

To Study of Various Plants Grafting For the Home-Gardening Purposes

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ABSTRACT

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In India, almost all people parches grafted varieties of fruit plants from nursery at near from home and very high rate without knowing about how to select and grafted properly infection free, rare and testy fruit plant varieties using proper techniques at near home open space or Garden.

Grafting is a horticultural technique where by tissues of plants are joined to continue their growth together. The upper part of the plant is said the scion while the lower part is named the rootstock. The success of this joining requires that the vascular tissues grow together and such joining is known as inosculation. The technique is most ordinarily utilized in asexual propagation of commercially grown plants for the horticultural and agricultural trades.

The experiment was conducted on the farm located at Khandepargaon, V-P High-tech Research farm, Dist. Beed. One plant was selected for its roots and was called the stock or rootstock. The other plant was selected for its stems, leaves, flowers or fruits are called the scion or cion. The scion contains the specified genes to be duplicated in future production by the stock/scion plant. I used some modern facility available near and use of it increased the success rate of grafting some popular current trends in ornamental & fruit plant grafts take appropriate and it ideally suited to garden conditions.

On the basis of result obtained it was concluded that favorite varieties are not grown by seed sowing. Many of popular fruit & ornamental plants of desirable characters like smell, texture, taste, color, size, etc. was grown by vegetative propagation method (artificial) named as grafting.

Keywords: asexual, propagation, techniques, section, scion, rootstock.

I. INTRODUCTION

As humans began to domesticate plants and animals, horticultural techniques that could reliably propagate

the desired qualities of long-lived woody plants needed to be developed.

For successful grafting to take place, the vascular cambium tissues of the stock and scion plants must be

placed in contact with each other. Both tissues must be kept alive until the graft has "taken", usually a period of a few weeks. Successful grafting only requires that a vascular connection take place between the grafted tissues. Joints formed by grafting are not as strong as naturally formed joints, so a physical weak point often still occurs at the graft because only the newly formed tissues inosculate with each other. The existing structural tissue (or wood) of the stock plant does not fuse.

In stem grafting, a common grafting method, a shoot of a selected, desired plant cultivar is grafted onto the stock of another type. In another common form called bud grafting, a dormant side bud is grafted onto the stem of another stock plant, and when it has inosculated successfully, it is encouraged to grow by pruning off the stem of the stock plant just above the newly grafted bud.

II. MATERIALS AND METHODS:

Field site:

The experiment was conducted on the farm located at Khandepargaon, V-P High-tech Research farm, Dist. Beed. One plant was selected for its roots and was called the stock or rootstock. The other plant was selected for its stems, leaves, flowers or fruits are called the scion or cion. The scion contains the desired genes to be duplicated in future production by the stock/scion plant. I used some modern facility available near and use of it increased the success rate of grafting some popular current trends in ornamental & fruit plant grafts take appropriate and it ideally suited to garden conditions. "Scientific information was collected from different authentic websites, journals and e-contents related to topics, near about all are highlighted in references".

Cutting tools:

It is good procedure to keep the cutting tool sharp to minimize tissue damage and clean from dirt and other substances to avoid the spread of disease. A good knife

for general grafting should have a blade and handle length of about 3 inches and 4 inches respectively. Specialized knives for grafting include bud-grafting knives, surgical knives, and pruning knives. Cleavers, chisels, and saws are utilized when the stock is too large to be cut otherwise.

Disinfecting tools:

Treating the cutting tools with disinfectants ensures the grafting site is clear of pathogens. A common sterilizing agent is absolute alcohol.

Graft seals:

Keeps the grafting site hydrated. Good seals should be tight enough to retain moisture while, at the same time, loose enough to accommodate plant growth. Includes specialized types of clay, wax, petroleum jelly, and adhesive tape.

Tying and support materials:

Adds support and pressure to the grafting site to hold the stock and scion together before the tissues join, which is especially important in herbaceous grafting. The employed material is often dampened before use to help protect the site from desiccation. Support equipment includes strips made from various substances, twine, nails, and splints.

III. ARTIFICIAL GRAFTING TECHNIQUES

Artificial Grafting is an artificial method of asexual reproduction used to produce plants combining favorable stem characteristics with favorable root characteristics. The stem of the plant to be grafted is known as the scion, and the root is called the stock.

Approach (T budding):

Approach grafting or inarching is used to join together plants that are otherwise difficult to join. The plants are grown close together, and then joined so that each plant has roots below and growth above the point of union. Both scion and stock retain their

respective parents that may or may not be removed after joining. Also used in pleaching. The graft can be successfully accomplished any time of year.

Bud Grafting:

Bud grafting (also called chip budding) uses a bud instead of a twig. Grafting roses is the most common example of bud grafting. In this method a bud is removed from the parent plant, and the base of the bud is inserted beneath the bark of the stem of the stock plant from which the rest of the shoot has been cut. Any extra bud that starts growing from the stem of the stock plant is removed. Examples: roses and fruit trees like peaches. Bud wood is a stick with several buds on it that can be cut out and used for bud grafting. It is a common method of propagation for citrus trees.

Cleft Grafting:

In cleft grafting a small cut is made in the stock and then the pointed end of the scion is inserted in the stock. This is best done in the early spring and is useful for joining a thin scion about 1 cm ($\frac{3}{8}$ in) diameter to a thicker branch or stock. It is best if the former has 3–5 buds and the latter is 2–7 cm ($\frac{3}{4}$ – $2\frac{3}{4}$ in) in diameter. The branch or stock should be split carefully down the middle to form a cleft about 3 cm ($1\frac{1}{2}$ in) deep. If it is a branch that is not vertical then the cleft should be cut horizontally. The end of the scion should be cut cleanly to a long shallow wedge, preferably with a single cut for each wedge surface, and not whittled. A third cut may be made across the end of the wedge to make it straight across. Slide the wedge into the cleft so that it is at the edge of the stock and the centre of the wedge faces are against the cambium layer between the bark and the wood. It is preferable if a second scion is inserted in a similar way into the other side of the cleft. This helps to seal off the cleft. Tape around the top of the stock to hold the scion in place and cover with grafting wax or sealing compound. This stops the cambium layers

from drying out and also prevents the ingress of water into the cleft.



1. Approach (T budding)



2. Bud Grafting



3. Cleft Grafting

Whip Grafting:

In whip grafting the scion and the stock are cut slanting and then joined. The grafted point is then bound with tape and covered with a soft sealant to prevent dehydration and infection by germs. The common variation is a whip and tongue graft, which is considered the most difficult to master but has the highest rate of success as it offers the most cambium

contact between the scion and the stock. It is the most common graft used in preparing commercial fruit trees. It is generally used with stock less than 1.25 cm (½ in) diameter, with the ideal diameter closer to 1 cm (¾ in) and the scion should be of roughly the same diameter as the stock.

The stock is cut through on one side only at a shallow angle with a sharp knife. (If the stock is a branch and not the main trunk of the rootstock then the cut surface should face outward from the centre of the tree.) The scion is similarly sliced through at an equal angle starting just below a bud, so that the bud is at the top of the cut and on the other side than the cut face.

In the whip and tongue variation, a notch is cut downwards into the sliced face of the stock and a similar cut upwards into the face of the scion cut. This act as the tongues and it requires some skill to make the cuts so that the scion and the stock marry up neatly. The elongated "Z" shape adds strength, removing the need for a companion rod in the first season (see illustration).

The joint is then taped around and treated with tree-sealing compound or grafting wax. A whip graft without a tongue is less stable and may need added support.

Stub Grafting:

Stub grafting is a technique that requires less stock than cleft grafting, and retains the shape of a tree. Also scions are generally of 6–8 buds in this process.

An incision is made into the branch 1 cm (¾ in) long, then the scion is wedged and forced into the branch. The scion should be at an angle of at most 35° to the parent tree so that the crotch remains strong. The graft is covered with grafting compound. After the graft has taken, the branch is removed and treated a few centimeters above the graft, to be fully removed when the graft is strong.

Four-flap Grafting:

The four-flap graft (also called banana graft) is commonly used for pecans, and first became popular with this species in Oklahoma in 1975. It is heralded for maximum cambium overlap, but is a complex graft. It requires similarly sized diameters for the rootstock and scion. The bark of the rootstock is sliced and peeled back in four flaps, and the hardwood is removed, looking somewhat like a peeled banana. It is a difficult graft to learn.



4. Whip Grafting



5. Stub Grafting



6. Four-flap Grafting

Awl Grafting:

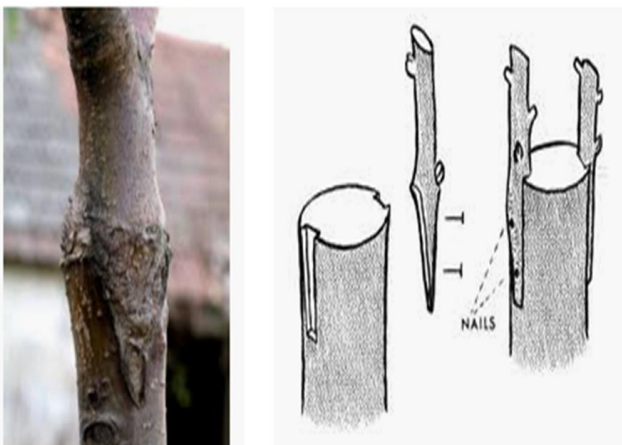
Awl grafting takes the least resources and the least time. It is best done by an experienced grafter, as it is possible to accidentally drive the tool too far into the stock, reducing the scion's chance of survival. Awl grafting can be done by using a screwdriver to make a slit in the bark, not penetrating the cambium layer completely. Then inset the wedged scion into the incision.

Veneer Grafting:

Veneer grafting, or inlay grafting, is a method used for stock larger than 3 cm (1 1/8 in) in diameter. The scion is recommended to be about as thick as a pencil. Clefs are made of the same size as the scion on the side of the branch, not on top. The scion end is shaped as a wedge, inserted, and wrapped with tape to the scaffolding branches to give it more strength. May alternately be named a rind graft or a bark graft.

Air Layering:

Air layering is a propagation method for woody plants that allows you to root branches while still attached to the parent plant. It is useful for plants that are hard to propagate by cuttings or if you want your new plant to have a larger size than could be accomplished by taking cuttings.



7. Awl Grafting



8. Veneer Grafting



9. Air Layering Grafting

IV. RESULTS

Grafting methods give the plant a certain characteristic of the rootstock - for example, hardiness, drought tolerance, or disease resistance. Methods require extensive knowledge of nursery crop species and their compatibility, grafting techniques that are usually practiced only by more experienced nursery operators. Ornamental & fruit plant grafting is very popular in India. The main advantage of grafting is for disease-resistant rootstocks.

V. CONCLUSION

On the basis of result obtained it was concluded that favourite varieties are not grown by seed sowing. Many of popular fruit & ornamental plants of desirable characters like smell, texture, taste, color,

size, etc. was grown by vegetative propagation method (artificial) named as grafting.

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