

Growth response and production of tomato plant with application of Azolla Composting.

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ABSTRACT: In the present study, a field experiment was conducted to study the effect of azolla compost and other 3 fertilizers on same variety of tomato for its growth, yield and fruits sensory. Azolla compost is used as microbial inoculant or biofertilizer and promotes the growth and increase the yield by 20-30%. Beside acting as N₂ fixing for rice production. Azolla compost also contains other nutrient i.e., N, P, K content. Four types of fertilization regimes were compared. (1) Azolla compost (2) Inorganic fertilizer (3) FYM (4) no fertilizer. The effect of plant growth, yield was investigated.

The main result showed that: (1) Azolla compost and FYM more effectively promoted plant growth, number of fruits and height of plant with other fertilizer treatments. We conclude that Azolla compost can be recommended as a fertilizer to improve tomato fruit quality and yield.

I. INTRODUCTION:

Azolla is a free-floating aquatic fern mostly found on moist soils. Azolla can symbiotically associate with Anabaena. Azolla is very appropriate as a substitute for organic fertilizer with rapid growth of this plant has organic productivity. With compost. We were able to grow different kinds of vegetables like tomatoes, potatoes, onions etc. Azolla compost has highest N, P, K content. i.e N -3.68 %, P - 20%, K - 0.15% as compared to other organic sources experiments conducted at IRRI, Philippines showed that conversion of compost from Azolla was rather quick but further research is required to evaluate the exact potential. Fresh Azolla collected from field and ponds were used in compost preparation and since it has an excellent C: N ratio it decomposes quickly and accelerates the decomposition of other organic residues inside the compost pit. Our main objective was to investigate the effect of Azolla compost application on tomato plant growth, yield and fruit quantity.

Now a days the rise of food production is the major challenges to meet the food requirements of growing population in agriculture and it will be remained essential in the future due to the pressure of inhabitants. Many factors influence the crop quality in food production and one of the main factors is the fertilization system. Because, soil fertility is one of the major problems limiting crop production [7]. The growth and yield of vegetable crops are mainly depending on the quality and quantity of fertilizers used [8]. So, to accumulate the soil fertility and yield azolla compost are often used. Frequent and high-rate uses of inorganic fertilizer have been associated with some environmental pollution, alteration in soil textures and physical property of the soil. Moreover, the nutritional value of the crops will be affected seriously by the continuous use of synthetic fertilizer [9] also inorganic fertilizers will increase the cost of crop production. Now, throughout the world, the demand for organic foods is increased among the consumers that are good for environment and health. Furthermore, consumers often look upon the taste of organic products and it should be healthier one than the conventional one. Apart from the release of nutrient in slow manner, the application of organic fertilizers, which are made from animal excreta or other agricultural wastes is usually used to improve the structure and stability of the soil and in addition to enhancing the yield and quality of the crop plants [8,9]

II. MATERIALS AND METHODS

- Preparation of Azolla compost:
- 2 kg of Azolla plant material was collected and washed with water for 3 times and dried.
- The dried biomass was placed in a black plastic bucket and add 250 kg cow dung + 10 kg ash was added then the bucket was tightly covered with black plastic
- The Composting process continued for 2 weeks

•After 2 week the Compost is directly apply on tomato plant.

Period of study:

For Azolla growth: 13thJun 2018 – 11thJuly 2018.
 For tomato plant: 29thSep 2018 – 17thDec 2018

Tomato variety:

TO-1057 were selected based on available in the markets of theKolhapur district.

Study site-

The experiment was conducted in our farm during 2020-2021 at Honyali village.

Experimental Design-

Treatment of Azolla compost 4 tomato plants was taken for the experiment --

1st plant was grown with Azolla compost at the rate of 100g per week

2nd plant was grown with FYM rate of 100g per week

3rd plant was grown with any inorganic fertilizer rate of 100g per week

4th plant was grown without any fertilizers

Measurement of plant growth parameters-

Vegetative growth of the studied tomato plants (viz., plant height, stem diameter, number of branches and leaves per plant were evaluated. The plant height was measured from the soil level to the tip of the shoot and expressed in foot.

Measurement of yield parameters-

Tomato fruits were harvested twice weekly at the pink to red-ripe stage. Weekly yields were determined by pooling the two weekly harvests. Measured yield parameters included number of flowers per plant, number of fruits per plant and yield per plant.

Expected outcome:

1. It gives 25% more yield.
2. As compared to chemical fertilizers it has less cost so farmers can save his money.
3. It is eco-friendly and no hazards for humans and animals.
4. The bacteria anabaena is isolated in compost and these bacteria can help for degradation of azolla

Observation Table: 1

Plants number	Type of Fertilizers	Height of Plants	Fruits per day	Life period of plants
1 st plant	Azolla compost	5.7 feet	13 fruits	170 days
2 nd plant	Farm Yard Manure	5 feet	9 fruits	166 days
3 rd plant	Chemical fertilizers	4.4 feet	6 fruits	152 days
4 th plant	No any fertilizer	3.9 feet	2-3 fruits	122 days

Observation:



Figure :1 Mass production of Azolla



Figure:2 Azolla compost



Figure:3 Plant with azolla compost



Figure:4 Plant with FYM Figure: 5 Plant with chemical fertilizers



Figure: 6 Plant without any fertilizers

III. RESULTS AND DISCUSSION

In the present study, the organic fertilizers had the significant influence on the plant growth, yield and quality of studied tomato varieties and the results are presented in Figure Nos. 3 to 6 and Table No1 showed the significant differences between effects of fertilizers on tomato plant height, tomato fruits count and life period of plants. The

results revealed that Azolla compost had the best effect as compared to other two fertilizers on plant height and tomato yield.

IV. CONCLUSION:

Application of Azolla Compost, shows very effective result. It shows the high degree effect on tomato stem height, growth, life span &

tomato fruit gain. As compared to chemical fertilizers azolla compost gives better result as it has excellent C&N ratio & gives highly increasing yield.

The application of compost increase organic matter & triggers the growth and multiplication of soil microbes. It is cost effective and eco-friendly so we can directly apply on plant.

The result of the present study shows that azolla compost had a significant impact on soil microbial C&N value. Different fertilizer treatments, had significant effect on the soil water soluble organic carbon content at all four growing plants. In most of cases, the compost treatment had highest the soil water soluble organic carbon content.

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