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A Vermiwash for Better Mango Fruit Production

KEYWORDS: Vermiwash, Mango tonic, Fruit productivity, pesticide, disease curative.

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ABSTRACT *Vermiwash acts as pesticide, disease curative and crop tonic and increase the yield of crops in multiples. Therefore, vermiwash have been tested against indigenous and hapus mango fruit productivity in Kolhapur region of Maharashtra, India. Vermiwash increased fruit productivity from 1.00 (control) to 8.5 (treated) and 1.00 (control) to 3.5 (treated) per fruiting body in indigenous and hapus mango varieties respectively. During the study (Oct. - Feb.) no insect pests and bacterial or fungal diseases were noted on the crop indicating its pesticidal and disease curative property. 1 lit of vermiwash in 1 lit of water was the dose used in the experiments.*

INTRODUCTION

India is one of the major producers and exports many agricultural commodities. However, in horticultural practices India is lagging far behind the European countries and expected yield of the crop is not achieved so far because of the damage caused by the insect pests and due to the lack of awareness and scientific training to farmers and pesticidal pollutions which lead pest resistance, pest resurgence and secondary pest out break etc. Water, soil and air pollution seriously affect vermiculture and vermiwash technology (Kale, 2006). Vermiwash plays an important role in agriculture as tonic, growth regulator, yield producer, pesticide and disease controller. However, the use of vermiwash for improving the quality of crops remained unexploited due to unavailability of standard method or technique of production of qualitative vermiwash. Therefore, for better yield of the mango crop Sathe & Patil (2008) developed a new vermiwash production system with five major modifications which was new window for sustainable development of agriculture in India. Vermiwash is ecofriendly model which is helpful to farmer's community. The qualitative and quantitative effects of use of vermiwash on crop plants and horticultural produce are known in some crops (Krishnamurthy & Vajranabhai, 1986; Prasad & Pawar, 1977; Ismail, 1994, 1995; Sathe, 2006; Kale, 2006; Patil et al. 2006; etc). However, no attention is paid on high production of mango fruits by using vermiwash. The present work will add great relevance in fruit production technology of mango.

MATERIALS & METHODS

Vermiwash production technology was given by Patil et al., (2008) which is given below briefly. An empty cylindrical plastic barrel of 200 liters capacity with one side open was used. ½" plastic tap was fitted at lower side of barrel. The layers have been arranged from bottom to top-first layer of brick pieces 7" (size 1 x 1 cm), total no. of bricks used 60 to 75, second layer was of coarse sand 6" (80 kg) and third layer was of fine sand 5" (65 kg). On third layer circular mosquito netlon mesh was spread. On netlon mesh 16" to 17" fresh dung + partly decomposed dung + decayed leaf moulds (Ratio 2 : 2 : 1 thoroughly mixed) have been arranged. At the centre of barrel, in the middle of feeding layer, the perforated plastic pipe of length 2' and breadth 2" was inserted upto netlon mesh. Then 2 kg mature earthworms Eudrilus eugeniae (1200 to 1500) in the unit have been released. A total unit set on iron stand with water bowls protected from ants and other predators and height 2 feet above the ground level was useful for easy management. After setting the unit, 2 kg mature earthworms were released. On the other hand, water drop by drop with at least four water regulators or controller, at the rate of 2 liters per day have been adjusted. Within 9 to 10 days about 1750 ml vermiwash each day was possible. However, the best quality of vermiwash was possible after 16 days.

The vermiwash produced by above method was collected in sufficient quantity and stored for 3 years and later, it was used as foliar 5 sprays on mango crop in Kolhapur at the rate of 1 lit vermiwash + 9 lit water. Later, observations on fall down flowering and fruiting bodies have been taken from February to May.

RESULTS

Results recorded in table-1 and figs. 1 to 3 indicate that a liquid vermiwash is good biofertilizer and tonic to mango M. indica which increased the fruit production from 1.00 (control) to 8.5 (treated) and 1.00 (control) to 3.5 (treated) fruits per fruiting body in indigenous and Hapus varieties of mango respectively in Kolhapur region of Maharashtra, India. As regards to bloosming the percentage was increased from 62.00 (control) to 95% (treated) in indigenous varieties and 70% (control) to 100% (treated) in Hapus varieties of mango. There was tremendous improvement in size, test and luster of the fruits. During the experimental period (Oct. to May) and the flowering and fruiting period (Feb. - May) no pesticides were used for control of insect pests. Very interestingly, during the experimental period (Oct. to May) no insect pests and bacterial or fungal diseases noticed on mango indicating pest and disease controlling capacity of vermiwash.

DISCUSSION

Earthworm lives in moist soil, if by chance water logged condition exists around them, simply through body wall water enters into the coelomic cavity due to integumentary, pharyngeal and septal nephridia which have osmoregulatory and excretory functions. Such excluded and excess water released with organic, inorganic materials, symbiotic gut bacteria and fungi along with pullets is vermiwash.

According to Patil et al, (2008) vermiwash acts as plant tonic, because it contains microorganisms, actinomycetes, enzymes, hormones and multi nutrients. These characteristics increased 15% vegetative and reproductive growth in fruit trees and flowering plants which resulted in increase 40% to 80% yield of the crops. Vermiwash increased disease resistance capacity in many agricultural crop plants against various bacterial, vital and fungal diseases. Patil et al, (2007) also reported that if vermiwash is used in nursery for mulberry cutting and grafting layering affects 80% or more. Vermiwash is very good foliar spray which prevents detachment of flowers,

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helps in fruit setting. In the present study vermiwash was tested against flowering and fruiting bodies of M. indica which showed increased productivity and size of the fruits and test.

The role of organic agriculture, whether in farming, processing, distribution and consumption is to sustain and enhance the health of ecosystem and organisms from the smallest in the soil to human beings (IFOAM). Therefore, organic farming and vermiwash technology is the need of the day. Vermiwash as liquid biofertilizer obtained from the worm's activities viz., coelomic fluid and vermicasting filtrate has tremendous economic importance in sustainable development of agriculture and horticulture.

According to Krishnasastry (1994) plant growth and development depend on a favorable environment, adequate sunlight, water and plant nutrients and productivity of any crop plant is influenced by a judicious management of these inputs. In the present study, vermiwash provided all essential inputs to mango crop for metabolism and growth which has resulted in increase in size, test and luster of the fruits and finally the production of fruits both qualitatively and quantitatively. Paitl et al, (2008) reported that vermiwash has very good keeping quality. In the present study, vermiwash was stored at 27±1°C, 65-70% RH, 12 hr photoperiod for 3 year in sealed plastic bottles of 1 litre and then used in the tests. The present investigations probably are related to the duration of storage time of vermiwash.

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Table 1 : Effect of Vermiwash on bloosming and fruiting bodies of M. indica

Sr. No.	Mango variety	Per cent Bloosming	Per cent fruiting	Av. no. of fruits on each fruiting body
1.	Indigenous	95.00 (62.00)	100.00 (40.00)	8.5 (1.00)
2.	Hapus	100.00 (70.00)	100.00 (42.00)	2.5 (1.00)

(Figs. In parenthesis denotes control)

Fig. 1 – Indigenous Mango variety fruit production.

Fig. 2 – Indigenous Mango variety fruit production.

Fig. 3 – Hapus Mango variety fruit production.

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