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“To Study the Combining Effect of Vermicompost and Vermiwash on the Productivity of Grapes (*Vitis Vinifera*) in Pimpalgaon (B) of Nashik District, Maharashtra”

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ABSTRACT:

The grape is a type of fruit that grows in the form of cluster or bunch with delicious, refreshing and nourishing value in health. It has their own taste due precious nutrients present in it. It has low calorific value as it is helpful to maintain body health. In India, the grapes are produce and commonly consumed as table fruit while in European countries 99% grapes production is used for preparation of wines. Grapes are important fruit with high amount of sugar source hence used in various byproducts like raisins, fresh juice, wine and Jams etc. Grapes has good source of minerals like Calcium, Phosphorous and Iron and vitamins. The grape juice is mild laxative and antioxidant in nature.

The present work was carried out at Pimpalgaon (B) farm of Nashik district of Maharashtra (India) for to study combining effect of vermicompost and vermiwash on the productivity of different varieties of grapes. During experiment the soil quality maintaining by adding vermicompost 2000kg/hector and vermiwash (1:10v/v in water) in a respective proportion simultaneously for improving soil quality. The grape white variety Thompson and black variety Sharad yield was considered for the experiment. The vermicompost and vermiwash not only increased soil posture but also the yield of grapes in reference with size, brix value (total content in the juice) and also reduces acidity of grape juice.

KEYWORDS: *Vermiwash, Vermicompost, Brix, Grapes, Pruning*

I. INTRODUCTION:

The commercial grape cultivation in India is about hundred years old and mostly it has been cultivated in the tropical and sub-tropical areas of Maharashtra (Nasik, Solapur, Sangli and Pune) The Pimpalgaon (B) city include in Niphad tehsil of Nashik district and is well known famous city for commercial grapes in Maharashtra. Pimpalgaon Baswant is a city located in Nashik district of Maharashtra, India. The geographical location of Pimpalgaon Baswant latitude 20.165369 and the longitude is 73.987991. The climatic condition is

also suitable for export quality grapes. Commercial classification of grape varieties may be classified into five categories namely Table, Resin, Wine, Juice and Canning grapes. Vermicompost is one of the most important product of decomposition by earthworm. Earthworms are the annelid invertebrate on the earth occurs in burrowing habitat. The organic waste in the form of plant leaves, branches, crop stubbles, etc. decomposed into soil and form humus which is natural food of earthworm. Earthworm plays an important role in agro ecosystem due to their feeding and burrowing habitat. They incorporate organic residue and amendments into the soil enhancing decomposition, humus formation, nutrient recycling and soil structural development (Kladinko et al, 1986).

The Vermitechnology is a green technology helps to converts organic wastes into nutrient rich organic fertilizer. It also increases soil structure and reduces soil erosion. Use of vermicompost enhances plant growth and development. The earthworm acts in soil as an aerator, grinder, chemical degrader, biological stimulant, their utilization and importance (Darwin, 1981). Vermicompost is a fine granular organic matter when added to the soil, the soil became porous and well aerated with the environment. The mucus associated with cast being hydroscopic (absorb water), prevents water logging and improve water holding capacity of the soil. The organic carbon in the vermicompost release the nutrient slowly bound steadily into the system and enable to plant to absorb these nutrients from the soil. Vermicompost provides additional substances that are not found in chemical fertilizer (Kale, 1998).

Vermiwash is a liquid extract obtained from vermicomposting units and is used as an organic fertilizer for crop yield. Vermiwash includes mucus secretions of earthworms along with micronutrients from the soil organic molecules. Vermiwash is a type of liquid collected through the vermicompost unit and is very useful as foliar spray to the crops. It is a mucus secretion of earthworm along with the micronutrients from the soil. Vermiwash if collected properly is a clear transparent pale yellow color fluid (Ismail, 1997). The application of chemical fertilizer over a period resulted in poor soil health, reduction in production and increase the incidences of pest, diseases and pollute the environment. In order to cope these problems the Vermitechnology has become most suitable remedial device (Edward and Bohlen, 1996; Kumar, 2005). Thus the organic farming helps to provide many advantages such as eliminate the use of chemicals in the form of fertilizer, pesticide recycle and regenerate the waste into wealth, improve soil, plant and animal health for creating an eco-friendly sustainable and economical bio system (Ansari and Ismail, 2001). As the huge importance of vermicompost and vermiwash sustainable role in agro ecosystem the present study was undertaken to evaluate the combining effect of vermicompost and vermiwash on the yield of grapes in Niphad tehsil of Nashik district of Maharashtra.

II. MATERIAL AND METHODOLOGY:

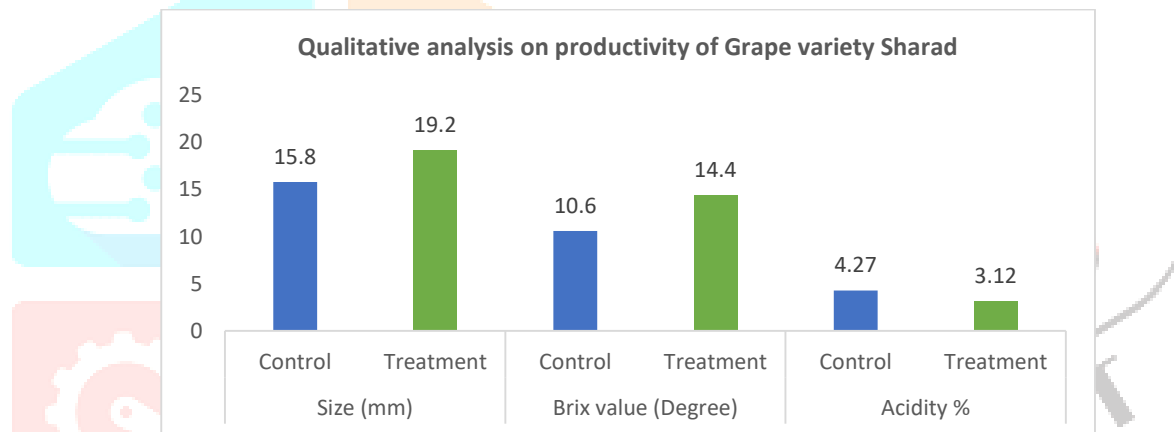
The present study was carried out in the farm of farmers holding at Niphad of Nashik district. Two plots of grapes variety namely Sharad (Black variety), Thompson (white variety) were selected for the experiment. (Each plot of grapes has 2000 plants) The vermicompost and vermiwash was collected in Samarth vermitech, Nashik. Each plot treated with vermicompost plant ratio 2000kg/hectar i.e. for 2000 plants. After the first pruning in month of April and second treatment given after second pruning in the month of October.

Same Plot was treated with vermiwash in proportionate ratio (1:10 v/v in water) through drip irrigation system to every month. Beside to this another on plot was considered for control (No use of vermicompost and vermiwash) for comparing the combining effect with treated plot of grapes yield. The harvested grapes, the productivity quality parameters viz. Brix value was recorded by using refractometer, total sugar as per procedure adopted by (Somogyi,1952) and size by size guazemeter while acidity of the grape juice as per (A.O.A.C., 1980)

III. OBSERVATION TABLE:

3.1 Table-1: Vermicompost and vermiwash treated and control plot of Sharad variety (Black variety)

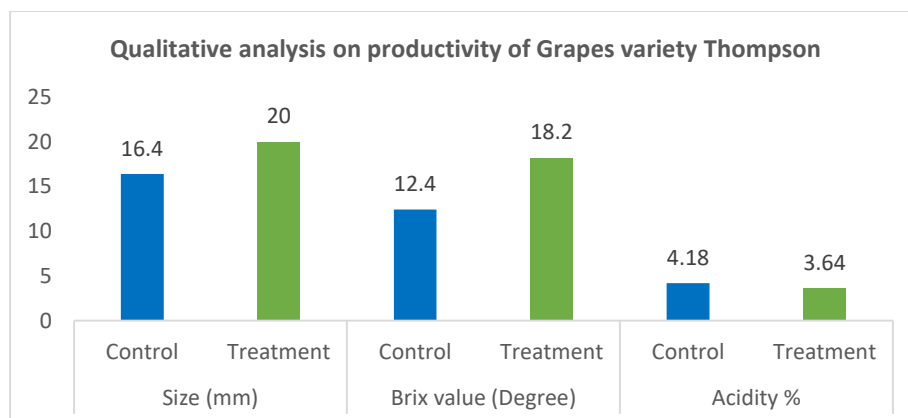
Sr. No.	Parameters	Sample	S -1	S -2	S -3	S -4	S -5	Mean/S.D.
1	Size (mm)	Control	15	16	14	16	18	15.8 ± 1.2
		Treatment	20	18	19	20	19	19.2 ± 1.1
2	Brix value (Degree)	Control	12	10	10	12	11	10.6 ± 1.0
		Treatment	18	20	19	18	17	14.4 ± 1.3
3	Acidity %	Control	4.97	3.34	5.73	4.12	3.57	4.27 ± 1.1
		Treatment	3.25	3.85	2.42	2.20	2.38	3.12 ± 1.2



3.1 Fig No.1: Qualitative analysis on productivity of Grape variety Sharad

3.2 Table-2: Vermicompost and vermiwash treated and control plot of Thompson variety (White variety)

Sr. No.	Parameters	Sample	S -1	S -2	S -3	S -4	S -5	Mean/S.D.
1	Size (mm)	Control	16	19	18	20	22	16.4 + 1.4
		Treatment	21	19	19	20	21	20.0 + 1.1
2	Brix value (Degree)	Control	14	12	11	11	14	12.4 ± 0.6
		Treatment	19	16	19	18	19	18.2 ± 0.3
3	Acidity %	Control	4.97	3.34	5.73	4.12	3.57	4.18 ± 0.1
		Treatment	3.28	3.46	3.18	2.93	3.11	3.64 ± 0.1



3.2 Fig No.2: Qualitative analysis on productivity of Grapes variety Thompson

IV. RESULTS AND DISCUSSION:

The outcome of present study revealed that application of vermicompost and vermiwash effectively increases the physicochemical properties of grapes. In an export market grapes has good market value if good quality of grapes maintain by farmers. The organic fertilizer like vermicompost and vermiwash collectively less expensive as compare to synthetic fertilizer. The physical property like size of a fruit plays an important role in the market. In the present investigation fruit size was recorded between 18 -22 mm in Sharad variety and 15- 18 mm in Ganesh variety which is good size mentioned by Agriculture and processed products export development Authority (APEDA)

Brix value does not differentiate between the different sugars but indicates the total content of all sugars and it denotes quality of fruits. The Brix value of grape accounts for 90-95% of the fermentable sugars. The ratio of sugar to water may change due to physiological conditions present within the fruit. The brix value (Total content of sugar in grape juice) was recorded between 16° - 17° and the brix value is the standard range of grape fruit demanded in the market.

The acidity of grape juice was recoded in acidic medium in treated plot of grapes. The pH of grape juice was recorded in between 3 to 4 while in control plot of grapes the acidity of grapes was in between 5 to 6. The fruit juice with low pH value is considered to be as acidic and it is good for a taste. The acidity of fruit juices measures taste of fruits. Thus the present work recommended the organic farming packages to be offered to the farmers for increasing the productivity of grapes yield. Vermicompost and vermiwash collectively improve the soil structure and good fruit quality results profitable income to the farmers and always ecofriendly to the environment.

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