



Performance of different varieties of crops under Malwa Plateau situation of Mandsaur district

KEYWORDS

Soybean, Blackgram, Greengram, Maize, Sorghum, Pigionpea, Yield, Economics.

R. P. S. Shaktawat

RVSKW Krishi Vigyan Kendra,
Mandsaur, 458001 (Madhya
Pradesh), India

Durga Singh

RVSKW Krishi Vigyan Kendra,
Mandsaur, 458001 (Madhya
Pradesh), India

H. P. Singh

RVSKW Krishi Vigyan Kendra,
Mandsaur, 458001 (Madhya
Pradesh), India

ABSTRACT A demonstration cum field experiment was conducted at Patan Farm, Krishi Vigyan Kendra, Mandsaur during the year 2008- 2012 in kharif season to study the performance of different varieties of crops under Malwa Plateau situation of Mandsaur district. Among various crops demonstrated and tested on the basis of equivalent yield, pignonpea crop gave highest yield and net return compared with other crops. Among the different varieties tested JS - 9752, T - 9, JM - 721, ICPH - 2671, HQPM - 1 and JJ - 1022 variety of soybean, blackgram, greengram, pignonpea, maize and jowar were significantly superior compared with other varieties tested.

Introduction

Mandsaur district comes under Malwa plateau region of Madhya Pradesh having the black, brown and stony soils. The black soil requires less irrigation because of its high capacity for moisture retention. While brown and stony soils are lighter and having higher portion of sand. The climate of the district is mostly dry except when south-west monsoon starts and continues up to about the middle of September. District having maximum temperature range of 35° - 45° C and the minimum range of 9° - 25° C. The average annual rainfall in the District is 786.6 mm. Most of the farmers are growing soybean and maize. While this region is suitable for the cultivation of greengram (*Vigna radiata*), blackgram (*Vigna mungo*), pignonpea (*Cajanus cajan* L.), soybean (*Glycine max* L.), maize (*Zea mays*), groundnut (*Arachis hypogaea*) and sesame (*Sesamum indicum*) during rainy season with short to medium duration varieties. Keeping these in mind, the demonstration cum experiment was laid out to study the performance of different varieties of crops under Malwa Plateau situation of Mandsaur district and to find out the drought resistant crop and varieties suitable for dry land farming.

Material and method

A demonstration cum experiment was undertaken during kharif seasons of 2008 to 2012 at Patan Farm, Krishi Vigyan Kendra, Mandsaur (Madhya Pradesh) to study the performance of different varieties of crops under Malwa Plateau situation of Mandsaur district. The soil of experimental site was loamy soil with pH 8.4, organic carbon content 0.10%, low in available nitrogen (112.5 kg/ha), medium in available phosphorus (12.4 kg/ha) and medium in available potassium (345.8 kg/ha). The crops were sown on the onset of monsoon every year and recommended agronomic practices were undertaken. Economics of various treatments was calculated using the prevailing market prices of the different crops.

Result and discussion

Yield of crops

Among the different crops sown soybean variety JS 9752 and JS 335 gave significantly highest grain yield i.e. 1592.8 and 1571.4 q/ha which was 13.90 and 12.37 percent higher as compared to JS 9560. Soybean variety JS 9560 gave lowest grain yield i.e. 1398.4 q/ha but matures in 88 days while JS 9752 and JS 335 mature in 103 and 105 days, respectively. Data further revealed that blackgram variety T - 9 gave significantly highest grain yield i.e. 777.8 q/ha which was 12.17 percent higher as compared to PU 35. Blackgram variety PU 35 gave lowest grain yield i.e. 693.4 q/ha and matures in 78 days while T - 9 variety mature in 75 days.

Under Malwa plateau situation of Mandsaur district greengram variety JM - 721, Pusa Vishal and TM - 9937 gave significantly highest grain yield i.e. 792.0, 772.8 and 767.8 q/ha which was 56.83, 53.02 and 52.03 percent higher as compared to local seed sown. Greengram local seed gave lowest grain yield i.e. 505.0 q/ha and matures in 72 days while JM - 721, Pusa Vishal and TM - 9937 mature in 76, 70 and 68 days, respectively.

It is apparent from data presented in table 1 that maximum grain yield of 2796.4 q/ha was recorded with JJ 1022 variety of jowar which matures in 105 days. JJ 1022 variety of jowar gave 2.43 and 15.24 per cent higher yield as compared to JJ 1041 and JJ 938, respectively. Similarly, maximum grain yield of 3293.4 q/ha was recorded with HQPM-1 variety of maize which matures in 100 days. HQPM-1 and JM 216 variety of maize gave 9.00 and 8.74 per cent higher yield as compared to JM 12, respectively.

Among the different crops sown pignonpea variety ICPH 2671 and ICPL 87119 gave significantly highest grain yield i.e. 1380.0 and 1285.0 q/ha which was 18.96 and 10.77 percent higher as compared to ICPL 87 variety tested. Pignonpea variety ICPL 87 gave lowest grain yield 1160.0 q/ha and mature in 165 days while ICPH 2671 and ICPL 87119 mature in 190 days.

Equivalent Yield of crops

There was a significant effect of varieties on equivalent yield of crops grown under demonstration. Pignonpea varieties gave significantly maximum equivalent yield compared with all other varieties of different crops. Among the different crops sown pignonpea gave the highest average equivalent yield 2911.89 kg/ha followed by soybean (1508.32 kg/ha), maize (1304.88 kg/ha), blackgram (1264.66 kg/ha), greengram (1167.27 kg/ha) and jowar (785.71 kg/ha). While these when compared with each other, variety JS 9752 of soybean (1592.8 kg/ha), blackgram variety T-9 (1318.2 kg/ha), greengram variety JM 721 (1349.3 kg/ha), jowar variety JJ - 1022 (830.6 kg/ha), maize variety HQPM-1 (1374.6 kg/ha) and pignonpea variety ICPH - 2671 (3190.2 kg/ha) gave significantly highest equivalent yield as compared to different varieties of soybean, blackgram, greengram, jowar, maize and pignonpea tested, respectively.

Economics of crops

Among the different crops sown, pignonpea variety ICPH 2671 gave the highest gross and net return of Rs 67100 and 54240 with a B: C ratio of 5.11:1, respectively. While within

crops, soybean variety JS 9752, blackgram variety T-9, greengram variety JM 721, jowar variety JJ – 1022, maize variety HQPM-1 and pegenionpea variety ICPH – 2671 recorded significantly highest gross return of Rs 33439, 27994, 28900, 28084, 17433 and 67100/ha, respectively among different varieties of soybean, blackgram, greengram, jowar, maize and pegenionpea. These varieties also recorded significantly maximum value of net return and B: C ratio. The findings of this investigation are in close conformity with the results of

Saxena et al., (2011).

Conclusion

With higher productivity of pegenionpea (1380.0 kg/ha), higher market price of Rs. 4800/q, farmers can earn gross income of Rs. 87100/- with a B:C ratio of 5.11. With the five years of experiment with the crops and variety, farmers intend to grow pegenionpea on a still larger scale in next years.

Table : 1. Performance of different varieties of kharif crops tested under crop cafeteria during kharif, 2008 to 2012 at Patan Farm, KVK, Mandasaur

S. N.	Crop	Variety	Grain yield (kg/ha)					Mean	Mean of crop
			2008	2009	2010	2011	2012		
1.	Soybean	JS-9305	1300	1550	1628	1600	1450	1505.6	
2.	Soybean	JS-9560	1100	1500	1542	1450	1400	1398.4	
3.	Soybean	JS-335	1400	1550	1657	1600	1650	1571.4	
4.	Soybean	JS-9041	1275	1450	1542	1550	1550	1473.4	
5.	Soybean	JS-9752	1500	1550	1714	1600	1600	1592.8	1508.3
6.	Urd	LBG-20	675	700	857	800	725	751.4	
7.	Urd	T-9	650	650	914	850	825	777.8	
8.	Urd	PU-35	600	650	742	750	725	693.4	
9.	Urd	JU-86	650	675	885	800	800	762.0	746.1
10.	Moong	Neha	550	625	857	700	750	696.4	
11.	Moong	TM-9937	650	650	914	825	800	767.8	
12.	Moong	JM 721	600	650	885	900	925	792.0	
13.	Moong	Pusa Vishal	525	650	914	875	900	772.8	
14.	Moong	HUM – 1	575	625	571	700	675	629.2	
15.	Moong	TJM – 3	575	650	628	850	800	700.6	
16.	Moong	Ganga – 8	525	600	685	800	775	677.0	
17.	Moong	Hariyali	525	600	857	750	700	686.4	
18.	Moong	Samrat	600	675	742	775	675	693.4	
19.	Moong	Narendra – 1	575	575	628	675	700	630.6	
20.	Moong	Local	500	450	600	475	500	505.0	686.4
21.	Maize	JM-8	2925	3600	3142	3200	3000	3173.4	
22.	Maize	JM-12	2875	3575	2857	3000	2800	3021.4	
23.	Maize	JM-216	3000	3800	3428	3300	2900	3285.6	
24.	Maize	HQPM-1	3750	3575	3142	3000	3000	3293.4	
25.	Maize	Farmers var	2875	3000	2800	2900	2800	2875.0	3129.7
26.	Jowar	JJ-938	2675	2800	1857	2300	2500	2426.4	
27.	Jowar	JJ-1041	2750	3000	2000	3000	2900	2730.0	
28.	Jowar	JJ-1022	2875	2950	2057	3100	3000	2796.4	2253.8
29.	Arhar	JA-4	1025	1200	1300	1250	1400	1235.0	
30.	Arhar	ICPL-87	1000	1150	1200	1150	1300	1160.0	
31.	Arhar	ICPL-87119	1125	1300	1300	1200	1500	1285.0	
32.	Arhar	ICPH-2671	1250	1350	1400	1350	1550	1380.0	
33.	Arhar	JKM-189	1050	1200	1250	1250	1450	1240.0	
34.	Arhar	JKM-7	1075	1250	1300	1300	1400	1265.0	
35.	Arhar	UPAS-120	1100	1300	1250	1200	1250	1220.0	1258.3

Table : 2. Yield attributing characters of different varieties of crops under crop cafeteria at Patan Farm, KVK, Mandasaur (average of 5 years from 2008 to 2012)

S. N.	Crop	Variety	Maturity in days	Plant height cm	Pods or tillers per plant	Grains per pod or cob or ear
1.	Soybean	JS-9305	93	45.7	75	3.4
2.	Soybean	JS-9560	88	55.8	42	4.0
3.	Soybean	JS-335	105	60.9	76	2.8
4.	Soybean	JS-9041	94	86.3	35	3.0

5.	Soybean	JS-9752	103	91.4	85	2.6
6.	Urd	LBG-20	78	43.1	37	6.0
7.	Urd	T-9	75	60.0	32	7.0
8.	Urd	PU-35	78	66.0	38	6.0
9.	Urd	JU-86	75	55.2	35	5.2
10.	Moong	Neha	68	60.5	33	11.8
11.	Moong	TM-9937	68	61.0	35	11.0
12.	Moong	JM 721	76	91.0	34	8.0
13.	Moong	Pusa Vishal	70	91.4	36	12.0
14.	Moong	HUM – 1	70	73.6	40	10.0
15.	Moong	TJM – 3	68	60.9	32	12.0
16.	Moong	Ganga – 8	70	68.5	35	7.0
17.	Moong	Hariyali	72	56.8	34	11.2
18.	Moong	Samrat	77	65.2	35	10.7
19.	Moong	Narendra – 1	70	66.0	32	9.8
20.	Moong	Local	72	63.9	31	7.8
21.	Maize	JM-8	95	180.0	2	404.0
22.	Maize	JM-12	100	230.0	2	409.0
23.	Maize	JM-216	100	226.0	2	441.0
24.	Maize	HQPM-1	100	188.0	2	375.0
25.	Maize	Farmers var	95	200.0	3	530.0
26.	Jowar	JJ-938	105	222.0	29	63.0
27.	Jowar	JJ-1041	108	261.0	27	107.0
28.	Jowar	JJ-1022	105	257.0	34	75.0
29.	Arhar	JA-4	196	216.0	-	2.6
30.	Arhar	ICPL-87	165	149.0	-	2.8
31.	Arhar	ICPL-87119	190	220.0	-	3.2
32.	Arhar	ICPH-2671	190	205.0	-	4.2
33.	Arhar	JKM-189	185	230.0	-	3.0
34.	Arhar	JKM-7	180	208.0	-	4.0
35.	Arhar	UPAS-120	190	205.0	-	4.2

Table : 3. Economic and equivalent yield of different varieties of crops under crop cafeteria at Patan Farm, KVK, Mandasaur (pool data of 5 years from 2008 to 2012)

S. N.	Crop	Variety	Equivalent Yield (kg/ha)	Gross Return (Rs/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	B:C ratio
1.	Soybean	JS-9305	1505.6	31455	12940	18515	2.48
2.	Soybean	JS-9560	1398.4	29263	12940	16323	2.29
3.	Soybean	JS-335	1571.4	33091	12940	20151	2.60
4.	Soybean	JS-9041	1473.4	31034	12940	18094	2.43
5.	Soybean	JS-9752	1592.8	33439	12940	20499	2.64
6.	Urd	LBG-20	1271.7	26722	10560	16162	2.50
7.	Urd	T-9	1318.2	27994	10560	17434	2.60
8.	Urd	PU-35	1177.9	24902	10560	14342	2.32
9.	Urd	JU-86	1290.5	27340	10560	16780	2.55
10.	Moong	Neha	1178.5	25012	10560	14452	2.32
11.	Moong	TM-9937	1299.8	27554	10560	16994	2.56
12.	Moong	JM 721	1349.3	28900	10560	18340	2.66
13.	Moong	Pusa Vishal	1317.0	28184	10560	17624	2.59
14.	Moong	HUM – 1	1073.4	22696	10560	12136	2.12
15.	Moong	TJM – 3	1201.0	25578	10560	15018	2.36
16.	Moong	Ganga – 8	1157.4	24690	10560	14130	2.28
17.	Moong	Hariyali	1163.2	24592	10560	14032	2.28
18.	Moong	Samrat	1178.5	24742	10560	14182	2.31
19.	Moong	Narendra – 1	1072.1	22798	10560	12238	2.12
20.	Moong	Local	849.3	17910	10560	7350	1.68
21.	Maize	JM-8	1325.4	27214	12120	15094	2.28
22.	Maize	JM-12	1262.4	25846	12120	13726	2.18
23.	Maize	JM-216	1365.1	28014	12120	15894	2.36

24.	Maize	HQPM-1	1374.6	28084	12120	15964	2.38
25.	Maize	Farmers var	1196.6	24692	12120	12572	2.07
26.	Jowar	JJ-938	715.1	14923	12120	2803	1.25
27.	Jowar	JJ-1041	811.2	16990	12120	4870	1.41
28.	Jowar	JJ-1022	830.6	17433	12120	5313	1.44
29.	Arhar	JA-4	2877.2	60550	12860	47690	4.59
30.	Arhar	ICPL-87	2693.1	56600	12860	43740	4.30
31.	Arhar	ICPL-87119	2967.5	62550	12860	49690	4.76
32.	Arhar	ICPH-2671	3190.2	67100	12860	54240	5.11
33.	Arhar	JKM-189	2881.1	60800	12860	47940	4.60
34.	Arhar	JKM-7	2945.9	61850	12860	48990	4.70
35.	Arhar	UPAS-120	2827.9	58900	12860	46040	4.51
		S. Em. \pm	129.69	3030.3	--	3093.6	0.220
		CD 5%	362.71	8475.0	--	8652.0	0.617

REFERENCE

Saxena, M. K.; Saxena, Usha; Saxena, K. B.; Khandalkar, V. S. and Sultana, Rafat (2011). Profitability and production cost of hybrid pigeonpea seed.. Electronic Journal of Plant Breeding. 2(3): 409-412.