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Evaluation of system performance and economics of off-season french bean-cauliflower crop sequence under different shade net colours and fertigation levels

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Abstract
A field experiment entitled "Off-season cultivation of French bean under different shade net colours and fertigation levels" was carried out during *late kharif* season of 2017 and 2018 at Post Graduate Institute Research Farm, Mahatma Phule Krishi Vidyapeeth, Rahuri Dist. Ahmednagar, Maharashtra (India).
The experiment was laid in Factorial RBD design with three replications. The treatment consist of six shade net colours (75% shading intensity) *viz*., White, Blue, Green + White, Green, Red and Black and Open field and two fertigation levels *viz*., 100% RDF and 125% RDF applied in 3 equal splits to french bean (*late Kharif*).
The finding of the experiment shows that under white colour shad net and 125% RDF off season french bean cauliflower performs good and results in high yield and subsequent high economic returns. Study also shows that while considering off season sequence under different shade net colour system performance is appreciable. Red colour shadenet registered significantly higher french bean green pod equivalent yield of cauliflower which was at par white colour during both the years and on pooled mean. Result of the experiment also shows that White colour shadenet and 125% RDF registered significantly higher system productivity, production efficiency and economic efficiency of french bean- cauliflower cropping sequence which was at par Red colour followed by Green, Green + White, Blue and Black during 2017-18, 2018-19 and pooled mean respectively.
Cultivation under Open field recorded significantly lower french bean green pod equivalent yield of cauliflower, system productivity, production efficiency and economic efficiency of french bean-cauliflower cropping sequence during 2017-18, 2018-19 and pooled mean respectively.
Highest B:C ratio was recorded with white colour shadenet and 125%RDF while lowest B:C ratio recorded with open field cultivation and 100% RDF during both the years and pooled mean respectively.

Keywords: Indian mustard, path coefficient analysis

Introduction
Protective cultivation is unique and specialized form of agriculture. Protected cultivation of vegetable is one of the means for clean vegetable production in peri-urban areas. The protective cultivation facilitates year round production of high quality produce with minimum labour, irrigation water and almost wards off pest problem (Sidhu *et al*., 2014) [6]. Looking to the increasing population, climate change, high demand of quality horticultural fresh produce we are forced to shift towards modern technologies of crop production like protected cultivation. Promotion of protected cultivation will certainly help in creation of huge self-employments for unemployed educated youths and will also raise the national economy by sale of high quality produce in domestic and international markets. Production of vegetable under protected conditions not only provides high water and nutrient use efficiency but it can easily increase the productivity by 3-5 folds over open field cultivation of crops under varied agro climatic conditions of the country (Singh, 2014) [7]. Open field cultivation of vegetables is often damaged by unfavorable weather conditions especially during sensitive stages of growth and development. Vegetables are very sensitive, and even a slight variation in any of the weather parameters would lead to significant changes in growth physiology of the crops resulting in considerable yield loss.
French bean (*Phaseolus vulgaris* L.) is a high value cash crop belongs to family leguminosae. It is also known as Kidney bean, Snap bean, Common bean, Haricot bean, Tepary bean, Bush bean and Fras bean. It is used as vegetable when pods are immature and tender. Beans are also pickled and cooked beans are served cold in salads. Canned and home-prepared red kidney beans are used in salads, meat and fish dishes (Begum *et al.*, 2003) [3].

French bean is a good source of protein, carbohydrate, calcium, iron, phosphorus and vitamins, particularly, Vitamin B. Fresh pods are rich in protein, minerals and digestible fibers. According to Horticulture at a glance 2017 total area of french bean in India is 230 M ha with a production of 2278 MT. Maharashtra having area under total vegetable production is 693.15 M ha having production of 1036.76 MT and total production share 5.9 per cent securing sixth position in India. In Maharashtra total area under production of beans is 4.88 million hectare and total production is 45.27 Million ton with productivity 9.27 MT ha^{-1}.

Cauliflower (*Brassica Oleracea* Var. botrytis L.) belongs to the family of Brassicaceae originated from Europe and Africa (Ajithkumar *et al*., 2014). Most daily consumed important vegetable of commercial crop in the world. It also has good demand in India. Consuming cauliflower is useful to fight against cancer, boost heart health, rich in vitamins and minerals boost brain health, detoxification support and digestive benefits. In cauliflower, the edible curd is made up of abortive flowers. The stalk of cauliflower is short, fleshy and closely crowded (Shanmugavelu, 1989) [8]. The growers can cultivate a crop in any season under protected environment, as he can provide the temperature, humidity and light, as required by the plant species. The optimum monthly temperature requirement for cauliflower is 15 to 20 °C with an average maximum of 25 °C and average minimum of 8 °C. Plants require light for optimum growth and development, but the three different aspects of light, quantity, quality and duration, also have a significant influence on growth. A plant under natural conditions receives light from the sun; the amount, quality and duration greatly depend on the season of the year, hour of the day, geographical location and weather. Plants use light as a source of energy for photosynthesis. It is primary metabolites in plants (Kopsell and Kopsell, 2008; Perez Balibrea *et al*., 2008) [4, 5]. The carbohydrates produced during photosynthesis are stored and used by the plant as a food source.

According to Horticulture at a glance 2017 total area of cauliflower in India is 452 M ha with a production of 8499 MT. In Maharashtra total area under production of cauliflower is 12.38 M ha^{-1} and total production is 259.69 MT having productivity 20.49 MT ha^{-1}. Leading states of cauliflower production in India are West Bengal, Bihar, Madhya Pradesh, Odisha, Gujarat, Haryana, Assam, Jharkhand, Chhattisgarh, Utter Pradesh and Maharashtra

Material and Methods

A field experiment entitled "Off-season cultivation of French bean under different shade net colours and fertigation levels" was carried out during *late kharif* season of 2017 and 2018 at Post Graduate Institute Research Farm, Mahatma Phule Krishi Vidyapeeth, Rahuri Dist. Ahmednagar, Maharashtra (India).

The experiment was laid in Factorial RBD design with three replications. The treatment consist of six shade net colours (75% shading intensity) *viz*., White, Blue, Green + White, Green, Red and Black and Open field and two fertigation levels *viz*., 100% RDF and 125% RDF applied in 3 equal splits to french bean (*late Kharif*).

The soil of the experimental field was sandy clay, low in available nitrogen (185.54 kg ha^{-1}), medium in available phosphorous (17.83 kg ha^{-1}) and high in available potassium (385.14 kg ha^{-1}). The physical parameters *viz*., field capacity, permanent wilting point and bulk density were 25.45, 13.17 per cent and 1.41 g cm^{-3}, respectively. The soil chemical properties such as pH, EC and organic carbon content were 7.75, 0.28 dSm^{-1} at 25 ^{0}C and 0.50 per cent, respectively. French bean (*Var.* Phule Suyash) sown on raised beds of 45 cm height, 18 m length and 1.20 m width along with walking space of 30 cm between the beds in shade net house as well as in open field for both season. Soil fumigation is also carried out for both seasons. The required quantity of farmyard manure (1.5 kg m^2) was applied 15 days before preparation of Broad Bed Furrows in shade net and open field conditions for both seasons. Seeds of french bean were dibbled on raised bed at the spacing of 45 cm x 30 cm with 5 cm depth and pressed for better establishment. Sowing was done on 1.9.2017 and 2.9.2018 during both years, respectively. Trailing was done to shade net crop. Fertigation of NPK was scheduled as per recommended dose at 7, 14 and 21 DAS for French bean through Urea, 12:61:00 and MOP (WSF). The analysis of economics and different system indices is done by using following formulae.

Gross monetary returns (₹ ha^{-1})

The gross monetary returns were obtained by multiplying prevailing market price (q^{-1}) with total yield of cauliflower.

Cost of cultivation (₹ ha^{-1})

The total cost of cultivation of cauliflower was estimated by considering the various field operation charges such as shadenet charges, drip system charges, wages, irrigation charges, input cost, plant protection cost, interest on working capital etc.

Net monetary returns (₹ ha^{-1})

The treatment wise net monetary returns were worked out by subtracting treatment wise cost of cultivation from the gross monetary returns.

Benefit: cost ratio (B: C ratio)

The treatment wise B: C ratio was worked out by dividing the gross monetary returns with the cost of cultivation of respective treatment.

$$\text{B: C ratio} = \frac{\text{Gross monetary returns (₹ unit}^{-1}\text{ of shade net)}}{\text{Cost of cultivation (₹ unit}^{-1}\text{ of shade net)}}$$

$$\text{FGPEY (q ha}^{-1}\text{)} = \frac{\text{Cauliflower curd yield (q ha}^{-1}\text{) x Price of cauliflower (₹ q}^{-1}\text{)}}{\text{Price of Frenchbean (₹ q}^{-1}\text{)}}$$

System productivity (q ha^{-1})

System productivity (q ha^{-1}) = (Yield of french bean of respective treatment) + (French bean equivalent yield of cauliflower of respective treatment)

Efficiencies of cropping system

$$\text{Production efficiency (q ha}^{-1}\text{ day}^{-1}\text{)} = \frac{\text{French bean equivalent yield of cauliflower (q ha}^{-1}\text{)}}{\text{Total duration of cropping sequence (days)}}$$

$$\text{Economic efficiency (₹ ha}^{-1}\text{ day}^{-1}\text{)} = \frac{\text{Net monetary returns over year (₹ ha}^{-1}\text{)}}{\text{Total duration of cropping sequence (days)}}$$

The data recorded were statistically analyzed by using technique of analysis of variance (Fisher, 1970) and significance was determined for factorial randomized block

design (Panse and Sukhatme, 1984).

Result and Discussion

French bean green pod equivalent yield of cauliflower

The french bean green pod equivalent yield of cauliflower influenced significantly due to different treatments is presented in Table 1. The mean french bean green pod equivalent yield of cauliflower was 168.15, 194.97 and 181.56 q ha^{-1} during first year, second year and pooled mean, respectively.

Table 1: French bean green pod equivalent yield (FPEY) as influenced by different treatments

Treatment		Cauliflower curd yield (q ha^{-1})			FGPEY (q ha^{-1})		
		2017-18	2018-19	Pooled	2017-18	2018-19	Pooled
Shadenet colours 75% shading intensity (C)							
C_1:	White	208.50	232.51	220.51	198.57	232.51	215.54
C_2:	Blue	160.16	181.24	170.70	152.53	181.24	166.88
C_3:	Green + white	165.27	187.41	176.34	157.40	187.41	172.41
C_4:	Green	184.59	207.97	196.28	175.80	207.97	191.89
C_5:	Red	225.07	251.27	238.17	214.35	251.27	232.81
C_6:	Black	153.13	172.61	162.87	145.84	172.61	159.22
C_7:	Open field	139.20	156.04	147.62	132.57	131.76	132.17
	S.Em. (±)	6.27	7.60	8.53	5.97	7.49	8.29
	C.D. at 5%	18.21	22.09	24.21	17.35	21.78	23.54
Fertigation levels (F)							
F_1:	100% RDF	171.37	193.12	182.24	163.21	189.55	176.38
F_2:	125% RDF	181.75	203.75	192.75	173.10	200.39	186.74
	S.Em. (±)	3.35	4.06	4.56	3.19	4.00	4.43
	C.D. at 5%	9.74	11.81	NS	9.27	11.64	NS
Interaction effect (C X F)							
	S.Em. (±)	8.86	10.75	12.06	8.44	10.59	11.73
	C.D. at 5%	NS	NS	NS	NS	NS	NS
	General mean	176.56	198.43	187.50	168.15	194.97	181.56

Effect of shadenet colours

The french bean green pod equivalent yield of cauliflower as influenced significantly due to different shadenet colours during both the years and on pooled mean. Data presented in Table 1 revealed that Red colour shadenet registered significantly higher french bean green pod equivalent yield (214.35, 251.27, 232.81 q ha^{-1}) of cauliflower which was at par white colour (198.57, 232.51, 215.54 q ha^{-1}) during 2017-18, 2018-19 and pooled mean respectively. While Open field condition recorded significantly lower french bean green pod equivalent yield of cauliflower during both the years and in pooled mean respectively.

Effect of fertigation levels

Data presented in Table 1 revealed that the french bean green pod equivalent yield of cauliflower is influenced significantly due to different fertigation levels. Fertigation of 125% RDF recorded significantly higher french bean green pod equivalent yield of cauliflower i.e 173.10, 200.39 and 186.74 q ha^{-1} during 2017-18, 2018-19 and on pooled mean respectively. While fertigation of 100% RDF recorded significantly lower french bean green pod equivalent yield of cauliflower during both the years and in pooled mean respectively**.**

Interaction effect

Interaction effect between shadenet colours and fertigation levels was found to be non-significant in respect of french bean green pod equivalent yield of cauliflower during both the years and on pooled mean.

System productivity

The system productivity of french bean- cauliflower cropping sequence as influenced significantly due to different treatments is presented in Table 2 The mean system productivity of french bean- cauliflower cropping sequence was 300.93, 330.23 and 315.58 q ha^{-1} during first year, second year and pooled mean, respectively.

Effect of shadenet colours

The system productivity of french bean- cauliflower cropping sequence as influenced significantly due to different shadenet colours. Data presented in Table 2 revealed that White colour shadenet registered significantly higher system productivity of french bean- cauliflower sequence (353.99, 397.02, 375.50 q ha^{-1}) which was at par Red colour (353.67, 396.59, 375.13 q ha^{-1}) followed by Green (326.95, 340.49, 333.72 q ha^{-1}), Green + White (303.53, 339.43 and 321.48 q ha^{-1}), Blue (287.94, 321.62 and 304.78 q ha^{-1}) and Black (267.54, 299.61 and 283.58 q ha^{-1}) during 2017-18, 2018-19 and pooled mean respectively.

Table 2: System productivity, production efficiency and economic efficiency of french bean (green pods)-cauliflower cropping system

Treatment		System productivity (q ha^{-1})			Production efficiency (kg ha^{-1}day^{-1})			Economic efficiency (₹ ha^{-1} day^{-1})		
		2018	2019	Pooled	2018	2019	Pooled	2018	2019	Pooled
Shadenet colours 75% shading intensity (C)										
C_1:	White	353.99	397.02	375.50	147.50	165.42	156.46	2746.12	3982.29	3364.21
C_2:	Blue	287.94	321.62	304.78	119.97	134.01	126.99	1573.35	2551.83	2062.59
C_3:	Green + white	303.53	339.43	321.48	126.47	141.43	133.95	1863.17	2902.59	2382.88
C_4:	Green	326.95	340.49	333.72	136.23	141.87	139.05	2272.93	3398.42	2835.68
C_5:	Red	353.67	396.59	375.13	147.36	165.25	156.30	2723.59	3957.43	3340.51
C_6:	Black	267.54	299.61	283.58	111.48	124.84	118.16	1233.29	2156.00	1694.64
C_7:	Open field	212.92	216.87	214.90	88.72	90.36	89.54	594.00	1139.54	866.77
	S.Em. (±)	6.38	12.46	12.12	2.66	5.19	5.05	124.93	188.25	195.67
	C.D. at 5%	18.53	36.21	34.39	7.72	15.09	14.33	363.17	547.25	555.27
Fertigation levels (F)										
F_1:	100% RDF	288.52	320.34	304.43	120.22	133.48	126.85	1647.32	2663.43	2155.38
F_2:	125% RDF	313.35	340.12	326.73	130.56	141.72	136.14	2068.81	3076.03	2572.42
	S.Em. (±)	3.41	6.66	6.48	1.42	2.77	2.70	66.78	100.63	104.59
	C.D. at 5%	9.91	19.36	18.38	4.13	8.07	7.66	194.12	292.52	296.80
Interaction effect (C X F)										
	S.Em. (±)	9.02	17.62	17.14	3.76	7.34	7.14	176.68	266.23	276.71
	C.D. at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS
	General mean	300.93	330.23	315.58	125.39	137.60	131.49	1858.06	2869.73	2363.90

Cultivation under Open field recorded significantly lower system productivity of french bean-cauliflower cropping sequence (212.92, 216.87, 214.90 q ha^{-1}) 2017-18, 2018-19 and pooled mean respectively.

Effect of fertigation levels

Data presented in Table 4.39 revealed that the system productivity of french bean- cauliflower cropping sequence is influenced significantly due to different fertigation levels. Fertigation of 125% RDF recorded significantly higher system productivity of french bean- cauliflower sequence i.e 313.35, 340.12 and 326.73 q ha^{-1} during 2017-18, 2018-19 and on pooled mean respectively. Fertigation of 100% RDF recorded significantly lower system productivity of french bean-cauliflower cropping sequence during 2017-18, 2018-19 and pooled mean, respectively.

Interaction effect

Interaction effect between shadenet colours and fertigation levels was found to be non-significant in respect of system productivity of french bean- cauliflower cropping sequence during both the years and on pooled mean.

Production efficiency

The production efficiency of french bean- cauliflower cropping sequence as influenced significantly due to different treatments is presented in 2 The mean production efficiency of french bean- cauliflower cropping sequence was 125.39, 137.60 and 131.49 kg ha^{-1} day^{-1} during 2017-18, 2018-19 and on pooled mean, respectively.

Effect of shade net colours

The production efficiency of french bean- cauliflower sequence as influenced significantly due to different shadenet colours. Data presented in Table 2 revealed that White colour shadenet registered significantly higher production efficiency of french bean- cauliflower sequence (147.50, 165.42, 156.46 kg ha^{-1} day^{-1}) which was at par with Red colour (147.36, 165.25, 156.30 kg ha^{-1} day^{-1}) followed by Green (136.23, 141.87 and 139.05 kg ha^{-1} day^{-1}), Green + White (126.47, 141.43 and 133.95 kg ha^{-1} day^{-1}), Blue (119.97, 134.01 and 126.99 kg ha^{-1} day^{-1}) and Black (111.48, 124.84 and 118.16 kg ha^{-1} day^{-1}) during 2017-18, 2018-19 and pooled mean respectively during 2017-2018, 2018-2019 and on pooled mean, respectively.

Cultivation under Open field recorded significantly lower production efficiency of french bean- cauliflower cropping sequence (88.72, 90.36 and 89.54 kg ha^{-1} day^{-1}) 2017-18, 2018-19 and pooled mean, respectively.

Effect of fertigation levels

Data presented in Table 2 revealed that the production efficiency of french bean- cauliflower cropping sequence is influenced significantly due to different fertigation levels. 125% RDF recorded significantly higher production efficiency of french bean- cauliflower sequence i.e 130.56, 141.72 and 136.14 kg ha^{-1} day^{-1} during 2017-18, 2018-19 and on pooled mean respectively. Fertigation of 100% RDF recorded significantly lower production efficiency of french bean- cauliflower cropping sequence during 2017-18, 2018-19 and pooled mean, respectively.

Interaction effect

Interaction effect between shade net colours and fertigation levels was found to be non-significant in respect of production efficiency of french bean- cauliflower cropping sequence during both the years and on pooled mean.

Economic efficiency

The economic efficiency of french bean- cauliflower cropping sequence as influenced significantly due to different treatments is presented in Table 2.The mean economic efficiency of french bean- cauliflower cropping sequence was 2869.73, 1858.06 and 2363.90 ₹ ha^{-1} day^{-1} during 2017-2018, 2018-2019 and on pooled mean, respectively.

Effect of shade net colours

The economic efficiency of french bean- cauliflower sequence as influenced significantly due to different shadenet colours. Data presented in Table 2. revealed that White colour shadenet registered significantly higher economic efficiency

of french bean- cauliflower cropping sequence (2746.12, 3982.29, 3364.21 ₹ ha^{-1} day^{-1}) which was at par with Red colour (1233.29, 2156.00, 1694.64 ₹ ha^{-1} day^{-1}) followed by Green (2272.93, 3398.42 and 2835.68 ₹ ha^{-1} day^{-1}), Green + White (1863.17, 2902.59 and 2382.88 ₹ ha^{-1} day^{-1}), Blue (1573.35, 2551.83 and 2062.59 ₹ ha^{-1} day^{-1}) and Black (1233.29, 2156.00 and 1694.64 ₹ ha^{-1} day^{-1}) during 2017-18, 2018-19 and on pooled mean, respectively during 2017-2018, 2018-2019 and on pooled mean.

Cultivation under open field recorded significantly lower economic efficiency of french bean- cauliflower cropping sequence (594.00, 1139.54 and 866 ₹ ha^{-1} day^{-1}) 2017-18, 2018-19 and pooled mean, respectively.

Effect of fertigation levels

Data presented in Table 4.39 revealed that the economic efficiency of french bean- cauliflower sequence is influenced significantly due to different fertigation levels. 125% RDF recorded significantly higher economic efficiency of french bean- cauliflower sequence i.e 130.56, 141.72 and 136.14 ₹ ha^{-1} day^{-1} during 2017-2018, 2018-2019 and pooled mean respectively. Fertigation of 100% RDF recorded significantly lower economic efficiency of french bean- cauliflower cropping sequence during 2017-18, 2018-19 and pooled mean, respectively.

Interaction effect

Interaction effect between shadenet colours and fertigation levels was found to be non-significant in respect of economic efficiency of french bean- cauliflower sequence during both the years and on pooled mean.

Economics

The economics of french bean- cauliflower sequence as influenced significantly due to different treatments is presented in Table 3 The mean gross monetary returns, net monetary returns and B: C ratio was of french bean- cauliflower sequence was ₹ 94655, ₹ 33567 and 1.54 during 2017-2018 and ₹ 113401, ₹ 51890 and 1.82 during 2018-2019 and ₹ 104028, ₹ 42729 and 1.68 on pooled mean, respectively.

Effect of shadenet colours

The economics of french bean- cauliflower sequence is influenced significantly due to different shadenet colours. Data presented in Table 3 revealed that White colour shadenet registered significantly higher gross monetary returns (₹ 112233 and (₹ 134864) and net monetary returns (₹ 49660 and ₹ 72054, respectively), which was at par with Red colour. During off season of vegetables in shadenet fetches good prices due to market glut and availability of vegetables during off season. While the lowest gross and net monetary return was recorded with open field because during off season due to unfavourable climate, vegetable's performance is not good. There is severe attack of disease, insect and pest and thereby reduces the quality of produce. Highest B:C ratio was recorded with white colour (1.79, 2.13 and 1.96) shadenet while lowest B:C ratio recorded with open field cultivation (1.21, 1.38 and 1.29) during both the years and pooled mean respectively.

Effect of fertigation levels

The economics of french bean- cauliflower sequence is influenced significantly due to different fertigation levels. Data presented in Table 4.40 revealed that fertigation of 125% RDF recorded significantly higher gross monetary returns (₹ 98619, ₹117474)and net monetary returns of (₹ 37385, ₹ 55644) of french bean- cauliflower sequence during both the years and pooled data, respectively. 100% RDF recorded significantly lower gross and net monetary returns. Increased levels of nutrients increased vegetative and yield characters which results in increased yield and more economic returns.

Highest B: C ratio was recorded with 125% RDF (1.60, 1.88 and 1.74) shadenet while lowest B: C ratio was recorded with 100% RDF (1.48, 1.77 and 1.63) during both the years and on pooled mean respectively.

Interaction effect

Interaction effect between shadenet colours and fertigation levels was found to be non-significant in respect of gross and net monetary returns of french bean- cauliflower sequence during both the years and pooled mean.

Table 3: Economics of french bean - cauliflower sequence under shade net colours and fertigation levels (Per unit 756 m^2)

Treatment		Gross monetary returns (₹ Per unit 756 m^2)			Cost of cultivation (₹ Per unit 756 m^2)			Net monetary returns (₹Per unit 756 m^2)			B:C ratio		
		2018	2019	Pooled	2018	2019	Pooled	2018	2019	Pooled	2018	2019	Pooled
Shadenet colours 75% shading intensity (C)													
C_1:	White	112233	134864	123549	62573	63592	63083	49660	72054	60857	1.79	2.13	1.96
C_2:	Blue	91282	109245	100263	62879	63898	63389	28403	46129	37266	1.45	1.72	1.59
C_3:	Green + white	96222	115288	105755	62573	63592	63083	33649	52478	43064	1.54	1.82	1.68
C_4:	Green	103654	124275	113964	62573	63592	63083	41081	61465	51273	1.66	1.97	1.81
C_5:	Red	112120	134704	123412	62879	63898	63389	49241	71588	60414	1.78	2.12	1.95
C_6:	Black	84821	101772	93297	62573	63592	63083	22248	38962	30605	1.36	1.61	1.48
C_7:	Open field	62255	73660	67958	51568	53887	52728	10687	20555	15621	1.21	1.38	1.29
	S.Em. (±)	2016	3186	3265	-	-	-	2264	3159	3366	-	-	-
	C.D. at 5%	5859	9261	9265	-	-	-	6580	9184	9552	-	-	-
Fertigation levels (F)													
F_1:	100% RDF	90692	109329	100010	60615	61820	61218	29749	48136	38942	1.48	1.77	1.63
F_2:	125% RDF	98619	117474	108046	61561	62766	62164	37385	55644	46515	1.60	1.88	1.74
	S.Em. (±)	1077	1703	1745	-	-	-	1210	1689	1799	-	-	-
	C.D. at 5%	3132	4950	4952	-	-	-	3517	4909	5106	-	-	-
Interaction effect (C X F)													
	S.Em. (±)	2851	4505	4617	-	-	-	3201	4468	4760	-	-	-
	C.D. at 5%	NS	NS	NS	-	-	-	NS	NS	NS	-	-	-
	General mean	94655	113401	104028	61088	62293	61691	33567	51890	42729	1.54	1.82	1.68

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