Original Research Article

Studies the Growth Parameters of Various Rice Genotypes under Low Light Intensity

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A B S T R A C T

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Present experiment was conducted at RARS, Karjat during *Kharif* 2017 for the evaluation of 16 rice genotypes under low light intensity by *factorial* randomized block design with three replications. The experiment consisted of two factors *viz.* two treatments (T_1-Without shade net and T_2-Shade net condition). From recorded data, genotype Palghar-2 was observed significantly higher AGR, RGR, NAR and LAI over other genotypes under shade net condition i.e. low light intensity whereas Ratnagiri-4 was found significantly higher AGR, RGR, NAR and LAI over other genotypes under without shade net condition. Karjat BM-4 was noticed significantly minimum AGR, RGR, NAR and LAI over other genotypes under shade net condition i.e. low light intensity and without shade net condition. Genotype Palghar-2 showed significantly maximum grain yield per plant under shade net condition whereas genotype Ratnagiri-4 recorded significantly maximum grain yield per plant under without shade net condition. Among 16 tested rice genotypes, genotype Palghar-2 and Ratnagiri-4 could be use for further breeding programme.

Introduction

Rice (*Oryza sativa* L.) is the staple food of more than half of the world population. It is the most consumed cereal grain in the world, constituting the dietary staple food for more than half of the planets human population. It is cultivated over an area of 161.85 m ha with a production of 483.8 million tonnes (Anonymous, 2017-18). In Konkan region, area under rice was 3.79 lakh/ha, with production 16.10 lakh tons and productivity 42.5 q/ha. (Anonymous 2016-17).

Light is the main energy source for plant photosynthesis and is an environmental signal used to trigger growth and structural differentiation in plants. Without light, the net photosynthesis rate shows a negative value because of discharging CO_2 through dark respiration (Chen *et al.*, 2014). Light intensity is very important component for plant growth, development, survival and crop productivity (Wang *et al.*, 2013). The researchers have been evaluated the effects of variation in light regimes on morphological characteristics, physiological characteristics, yield and quality of agricultural crops because difficult to control light intensity (Wang *et al.*, 2007). Shade has pronounced effect on the growth of rice. It tends to increase plant height, decrease tillers and panicle number hill[-1], grains panicle[-1] and grain yield. Shade stimulates cellular expansion and rapid cell division resulting in increasing leaf length and plant height

(Schoch, 1972). The yield of field-grown rice mainly depends on the solar radiation throughout the growth period, especially during the reproductive and grain filling stages. Shading effects are not just about the plants growth and development, but it also has a major impact on plant photosynthesis (Fageria, 2007).

Shading applied during developmental stages could reduce the plant dry matter accumulation and disturb the redistribution of photosynthetic products from vegetative organs into grains. In plant photosynthesis, chlorophyll is the most important photosynthetic pigment and shading also affects the chlorophyll content of plants. Shading altered light-use efficiency by increasing leaf chlorophyll a, chlorophyll b, and total chlorophyll and decreasing chlorophyll a/b ratios (Wang *et al.,* 2013). The effects of low light on agronomic and quality as well as the formation of grain, and mainly reviewed the physiological metabolism of rice plants, including characteristics of photosynthesis, activities of antioxidant enzymes in rice leaves and key enzymes involved in starch synthesis in grains, as well as the translocation of carbohydrate and nitrogen. These characteristics include various grain yield and rice quality components (milling and appearance as well as cooking, eating and nutritional qualities) under different rates of shading imposed at the vegetative or reproductive stages of rice plants (Liu *et al.,* 2014).

It is well grasped that shading is major negative effect of trees on crop growth, which constitute a major obstacle for farmer's adaptation of agro forestry. To confirm effect of shading on rice growth and gaining more knowledge in this respect, the objective of study where to determine the effect of shading on rice growth and yield

under control treatment of field experiment condition. To systematically study for identification of suitable genotypes of rice under artificial shade net, the experiment was carried out by using sixteen genotypes of rice under shade net condition. Considering the importance of rice and need of its improvement under shade conditions this could be achieved by testing promising types having higher productivity and better adaptability under shade condition system.

Materials and Methods

The experiment comprised of sixteen varieties of rice laid out in *factorial* randomized block design with three replications in artificial shading and open condition. The plots were artificially shaded by using 50 per cent shade net. Such that 50 to 60 per cent of natural light was only received by the crop canopy. The shades were erected in the field in the form of tents. The net was fastened tight to the wire which served as a lining connecting the wooden (bamboo) supports all round both at the bottom and top of the supports. The shade constructed leaving one foot height space from the ground open for ventilation. Data were recorded for the growth parameters viz. AGR, RGR, NAR, LAI, SLW and grain yield per plant (Table 1–7).

Results and Discussions

Data revealed (Table 2a, 2b & 2c) that AGR (g day^{-1} plant$^{-1)}$ increased continuously from 20-40 days after transplanting to 60-80 DAT. As regards treatments it was observed that in all the stages from 0-20 to 80-100 DAT and 100 DAT-at harvest the mean differences in AGR were differed significantly. Significantly higher AGR were observed in T_1 at 20-40, 40-60, 60-80, 80-100 and 100 DAT-at harvest than T_2 treatment. In T_2 treatment significantly higher AGR (0.0995g)

at 20-40 DAT, (0.3384 g) at 40-60 DAT, (0.3284 g) at 60-80 DAT and (0.0.2273 g) at 80-100 DAT were observed in Palghar-2 over other genotypes. While At 100 DAT, significantly higher AGR (0.0033 g) was observed in Karjat-1-1-12-24-1-13 over other genotypes. Similar results were reported by Reduction in absolute growth rate under shade net as compared to without shade net condition was also recorded by Burondkar (1985).

Data revealed (Table no. 3a, 3b & 3c) that RGR (g g^{-1} day^{-1} $plant^{-1}$) increased continuously from 20-40 days after transplanting to 60-80 DAT. As regards treatments it was observed that in all the stages from 0-20 to 80-100 DAT and 100 DAT-at harvest the mean differences in RGR were differed significantly. Significantly higher RGR were observed in T_1 at 20-40, 40-60, 60-80, 80-100 and 100 DAT-at harvest than T_2 treatment. In T_2 treatment significantly higher RGR (0.015g) at 20-40 DAT, (0.042 g) at 40-60 DAT, (0.041 g) at 60-80 DAT, (0.033 g) at 80-100 DAT and (0.0129g) At 100 DAT- at harvest were observed in Palghar-2 over other genotypes. Similar results were reported reduction in relative growth rate under shade net as compared to without shade net condition was also recorded by Sahoo and Guru (1998), Burondkar (1985), Srinivasulu *et al*., (1999), Janardhan and Murty (1980) and Chauhan *et al.,* (1996).

Data revealed (Table no. 4a, 4b & 4c) that NAR (g dcm^{-2} day^{-1}) increased continuously from 20-40 days after transplanting to 60-80 DAT. As regards treatments it was observed that in all the stages from 0-20 to 80-100 DAT and 100 DAT-at harvest the mean differences in NAR were differed significantly. Significantly higher NAR were observed in T_2 at 20-40, 40-60, 60-80, 80-100 and 100 DAT-at harvest than T_1 treatment. In

T_2 treatment significantly higher NAR (0.0007g) at 20-40 DAT was shown by Palghar-2 and Karjat-5-10-10-16-13, at 40-60 DAT in Karjat-7 (0.010 g), at 60-80 DAT in Ratnagiri-4 (0.007 g) and Karjat-6-22-9-14-13 (0.007 g) and at 80-100 DAT were observed (0.007 g) in Palghar-2, Karjat-1-1-12-24-1-13, Karjat-BM4 and Karjat-5-10-10-16-13 over other genotypes. While At 100 DAT, significantly higher NAR (0.0002 g) was observed in Karjat-5-10-10-16-13 over other genotypes. Similar results were reported reduction in assimilation rate under shade net as compared to without shade net condition was also recorded by Nanja Reddy *et al.,* (1995), Chauhan *et al.,* (1996), Asana and Salunke (1971), Burondkar (1985), Srinivasulu *et al.,* (1999), Sahoo and Guru (1998), Ahmad *et al.,* (2009) and Janardhan and Murty (1980).

Data revealed (Table no. 5a, 5b & 5c) that LAI increased continuously from 20 days after transplanting to 80 DAT. As regards treatments it was observed that in all the stages from 0 to 100 DAT and at harvest the mean differences in LAI were differed significantly. Significantly higher LAI were observed in T_2 at 20, 40, 60, 80, 100 DAT and at harvest than T_1 treatment. In T_2 treatment significantly higher LAI (0.519) at 20 DAT, (1.673) at 40 DAT, (6.707) at 60 DAT, (7.110) at 80 DAT, (7.410) at 100 DAT and (7.381) at harvest stage were observed in Palghar-2 over other genotypes. Similar results were reported reduction in leaf area index under shade net as compared to without shade net condition was also recorded by Ren *et al.,* (2012), Varon *et al.,* (2015), Srinivasulu *et al1.,* (1999), Chaturvedi and Ingram (1989), Ahmad *et al.,* (2009) and Barmudoi *et al.,* (2016).

Data revealed (Table no. 6a, 6b & 6c) that SLW (g cm^{-2}) increased continuously from 20 days after transplanting to 80 DAT.

Table.1 List of Genotypes

Sr. No.	Name of the genotypes	Sr. No.	Name of the genotypes
1.	Sahyadri-5	2.	Karjat -5-17-25-29-6
3.	Karjat-8	4.	Karjat -5-10-10-16-13
5.	Karjat-9	6.	Karjat -BM4
7.	Ratnagiri-4	8.	Karjat -6-22-9-14-13
9.	Ratnagiri-5	10.	Karjat -5-8-13-15-7
11.	Palghar-2	12.	Karjat -5-7-10-12-2
13.	Phondaghat-1	14.	Karjat- 7 (Check Variety)
15.	Karjat -1-1-12-24-1-13	16.	Swarnaprabha (Check Variety)

Table 2(a) Effects of normal light (Without Shade Net) and low light (Shade Net) on absolute growth rate (g day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	20-40 DAT				40-60 DAT			
	T$_1$	T$_2$	Mean	Reduction (%)	T$_1$	T$_2$	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.1739	0.0774	0.13	55.5	0.5116	0.2991	0.41	41.5
Karjat-8 (G$_2$)	0.1411	0.0601	0.10	57.4	0.4456	0.2690	0.36	39.6
Karjat-9 (G$_3$)	0.1325	0.0604	0.10	54.5	0.4214	0.2743	0.35	34.9
Ratnagiri-4 (G$_4$)	0.2237	0.0781	0.15	65.1	0.5732	0.3014	0.44	47.4
Ratnagiri-5 (G$_5$)	0.2102	0.0881	0.15	58.1	0.5248	0.3074	0.42	41.4
Palghar-2 (G$_6$)	0.1863	0.0995	0.14	46.6	0.5025	0.3384	0.42	32.7
Phondaghat-1 (G$_7$)	0.1496	0.0737	0.11	50.7	0.4540	0.2962	0.38	34.8
Karjat-1-1-12-24-1-13 (G$_8$)	0.1211	0.0704	0.10	41.8	0.4348	0.2646	0.35	39.1
Karjat-5-17-25-29-6 (G$_9$)	0.1153	0.0685	0.09	40.6	0.4117	0.2574	0.33	37.5
Karjat-5-10-10-16-13 (G$_{10}$)	0.1446	0.0788	0.11	45.5	0.4803	0.2769	0.38	42.3
Karjat-BM4 (G$_{11}$)	0.1091	0.0532	0.08	51.3	0.3623	0.2428	0.30	33.0
Karjat-6-22-9-14-13 (G$_{12}$)	0.1426	0.0768	0.11	46.1	0.4250	0.2490	0.34	41.4
Karjat-5-8-13-15-7 (G$_{13}$)	0.1262	0.0697	0.10	44.8	0.4049	0.2746	0.34	32.2
Karjat-5-7-10-12-2 (G$_{14}$)	0.1142	0.0679	0.09	40.5	0.3920	0.2717	0.33	30.7
Karjat-7 (G$_{15}$)	0.1474	0.0713	0.11	51.7	0.4325	0.2528	0.34	41.6
Swarnaprabha (G$_{16}$)	0.1421	0.0818	0.11	42.5	0.4478	0.2551	0.35	43.0
Mean	**0.1487**	**0.0735**			**0.4515**	**0.2769**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.0033	0.0012			0.0089	0.0031		
Treatment	0.0012	0.0004			0.0031	0.0011		
Interaction (G × T)	0.0046	0.0016			0.0125	0.0044		

DAT – Days after transplanting   T$_1$ –Without Shade Net   T$_2$ – Shade Net

Table 2(b) Effects of normal light (Without Shade Net) and low light (Shade Net) on absolute growth rate (g day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	60-80 DAT				80-100 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.4961	0.2779	0.39	44.0	0.3502	0.1926	0.27	45.0
Karjat-8 (G_2)	0.4265	0.2407	0.33	43.6	0.3008	0.1662	0.23	44.8
Karjat-9 (G_3)	0.4056	0.2502	0.33	38.3	0.2860	0.1708	0.23	40.3
Ratnagiri-4 (G_4)	0.5825	0.2814	0.43	51.7	0.4103	0.1933	0.30	52.9
Ratnagiri-5 (G_5)	0.5349	0.2950	0.41	44.9	0.3772	0.2041	0.29	45.9
Palghar-2 (G_6)	0.4977	0.3284	0.41	34.0	0.3516	0.2273	0.29	35.3
Phondaghat-1 (G_7)	0.4391	0.2726	0.36	37.9	0.3090	0.1893	0.25	38.8
Karjat-1-1-12-24-1-13 (G_8)	0.4046	0.2536	0.33	37.3	0.2867	0.1719	0.23	40.0
Karjat-5-17-25-29-6 (G_9)	0.3829	0.2450	0.31	36.0	0.2726	0.1662	0.22	39.0
Karjat-5-10-10-16-13 (G_{10})	0.4459	0.2672	0.36	40.1	0.3227	0.1829	0.25	43.3
Karjat-BM4 (G_{11})	0.3485	0.2264	0.29	35.0	0.2442	0.1512	0.20	38.1
Karjat-6-22-9-14-13 (G_{12})	0.4051	0.2418	0.32	40.3	0.2933	0.1682	0.23	42.6
Karjat-5-8-13-15-7 (G_{13})	0.3889	0.2645	0.33	32.0	0.2749	0.1779	0.23	35.3
Karjat-5-7-10-12-2 (G_{14})	0.3716	0.2655	0.32	28.5	0.2646	0.1738	0.22	34.3
Karjat-7 (G_{15})	0.4144	0.2417	0.33	41.7	0.3000	0.1686	0.23	43.8
Swarnaprabha (G_{16})	0.4252	0.2495	0.34	41.3	0.3034	0.1739	0.24	42.7
Mean	**0.4356**	**0.2626**			**0.3092**	**0.1800**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%).**	**S.Em±**		
Genotypes	0.0065	0.0023			0.0036	0.0013		
Treatment	0.0023	0.0008			0.0013	0.0005		
Interaction (G × T)	0.0092	0.0033			0.0051	0.0018		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 2(c) Effects of normal light (Without Shade Net) and low light (Shade Net) on absolute growth rate (g day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	100 DAT-AT HARVEST			
	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.0064	0.0014	0.00	78.2
Karjat-8 (G_2)	0.0104	0.0025	0.01	76.4
Karjat-9 (G_3)	0.0103	0.0007	0.01	93.1
Ratnagiri-4 (G_4)	0.0117	0.0010	0.01	91.1
Ratnagiri-5 (G_5)	0.0087	0.0017	0.01	80.1
Palghar-2 (G_6)	0.0118	0.0028	0.01	76.3
Phondaghat-1 (G_7)	0.0051	0.0019	0.00	62.9
Karjat-1-1-12-24-1-13 (G_8)	0.0098	0.0033	0.01	65.9
Karjat-5-17-25-29-6 (G_9)	0.0098	0.0011	0.01	89.3
Karjat-5-10-10-16-13 (G_{10})	0.0069	0.0043	0.01	38.0
Karjat-BM4 (G_{11})	0.0091	0.0002	0.00	97.4
Karjat-6-22-9-14-13 (G_{12})	0.0079	0.0012	0.00	84.1
Karjat-5-8-13-15-7 (G_{13})	0.0115	0.0021	0.01	81.5
Karjat-5-7-10-12-2 (G_{14})	0.0129	0.0003	0.01	97.4
Karjat-7 (G_{15})	0.0130	0.0005	0.01	96.1
Swarnaprabha (G_{16})	0.0124	0.0032	0.01	74.3
Mean	**0.0099**	**0.0018**		
Factors	**C.D.(5%)**	**S.Em±**		
Genotypes	0.0008	0.0003		
Treatment	0.0003	0.0001		
Interaction (G × T)	0.0011	0.0004		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 3(a) Effects of normal light (Without Shade Net) and low light (Shade Net) on relative growth rate (g g^{-1} day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	20-40 DAT				40-60 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.027	0.009	0.018	65.1	0.050	0.039	0.045	23.1
Karjat-8 (G$_2$)	0.023	0.004	0.013	82.4	0.047	0.037	0.042	23.1
Karjat-9 (G$_3$)	0.021	0.004	0.012	80.8	0.046	0.037	0.042	20.1
Ratnagiri-4 (G$_4$)	0.033	0.010	0.021	70.2	0.053	0.039	0.046	26.3
Ratnagiri-5 (G$_5$)	0.031	0.012	0.021	60.6	0.051	0.039	0.045	22.8
Palghar-2 (G$_6$)	0.029	0.015	0.021	47.7	0.050	0.042	0.046	17.1
Phondaghat-1 (G$_7$)	0.024	0.008	0.016	64.6	0.048	0.039	0.043	19.4
Karjat-1-1-12-24-1-13 (G$_8$)	0.019	0.007	0.013	61.3	0.047	0.036	0.042	23.0
Karjat-5-17-25-29-6 (G$_9$)	0.018	0.007	0.012	62.4	0.046	0.036	0.041	22.3
Karjat-5-10-10-16-13 (G$_{10}$)	0.023	0.010	0.016	57.1	0.049	0.037	0.043	24.3
Karjat-BM4 (G$_{11}$)	0.017	0.001	0.009	92.1	0.043	0.034	0.039	20.2
Karjat-6-22-9-14-13 (G$_{12}$)	0.023	0.009	0.016	59.1	0.046	0.035	0.041	25.1
Karjat-5-8-13-15-7 (G$_{13}$)	0.020	0.007	0.014	64.2	0.045	0.037	0.041	18.6
Karjat-5-7-10-12-2 (G$_{14}$)	0.018	0.007	0.012	63.0	0.045	0.037	0.041	17.8
Karjat-7 (G$_{15}$)	0.023	0.008	0.016	67.2	0.047	0.035	0.041	24.9
Swarnaprabha (G$_{16}$)	0.023	0.011	0.017	53.0	0.048	0.035	0.041	25.7
Mean	**0.023**	**0.008**			**0.047**	**0.037**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.0007	0.0003			0.0006	0.0002		
Treatment	0.0003	0.0001			0.0002	0.0001		
Interaction (G × T)	0.0011	0.0004			0.0009	0.0003		

DAT – Days after transplanting　　T_1 –Without Shade Net　　T_2 – Shade Net

Table 3(b) Effects of normal light (Without Shade Net) and low light (Shade Net) on relative growth rate (g g^{-1} day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	60-80 DAT				80-100 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.050	0.037	0.044	25.3	0.042	0.029	0.036	30.7
Karjat-8 (G$_2$)	0.047	0.034	0.040	26.7	0.039	0.026	0.033	33.1
Karjat-9 (G$_3$)	0.045	0.035	0.040	23.1	0.038	0.027	0.032	29.6
Ratnagiri-4 (G$_4$)	0.053	0.038	0.045	29.6	0.046	0.029	0.038	35.8
Ratnagiri-5 (G$_5$)	0.051	0.039	0.045	25.1	0.044	0.031	0.037	30.4
Palghar-2 (G$_6$)	0.050	0.041	0.045	18.1	0.042	0.033	0.038	22.4
Phondaghat-1 (G$_7$)	0.047	0.037	0.042	22.0	0.040	0.029	0.034	26.9
Karjat-1-1-12-24-1-13 (G$_8$)	0.045	0.035	0.040	22.3	0.038	0.027	0.032	29.3
Karjat-5-17-25-29-6 (G$_9$)	0.044	0.035	0.039	21.9	0.037	0.026	0.031	29.2
Karjat-5-10-10-16-13 (G$_{10}$)	0.048	0.036	0.042	23.4	0.040	0.028	0.034	30.5
Karjat-BM4 (G$_{11}$)	0.042	0.033	0.037	22.2	0.034	0.024	0.029	30.2
Karjat-6-22-9-14-13 (G$_{12}$)	0.045	0.034	0.040	24.8	0.038	0.026	0.032	31.5
Karjat-5-8-13-15-7 (G$_{13}$)	0.045	0.036	0.040	18.8	0.037	0.028	0.032	25.5
Karjat-5-7-10-12-2 (G$_{14}$)	0.044	0.036	0.040	16.8	0.036	0.027	0.032	25.2
Karjat-7 (G$_{15}$)	0.046	0.034	0.040	25.5	0.039	0.026	0.033	32.2
Swarnaprabha (G$_{16}$)	0.046	0.035	0.041	24.9	0.039	0.027	0.033	30.9
Mean	**0.047**	**0.036**			**0.039**	**0.028**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.0007	0.0003			0.0006	0.0002		
Treatment	0.0003	0.0001			0.0002	0.0001		
Interaction (G × T)	0.0011	0.0004			0.0009	0.0003		

DAT – Days after transplanting　　T_1 –Without Shade Net　　T_2 – Shade Net

Table 3(c) Effects of normal light (Without Shade Net) and low light (Shade Net) on relative growth rate (g g^{-1} day^{-1} plant^{-1}) of rice (*Oryza sativa* L.)

Genotypes	100 DAT-AT HARVEST			
	T$_1$	T$_2$	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.0173	0.0093	0.0133	46.1
Karjat-8 (G$_2$)	0.0140	0.0061	0.0100	56.3
Karjat-9 (G$_3$)	0.0129	0.0068	0.0098	47.5
Ratnagiri-4 (G$_4$)	0.0208	0.0094	0.0151	54.7
Ratnagiri-5 (G$_5$)	0.0189	0.0105	0.0147	44.3
Palghar-2 (G$_6$)	0.0173	0.0129	0.0151	25.5
Phondaghat-1 (G$_7$)	0.0146	0.0089	0.0117	38.8
Karjat-1-1-12-24-1-13 (G$_8$)	0.0129	0.0069	0.0099	46.4
Karjat-5-17-25-29-6 (G$_9$)	0.0118	0.0060	0.0089	49.0
Karjat-5-10-10-16-13 (G$_{10}$)	0.0155	0.0082	0.0118	47.5
Karjat-BM4 (G$_{11}$)	0.0094	0.0041	0.0068	56.5
Karjat-6-22-9-14-13 (G$_{12}$)	0.0134	0.0062	0.0098	54.0
Karjat-5-8-13-15-7 (G$_{13}$)	0.0120	0.0076	0.0098	36.9
Karjat-5-7-10-12-2 (G$_{14}$)	0.0112	0.0070	0.0091	36.8
Karjat-7 (G$_{15}$)	0.0140	0.0067	0.0103	52.3
Swarnaprabha (G$_{16}$)	0.0142	0.0070	0.0106	50.8
Mean	**0.0144**	**0.0077**		
Factors	**C.D.(5%)**	**S.Em±**		
Genotypes	0.0005	0.0002		
Treatment	0.0002	0.0001		
Interaction (G × T)	0.0007	0.0002		

DAT – Days after transplanting   T$_1$ –Without Shade Net   T$_2$ – Shade Net

Table 4(a) Effects of normal light (Without Shade Net) and low light (Shade Net) on net assimilation rate (g dcm^{-2} day^{-1}) of rice (*Oryza sativa* L.)

Genotypes	20-40 DAT				40-60 DAT			
	T$_1$	T$_2$	Mean	Reduction (%)	T$_1$	T$_2$	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.0019	0.0006	0.0012	70.1	0.0019	0.0008	0.0014	55.9
Karjat-8 (G$_2$)	0.0013	0.0005	0.0009	60.2	0.0017	0.0008	0.0013	51.2
Karjat-9 (G$_3$)	0.0013	0.0005	0.0009	64.0	0.0019	0.0008	0.0014	58.7
Ratnagiri-4 (G$_4$)	0.0027	0.0006	0.0017	76.8	0.0016	0.0008	0.0012	48.4
Ratnagiri-5 (G$_5$)	0.0023	0.0006	0.0014	71.7	0.0016	0.0007	0.0012	55.3
Palghar-2 (G$_6$)	0.0020	0.0007	0.0014	63.0	0.0018	0.0007	0.0013	60.6
Phondaghat-1 (G$_7$)	0.0011	0.0006	0.0008	50.0	0.0021	0.0007	0.0014	65.0
Karjat-1-1-12-24-1-13 (G$_8$)	0.0011	0.0005	0.0008	55.9	0.0019	0.0008	0.0013	60.7
Karjat-5-17-25-29-6 (G$_9$)	0.0010	0.0006	0.0008	39.6	0.0016	0.0008	0.0012	49.4
Karjat-5-10-10-16-13 (G$_{10}$)	0.0014	0.0007	0.0011	53.2	0.0019	0.0007	0.0013	64.1
Karjat-BM4 (G$_{11}$)	0.0010	0.0005	0.0008	50.3	0.0016	0.0009	0.0013	41.0
Karjat-6-22-9-14-13 (G$_{12}$)	0.0012	0.0005	0.0009	55.2	0.0017	0.0006	0.0012	62.7
Karjat-5-8-13-15-7 (G$_{13}$)	0.0010	0.0005	0.0008	48.9	0.0019	0.0008	0.0014	58.9
Karjat-5-7-10-12-2 (G$_{14}$)	0.0011	0.0006	0.0008	43.7	0.0014	0.0008	0.0011	37.6
Karjat-7 (G$_{15}$)	0.0014	0.0006	0.0010	58.9	0.0016	0.0010	0.0013	38.6
Swarnaprabha (G$_{16}$)	0.0011	0.0006	0.0008	41.4	0.0017	0.0009	0.0013	45.8
Mean	**0.0014**	**0.0006**			**0.0017**	**0.0008**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.00010	0.00004			0.00017	0.00006		
Treatment	0.00004	0.00001			0.0006	0.00002		
Interaction (G × T)	0.00014	0.00005			0.00024	0.00009		

DAT – Days after transplanting   T$_1$ –Without Shade Net   T$_2$ – Shade Net

Table 4(b) Effects of normal light (Without Shade Net) and low light (Shade Net) on net assimilation rate (g dcm^{-2} day^{-1}) of rice (*Oryza sativa* L.)

Genotypes	60-80 DAT				80-100 DAT			
	T$_1$	T$_2$	Mean	Reduction (%)	T$_1$	T$_2$	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.005	0.003	0.00	44.9	0.010	0.004	0.01	62.2
Karjat-8 (G$_2$)	0.005	0.004	0.00	31.3	0.008	0.004	0.01	49.1
Karjat-9 (G$_3$)	0.008	0.003	0.01	62.9	0.006	0.003	0.00	55.9
Ratnagiri-4 (G$_4$)	0.007	0.007	0.01	1.5	0.006	0.004	0.01	41.3
Ratnagiri-5 (G$_5$)	0.006	0.005	0.01	3.4	0.007	0.004	0.01	41.2
Palghar-2 (G$_6$)	0.007	0.006	0.01	19.3	0.007	0.007	0.01	-1.2
Phondaghat-1 (G$_7$)	0.007	0.006	0.01	9.8	0.009	0.005	0.01	47.0
Karjat-1-1-12-24-1-13 (G$_8$)	0.008	0.004	0.01	48.4	0.007	0.007	0.01	3.8
Karjat-5-17-25-29-6 (G$_9$)	0.011	0.004	0.01	65.8	0.007	0.006	0.01	5.3
Karjat-5-10-10-16-13 (G$_{10}$)	0.009	0.006	0.01	33.9	0.009	0.007	0.01	26.3
Karjat-BM4 (G$_{11}$)	0.004	0.002	0.00	38.4	0.008	0.007	0.01	12.0
Karjat-6-22-9-14-13 (G$_{12}$)	0.007	0.007	0.01	2.4	0.012	0.005	0.01	53.9
Karjat-5-8-13-15-7 (G$_{13}$)	0.007	0.005	0.01	25.5	0.008	0.005	0.01	36.9
Karjat-5-7-10-12-2 (G$_{14}$)	0.006	0.004	0.00	29.1	0.006	0.005	0.01	13.2
Karjat-7 (G$_{15}$)	0.005	0.003	0.00	49.7	0.018	0.004	0.01	78.8
Swarnaprabha (G$_{16}$)	0.008	0.005	0.01	44.1	0.009	0.003	0.01	63.2
Mean	**0.0079**	**0.0067**			**0.0086**	**0.0050**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%).**	**S.Em±**		
Genotypes	0.0044	0.0016			0.0049	0.0017		
Treatment	0.0016	0.0005			0.0017	0.0006		
Interaction (G × T)	0.0062	0.0022			0.0070	0.0025		

DAT – Days after transplanting   T$_1$ –Without Shade Net   T$_2$ – Shade Net

Table 4(c) Effects of normal light (Without Shade Net) and low light (Shade Net) on net assimilation rate (g dcm^{-2} day^{-1}) of rice (*Oryza sativa* L.)

Genotypes	100 DAT-AT HARVEST			
	T$_1$	T$_2$	Mean	Reduction (%)
Sahyadri-5 (G$_1$)	0.0005	0.0000	0.0003	89.6
Karjat-8 (G$_2$)	0.0004	0.0001	0.0002	80.5
Karjat-9 (G$_3$)	0.0003	0.0000	0.0002	94.0
Ratnagiri-4 (G$_4$)	0.0003	0.0000	0.0002	90.1
Ratnagiri-5 (G$_5$)	0.0002	0.0001	0.0001	70.6
Palghar-2 (G$_6$)	0.0004	0.0001	0.0002	78.9
Phondaghat-1 (G$_7$)	0.0001	0.0001	0.0001	59.8
Karjat-1-1-12-24-1-13 (G$_8$)	0.0004	0.0001	0.0002	71.9
Karjat-5-17-25-29-6 (G$_9$)	0.0003	0.0000	0.0002	88.6
Karjat-5-10-10-16-13 (G$_{10}$)	0.0002	0.0002	0.0002	8.2
Karjat-BM4 (G$_{11}$)	0.0003	0.0000	0.0001	94.3
Karjat-6-22-9-14-13 (G$_{12}$)	0.0006	0.0000	0.0003	92.1
Karjat-5-8-13-15-7 (G$_{13}$)	0.0004	0.0001	0.0002	80.8
Karjat-5-7-10-12-2 (G$_{14}$)	0.0004	0.0000	0.0002	96.8
Karjat-7 (G$_{15}$)	0.0004	0.0000	0.0002	95.9
Swarnaprabha (G$_{16}$)	0.0004	0.0001	0.0003	74.7
Mean	**0.0004**	**0.0001**		
Factors	**C.D.(5%)**	**S.Em±**		
Genotypes	0.00019	0.00007		
Treatment	0.0007	0.00002		
Interaction (G × T)	0.00026	0.00009		

DAT – Days after transplanting   T$_1$ –Without Shade Net   T$_2$ – Shade Net

Table 5(a) Effects of normal light (Without Shade Net) and low light (Shade Net) on Leaf area index (LAI) of rice (*Oryza sativa* L.).

Genotypes	20 DAT				40 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.611	0.445	0.53	27.2	1.312	1.582	1.45	-20.5
Karjat-8 (G_2)	0.519	0.451	0.48	13.2	1.411	1.428	1.42	-1.2
Karjat-9 (G_3)	0.515	0.349	0.43	32.3	1.326	1.420	1.37	-7.2
Ratnagiri-4 (G_4)	0.628	0.468	0.55	25.5	1.262	1.515	1.39	-20.0
Ratnagiri-5 (G_5)	0.598	0.481	0.54	19.6	1.330	1.655	1.49	-24.5
Palghar-2 (G_6)	0.540	0.519	0.53	3.9	1.286	1.673	1.48	-30.1
Phondaghat-1 (G_7)	0.394	0.314	0.35	20.3	1.525	1.418	1.47	7.0
Karjat-1-1-12-24-1-13 (G_8)	0.333	0.382	0.36	-14.9	1.181	1.561	1.37	-32.2
Karjat-5-17-25-29-6 (G_9)	0.437	0.330	0.38	24.4	1.356	1.221	1.29	10.0
Karjat-5-10-10-16-13 (G_{10})	0.433	0.297	0.37	31.6	1.235	1.266	1.25	-2.4
Karjat-BM4 (G_{11})	0.309	0.304	0.31	1.7	1.143	1.122	1.13	1.8
Karjat-6-22-9-14-13 (G_{12})	0.385	0.351	0.37	8.8	1.397	1.600	1.50	-14.5
Karjat-5-8-13-15-7 (G_{13})	0.324	0.360	0.34	-11.0	1.372	1.513	1.44	-10.3
Karjat-5-7-10-12-2 (G_{14})	0.343	0.286	0.31	16.8	1.208	1.212	1.21	-0.3
Karjat-7 (G_{15})	0.448	0.310	0.38	30.8	1.270	1.310	1.29	-3.1
Swarnaprabha (G_{16})	0.450	0.442	0.45	1.8	1.592	1.552	1.57	2.5
Mean	**0.454**	**0.380**			**1.325**	**1.440**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.0153	0.0054			0.0913	0.0323		
Treatment	0.0054	0.0019			0.0323	0.0114		
Interaction (G × T)	0.0217	0.0077			0.1291	0.0457		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 16(b) Effects of normal light (Without Shade Net) and low light (Shade Net) on Leaf area index (LAI) of rice (*Oryza sativa* L.).

Genotypes	60 DAT				80 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	3.971	5.317	4.64	-33.9	4.708	6.101	5.40	-29.6
Karjat-8 (G_2)	3.873	4.625	4.25	-19.4	4.542	5.125	4.83	-12.8
Karjat-9 (G_3)	3.391	4.978	4.18	-46.8	3.622	5.696	4.66	-57.3
Ratnagiri-4 (G_4)	5.012	5.335	5.17	-6.4	5.676	5.585	5.63	1.6
Ratnagiri-5 (G_5)	4.580	6.069	5.32	-32.5	5.328	6.505	5.92	-22.1
Palghar-2 (G_6)	4.000	6.707	5.35	-67.7	4.492	7.110	5.80	-58.3
Phondaghat-1 (G_7)	3.521	5.587	4.55	-58.7	3.990	5.950	4.97	-49.1
Karjat-1-1-12-24-1-13 (G_8)	3.323	5.099	4.21	-53.5	3.640	5.552	4.60	-52.5
Karjat-5-17-25-29-6 (G_9)	3.942	4.512	4.23	-14.5	4.224	5.068	4.65	-20.0
Karjat-5-10-10-16-13 (G_{10})	3.698	5.540	4.62	-49.8	4.066	5.848	4.96	-43.8
Karjat-BM4 (G_{11})	3.267	3.576	3.42	-9.5	3.990	4.329	4.16	-8.5
Karjat-6-22-9-14-13 (G_{12})	3.802	5.638	4.72	-48.3	4.245	5.777	5.01	-36.1
Karjat-5-8-13-15-7 (G_{13})	3.299	5.012	4.16	-51.9	3.703	4.991	4.35	-34.8
Karjat-5-7-10-12-2 (G_{14})	4.027	4.398	4.21	-9.2	4.171	4.535	4.35	-8.7
Karjat-7 (G_{15})	3.917	3.784	3.85	3.4	4.530	4.520	4.52	0.2
Swarnaprabha (G_{16})	4.200	4.320	4.26	-2.9	4.556	4.515	4.54	0.9
Mean	**3.864**	**5.031**			**4.343**	**5.450**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D(5%)**	**S.Em±**		
Genotypes	0.4145	0.1466			0.4372	0.1547		
Treatment	0.1466	0.0518			0.1546	0.0547		
Interaction (G × T)	0.5862	0.2074			0.6184	0.2187		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 16(c) Effects of normal light (Without Shade Net) and low light (Shade Net) on Leaf area index (LAI) of rice (*Oryza sativa* L.).

Genotypes	100 DAT				AT HARVEST			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	4.963	6.478	5.72	-30.5	5.011	6.545	5.78	-30.6
Karjat-8 (G_2)	4.792	5.415	5.10	-13.0	4.710	5.479	5.09	-16.3
Karjat-9 (G_3)	3.925	6.146	5.04	-56.6	3.939	6.156	5.05	-56.3
Ratnagiri-4 (G_4)	6.130	5.948	6.04	3.0	6.263	6.051	6.16	3.4
Ratnagiri-5 (G_5)	5.690	6.927	6.31	-21.7	5.710	6.989	6.35	-22.4
Palghar-2 (G_6)	4.862	7.410	6.14	-52.4	4.901	7.386	6.14	-50.7
Phondaghat-1 (G_7)	4.214	6.220	5.22	-47.6	4.138	6.121	5.13	-47.9
Karjat-1-1-12-24-1-13 (G_8)	3.908	5.920	4.91	-51.5	3.730	5.993	4.86	-60.7
Karjat-5-17-25-29-6 (G_9)	4.493	5.423	4.96	-20.7	4.660	5.353	5.01	-14.9
Karjat-5-10-10-16-13 (G_{10})	4.285	6.035	5.16	-40.8	4.360	6.051	5.21	-38.8
Karjat-BM4 (G_{11})	4.192	4.471	4.33	-6.6	4.209	4.336	4.27	-3.0
Karjat-6-22-9-14-13 (G_{12})	4.436	6.094	5.26	-37.4	4.466	6.136	5.30	-37.4
Karjat-5-8-13-15-7 (G_{13})	3.946	5.283	4.61	-33.9	3.992	5.365	4.68	-34.4
Karjat-5-7-10-12-2 (G_{14})	4.465	4.815	4.64	-7.8	4.345	4.839	4.59	-11.4
Karjat-7 (G_{15})	4.666	4.831	4.75	-3.5	4.734	4.883	4.81	-3.1
Swarnaprabha (G_{16})	4.818	5.102	4.96	-5.9	4.820	5.153	4.99	-6.9
Mean	**4.612**	**5.782**			**4.624**	**5.802**		
Factors	**C.D.(5%).**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.4339	0.1535			0.4518	0.1598		
Treatment	0.1534	0.0543			0.1597	0.0565		
Interaction (G × T)	0.6136	0.2170			0.6390	0.2260		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 6(a) Effects of normal light (Without Shade Net) and low light (Shade Net) on specific leaf weight (g cm^{-2}) of rice (*Oryza sativa* L.).

Genotypes	20 DAT				40 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.0012	0.0013	0.0013	-9.3	0.0047	0.0018	0.0032	60.5
Karjat-8 (G_2)	0.0010	0.0009	0.0010	4.8	0.0037	0.0016	0.0026	57.6
Karjat-9 (G_3)	0.0011	0.0018	0.0015	-56.9	0.0038	0.0015	0.0027	58.9
Ratnagiri-4 (G_4)	0.0012	0.0012	0.0012	-6.9	0.0062	0.0018	0.0040	71.3
Ratnagiri-5 (G_5)	0.0012	0.0013	0.0013	-6.1	0.0056	0.0019	0.0038	66.0
Palghar-2 (G_6)	0.0009	0.0013	0.0011	-44.5	0.0051	0.0021	0.0036	59.5
Phondaghat-1 (G_7)	0.0019	0.0016	0.0017	11.9	0.0036	0.0018	0.0027	50.1
Karjat-1-1-12-24-1-13 (G_8)	0.0018	0.0011	0.0015	40.7	0.0035	0.0016	0.0026	54.0
Karjat-5-17-25-29-6 (G_9)	0.0013	0.0015	0.0014	-9.6	0.0029	0.0019	0.0024	34.3
Karjat-5-10-10-16-13 (G_{10})	0.0016	0.0013	0.0014	22.1	0.0038	0.0023	0.0031	40.8
Karjat-BM4 (G_{11})	0.0015	0.0015	0.0015	-3.7	0.0032	0.0016	0.0024	50.1
Karjat-6-22-9-14-13 (G_{12})	0.0013	0.0016	0.0014	-19.4	0.0034	0.0018	0.0026	47.2
Karjat-5-8-13-15-7 (G_{13})	0.0013	0.0013	0.0013	-1.2	0.0030	0.0016	0.0023	45.1
Karjat-5-7-10-12-2 (G_{14})	0.0014	0.0021	0.0017	-50.8	0.0032	0.0019	0.0025	39.8
Karjat-7 (G_{15})	0.0009	0.0021	0.0015	-145.2	0.0039	0.0020	0.0029	50.0
Swarnaprabha (G_{16})	0.0010	0.0009	0.0010	5.3	0.0032	0.0017	0.0025	45.7
Mean	**0.0013**	**0.0014**			**0.0039**	**0.0018**		
Factors	**C.D.(5%)**	**S.Em±**			**C.D.(5%)**	**S.Em±**		
Genotypes	0.00010	0.00003			0.00021	0.00008		
Treatment	0.00003	0.00001			0.00008	0.00003		
Interaction (G × T)	0.00014	0.00005			0.00030	0.00011		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 6(b) Effects of normal light (Without Shade Net) and low light (Shade Net) on specific leaf weight (g cm^{-2}) of rice (*Oryza sativa* L.).

Genotypes	60 DAT				80 DAT			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.0039	0.0015	0.0027	62.0	0.0057	0.0022	0.0040	60.7
Karjat-8 (G_2)	0.0035	0.0015	0.0025	57.5	0.0051	0.0023	0.0037	55.1
Karjat-9 (G_3)	0.0038	0.0014	0.0026	63.1	0.0061	0.0021	0.0041	65.5
Ratnagiri-4 (G_4)	0.0036	0.0015	0.0026	57.2	0.0054	0.0025	0.0039	53.5
Ratnagiri-5 (G_5)	0.0035	0.0014	0.0025	60.0	0.0052	0.0022	0.0037	56.5
Palghar-2 (G_6)	0.0037	0.0015	0.0026	59.2	0.0055	0.0024	0.0040	56.7
Phondaghat-1 (G_7)	0.0039	0.0014	0.0027	63.8	0.0059	0.0023	0.0041	61.6
Karjat-1-1-12-24-1-13 (G_8)	0.0040	0.0014	0.0027	65.1	0.0063	0.0022	0.0042	65.0
Karjat-5-17-25-29-6 (G_9)	0.0032	0.0015	0.0023	52.5	0.0050	0.0023	0.0036	54.7
Karjat-5-10-10-16-13 (G_{10})	0.0038	0.0013	0.0025	65.7	0.0058	0.0021	0.0039	64.3
Karjat-BM4 (G_{11})	0.0033	0.0018	0.0025	46.1	0.0046	0.0025	0.0035	45.6
Karjat-6-22-9-14-13 (G_{12})	0.0035	0.0013	0.0024	63.4	0.0053	0.0021	0.0037	60.2
Karjat-5-8-13-15-7 (G_{13})	0.0038	0.0014	0.0026	62.3	0.0057	0.0024	0.0041	57.4
Karjat-5-7-10-12-2 (G_{14})	0.0028	0.0016	0.0022	42.3	0.0046	0.0027	0.0037	42.0
Karjat-7 (G_{15})	0.0034	0.0017	0.0025	50.0	0.0049	0.0024	0.0036	51.4
Swarnaprabha (G_{16})	0.0031	0.0015	0.0023	51.8	0.0049	0.0025	0.0037	49.9
Mean	0.0035	0.0015			0.0054	0.0023		
Factors	C.D.(5%)	S.Em±			C.D(5%)	S.Em±		
Genotypes	0.00028	0.00010			0.00041	0.00015		
Treatment	0.00010	0.00003			0.00015	0.00005		
Interaction (G × T)	0.00040	0.00014			0.00058	0.00021		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table 6(c) Effects of normal light (Without Shade Net) and low light (Shade Net) on specific leaf weight (g cm^{-2}) of rice (*Oryza sativa* L.).

Genotypes	100 DAT				AT HARVEST			
	T_1	T_2	Mean	Reduction (%)	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	0.0067	0.0026	0.0047	60.9	0.0065	0.0025	0.0045	61.1
Karjat-8 (G_2)	0.0060	0.0027	0.0043	55.1	0.0060	0.0026	0.0043	57.0
Karjat-9 (G_3)	0.0071	0.0024	0.0048	65.6	0.0069	0.0023	0.0046	66.3
Ratnagiri-4 (G_4)	0.0062	0.0029	0.0046	52.8	0.0059	0.0028	0.0044	53.1
Ratnagiri-5 (G_5)	0.0060	0.0026	0.0043	56.5	0.0059	0.0025	0.0042	57.4
Palghar-2 (G_6)	0.0064	0.0029	0.0046	55.0	0.0063	0.0028	0.0045	55.3
Phondaghat-1 (G_7)	0.0070	0.0027	0.0048	61.2	0.0069	0.0027	0.0048	61.6
Karjat-1-1-12-24-1-13 (G_8)	0.0073	0.0026	0.0049	64.9	0.0074	0.0025	0.0050	66.8
Karjat-5-17-25-29-6 (G_9)	0.0059	0.0026	0.0043	55.2	0.0055	0.0026	0.0041	53.4
Karjat-5-10-10-16-13 (G_{10})	0.0069	0.0025	0.0047	63.6	0.0066	0.0024	0.0045	63.1
Karjat-BM4 (G_{11})	0.0054	0.0030	0.0042	44.7	0.0053	0.0030	0.0041	43.6
Karjat-6-22-9-14-13 (G_{12})	0.0063	0.0025	0.0044	60.6	0.0062	0.0024	0.0043	61.4
Karjat-5-8-13-15-7 (G_{13})	0.0068	0.0029	0.0048	57.4	0.0066	0.0027	0.0047	58.1
Karjat-5-7-10-12-2 (G_{14})	0.0054	0.0032	0.0043	41.6	0.0055	0.0030	0.0042	44.7
Karjat-7 (G_{15})	0.0059	0.0028	0.0044	53.1	0.0058	0.0026	0.0042	54.6
Swarnaprabha (G_{16})	0.0058	0.0027	0.0043	53.3	0.0058	0.0026	0.0042	54.5
Mean	0.0063	0.0027			0.0062	0.0026		
Factors	C.D.(5%).	S.Em±			C.D.(5%)	S.Em±		
Genotypes	0.00047	0.00017			0.00042	0.00015		
Treatment	0.00017	0.00006			0.00015	0.00005		
Interaction (G × T)	0.00066	0.00024			0.00059	0.00021		

DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net

Table.7 Effects of normal light (without shade net) and low light (Shade Net) on grain yield per plant (g) of rice (Oryza sativa L.)

Genotypes	T_1	T_2	Mean	Reduction (%)
Sahyadri-5 (G_1)	23.33	8.04	15.69	65.5
Karjat-8 (G_2)	19.71	6.53	13.12	66.8
Karjat-9 (G_3)	18.35	7.05	12.70	61.5
Ratnagiri-4 (G_4)	27.71	7.87	17.79	71.5
Ratnagiri-5 (G_5)	24.41	8.67	16.54	64.4
Palghar-2 (G_6)	22.46	10.36	16.41	53.8
Phondaghat-1 (G_7)	18.29	8.50	13.39	53.5
Karjat-1-1-12-24-1-13 (G_8)	17.59	7.37	12.48	58.1
Karjat-5-17-25-29-6 (G_9)	17.87	6.97	12.42	61.0
Karjat-5-10-10-16-13 (G_{10})	20.07	7.37	13.72	63.2
Karjat-BM4 (G_{11})	14.85	6.07	10.46	59.0
Karjat-6-22-9-14-13 (G_{12})	18.03	7.58	12.80	57.9
Karjat-5-8-13-15-7 (G_{13})	16.09	7.93	12.01	50.7
Karjat-5-7-10-12-2 (G_{14})	16.17	7.52	11.84	53.4
Karjat-7 (G_{15})	18.51	7.08	12.79	61.7
Swarnaprabha (G_{16})	18.02	7.43	12.72	58.7
Mean	**19.47**	**7.65**		
Factors	**C.D.(5%)**	**S.Em±**		
Genotypes	1.2229	0.6118		
Treatment	0.4324	0.2163		
Interaction (G × T)	1.7294	0.8651		
DAT – Days after transplanting T_1 –Without Shade Net T_2 – Shade Net				

As regards treatments it was observed that in all the stages from 0 to 100 DAT and at harvest the mean differences in SLW were differed significantly. In T_2 treatment significantly higher SLW were observed in T_2 at 20, 40, 60, 80, 100 DAT and at harvest than T_1 treatment. Significantly higher SLW (0.0021g) at 20 DAT was found in Karjat 5-7-10-12-2 and Karjat-7, at 40 DAT in Palghar-2 (0.0021g), at 60 DAT in Karjat BM-4 (0.0018 g). While genotype Karjat5-7-10-12-2 shows higher SLW at 80,100 DAT and harvest stage (0.0027 g), (0.0032 g) and (0.0030 g) respectively. Similar results were reported reduction in specific leaf weight under shade net as compared to without shade net condition was also recorded by Shaobing Peng *et al.,* (1993), Thakur *et al.,* (2009) and Hendrik Poorter, (1989).

It is concluded that, among the treatments studied, Absolute growth rate, Relative growth rate and Specific Leaf Weight were significantly differed in all the genotypes under shade net and without shade net. The leaf area index (LAI) is the most important parameter of growth analysis. Leaf area index significantly differed in all the genotypes under shade net and without shade net. The leaf area index increased under the shade net condition whereas; decrease under without shade net treatment due to the shade stimulates cellular expansion and rapid cell division as compared to without shade net.

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