



QUALITY ASSESSMENT FOR DISEASE FREE HEALTHY PLANTING MATERIAL PRODUCTION AND ITS IMPACT ON FLORICULTURE

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ABSTRACT

The quality of planting material is very important aspect in the floriculture industry. Poor quality planting material in floricultural crops Inferior quality planting material has detrimental impacts on overall production and quality of the produce. It may badly affect the important traits of floricultural crops viz. size, colour, quality and stalk length etc. use of diseased planting material can cause severe spread of the many plant pathogens including viruses, fungi and bacteria. All these factors may lead to severe economic loss to the floriculture industries. In the present article we have discussed about various Priority areas for quality planting materials for floriculture crops, impact of the non-standred planting material usage on floriculture sector and some methods of selection of production of healthy planting material in floriculture crops.

INTRODUCTION

Plants in the floriculture industry are propagated in both sexual and asexual ways. Seeds, bulbs, bulblets, corms, cormels, rhizomes, stolons, layers, tubers, suckers, off shoots, slips, cuttings, budded, and grafted plants are all examples of planting material in floriculture. The quality planting materials influences the production of ornamental crops (Sankari et al., 2020). The lack of high-quality planting material is the most significant impediment to India's floriculture potential. Commercial flower manufacturing, pot plant cultivation, and landscaping all require various types of planting material. These requirements were formerly satisfied by local nurseries with inferior local material, but as urbanization and per capita income levels have increased, demand for novel floriculture products has surged, resulting in a dramatic spike in the demand for quality planting material. The major challenge which floriculture industry face is lack of quality planting material.

PRIORITY AREAS FOR QUALITY PLANTING MATERIALS FOR FLORICULTURE CROPS

The standards for high-quality planting materials are not uniform. There is a need to develop global quality standards for various crops so that the plants produced can compete on a worldwide scale.

Priority areas for quality planting material include:

- Strengthening model floriculture centers established by State Department of horticulture /Agriculture.
- Set up a mechanism for multiplication of varieties developed by SAUs and institutes through a National Level Multiplication Agency like National Seed Corporation.
- Tissue culture techniques should be used wherever possible, in addition to using the services of certified growers for the multiplication of novel plant varieties.
- New seed and planting material should meet the requirement for international trade.
- An existing protocol for micro propagation of floral plants might be enhanced and tested on a large scale.
- Should develop protocol of multiplication on flower crops which are difficult to propagate and also for new exotic material.
- Establish cutting-edge infrastructure such as tissue culture labs, polyhouses, mist chambers, net-houses, micro irrigation, and hardening facilities etc.
- Improve nursery propagation strategies for the mother plant as well as secondary materials.
- Develop a standard for micro propagated flower and foliage plants in terms of media and containers.
- Develop/manufacture indigenous seed-processing machinery and equipment.
- Develop male sterile lines in annual flower crops for the development of F1 hybrids, as well as standardize hybrid seed production technology for a variety of annual flower crops.
- Establish proper handling and storage procedures for a variety of plant materials and annual seed.

IMPACT OF POOR QUALITY ON FLORICULTURE INDUSTRY

In the nursery industry, the spread of bacterial, fungal, and viral disease is a major concern. The problem of disease spread is exacerbated by unsanitary propagation instruments, improper practices, and messy nursery premises. There is no system in place to identify the mother stock and verify that it is clear of disease. In recent years, there have been classic examples demonstrating the rapid development of crown gall disease caused by agrobacterium in greenhouse grown roses, which had spread predominantly through

the planting material. In none of the decorative crops is a viral indexing system in place. As a result, the disease-free nature of the planting material produced by nurseries cannot be guaranteed. To assure the production of disease-free planting material, viral indexing processes should be established in some of the major nurseries in the public and commercial sectors.

When it comes to roses that are propagated by budding, disease-free rootstock production is critical. As a result, the rootstock material must be regularly monitored because there is a high risk of infection by viruses, bacteria, and fungus, which are typically spread by insects or by manual labour.

In the case of bulbous ornamentals, such as gladioli, iris, and tulips, light and clean soil are required to produce healthy bulbs. To attain an appropriate flower-grade size, bulbs are usually grown for two to three years (for expansion). The same is true for *Lilium*, whether it is propagated through scales or tissue culture. To avoid disease buildup in the growing medium, it is highly advised that the growing substrate (soil) be changed every year.

The cultivation of bulbs for expansion in *Lilium* is not difficult if the farm has some required facilities such as a cold room and a storage room. In the case of tulips and iris bulbs, cool room management is critical for delivering on time, sound material that is ready to flower according to the cropping schedule. This problem is avoided in the manufacture of tropical bulbs (*caladium*, *hippeastrum*, ginger, alpine, glories, and so on). Bulbs that do not respond to cool treatments and are grown in a tropical environment are excellent for growing and increasing.

Starting with clean propagation material is an important part of plant health management. Because most ornamentals are propagated by vegetative means rather than seed, there is a higher risk of disease transmission. In order to offer new lines more quickly, the bedding plant sector is increasingly using vegetative propagation for the development of new annuals. Unrooted cuttings taken from mother plants are used to propagate them (Daughtrey and Benson, 2005).

SELECTION OF DISEASE FREE HEALTHY PLANT MATERIAL

VIRUS INDEXING

Virus and viroid indexing techniques is progressed over the time. The traditional bioassays are still in use but to favour speedier methods, they have mostly been abandoned. Enzyme-Linked Immunosorbent Assay (ELISA), a serological approach, has recently become the gold standard for virus testing.

CULTURE INDEXING FOR BACTERIAL AND FUNGAL PATHOGENS

Systemic illnesses is a key restrictive problem in the production of conventional flower crops in the mid-twentieth century. Prior to meristem tip culture, technology was established to ensure a clean start by using culture indexing to destroy viruses. To ensure that only healthy plant material is used for production, an indexing algorithm is employed to systematically identify and removal of diseased propagation material (Daughtrey and Benson, 2005).



ADOPTION OF HI –TECH HORTICULTURE PRACTICES

- Hi-tech horticulture practices such as micro-irrigation via drip and sprinkler systems, greenhouse/playhouse for propagation, mist chambers, net/shade house, and use of latest varieties of mother plants propagated from elite clones are out of reach for a large numbers of smaller nurseries, which is one of the main reasons for the variable quality planting material produced by them.
- Some public-sector nurseries need to upgrade their infrastructure in order to deliver high-quality planting on a commercial scale and compete with the private sector. With absolute technology, many of the state department's nurseries, state agricultural universities, and smaller commercial nurseries are unnecessary. Tissue culture propagation must be strengthened to support traditional propagation methods in order to generate uniformly high-quality planting material.

- Scientific management is inadequate in the majority of nurseries. Healthy clones require proper spacing and planting material in the nursery, as well as better management. Nursery stock is frequently of poor quality because to a lack of information about soil, water management, and plant protection measures.

CONCLUSION

Floriculture is playing important role in improving the economic status of the farmers. To fulfil High demand of the floriculture based various sectors we need to produce high quality disease free planting material for the flower growers. We can fulfil the high demand of quality planting material by following the priority area based set standards for floriculture, utilizing upgraded scientific technology for the production of planting material and selection of pathogen free planting by utilizing advanced methods of pathogen indexing of the planting material.

REFERENCES

- Daughtrey, M. L., & Benson, D. M. (2005). Principles of plant health management for ornamental plants. *Annu. Rev. Phytopathol.*, 43: 141-169.
- Sankari, A., Loganayaki, P., Kayalvizhi, K., Kavitha, M., & Jerlin, R. (2020). Standardization of Planting Materials in Tuberose (*Polianthes tuberosa* L.) cv. Arka Prajwal. *Int. J. Curr. Microbiol. App. Sci*, 9(1), 2046-2053.
- Wilhelm, S., & Sciaroni, R. (1954). *Verticillium* in chrysanthemum: Costly disease controlled by practice of culture-indexing and soil fumigation with chloropicrin. *California Agriculture*, 8(5): 9-10.
