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FERTIGATION SCHEDULING FOR TOMATOES

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Abstract

The primary objective of this study was to determine the best fertilizer scheduling practice in order to achieve maximum yield with maximum fertilizer use efficiency and highest nutrient uptake. It is found nutrient use efficiency could be as high as 90 per cent in fertigation as compared to 40 to 60 per cent in conventional methods. The amount of fertilizer lost through leaching can be as low as 10 per cent in fertigation whereas it is 50 per cent in the traditional system. It is observed that fertigation scheduled at 75% ET and at 75% RDF, respectively could be a good alternate for saving nutrients with enhanced nutrient uptake, growth, yield and quality of crops.

Importance of Tomato Cultivation

Tomato is one of the most popular vegetable crops globally, widely cultivated due to its versatile culinary uses and nutritional benefits.

Nutritional Benefits

Tomatoes are not only delicious but also highly nutritious, rich in essential vitamins such as Vitamin A and Vitamin C.

Health Benefits

Source of Lycopene: Cooked tomatoes and tomato products are an excellent source of lycopene, a powerful antioxidant known for its potential in preventing various types of cancer.

Efficient Irrigation Techniques

Drip irrigation plays a crucial role in enhancing tomato cultivation efficiency.

Advantages of Drip Irrigation

Water and Fertilizer Efficiency: It provides efficient water and fertilizer delivery directly to the plant's root zone.

Precise Nutrient Application: Allows precise timing and uniform distribution of water and nutrients, optimizing crop growth and yield.

Fertigation: Integrates fertilization with irrigation, ensuring nutrients are delivered accurately to meet the crop's requirements.

Fertigation Benefits

Nutrient Utilization: Fertigation enhances nutrient use efficiency, achieving levels as high as 90%, compared to conventional methods which typically range from 40% to 60%.

Drip Fertigation Technology

Drip fertigation involves the application of both solid and liquid mineral fertilizers through a drip irrigation system, providing crops with nutrient-enriched irrigation water.

By combining the nutritional benefits of tomatoes with efficient drip fertigation techniques, farmers can optimize yields and produce high-quality tomatoes rich in essential nutrients.

METHODOLOGY:

N:P: K = 200: 250: 250 Kg/ha

1 ha = 247 cents

Calculating for 5 cents:

Nitrogen Requirement = 5*200/247
= 4.04 Kg/ cent
Phosphate Requirement = 5*250/247
= 5.06 Kg/ cent
Potassium Requirement = 5*250/247
= 5.06 Kg/ cent

N:P: K = 4.04:5.06:5.06 Kg/cent

MAP contains 18%N, 61%P

100Kg of MAP contains 61Kg of Phosphorous, therefore 5.06kg of Phosphorous requires **8.29Kg of MAP.**

100Kg of MAP contains 18Kg of Nitrogen, therefore 8.29Kg of MAP contains **1.49Kg of Nitrogen.**

Actually, 4.04Kg of Nitrogen is required. In which, 1.49Kg of Nitrogen is supplied through MAP and remaining amount of Nitrogen has to be supplied through Urea.

Nitrogen Requirement = 4.04-1.49
= 2.54Kg

Urea contains 46%N

100Kg of Urea contains 46Kg of Nitrogen, therefore 2.54Kg of Nitrogen requires **5.5Kg of Urea.**

MOP contains 60% Potassium

100Kg of MOP contains 60Kg of Potassium, therefore 5.06Kg of Phosphorous requires **8.4Kg of Phosphorous.**

RESULT:

As a result of fertigation scheduling, absolute nutrient requirement is identified. This helps to ensure application of fertilizers in required quantities. Moreover, it helps to increase the yield of the crop and thereby increasing the economy. Surplus amount of fertilizers that are applied through fertigation may cause hazardous impact on plant growth and yield. Estimating the nutrient requirement through fertigation scheduling gives a clear idea of applying fertilizers in required amount. Ultimately, nutrient enriched product with good quality was obtained.

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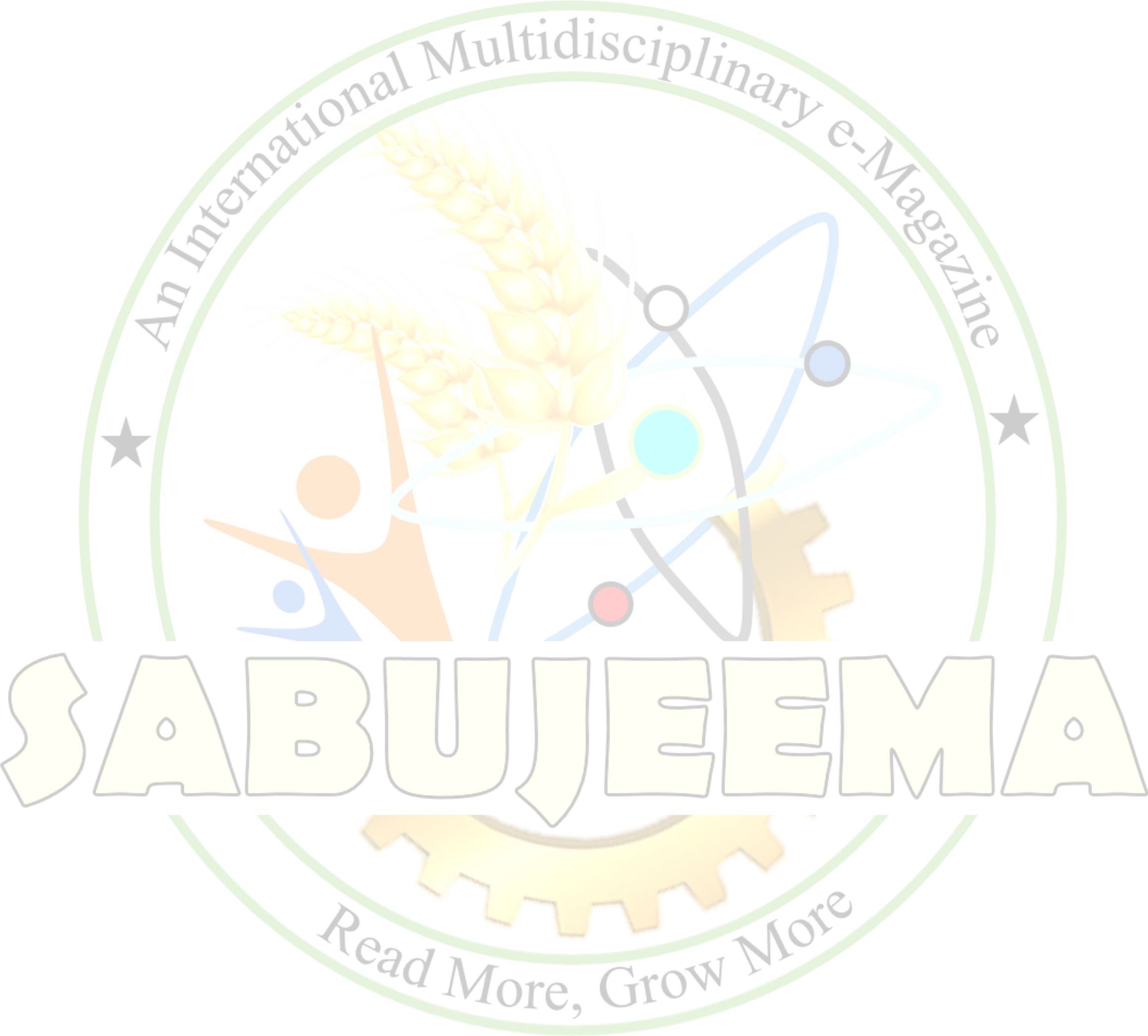
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