



## Inarching: A Traditional Grafting Technique

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Inarching, a traditional method of grafting, has been practiced for centuries in agriculture and horticulture to propagate plants. It is particularly beneficial for species that do not root easily through cuttings or seed propagation. Inarching is mainly used for establishing plants on new rootstocks, repairing damaged trees, or saving species with delicate root systems. It is a technique where two plants, typically a rootstock and a scion, are joined while both are still growing in the soil. This method is predominantly used in fruit trees such as mango, guava, apple, and citrus, but it also finds applications in ornamental plants and other horticultural crops. The success of inarching depends on proper alignment of vascular cambiums, environmental conditions, and post-grafting care.

### Principles of Inarching

The primary goal of inarching is to create a union between two plants so they grow as a single unit. The rootstock provides a sturdy root system, while the scion contributes the desirable traits such as fruit quality or disease resistance. This method is often utilized when other grafting techniques, like budding or conventional grafting, are not feasible.

Inarching is effective for trees that suffer from root or trunk damage and for replacing old or weak root systems. By allowing both plants to remain rooted during the grafting process, the risk of drying out or failure due to moisture loss is minimized.

### Techniques of Inarching

#### 1. Selection of Rootstock and Scion

- **Rootstock:** The rootstock used in inarching is typically a young seedling or a sapling growing in close proximity to the mature tree that will serve as the scion. It is crucial that the rootstock is healthy and compatible with the scion to ensure successful grafting.
- **Scion:** The scion is often a branch of a desired plant that contains the characteristics one wishes to preserve, such as fruit yield or resistance to disease. The scion is selected from a well-established, mature tree.

#### 2. Preparation of the Graft

- **Incision:** A precise, diagonal incision is made on both the rootstock and the scion at the point where they are to be joined. These cuts are made to expose the cambium layers of both plants, which must be aligned for the graft to succeed.
- **Cambium Alignment:** The cambium, a thin layer of actively growing cells just beneath the bark, must be perfectly aligned between the two plants. This alignment is crucial

because the cambium layers need to fuse and create a vascular connection for nutrients and water to flow between the rootstock and scion.

### 3. Securing the Union

- **Tying and Wrapping:** After the incisions are made and the cambium layers are aligned, the two plants are carefully tied together with grafting tape or a similar material. Wrapping the graft site tightly helps to keep the union stable and prevents movement that could disrupt the healing process.
- **Sealing:** Grafting wax or a wound-sealing compound is applied to the graft to prevent moisture loss and infection. This step is crucial to prevent desiccation and intrusion by pathogens, which could result in graft failure.

### 4. Aftercare

- **Moisture Management:** Adequate moisture is essential during the healing process. Regular watering is necessary to keep both the rootstock and scion hydrated and promote the development of the graft union.
- **Removal of Ties:** Once the graft has taken and the plants are securely united, the grafting tape or ties can be removed. This usually happens after several months, depending on the species and environmental conditions.
- **Pruning:** The rootstock plant is often pruned back to encourage the scion to grow more vigorously. This allows the scion to fully dominate the tree's growth and direct its resources toward developing the desired traits.

## Applications of Inarching

Inarching is commonly used for fruit trees such as mangoes and apples, particularly in regions where grafting is a traditional propagation method. The technique is widely practiced in India, Southeast Asia, and some Mediterranean countries. It is also used for plants that suffer from trunk injuries, where the main root system has been damaged, and for ornamental trees that are difficult to propagate through other methods.

- **Fruit Trees:** Inarching is a popular method for propagating mango trees, especially in areas where vegetative propagation is difficult. This technique provides trees with strong root systems, which improves their overall resilience and ability to bear fruit.
- **Ornamental Plants:** Ornamental species with delicate root systems can also benefit from inarching, as it ensures that the plant remains healthy during the grafting process without the risk of drying out.
- **Tree Repair:** Inarching is a valuable technique for repairing trees that have suffered damage to their trunk or root systems. By grafting healthy rootstock to the damaged tree, growers can save mature trees without needing to replace them entirely.

## Advantages and Disadvantages

### Advantages

- **High Success Rate:** Inarching generally has a higher success rate than other grafting techniques, particularly for plants that do not root easily or require a stable environment.
- **Continuous Growth:** Since both the rootstock and scion remain rooted during the process, the grafting procedure does not interrupt the plant's growth or its ability to take up water and nutrients.
- **Long-Term Benefits:** Inarched trees often develop stronger root systems, which leads to increased longevity and better resistance to environmental stressors.

### Disadvantages

- **Labor-Intensive:** Inarching is a time-consuming and labor-intensive technique. It requires precise alignment of the cambium layers and ongoing maintenance to ensure the graft takes properly.

- **Space Requirement:** Since the rootstock and scion need to be in close proximity to each other, inarching can only be done in limited space. This limits its application in larger commercial settings.
- **Limited Use for Some Species:** Not all plant species are suitable for inarching. The technique is primarily used for woody plants, especially fruit trees, but it may not work well for herbaceous species.

## Conclusion

Inarching remains a vital grafting technique for horticulturists and agriculturists, especially when dealing with plants that have difficult rooting characteristics or require repair after injury. The technique's high success rate, combined with its ability to strengthen the root system of a tree, makes it a preferred method in many traditional agricultural practices. While labor-intensive, the long-term benefits of inarching often outweigh the challenges, particularly for fruit and ornamental trees.

## References

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