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Performance of Ridge Gourd (*Luffa acutangula* L. Roxb.) Varieties and Nature of Cultivation for Yield and Yield Attributes

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A B S T R A C T

The present experiment was conducted at Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural University, Gujarat. The present experiment results were recorded and reported that maximum days taken for last picking, weight of fruit, number of fruits per plant, yield per plant, yield per plot, yield per hectare and Benefit cost ratio as well as minimum days taken for first picking in with trellising system as compared to without trellising system. In case, performance of varieties for yield parameters like highest weight of fruit, number of fruits per plant, yield per plant, yield per plot, yield per hectare and Benefit cost ratio as well as minimum days taken for first picking were recorded with variety Pusa Nasdar (v_3). Maximum days taken for last picking were recorded with variety PKM-1 (v_5).

Introduction

Ridge gourd belongs to genus *Luffa* species of cucurbitaceae family. It is rather difficult to assign accurately the indigenous areas of *Luffa* species. Ridge gourd is low in saturated fat and cholesterol, high in dietary fibre, vitamin C, riboflavin, zinc, thiamin, iron, magnesium and manganese. The nutritional value of gourd makes it suitable for maintaining optimum health and weight lose. It has excellent cooling properties. Ridge gourd contains a gelatinous compound called luffein (Thamburaj and Singh, 2013).

This trailing technique mainly used for vegetables like tomato, capsicum, cucurbits and some vine crops. Trailing provides better opportunity to the crop to exploit the sunlight by production of maximum vine length, number of leaves and side branches resulting in better assimilation of carbohydrates. To increase the productivity of crop, it is essential to standardize the agro techniques such as trailing of vines with appropriate manner to improve the fruit set, fruit yield and good quality of fruits.

The main objectives of this experiment are to know the suitable ridge gourd varieties and method of cultivation for obtaining high yield in North Gujarat region.

Materials and Methods

This present experiment was evaluated at Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural University, Gujarat. This experiment was planned with two factors *viz.,* - I-nature of cultivation (S) and II-varieties (V) with four replications under Factorial Randomized Block Design concept. Nature of cultivation factor was with two levels *viz.,* with trellising (s_1) and without trellising (s_2) system and six varieties *viz.,* Gujarat Anand Ridge Gourd-1 (v_1), Hisar Kalitori (v_2), Pusa Nasdar (v_3), Arka Sujath (v_4), PKM- 1 (v_5) and Local (v_6). In this experiment plants were trailed over the kniffin structure for with trellising system and plants were allowed to trail on the soil surface for without trellising system. Yield characters data were absorbed from each treatment analysed by using the principles of 'Ana1ysis of Variance' techniques as described by Panse and Sukhatme (1978). Finally, Benefit Cost ratio were calculated for each varieties and factors and compared with other varieties and factors.

Results and Discussion

Effect of nature of cultivation for yield parameters

The analyzed data for yield parameters are presented in table 1. The Factor I nature of cultivation (S) recorded significant results for all yield. Maximum days taken for last picking (106.19), weight of fruit (277.67 g), number of fruits per plant (9.95), yield per plant (2.81 kg), yield per plot (8.89 kg) and yield per hectare (14.82 t) as well as minimum days taken for first picking (47.49) were recorded for with trellising system (s_1). Minimum days taken for last picking (101.77), weight of fruit (257.02 g), number of fruits per plant (8.77), yield per plant (2.29 kg), yield per plot (7.01 kg) and yield per hectare (11.68 t) as well as maximum days taken for first picking (50.30) were recorded for without trellising system (s_1).

Beneficial and economical yield characters were observed from with trellising (s_1). In kniffin system vines and leaves are do not contact with soil so that, there is less chance of disease damages from soil living fungi and bacteria. If there is no disease problem then plant can grow more duration. The leaves are fully exposed to sunlight so, photosynthesis rate will increase it could be increase the number of picking as well as yield parameters. This present investigation results were similar to Bhokare and Ranpise (2004), Joshi *et al.,* (1995) and Bhagat (2012) in bitter gourd as well as Shinde (2014) in bottle gourd.

Effect of varieties for yield parameters

The Factor II varieties (V) recorded significant results for all yield characters. Minimum days taken for first picking (38.74) was recorded with variety Pusa Nasdar (v_3) whereas maximum days taken for last picking (117.92) was recorded for variety PKM-1 (v_5) which was statistically at par with variety Arka Sujath (114.82). Variety Pusa Nasdar (v_3) showed highest weight of fruit (309.94 g), number of fruits per plant (11.67), yield per plant (3.62 kg), yield per plot (10.90 kg) and yield per hectare (18.17 t) which was statistically at par with varieties Arka Sujath for weight of fruit (308.15 g) and Gujarat Anand Ridge Gourd-1 (11.23) for number of fruits per plant. The variety Local (v_6) recorded minimum weight of fruit (183.62 g) whereas minimum number of fruits per plant (5.74), yield per plant (1.61 kg), yield per plot (5.48 kg) and yield per hectare (9.14 t) were recorded with variety PKM-1 (v_5). Maximum days taken for first picking (62.24) and minimum days taken for last picking (89.96) were recorded with varieties PKM-1 (v_5) and Gujarat Anand Ridge Gourd-1 respectively.

Table.1 Yield parameters of ridge gourd under different nature of cultivation and different varieties

Treatments	Days taken for first picking	Days taken for last picking	Weight of fruit (g)	Number of fruits per plant	Yield per plant (kg)	Yield per plot (kg)	Yield per hectare (t)
Nature of cultivation (S)							
s_1	47.49	106.19	277.67	9.95	2.81	8.89	14.82
s_2	50.30	101.77	257.02	8.77	2.29	7.01	11.68
S.Em±	0.71	1.49	4.57	0.24	0.07	0.21	0.35
C.D. at 5%	2.04	4.29	13.15	0.70	0.19	0.60	1.00
Varieties (V)							
v_1	43.09	89.96	271.17	11.23	3.09	9.74	16.24
v_2	42.69	102.54	252.49	9.00	2.27	6.78	11.30
v_3	38.74	100.92	309.94	11.67	3.62	10.90	18.17
v_4	57.43	114.82	308.15	9.67	2.86	8.88	14.81
v_5	62.24	117.92	278.69	5.74	1.61	5.48	9.14
v_6	49.17	97.71	183.62	8.85	1.85	5.91	9.84
S.Em±	1.23	2.58	7.91	0.42	0.12	0.36	0.60
C.D. at 5%	3.54	7.42	22.77	1.22	0.33	1.04	1.74
Interaction (SxV)							
s_1v_1	41.89	90.68	284.70	12.21	3.49	11.14	18.56
s_1v_2	41.93	104.50	262.25	9.20	2.41	7.03	11.72
s_1v_3	36.42	103.12	315.29	12.64	3.98	12.25	20.41
s_1v_4	56.33	119.07	314.33	10.39	3.15	10.11	16.85
s_1v_5	60.54	120.00	291.25	6.25	1.82	6.17	10.28
s_1v_6	47.80	99.77	198.17	9.04	2.03	6.67	11.11
s_2v_1	44.28	89.25	257.64	10.26	2.71	8.35	13.91
s_2v_2	43.45	100.59	242.73	8.81	2.14	6.53	10.88
s_2v_3	41.06	98.72	304.58	10.71	3.27	9.56	15.93
s_2v_4	58.54	110.57	301.97	8.95	2.58	7.66	12.76
s_2v_5	63.94	115.84	266.15	5.23	1.39	4.80	8.00
s_2v_6	50.55	95.65	169.06	8.65	1.67	5.15	8.58
S.Em±	1.74	3.65	11.18	0.59	0.16	0.51	0.85
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS
C. V.%	7.11	7.01	8.37	12.79	12.86	12.90	12.90

Table.2 Economics and benefit cost ratio for different nature of cultivation and different varieties

Treatments	Yield/ha (t)	Gross returns (₹)/ha)	Total cost of cultivation (₹)/ha)	Net returns (₹)/ha)	Benefit: Cost ratio
Nature of Cultivation (S)					
S_1	14.82	296431	64951	231480	4.6
S_2	11.68	233528	55452	178076	4.2
Varieties (V)					
V_1	16.24	324708	60718	263990	5.3
V_2	11.30	226042	60518	165524	3.7
V_3	18.17	363375	60918	302457	6.0
V_4	14.81	296125	60318	235807	4.9
V_5	9.14	182792	59718	123074	3.1
V_6	9.84	196833	59018	137815	3.3

Varietal evaluation and screening of variety is very important necessary process to obtain most suitable and economical variety for farmer's cultivation. Each variety having its own specific genetical characters which are inherent. The variation in yield parameters for different varieties due to its genetic behaviours. This present investigation results are similar to Lingaiah *et al.,* (1993) and Jaiswal *et al.,* (1995) in bitter gourd, Ahmed *et al.,* (2004) in cucumber, Kutty and Dharmtti (2005), Narayan *et al.,* (2006), Raja *et al.,* (2007) and Nalawade *et al.,* (2011) in bitter gourd, More (2012) in water melon, Haque *et al.,* (2014) in snake gourd as well as Jamal Uddin *et al.,* (2014) in bottle gourd.

Effect of nature of cultivation and varieties for economics

Results regarding in economics *i.e.,* gross return, total cost of cultivation, net return and Benefit : Cost ratio are presented in table 2. The sale price of ridge gourd was ₹20 per Kg. The results indicated that with trellising system of ridge gourd c ultivation recorded maximum gross return (₹2,96,431), net return (₹2,31,480) and Benefit : Cost ratio (4.6) than without trellising system of cultivation. Because, with trellising system recorded highest for all yield parameters. In case of varieties variety Pusa Nasdar recorded maximum gross return (₹3,63,375), net return (₹3,02,457) and Benefit : Cost ratio (6.0) than other varieties. Because, the variety Pusa Nasdar recorded highest for yield per plant, plot and hectare. These findings were similar to Bhagat (2012) in bitter gourd and Shinde (2014) in bottle gourd. From the results of field experiment, this study concludes that growing ridge gourd variety Pusa Nasdar and trailing the vines on kniffin structure (with trellising) is beneficial and economical for the farmers of North Gujarat region.

Highlights: The variety Pusa Nasdar and with trellising system of cultivation method suitable for highest yield and Benefit Cost ratio.

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