect the levels of activity of various enzymes and it is possible that these variations may account for differential absorption of nutrients caused by pesticides, may be viewed as an out come largely of variation in certain proteins which are considered to be physiological carries of cations and anions (Liechtenstein *et al.*, 1967).

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ORGANIC AMENDMENTS ON PROTEIN AND OIL YIELD OF GROUNDNUT UNDER *Theri* SOILS (TYPIC USTIPSAMMENTS)

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ABSTRACT

A pot experiment was conducted with the object of studying the different locally available organic amendments on yield, protein and oil content of groundnut under *theri* soils. Arecanut waste recorded the highest protein content (17.81 per cent). Biogas slurry applied treatment recorded the highest oil content (48.4 per cent) The treatment with the application of arecanut waste gave the highest pod yield(19.00 g/pot) and total oil yield (4.9 g/pot).

KEY WORDS : Amendments, *Theri*, Arecanut waste, Biogas slurry, Pressmud

The need for evaluating the soil resources Rice, 1948; Sehgal, 1987) has become imperative, because the wealth of any nation lies in her soils and their intelligent use and management. *Theri* soils occur to the extent of 60,000 ha in Tirunelveli and Chidambaranar districts. *Theri* land soils are largely coarse textured, Where establishment of tree species suffers due to lower level of available nutrients, poor buffering capacity, poor moisture retention and rapid drying of these soils. In these sandy soils, palmyrah and *Acacia* species are natur ally growing. These soils are highly permeable with low water retentivity. These *Theri* soils are now being kept as wastelands. Hence an attempt was made to suggest suitable amendments for the reten tion of moisture and to put the land to proper use.

MATERIALS AND METHODS

A pot experiment was conducted with the object of studying the different locally available organic amendments, on yield, protein and oil content of groundnut under these *theri* soils. The details of the experiment conducted are given in Table 1. The nutrient content of amendments used is detailed in Table 2.

All the treatments received uniform doses of fertilisers *viz.*, 17 kg N/ha in the form of ammonium sulphate, 34 Kg P_2O_5/ ha in the form of super phosphate and 54 kg K_2O/ha in the form of potassium chloride. Gypsum 400 Kg/ha was applied 40 days after sowing.

Kernel protein content was estimated by multiplying the nitrogen content of kernel by the

Table 1. Details of the pot experiment.

Crop : Groundnut TMV.7 (*Arachis hypogaea* L.)
Soil : Sawyarpuram *Theri* soil (11 kg/pot)
Design : Completely randomized design
Replication : Seven

Treatments	Rate (t/ha)
CPC - Coir pith composted	12.5
PM - Pressmud	12.5
FYM - Farm Yard Manure	12.5
TKS - Thankaikulam silt	25.0
KKS - killikulam silt	25.0
GLM - *Cassia nigrigens*	5.0
BGS - Biogas slurry	12.5
BS - Banna sheath	5.0
TW - Tannery waste	5.0
JAL - Jalsakthi	12.5
Ipomoea - Ipomoea cornea	5.0
SWR - Sea weed residue	12.5
AW - Arecanut waste.	5.0
VC - Vermiculite clay	12.5
CON - Control	

factor 6.25. Microkjeldahl method (Humphries, 1956) was followed to estimate the nitrogen content in 3g of kernel.

RESULTS AND DISCUSSION

The data on yield of groundnut pod, oil content, kernel oil yield and protein content are presented in Table 3

Table 2. Total nitrogen, phosphorus and potassium content of amendments used in the pot experiment

Treatments	Nitrogen (%)	Phosphorus (%)	Potassium (%)
CPC	1.20	0.03	1.87
PM	0.35	0.73	1.2
FYM	0.47	0.2	0.294
TKS	0.029	0.038	0.278
KKS	0.084	0.013	0.173
GLM	2.9	0.17	1.7
BGS	1.2	0.7	0.8
BS	0.105	0.26	0.433
TW	0.44	-	0.475
JAL	-	-	-
SWR	1.596	0.06	0.76
Ipomoea	1.05	0.26	0.433
AW	1.46	0.09	0.20
VC	0.028	-	0.023
CON	-	-	-

NOTE :
Mechanical composition of silts (%)

Treatments	Clay	Silt	Coarse sand	Fine sand
TKS	73.4	12.5	3.5	9
KKS	48.4	12.5	28.5	6.5

Pod yield

Significant difference in the yield of groundnut pods due to the application of different amendments was observed. The pod yield ranged from 7.66 to 19.00 g/pot.Among the treatments, arecanut waste treatment resulted in the highest pod

Table 3. Influence of amendments on pod yield, protein, oil content and oil yield of groundnut crop.

Treatments	Pod yield (g/pot)	Oil content (%)	Total oil yield (g/pot)	Protein content (%)	Shelling percentage
CPC	15.00	47.7	4.1	12.69	57.33
PM	15.33	48.2	4.0	12.38	54.60
FYM	16.00	46.7	4.2	16.94	56.73
TKS	18.66	42.4	4.8	12.31	60.23
KKS	13.66	44.4	3.2	12.69	53.70
GLM	16.33	45.5	3.9	16.81	52.86
BGS	16.00	48.4	4.4	8.81	58.80
BS	12.66	41.8	3.0	10.94	56.56
TW	11.66	40.8	2.5	8.44	51.80
JAL	11.33	44.3	2.7	7.63	54.56
SWR	17.00	44.2	4.3	11.63	57.70
Ipomoea	12.66	37.5	2.8	10.81	57.80
AW	9.00	40.1	4.9	17.81	64.63
VC	13.00	39.8	2.8	12.00	53.80
CON	7.66	34.7	1.3	5.69	49.76
CD (P=0.05)	3.45	0.33	0.86	0.15	0.357

yield which was on par with the yield of Thankaikulam silt, sea weed residue, green leaf manure, farm yard manure and biogas slurry treatments. Sea weed residue also recorded higher pod yield, which is in conformity with the report of Koo (1988).

Protein content

There was a significant difference in the protein content of kernels due to the treatments. The protein content ranged from 5.69 to 17.81 per cent. The treatment with the application of arecanut waste recorded the highest protein content (17.81 per cent). The oil percentage ranged from 34.7 to 48.4 per cent.

Total oil yield

The treatment with the application of biogas slurry recorded the highest oil percentage (48.4 per cent) which was on par with pressmud applied treatment. The total oil yield ranged from 1.3 to 4.9 g/pot. The treatment with the application of arecanut waste gave the highest oil yield, which was on par with pressmud applied treatment. The higher content of oil content in biogas slurry applied treatment is due to high content of N,P and K. Balanced supply of these three nutrients play a major role. This is in conformity with the results of Rani Perumal *et al.*, (1978).

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HETEROSIS STUDIES IN BITTERGOURD*(Momordica charantia)*

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ABSTRACT

Four lines were crossed with fifteen testers and the resultant sixty hybrid combinations, were evaluated along with their parents for heterosis, for fruit yield and their component characters. Observations were recorded on 12 yield component characters. Appreciable amount of heterosis was observed for all the characters under study. The F_1 hybrids $L_3 \times T_1$ (Pusa Visesh x MC.13) $L_2 \times T_4$ (MC. 84 x MDU.1), and $L_{11} \times T_1$ (DFH. 21 x MC.13) gave the highest fruit yield per vine and they showed 65.74, 61.92 and 48.04 per cent heterosis for yield over the standard variety (MC.84). The best performing F_1 hybrid of the study $L_3 \times T_1$ (Pusa Visesh x MC.13) recorded 65.74 per cent heter osis over the standard variety (MC.84) and 49.00 per cent heterosis over the better parent (MC.13).

KEY WORDS : Bitter Gourd, Hetorosis

Bittergourd *(Momodica charantia*L.) is one of the most important nutritious cucurbitaceous vegetables, known for its peculiar characteristic bitter taste. It is highly cross pollinated and its monoecious nature has resulted in variations in several qualitative and quantitative characters. Despite of it importance and adaptability not much work has been done especially in crop improvement aspects. The present investigation was taken up using a 4 X 15 line x tester crossing system to produce promising F1 hybrids in this crop.

MATERIALS AND METHODS

The bittergourd material chosen for this study consisted of 15 lines and four testers which were crossed using the Line x Tester making system to produce 60 hybrids. The parents used were Co.1 (L_1), MC.84 (L_2), Pusa Visesh (l_3), Coimbatore local (L_4), Perumbavoor local (L_5), Vadakkancheri