

EFFECT OF PLANTING SYSTEMS AND DIFFERENT INTER-CROPS ON YIELD AND ECONOMICS OF LONG DURATION REDGRAM (*Cajanus cajan* (L.) Kilsp.)

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Experiments conducted at National Pulses Research Centre, Vamban during Kharif 1979 and 1980 revealed that paired row cultivation of long duration redgram (45/105 cm) and intercropping 2 rows of greengram in between paired rows was found to be significant in recording higher grain yield (808 kg/ha) and higher net return of Rs. 1373/ha.

Inter-cropping ensures effective land utilization and surety of atleast one crop under dry farming condition. In order to determine the suitable inter-crops and to increase the production of pulse per unit area, experiments were conducted under dryland condition of Pudukkottai District of Tamil Nadu.

MATERIAL AND METHODS

The trials were laid out at National Pulses Research Centre, Vamban during kharif seasons of 1979 and 1980. The treatments consisted of three systems of planting with 75 x 30 cm (one row of inter-crop), paired row system of planting with 105 x 45 cm (two rows of inter-crops) and paired row system of planting with 105x45 cm (three rows of inter crops). Inter-crops like green gram (Co. 3), Cowpea (C 152), Soybean (Kalithur),

groundnut (TMV 7) and redgram (Co 3), were tried in between the rows of long duration redgram (SA1). Redgram was also grown as a pure crop for comparison. The soil is of red sand loam with medium in nitrogen and potassium and low in phosphorous contents. The precipitation received during the crop period was 550 mm in 33 rainy days (1979-80) and 413 mm in 21 rainy days (1980-81). The experiments were laid out in a Randomized Block design replicated three times. Diammonium phosphate @ 200 kg/ha was applied as a basal dressing. The seeds were sown in lines as per schedule of treatments and harvested as and when the crops attained maturity. The grain yields of inter and main crops were recorded as cleaned grains.

RESULTS AND DISCUSSION

The yield components and grain yields were subjected to pooled analysis and presented in Table 1 and 2.

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Yield components

Among the inter-crops tried, greengram was found to be superior than the other inter-crops in increasing the yield contributing characters of the main crop of Redgram. The yield components of Redgram, viz number of seeds/pod, number of pods/plant, 500 grain weight were found to increase the grain yield. (Table 1).

Grain Yield :

Paired row cultivation of long duration redgram (45/105 cm) + 2 rows of greengram registered the highest grain yield of 808 kg/ha (Table 1). This was followed by single row of redgram + greengram, but it was found to be on par with pure cultivation of redgram. Paired row of redgram + 2 rows of cowpea recorded the lowest grain yield of (496 kg/ha) redgram indicating the competitive nature of cowpea.

Net return (Economics)

Data for the year 1979 and 80 were pooled and statistically analysed and the results were furnished in Table 2.

Paired row cultivation of redgram (45/105 cm) and intercropping 2 rows of greengram in between paired rows recorded higher net return of Rs. 1373/ha (Table 2). Redgram + Cowpea combination recorded the lowest net return, probably due to smothering effect of cowpea on redgram. The present study was in close conformity with the findings of Mahatim Singh *et. al.* (1977) that the 'Inter-cropping of arhar with urad mung (*Vigna radiata*) and soybean increased total seed yields and net profit by 42.4%, 17.8% and 9.1% respectively, compared with solid stand of *Cajanus cajan*. Inter-cropping with cowpea or *Setaria lalica* with Redgram was not profitable.

The result suggest the need for adopting inter-cropping in drylands, to stabilize production and to increase the economic returns to the farmers. 'Inter-cropping also lowers the risk of failure of monoculture due to uncertain weather conditions. Therefore, the improved techniques suggested above may be adopted for higher yield and monetary returns.

REFERENCE

- MAHTIM SINGH., B. S. SUMITRA, KALYAN SING., R. K. SINGH, 1977. Inter-crop for higher profit. Indian Farming 27 (5): 9.

Table 1. Effect of planting systems and different inter-crops on yield of Redgram (Pooled analysis data 1979-80, 1980-81).

Planting systems	No. of seeds/ pod	No. of pods/ plant	500 grain weight (g)	Grain yield (Main crop) (kg/ha)
T ₁ : Pure redgram (75 cm row)	3.66	63.4	29.08	792
T ₂ : Redgram (75 cm row) + Greengram	3.50	61.5	29.41	773
T ₃ : " " + Cowpea	3.10	41.83	27.16	507
T ₄ : " " + Soybean	3.40	48.60	27.75	667
T ₅ : " " + Groundnut	3.21	45.80	27.10	611
T ₆ : Redgram paired row (45/105 cm)	3.63	64.30	28.50	792
T ₇ : " " + 2 rows of greengram	3.61	70.50	29.10	808
T ₈ : " " + 2 rows of Cowpea	3.10	47.30	26.60	496
T ₉ : " " + 2 rows of soybean	3.33	49.30	27.90	640
T ₁₀ : " " + 2 rows of groundnut	3.26	49.60	28.60	619
T ₁₁ : " " + 3 rows of greengram	3.45	56.70	28.50	699
T ₁₂ : " " + 3 rows of Cowpea	3.23	50.20	27.40	541
T ₁₃ : " " + 3 rows of soybean	3.55	52.00	28.40	667
T ₁₄ : " " + 3 rows of groundnut	3.45	53.20	28.20	627
T ₁₅ : Redgram 75 cm row of short duration redgram + one row	3.26	45.30	26.50	507
T ₁₆ : Redgram paired row redgram (45/105 cm) + one row	3.25	47.40	27.00	493
CD at 5%	0.266	9.03	0.889	82

Table 2: Effect of planting systems and different inter-crops on net return (Pooled analysis data 1979 and 80).

Treatments (Planting systems)	Net value (Redgram + Inter - crops) (Rs/ha)
T ₁ : Pure redgram (75 cm row)	917
T ₂ : Redgram (75 cm row) + Greengram	1211
T ₃ : " " + Cowpea	427
T ₄ : " " + Soybean	560
T ₅ : " " + Groundnut	560
T ₆ : Redgram paired row (45/105 cm)	845
T ₇ : " " + 2 rows of greengram	1373
T ₈ : " " + 2 rows of cowpea	387
T ₉ : " " + 2 rows of soybean	589
T ₁₀ : " " + 2 rows of groundnut	640
T ₁₁ : " " + 3 rows of greengram	915
T ₁₂ : " " + 3 rows of of cowpea	491
T ₁₃ : " " + 3 rows of soybean	571
T ₁₄ : " " + 3 rows of groundnut	624
T ₁₅ : Redgram (75 cm row) + one rows of short duration redgram	579
T ₁₆ : Redgram paired row (45/105 cm) +	520
GD at 5%	77