

Slow succinate dehydrogenase decline in leaves was related to higher panicle dry weight in different rice varieties (Debata and Murthy, 1982).

The results indicated that genotypic correlation of total soluble proteins at boot and of mitochondrial ATPase activity at flowering are better biochemical indicators for predicting number of filled grains per panicle, while genotypic correlation of total soluble proteins at flowering and mitochondrial ATPase activity at 20 days after flowering for enhanced grain weight.

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## WEED MANAGEMENT IN PIGEONPEA - GROUNDNUT INTERCROPPING SYSTEM

M. RAMASAMY, K. SRINIVASAN and K. VAIRAVAN

National Pulses Research Centre  
Tamil Nadu Agricultural University  
Vamban 622 303

#### ABSTRACT

Field experiments were conducted for three years, to study the effect of different weed management practices in pigeonpea + groundnut intercropping system. The study revealed that the first 30 days after sowing is the critical period of weed management for pigeonpea + groundnut system. Weed free environment upto 30 days after sowing produced significantly higher yield which was on par with weed free upto 45, 60 days and weed free till maturity. Similar trend was observed for both the main and intercrops.)

**KEY WORDS :** Pigeonpea, Groundnut, Weed Management, Intercropping

Pigeonpea is a major pulse crop grown under rainfed condition during *kharif* season. The special requirement and nature of growth of this crop offer good scope for intercropping short duration compatible crops under such conditions. Efficient use of applied inputs and scarce soil moisture is of

timely and effective control of weeds, robing the soils, of nutrients and moisture (Masood Ali *et al.*, 1982). The extent of loss caused by weeds in pigeonpea systems varies with the intensity and nature of weeds, soil fertility and stage of crop (Mittal and Singh, 1983). If timely weeding is not

(Asokaraja and Jeyaraman, 1995). Weeds emerging 6 weeks after planting caused no reduction in groundnut yields. Weedy free upto 15-45 DAS is essential for higher yield. (Kalaiselvan *et al.* 1991). With an objective to find out an effective weed management practice and critical stage of weed management in pigeonpea intercropping system, this trial was initiated.

## MATERIALS AND METHODS

A field trial under All India Co-ordinated Pulses Improvement programme was conducted during the *kharif* seasons of 1990, 1991 and 1992 at National Pulses Research Centre, Vamban, under rainfed conditions. The soil was red-lateritic having a pH of 5.7 and low in available N and P, and medium in K. The trial was conducted in a randomised block design with three replications. The treatments details are presented in Table 1.

Short duration red gram cv ICPL-87 was raised as maincrop and groundnut (JL 24) as intercrop in 2:1 ratio. The crop was uniformly fed with 12.5 kg N and 25 kg P<sub>2</sub>O<sub>5</sub>/ha, as basal dressings. The total precipitation received during the cropping season during 1990, 1991, 1992 were 351 mm, 372 mm and 340 mm respectively. The weed control efficiency was worked as per the method suggested by Mani *et al.*, 1973. The plot was kept weed free as per treatments, by weekly hand weeding.

## RESULTS AND DISCUSSION

Table 1. Effect of weed management practices in red gram groundnut intercropping system

Treatment	Yield (kg/ha)		Weed dry weight (g/m <sup>2</sup> )	Weed control efficiency (%)	Cost benefit ratio
	Maincrop (Pigeonepa)	Intercrop (Groundnut)			
T1 Weed free upto 15 days	870	492	201	41.1	2.18
T2 Weed free upto 30 days	952	555	158	53.6	2.65
T3 Weed free upto 45 days	965	572	150	56.0	2.19
T4 Weed free upto 60 days	1011	587	141	58.6	2.15
T5 Unweeded upto 15 days	852	480	222	34.9	2.04
T6 Unweeded upto 30 days	702	402	240	29.6	1.73
T7 Unweeded upto 45 days	692	385	292	14.3	1.51
T8 Unweeded upto 60 days	685	372	302	11.4	1.40
T9 Weed free upto maturity	1090	593	7	97.9	2.17
T10 Unweeded upto maturity	652	251	341	-	-
SEd	40	18	11	-	-
CD (P=0.05)	83	38	23	-	-

Pooled data (mean of three years) are presented in Table 1.

## Weed flora

The predominant weed flora of the experimental field were *Digera arvensis* (F), *Amaranthus viridis* (L), *Cleome viscosa* (L), *Trianthema portulacastrum* (L), *Dactyloctenium aegyptium* (W), *Cyanadon dactylon* (L), *Echinochloa colona* (L) and *Cyperus rotundus* (L). Grasses and sedges were the dominant weeds.

## Grain yield

Different weed management practices had a significant effect on the yield of main and intercrop. Among them, weed free till maturity produced significantly higher yield. However, this was on par with weed free upto 15, 45 and 60 days. This indicates that the first 30 days after sowing is very critical for weed management and after that, the crop itself competes by smothering the weeds. Lowest yield was recorded in unweeded till maturity which was on par with unweeded upto 30, 45 and 60 days after sowing. This might be because of heavy initial crop weed competition, and the crop was unable to recover the growth after later periods. The increase in grain yield in weed free upto 30, 45 and 60 days over control (unweeded till maturity) were 46, 48, and 55% respectively. This yield increase is attributed for competition free initial growth period for the crop.

Maintaining a weed free condition till maturity or till 60 days is labourious and hence maintaining a weed free condition till the critical period of first 30 days after sowing is sufficient and also efficient. The economic analysis also reveals that weed free upto 30 DAS produces highest cost benefit ratio of 2.65.

Regarding the intercrop of groundnut, similar trend was observed. These results are in line with the findings of Kalaiselvan *et al.*, (1991).

#### Weed dry matter and weed control efficiency

Highest and significant weed dry weight of 341 g/m<sup>2</sup> was observed in unweeded check which was on par with unweeded upto 45 and 60 days. Lowest weed dry weight was seen in weed free upto 60 days which was on par with weed free upto 30 and 45 days. The weed control efficiency was higher for weed free upto 60 days which was closely followed by weed free upto 30 and 45 days.

The study clearly indicates that maintaining a weed free condition upto 30 days after sowing is the best weed management practice for pigeonpea + groundnut intercropping system.

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## INTERGATED WEED MANAGEMENT FOR THE PREMONSOON SOWN SORGHUM - COWPEA INTERCROPPING SYSTEM UNDER RAINFED VERTISOLS

S.KRISHNASAMY and R. KRISHNASAMY

Agricultural Research Station  
Tamil Nadu Agricultural University  
Kovilpatti 627 701

#### ABSTRACT

At the Agricultural Research Station, Kovilpatti, in rainfed vertisols, experiments were conducted to find out the effect of integrated weed management practice for pre monsoon sown sorghum cowpea intercropping system during 1992-93 and 1993 - 94 in a randomised block design. Different herbicides and their time of application formed the treatments. (The results revealed that butachlor applied at 1.00 kg or 0.75 kg ai/ha immediately after the receipt of sowing rain followed by one hand weeding on 40 days after sowing (DAS) recorded lesser weed density and increased grain yields of base crop sorghum and intercrop cowpea. Application of butachlor at 0.75 kg ai/ha with one hand weeding on 40 DAS registered highest net returns in both the years.)

**KEY WORDS:** Sorghum - Cowpea Intercropping, Rainfed Vertisols, Premonsoon Sowing, Integrated Weed Management

In rainfed farming system, sorghum intercropping with pulses especially cowpea is quite common to cover the risk of total crop failure. Intercrops suppress weed growth, but the efficiency of weed suppression largely depends on the nature of component crops (Venkateswaralu and Ahlawat, 1986). The main method of controlling weeds under intercropping system under rainfed situation

is mainly by manual weeding which is costlier and time consuming. Recommendations on application of herbicides for sole crop situations are available. But information on use of herbicides under sorghum+cowpea intercropping system which is predominant in the rainfed vertisols of Tamil Nadu is lacking.)