

# Effect of application of “Grinophyll” on Growth and Yield of Rice

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**Abstract**— The present investigation entitled “effect of application of “Grinophyll” on growth and yield of rice was carried out during kharif season of the year 2021 on the field of ASPEE, Agricultural Research and Development Foundation, Tansa farm, At-Nare, Tal-Wada, Dist- Palghar, Maharashtra. The experiment was laid out in Randomized Block Design. The three treatments (Control, Grinophyll @ 4ml, and Grinophyll @6ml per 15 liters of water) were replicated twice times on four varieties of rice namely Dandi, Gurjari, Jaya, and GAR-13. The plant population per meter square (34.5), plant height (105.9 cm), number of tillers per plant (13.7), number of panicles per plant (13), number of panicles per square meter (442) and length of panicle (25.8 cm) was recorded maximum with application of Grinophyll @ 6 ml /15 liters of water on rice cv. “GAR-13”. The highest number of seeds per panicle (203.5), test weight (34.1 g), grain yield (57.45 q/ha) and straw yield (85.08 q/ha) was found with application of Grinophyll @ 6 ml / 15 liters of water. The data clearly revealed that, the yield obtained with treatment Grinophyll @ 6 ml / 15 liters of water on rice cv. “GAR 13” was significantly higher than all other treatments and also for growth parameters.

**Keywords**— Grinophyll, Rice, Variety, Chlorophyll and Photosynthesis.

## I. INTRODUCTION

Rice is the most prominent crop of India as it is the staple food for most of the people of the country. This crop is the backbone of livelihood for millions of rural households and plays vital role in the country’s food security, so the term “rice is life” is most appropriate in Indian context. India occupies an important position both in area and production of rice. By the adoption of improved production technologies such as high-yielding varieties/hybrids, expansion of irrigation potential, and use of chemical fertilizer, supply of rice in the country has kept pace with the increase in demand. Demand for rice is expected to further increase in future as population is continuously increasing, so production of rice also needs to be increased. There is a need to further increase rice productivity because land area under rice cultivation is declining. Major constraints for productivity and sustainability of rice-based systems in the country are the

inefficient use of inputs (fertilizer, water, labor), increasing scarcity of water and labor especially for rice cultivation, new emerging challenges from climate change, rising fuel prices, increasing cost of cultivation, and socioeconomic changes such as migration of labor, urbanization, less liking for agricultural work by youths, and concerns from environmental pollution. The only way to sustain rice production for meeting the increasing population demand is to increase the productivity per unit of area of rice with enhanced resource use efficiency. For future productivity gain in rice in India, high-yielding varieties that might have resistance to multiple stresses (abiotic and biotic stress) particularly in the wake of climate change need to be explored. Crop production techniques in rice that could increase factor productivity by efficient utilization of inputs (water, fertilizers, pesticides, etc.) reduce cultivation cost, enhance profit, and provide safe environment must be explored. Encouraging resource conservation technologies

and cultivation of climate-resilient high-yielding varieties through demonstrations and making seed available to the farmers will be important to sustain rice production in India.

## II. Materials and Methods

The experiment was conducted at ASPEE, Agricultural Research and Development Foundation Farm, Village-Nare, Tauka- Wada, District- Palghar in *kharif* season during 2021 in Randomized Block Design (RBD) with 2 replications. The plot size was 19.5 m x 14.5 m. The experimental site was located at 19.65°N latitudes and 73.13°E longitudes with average annual rainfall of 3600 mm. Four varieties comprising 3 levels of Grinophyll were tested in crop production. Gross plot size and net plot size were 3.30 X 2.85 m and 3.15 X 2.80 m; respectively. Planting was done on 15 July 2021 at spacing 20 X 15 cm.

There were 12 treatment combinations comprising viz., V1F1, V2F1, V3F1, V4F1, V1F2, V2F2, V3F2, V4F2, V1F3, V2F3, V3F3 and V4F3 were indicates Dandi, Gujrati, Jaya and GAR-13 varieties; respectively. F1, F2 and F3 were indicates 0 ml, 4 ml and 6 ml Grinophyll per 15 liters of water applied; respectively.

Data were compiled and analyzed using appropriate statistical method. Keeping in view the above facts, the present study was designed with the objective to study the effect of Grinophyll on growth and yield attributes of four transplanted rice varieties. Seedlings were prepared as per recommended practices.

## III. RESULTS AND DISCUSSION

The results in table 1 and Graph 1 indicated that different treatments induced marked variations in number of panicles per plant, number of panicles per square meter, length of panicle, seeds per panicle, test weight, grain and straw yields.

### Plant growth parameters

The plant population per meter square (34.5), plant height (105.9 cm), number of tillers per plant (13.7), number of panicles per plant (13), number of panicles per square meter (442) and length of panicle (25.8 cm) was found

Table No. 1: Effect of application of "Grinophyll" on Growth and Yield of different Rice varieties under Konkan region.

Treatment	Plant population (per m <sup>2</sup> )	Plant height (cm)	No. of tillers per plant (Nos.)	No. of days to 50% flowering(Days)	No. of panicles per plant	No. of panicles(per m <sup>2</sup> )	Length of panicle (cm)	No. of seeds per panicle	Test weight (g)	Grains Yield (q/ha)	Straw Yield (q/ha)
T1	31.5	99.4	9.2	74.8	9.1	300.3	22.2	117.8	17.7	39	57.9
T2	31.5	100.4	9.4	72.5	9.2	276	23	122	19.4	47	69.6
T3	32	101.3	10.2	72	9.4	291.4	23.3	123.1	20.4	48.6	72.1

maximum with application of Grinophyll @ 6 ml / 15 liters of water on rice cv. "GAR-13".

Grinophyll help to increase chlorophyll concentration in the plant leading to higher degree of photosynthesis. This makes crops lush Green. It helps to enhancing rice production (Matsuzakiet. al. 1980)

### Yield parameters

The highest number of seeds per panicle (203.5), test weight (34.1 g), grain yield (57.45 q/ha) and straw yield (85.08 q/ha) was found with application of Grinophyll @ 6 ml / 15 liters of water. The data clearly revealed that, the yield obtained with treatment Grinophyll @ 6 ml / 15 liters of water) on rice cv. "GAR 13" was significantly higher than all other treatments and also for growth parameters.

Yield attributes viz., seeds per panicle, test weight and grain yield per panicle were significantly affected by Grinophyll in rice. Grinophyll application increased the number of spikelets per panicle of rice. This might be due to increased synthesis of carbohydrates and that might have increased the sink size and capacity (JunfeiGu et al., 2017).

The contribution of carbohydrates from photosynthetic activity for longer period might have resulted in efficient translocation of food material into the sink (grain) thereby increased the number of filled grains percentage. Grain yield per panicle of rice also increased by Grinophyll than controls (Raj and Tripathi, 1999).

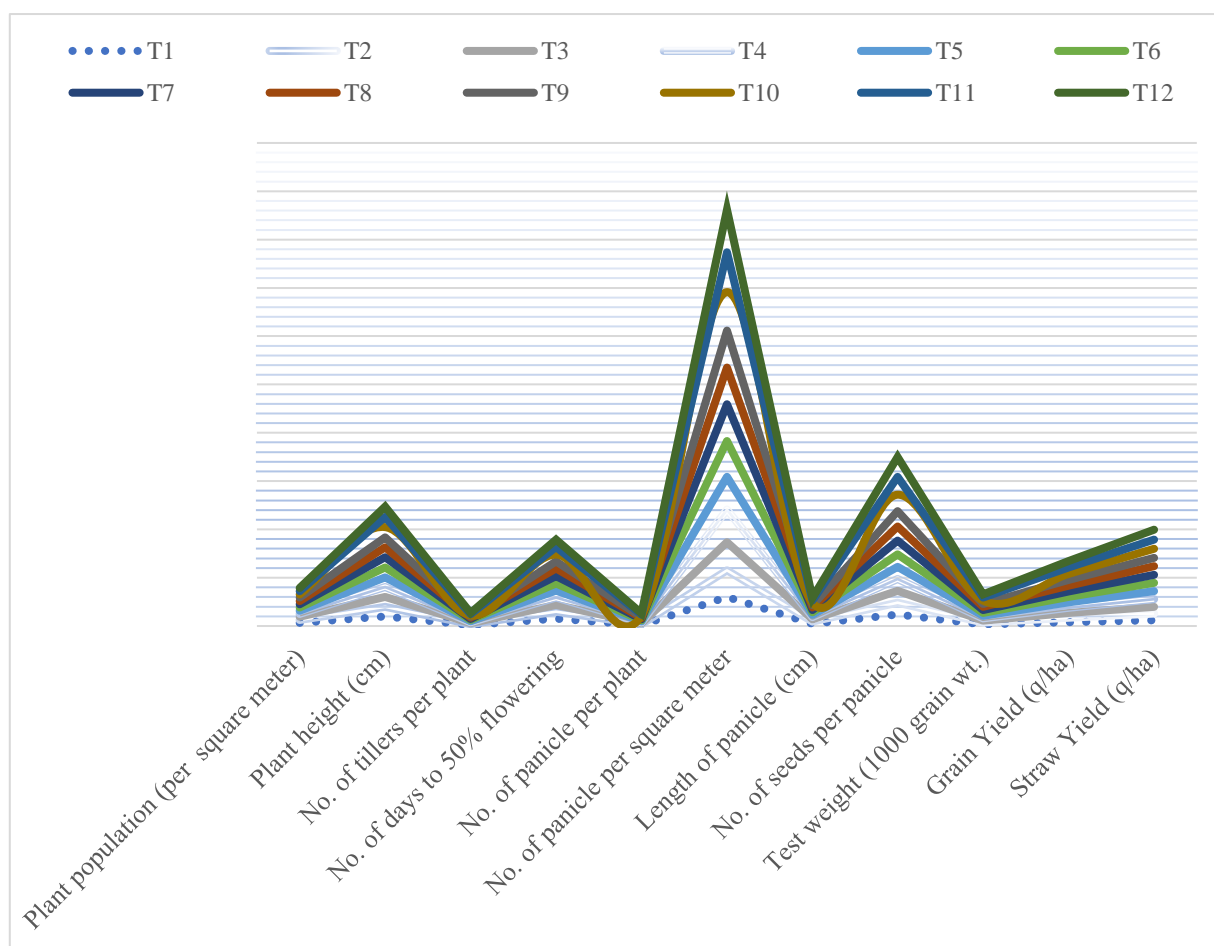
Grinophyll is a unique concentrated herbal formulation which stimulates the process of chlorophyll formation in leaves. This product is able to form chlorophyll in any plant irrespective of scarcity of water and other climatic variations. This product may be used separately or with other products to improve chlorophyll content in leaf. It relieves plant from stress conditions as well don't have any limitations as in the case of chemical fertilizers (Verma et al. 2004)

The grain weight increased with the increase in the carbohydrate production in source. It helps to increase transportation of carbohydrate from source to sink. (Arif et al. 2012).

T4	32	101.5	10.8	76.5	9.9	336.6	23.7	124	23	52.9	78.4
T5	32.5	101.7	11.2	72.5	10.3	339.9	24.2	125.2	25.7	56	83
T6	33	103.1	11.5	73.3	10.9	370.6	24.5	131	29.1	57.7	85.5
T7	33	103.2	11.6	75.5	11.2	380.8	24.6	141	29.7	57.3	84.8
T8	33.5	103.7	11.6	79	11.5	379.5	24.8	145.7	32.1	58.2	86.3
T9	34	104.1	11.7	73.8	11.6	382.8	25	158.4	32.3	58.9	87.3
T10	34	105.2	12.3	69.8	11.7	397.8	25.1	171.1	32.5	63.8	94.5
T11	34	105.5	12.9	76.8	12.5	412.5	25.3	184.7	33	64.9	96.3
T12	34.5	105.9	13.7	77	13	442	25.8	203.5	34.1	68.6	101.7
S.Em(±)	1.14	0.31	0.30	2.27	0.28	9.03	0.26	11.05	1.2	4.77	7.08
CD	NS	0.98	0.94	NS	0.88	28.1	0.79	34.39	3.72	14.86	22.02

NS – Non-Significant

Graph No. 1: Effect of application of “Grinophyll” on Growth, and Yield of different Rice varieties under Konkan region.



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