

RESPONSE OF DIFFERENT RABI CROPS UNDER DRYLANDS

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A field experiment was conducted during *Rabi* 1978-79 and 1979-80 on clay loam soils at Agriculture Research Station Banswara (Raj) to evaluate the comparative performance of different *Rabi* crops grown under drylands. The treatments consisted five crops, namely wheat, barley, gram, mustard and sunflower, two varieties of each crop with two dates of planting. All crops were treated with recommended fertilizer dose for respective crops. Two year data indicated that gram (RS-10/RS-11) gave significantly higher monetary return of Rs. 2975.63/ha when crop was planted just after *rabi* rains (November).

Crop selection and production in rainfed area is quite ticklish and difficult. Sowing time is a more important factor which influences, the yield of crops under drylands. Lomte *et al* (1979) and Saxena and Singh (1979) reported that the yield of wheat under rainfed, ranges from 16 to 17 q/ha. Hooda and Kalara (1977) and Singh and Paliwal (1979) found that barley gave a yield of 18.1 q/ha under unirrigated conditions. However, Krishnamurthy *et al* (1977) observed that barley and wheat varieties gave an yield of 12.6 and 10.52 q/ha, respectively. At Hiriya sunflower and gram as rainfed gave a grain yield of 14.05 and 8.43 q/ha and net return was Rs. 1517/- and Rs. 914/ha, respectively. However, gram gave more yield and net return (11.15 q/ha and Rs. 1254/ha) when compared with sunflower (9.57 q/ha and Rs. 890/ha) at Hagari. Mustard gave a yield of 3.24 q/ha and net return of Rs. 534/ha at Talab Tillo under drylands. Information on comparative performance and economic returns of

different *rabi* crops under dryland conditions is very limited for south Rajasthan tract. Therefore, an investigation was undertaken with a view to identify *rabi* crops.

MATERIALS AND METHODS

An experiment was conducted during *Rabi* 1978-79 and 1979-80 on clay loam soil at Agriculture Research Station Banswara (Rajasthan) to study the relative performance of different *rabi* crops under dryland conditions. The treatment consisted of five crops viz. wheat, barley, gram, mustard and sunflower, two locally popular varieties of each crop with two dates of planting. The experiment was laid out in split plot design and replicated four times. Full recommended dose of NPK for respective crop were applied as basal application at sowing time. Normal seed rate and spacing were followed for respective crop. Other details of experiment are given below :

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Table 1. Details of crops fertilizer doses and dates of sowing and harvesting.

Crops	Varieties	Fertilizer	Date of sowing	Date of Harvesting
Wheat	K. Sona/Raj 911	60-30-20	1978-79	
Barley	RDB-1 Local	40-30-20	D ₁ = 11-11-78 D ₂ = 27-11-78	D ₁ = 2-3-79 D ₂ = 10-3-79
Gram	RS-10 RS-11	40-30-20	1979-80	
Mustard	T ₅₉ & Local	30-30-30	D ₁ = 29-11-79	D ₁ = 3-3-80
Sunflower	Ec. 68413 Ec. 68415	60-45-30	D ₂ = 14-12-79	D ₂ = 11-3-80

Table 2. Mean monthly weather data during growing season of crops.

Month	Maximum Temp/C		Minimum Temp/C		Maximum R.H.%		Minimum R.H.%		Total Rainfall (mm)	
	78-79	79-80	78-79	79-80	78-79	79-80	78-79	79-80	78-79	79-80
November	30.56	31.90	18.48	21.40	70.56	53.52	46.96	39.02	21.90	48.40
December	27.86	28.46	14.60	15.24	65.30	69.90	39.36	43.20	17.80	Nil
January	27.00	27.34	14.50	15.64	63.12	57.16	37.54	33.28	3.20	Nil
February	28.15	31.95	14.55	16.47	52.80	61.22	25.50	42.27	28.60	Nil
March	33.20	34.52	19.62	21.15	46.16	41.25	28.76	27.65	2.00	Nil

RESULTS AND DISCUSSION

The weather conditions during 1978-79 remained favourable (Table 2). The 1978-79 season was comparatively wet and cool with evenly distributed rainfall of 73.50 mm. during the months of November to March when the rate of crop growth was faster. However, in 1979-80 low rainfall (48.40 mm.) in the month of November was not conducive for crop growth resulted in poor yield.

The differences between two dates of planting during 1979-80

were not significant (Table 3). This may be explained on the basis of even distribution of rainfall. This rainfall enhanced the crop growth and development under both dates of planting during 1st year of experimentation. Whereas, during 1978-79, in late planting, the crop growth and development is adversely affected resulting in lower drymatter production which has direct correlation with the grain yield.

Table 3. Mean yield (q/ha) and monetary returns (Rs./ha.)

Crop	Variety	Mean yield q/ha				Mean monetary return Rs./ha	
		Grain		Straw		D ₁	D ₂
		D ₁	D ₂	D ₁	D ₂		
Wheat	K. Sona	16.75	12.82	43.88	41.75	2975.63	2372.58
	Raj 911	14.88	13.69	43.69	41.25	2580.25	2453.20
Barley	RDB-1	11.60	10.75	42.44	42.31	2016.40	1910.25
	Local	12.53	11.63	44.19	43.56	2147.88	2064.00
Gram	RS-10	14.09	11.98	32.50	29.63	3517.50	3003.13
	RS-11	13.41	11.78	31.25	28.53	3382.50	2895.38
Mustard	T ₅₀	6.44	5.44	36.75	31.03	1826.75	1549.80
	Local	6.50	5.66	35.88	33.56	1831.88	1614.30
Sunflower	Ec. 68413	6.35	6.34	48.75	47.00	1672.50	1585.00
	Ec. 68415	5.84	5.56	45.25	45.81	1536.25	1390.00

On the basis of grain yield, crops can be arranged as wheat, barley, gram, sunflower and mustard during 1978-79. However, during 1979-80 (Dry year) more grain yield was obtained from gram (10.82 q/ha) followed by wheat, barley, mustard and sunflower. This might be because of more tolerance power of gram against adverse weather conditions.

Gross return :

During 1978-79, gram gave significantly more monetary return over mustard, sunflower and barley.

However monetary returns obtained from gram and wheat were on par. In drought year of 1979-80 significantly higher monetary return was obtained from gram (Rs. 3518/ha) than all other crops. Gram gave 18 and 63 per cent more monetary return than wheat and barley, respectively.

On the basis of two year results it may be concluded that under drylands, gram (RS-10/RS-11) and wheat (K. Sona/Raj-911) may be sown just after rainfall or in conserved moisture to achieve optimum yield and monetary return.

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EFFECTS OF DIFFERENT SEED RATES AND SOWING DATES ON THE YIELD OF SAFFLOWER (*Carthamus tinctorius L.*)

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The results of the field experiments in safflower conducted in deep black soils under rainfed conditions at Jalgaon (Maharashtra) during the *Kharif* seasons of 1977-78 to 1979-80 showed that the differences in grain yield due to seed rates were significant while the differences in yield due to sowing dates were not significant. Irrespective of seasons, sowing safflower at seed rates ranging from 5.0 to 12.5 kg/ha resulted in marginal variation in its yield. The first fortnight of October was found to be the best period for sowing of safflower in Jalgaon region of Maharashtra.

Safflower (*Carthamus tinctorius L.*) a drought resistant crop, is mostly grown rainfed in the peninsular region of India. The average seed yield in the country is considerably low (325 kg/ha) as compared to other countries viz. U.S.A. (2012 kg/ha) and Mexico (1316 kg/ha). Among

the various causes responsible for low yields of safflower, poor agronomic management is a prime factor.

A properly managed safflower crop can yield 1.5 tonnes/ha in the drylands of north-west India (De *et al.* 1974). Sounda *et al.* (1977)

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