Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 02, Issue: 03 (MAY-JUNE, 2022)
Available online at http://www.agriarticles.com

Integrated Nutrient Management in Flower Crops

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Integrated Nutrient Management is important component of sustainable agriculture. Many regions in India like Kashmir, Himachal and other hilly regions have huge potential for quality flower production. Because floriculture is a high-energy and high-cost type of farming, fertilizer input costs are particularly expensive, which can be saved by using alternative methods like INM. The lack of information on the use of fertilizer as the sole source of nutrients in flower production, particularly in flower cultivation, has made its application more challenging. INM, particularly includes the use of increased nutrient rates, more effective fertilizer supply, organic matter, and soil inoculation. It have excellent potential in proving the growing nutrient demands of intensive farming, such as Floriculture, and keeping production at its peak with a holistic improvement in resource base quality, which is especially relevant in the case of cut and bulbous flowers. It can be concluded that reducing chemical fertilizer levels and optimum dose of organic fertilizer can improve crop yield and quality without compromising agronomic and ecological characteristics.

Introduction

Floriculture is a branch of horticulture in which emphasizes on flower and decorative plants for gardening and floristry. The cut flowers, cut greens, bedding plants, houseplants, floral gardens and potted plants are included in floriculture. Growing demand for flowers and their products has arisen in rising living standards and continuous urbanization in today's world, making floriculture a vital commercial trade. Commercial cultivation has a greater potential per unit area than field crops and make a profitable company all over the world (Misra and Sudip, 2016).

Integrated Nutrient Management (INM) refers to maintenance of soil fertility and supply of plant nutrient at optimum level for sustaining the desired crop productivity. The program aims to improve biological inputs to crop production and reduce the usage of inorganic supplements, leading in a much more ecologically and environmentally sustainable agricultural production pattern (National Research Council, 1991). INM is the superior option for enhancing the physical, chemical, and biological characteristics of soils (Das et al., 2015).To keeping output and decreasing their dependency on chemical fertilisers alone is increasingly becoming important to flower growers. It is essential to maximize the value of organic manures, composts, crop residues, and biofertilizers, as well as their synergistic effect with chemical fertilisers, for improving nutrient supply in a balanced manner (Wani *et al.*, 2016).

Components of the INM

1. Organic Manures: Organic manures having high nutritional content included urban decomposition, Farmyard manure, residues, human excreta, urban waste, rural green waste, sludge, press mud, and other agricultural and agri-wastes. For maintaining soil fertility and yield stability, composting and Farm yard manure have traditionally been the most essential manures. There are other organic sources of nutrients, such as non-edible oil cakes and food processing waste. Additionally, there are a lot of industrial wastes and urban wastes that have a high nutrient potential. These nutrient transporters, on the other side, have not been thoroughly tested to determine their fertilizer equivalents. There is need to integrate these sources depending on their availability in different crops and cropping systems.

2. Legumes: Legumes have a long-standing history of being soil fertility restorers due to their ability to obtain N from the atmosphere in symbiosis with Rhizobia. Legumes could provide an important ingredient of INM when grown for grain or fodder in a cropping system, or when introduced for green manuring. Legumes grown as green manure, forage or grain crops improved the productivity (RWCS) and rejuvenated soil fertility (Yadav *et al.*, 2000).

3. Crop Residues: Crop residues have a lot of competing uses, thus therefore will not always be available as an ingredient in INM. However, in locations like North-West India where mechanical harvesting is used, a significant amount of residue is left in the field, which can contribute to nutrient supply. There are significant numbers of residues from other crops, such as potato, sugarcane, vegetables, and so on, that are almost always squandered. Although cereal crop wastes are a desirable cattle feed, they could be used to augment fertilisers when supplies are insufficient.

4. Fertilizers: Fertilizers were still the most significant component of INM. Because of the requirement to supply large nutrients in intense farming with high productivity, fertiliser consumption has been steadily growing. Local fertiliser production is insufficient to meet demand, and the position is unlikely to improve anytime soon. On the other side, constraints such as global fertiliser and raw material price hikes would prevent large-scale fertiliser imports, resulting in a substantial supply-demand disparity. While organics and biofertilizers are likely to fill some of the gap, fertiliser efficiency in closing the nutrient supply gap requires further attention.

5. Biofertilizers: Biofertilizers are substances that contain living or latent colonies of agriculturally beneficial microorganisms that enhance fertility of the soil by biological nitrogen fixation, solubilizing/mobilizing Phosphorus and degrading farm waste, releases nutrients to plants. The extent of these microorganisms' effects is governed by their quantity and efficiency, which is influenced by various of soil and environmental conditions.

Advantages

1. Enhances the availability of applied as well as native soil nutrients
2. Synchronizes the nutrient demand of the crop with nutrient supply from native and applied sources.
3. Provides balanced nutrition to crops and minimizes the antagonistic effects resulting from hidden deficiencies and nutrient imbalance.
4. Improves and sustains the physical, chemical and biological functioning of soil.
5. Minimizes the deterioration of soil, water and ecosystem by promoting carbon sequestration, reducing nutrient losses to ground and surface water bodies and to atmosphere

INM investigations in flower crops

Chaitra and Patil (2007) reported that the treatment T11 Azotobactor + PSB + 50% RDF significantly improved flowering and yield attributes of China aster cv. Kamini. Angadi

(2014) evaluated that the application of Azospirillum + PSB + 50 per cent vermicompost + 50 per cent were significantly higher chrysanthemum. Lambat and Pal (2012) in rose, Gayathri *et al.,* (2004) in statice cv. blue diamond and Sunitha and Hunje (2010) in marigold.

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