https://doi.org/10.29321/MAJ.10.A02496

Madras Agric. J 71 (7) 444—446, July 1984.

PERFORMANCE OF SOME *KHARIF* CROPS UNDER RAINFED CONDITIONS

VED SINGH*

A field experiment was conducted during 1978-79 and 1979-80 on clay loan soil of Agriculture Research Station, Banswara (Rajasthan) to study the performance of different *Kharif* crops under rainfed conditions. Five crops namely maize, black gram, cowpea, red gram and groundnut were taken under study and all crops were treated with recommended fertiiizer dose under rainfed conditions for respective crop. Two years results indicated that black gram recorded significantly higher monetary return of Rs 2205/ha followed by red gram.

Generally pulses and oilseeds are considered drought resistant crops. The consequent result is that the average yields of these crops are low. Chandra Mohan (1969) obtained a yield of 5.6 q/ha of red gram (*Arhar*) from rainfed crop at Bhavanisagar. It is very essential to identify crops which would give higher yield under dryland conditions. Information on comperative response and economic returns of different crops under rainfed conditions is limited. With the objective of studying the comperative response and economics of different *Kharif* crops under rainfed conditions in South Rajasthan, the present field expriment was under taken.

MATERIALS AND METHODS

The trial was conducted during *Kharif* season of 1978-79 and 1980-81 on clay loam soil at Agriculture Research Station, Banswara. Five crops namely maize, red gram, black gram, cowpea and groundnut were studied with a recommended fertilizer for respective crop. In maize half nitrogen was applied as basal application and remaining half at knee-high stage or pretasseling stage depending on availability of moisture. However, in remaining four legume crops full doss of nitrogen was applied as basal for early establishment of roots and nodules on roots. Full dose of phosphorus and potash were applied at sowing time in all five crops. The study was undertaken in randomized block design with four replications using a plot size of 100 m². Other details and informations of the experiment are given below.

Table 1. Fertilizer dose spacing and seed rates used for different crops.

Name of Crop	Varieties	Fertilizer doses N—P—K Kg/ha	Seed rate Kg/ha	Spacing
Maize	G-2	60-30-20	20	60cm x 20cm
Black gram	T-9	15-60-0	15	30cm line to line
Cowpea	G-152	40-60-40	20	30cm line to line
Red gram	UPAS-120	30-60-30	15	60cm x 30cm
Groundnut	RS-1	30-60-60	80	30cm line to line

*Agricultural Research Station, Sriganganagar-335001 (Rajesthan).

Table II. Mean monthly weather data during the crop growing season.

Month	Maximum temp. °C		Minimum temp. °C		Maximum relative humidity		Minimum relative humidity		Total rainfall (mm)	
	1978-79	79-80	78-79	79-80	78-79	79-80	78-79	79-80	78-79	79-80
June	36.18	38.68	26.10	27 42	75.60	69.46	47.72	42.14	66 4	40.9
July	29.74	32.42	24.52	25.32	27 58	81.76	72.80	59 52	451.4	118.5
Aug.	28.86	30.46	23.70	23.84	91 88	84.70	82 46	68 38	534.2	353.8
Sept.	32 54	34.82	23.54	24 36	81.62	73.94	55.68	39 86	46.2	3.8
Oct.	21.80	35.40	20.88	22 50	52.94	60.08	21.10	32.64	—	44.2
Nov.	30.56	31.90	18.48	21.40	70 56	63.52	46 96	39 02	21.9	48.4

The crops were sown on 10-7-78 and 30-6-79 during 1978-79 and 1979-80 respectively. Four crops were harvested upto middle of October while red gram was harvested in the first week of November during both years.

Table III Yields (q/ha) and economic returns (Rs/ha) during *kharif* 1978-79 and 1979-80.

Crops	Yield q/ha				Cross return Rs/ha		Mean return Rs /ha
	1978-79		1979-80				
	Grain	Straw	Grain	Straw	1978-79	1979-80	
Maize	13.45	61.50	5.35	20.70	2267.50	1006.00	1636.75
Black gram	8.50	35.10	6 38	10.95	2651.50	1759 25	2205.37
Cowpea	4.60	26.00	4.85	11.55	1645.00	1385.75	1515 37
Red gram	7.1	46.9	6.05	16 38	2265.50	1576 70	1921.10
Groundnut	1.90	19 60	2.58	26.58	380.00	516.00	448.00
S E D	0.69		0.53		148.11	131.10	
C D at 5%	1.52		1.15		298.19	259.73	

Cost of produce was calculated as follows :

Crop	1978-79	1979-80
Maize	Rs. 100/- per quintal	Rs. 130/- per quintal
Black gram	Rs. 250/- „ „	Rs. 250/- „ „
Red gram	Rs. 220/- „ „	Rs. 220/- „ „
Cowpea	Rs. 275/- „ „	Rs. 250/- „ „
Groundnut	Rs. 200/- „ „	Rs. 200/- „ „
Straw	Rs. 15/- „ „	Rs. 15/- „ „

RESULTS AND DISCUSSION

Grain yield :

Data presented in Table III revealed wide variation in yield of different crops in both the years of experimentation.

The response of crops in rainfed conditions were greatly influenced by the amount and distribution of rainfall In 1978-79 because of good and evenly distributed rainfall from June to September, a satisfactory grain yield was observed in maize, black gram and red gram (13.45, 8.50 and 7.1 q/ha respectively) followed by cowpea while groundnut gave poorest performance. The reason for decrease in groundnut yield was poor development of pods in heavy soils, Maize produced significantly higher grain than all other four crops and black gram and red gram also produced significantly higher grain yield than cowpea and groundnut.

In *Kharif* 1979-80, rainfall was low and 75% of total rainfall of whole year was received in the months of July and August. Because of this uneven distribution, the grain yield of maize (5.35 q/ha) was severly reduced and yields of black gram (6 38 q/ha) and red gram (6.5 q/ha) were also reduced. This reduction in yield as compared to 1978-79 was 60, 25 and 15 per cent in maize, black gram and red gram respectively. Black gram and red gram gave significantly higher grain yields than cowpea. It can be mentioned that yield of cowpea and black gram might have not been reduced under drylands due to their favaurable effect on soil fertility and moisture conservation during drought year by their spreading growth habit. In case of red gram, being a deep rooted crop, it exploits moisture and vital nutrients from the lower layers of the soil.

Variation in gross monetary return due to crops were significant. Black gram appeared to be significantly remunerative crop during both the years. Maize and red gram are equal and followed by cowpea while groundnut gave the lowest gross return in 1978-79. However, during 1978-80 red gram stands second followed by cowpea, maize and groundnut.

The average gross monetary return was also highest from black gram followed by red gram, maize, cowpea and very poor from groundnut which were Rs. 2205/-, Rs. 1921/-, Rs. 1636, Rs. 1515/- and Rs. 448/- per hectare, respectively. The data have thus indicated that higher gross monetary return were obtained from pulses under rainfed conditions. It appears that growing of black gram and red gram during *Kharif* will be more remunerative under rainfed and low rainfall area.

REFERENCE

CHANDRA MOHAN, J. 1969. A note on the effect of limited irrigation on the yield of pulses. Madras Agri. J. 56(2) : 85-86.