

Lecture on
Propagation Technique of Layering & Grafting
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LAYERING

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GRAFTING

Definition

Rootstock & Scion

Types of Grafting-

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Layering:- Layering is the development of roots on a stem while it is still attached to the mother plant.

□ The rooted stem is then detached to become a new plant growing on its own roots.

How root formation takes place in layering:-

□ Root formation during layering is stimulated by various stem treatments which cause an interruption in the downwards translocation of carbohydrate, auxin and other growth factors from leaves and growing shoot tips.

❑ These materials accumulate near the point of the treatment and rooting occurs in this area even though the stem is attached to the parent plant.

❑ Water and nutrients are supplied to the layered shoots, because the xylem remains intact.

❑ This is how the root formation takes place in simple, serpentine and air layering.

Etiolation:-

❖ That means the internal condition of the developing shoot can be modified during layering to stimulate rooting.

❖ The **absence of light is favorable for initiation of root primordia** in the stem tissues.

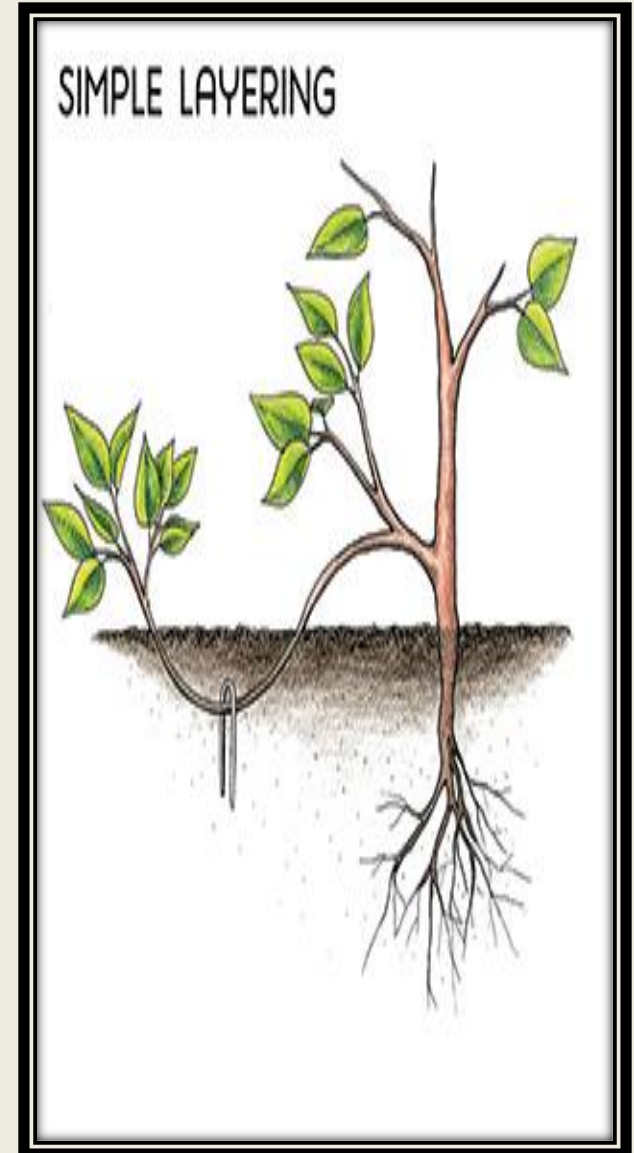
❖ This is how root formation take place in Mound and Trench layering.

Types of layering

1. Simple Layering-

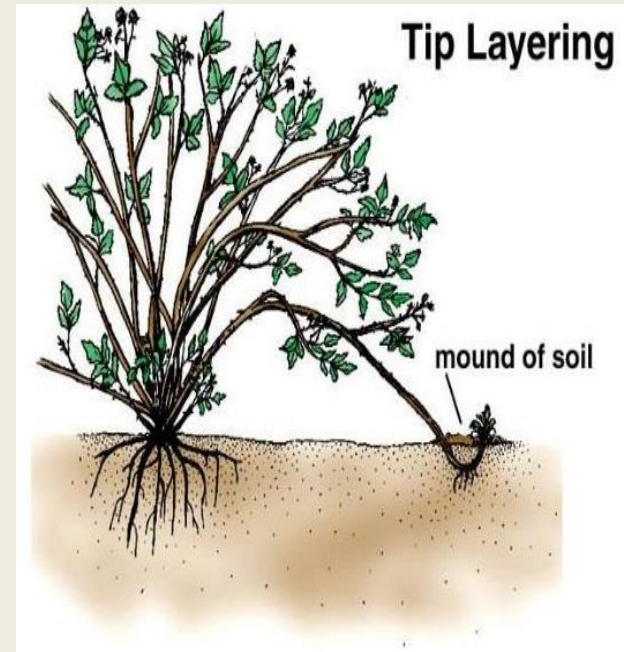
- ❑ Low flexible one year old shoots which bend freely are selected.
- ❑ Remove a ring of bark at 20-25 cm away from the growing tip and this wounded portion is then buried in the soil.
- ❑ Ideal time- Early spring or rainy season.
- ❑ Roots are developed in 4-5 months.

E.g.- **Lime, Lemon, Guava**

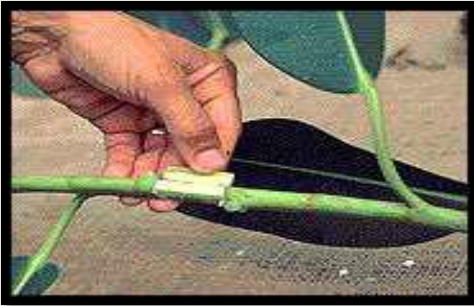


2. Tip Layering

- ❑ The tip of the current season shoot is placed 5-7 cm below the soil for rooting.
- ❑ Time taken for development of roots may be 2-3 months.
- ❑ E.g.- Blackberries and Raspberries.



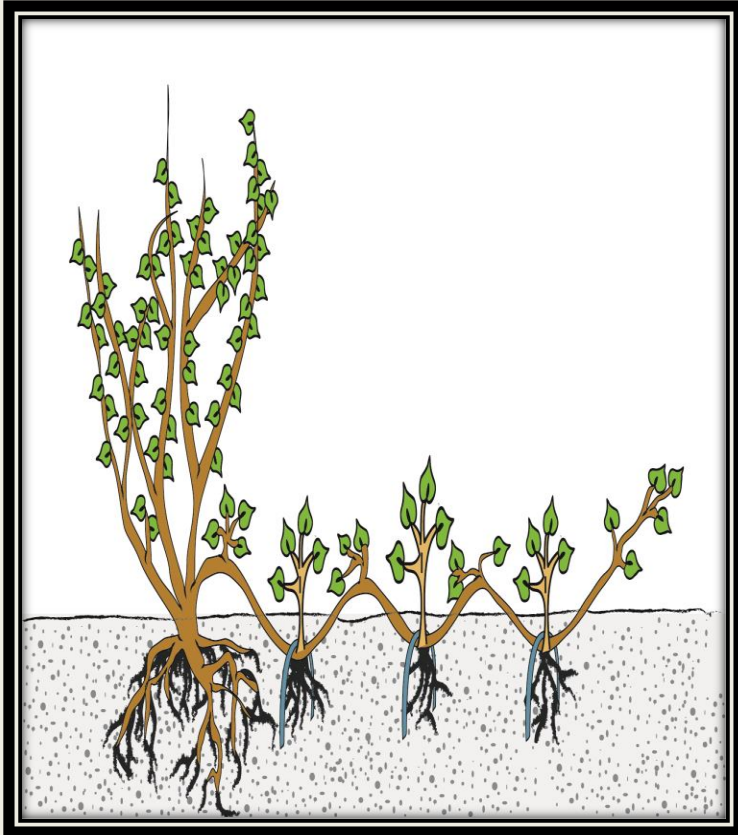
3. AIR LAYERING



- Air layering also called **Chinese layering** or **Gootee**.
- Previous season shoot of pencil thickness is selected.
- A girdle is made on the selected shoot by removing 2.5-3 cm bark.
- Girdle portion is then covered by using moist sphagnum moss grass and then wrapped with transparent polythene tape.
- Rooting appears in 2-3 months.
- Ideal time :- July-August.

E.g.- **Guava, Jackfruit, Litchi, Lime.**

4. Serpentine Layering



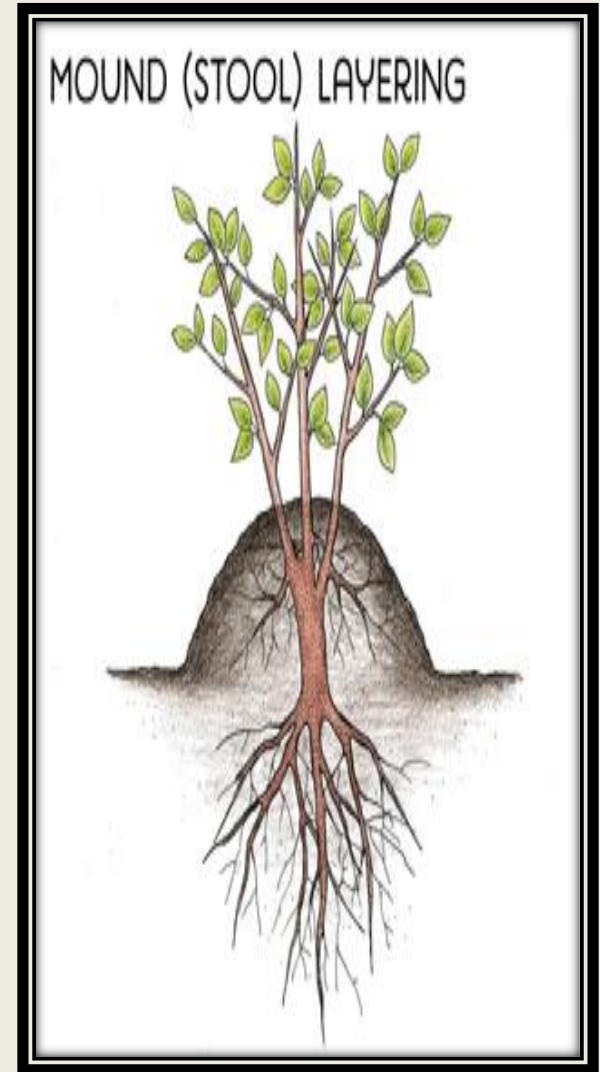
- ✓ This method is practiced in plants having long soft shoots which bend easily.
- ✓ The shoots are covered and exposed alternately along the length.
- ✓ Adventitious roots and new shoots are formed from the nodes buried into the soil.

E.g.- Muscadine grape.

5. Mound Layering

- ❖ It is also known as **Stooling**.
- ❖ In this method the plant is headed back to 5-7.5 cm above the ground level during dormant season.
- ❖ As the season progresses, new shoots emerge out from the base of the plant.
- ❖ These shoots are girdled at the base and it is covered with soil to height of about 15-20 cm.
- ❖ After 1 year, the shoots are rooted and removed from the parent plant.

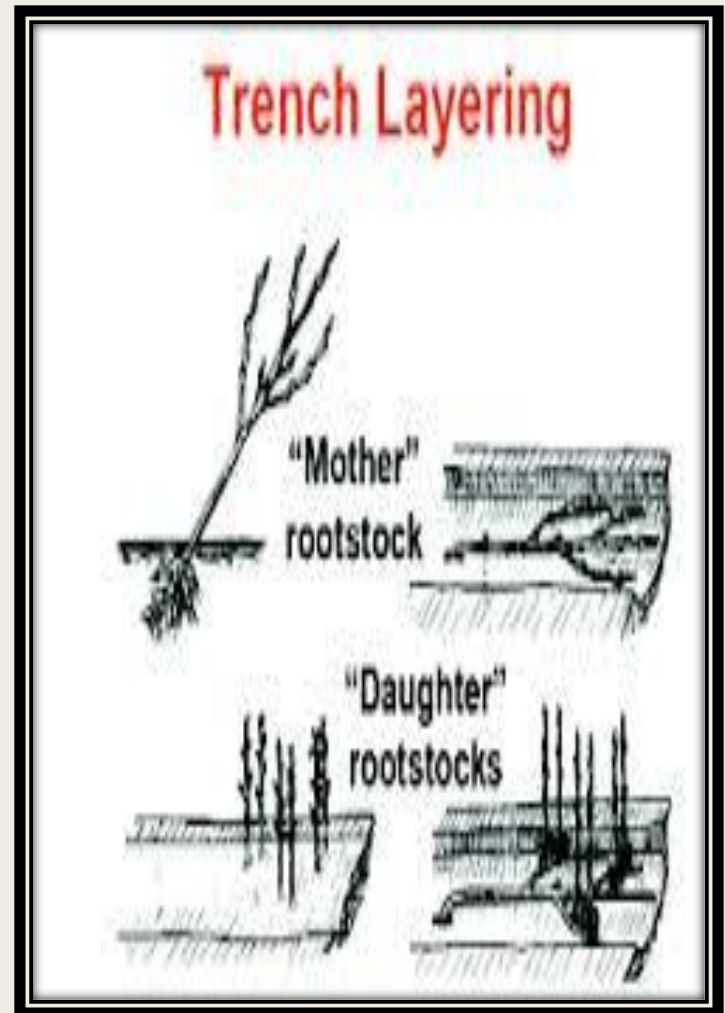
E.g.- **Guava, Apple, Pear.**



6. Trench Layering

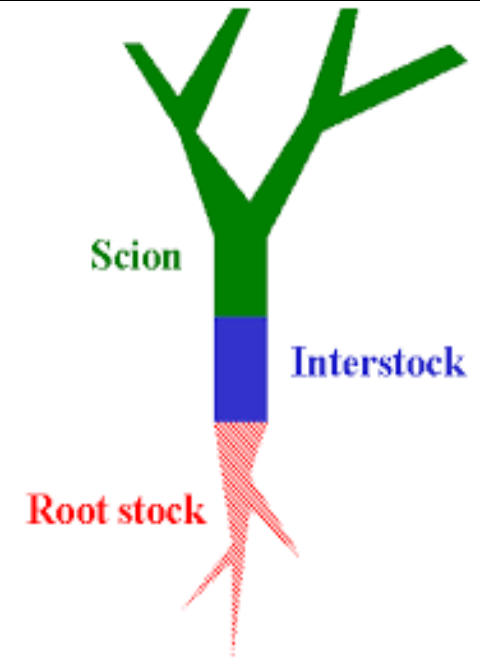
- This method is also known as Etiolation method of layering because there is complete covering of branch under the soil.
- Selected branch is bent to the ground and buried completely in shallow trench.
- Plants form at each node on covered branch.

E.g.- **Apple, Pear, Cherry.**



Grafting

Definition- Grafting is an asexual method of propagation in which parts of two different plants are joined so that they continue their growth as one plant (Muthukumar and Selvakumar, 2017).



Scion- The desired variety which is grafted or budded on a stock plant and forms the

Interstock- That plant part which is placed in between stock and scion to tide over the problem of incompatibility.

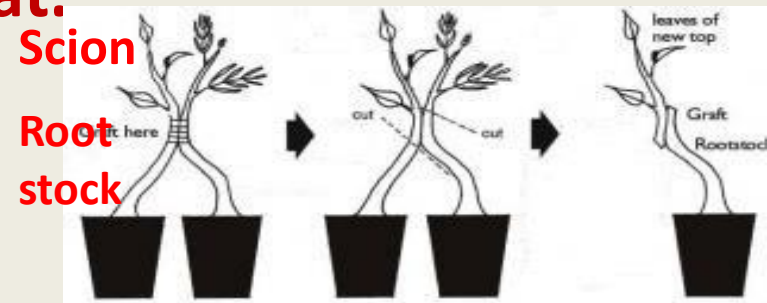
Stock- The plant part which will give rise to the root system and into which a bud or

Types of Grafting

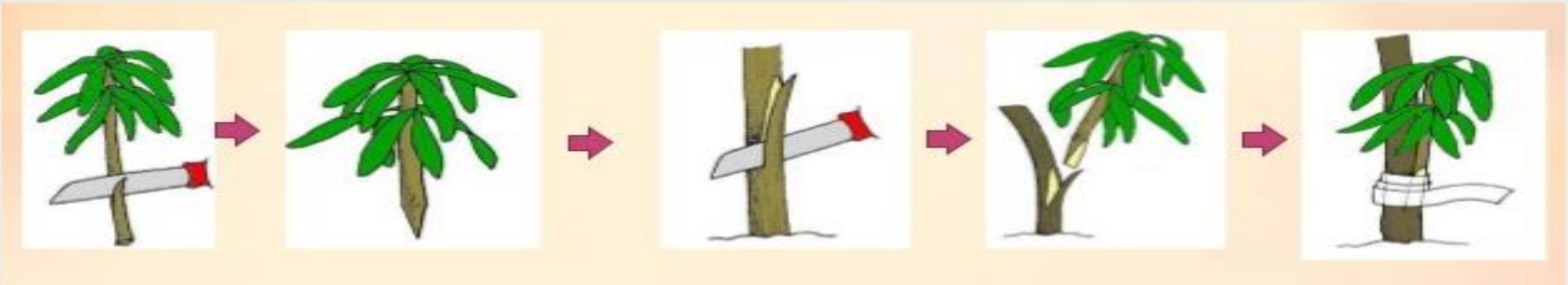
1. Inarching:

- Grafting by means of uniting a growing branch to a stock without separating the branch from its parent stock.
- Both the scion and the stock should be of pencil thickness.
- Ideal time- July-August.

E.g.- **Mango, Jackfruit, Sapota, Loquat.**



2. Veneer Grafting:

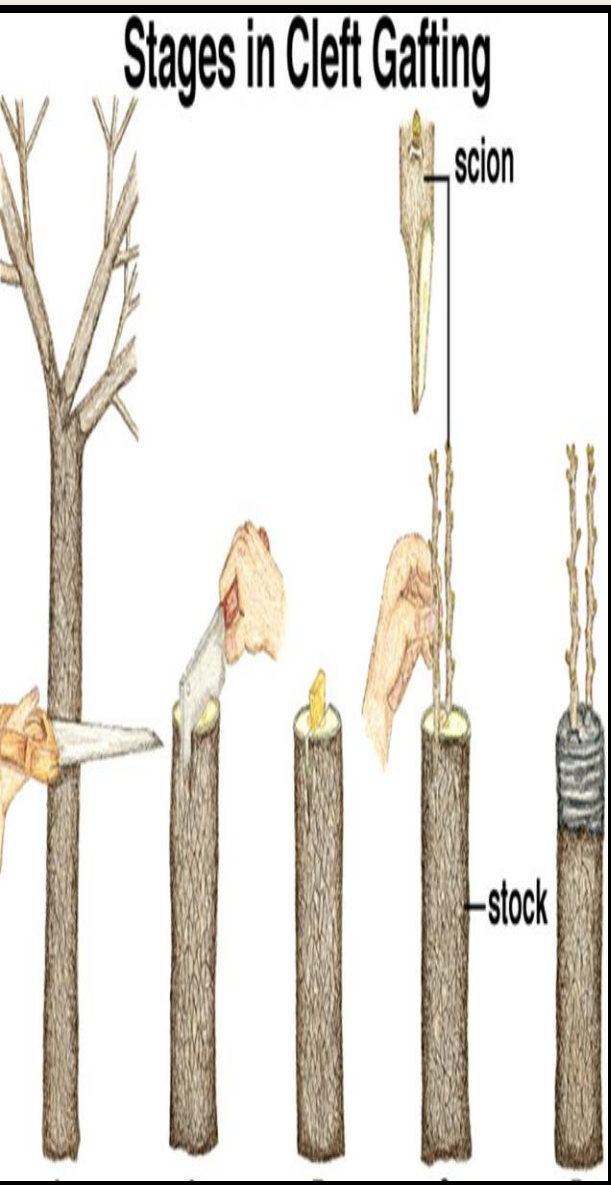


- ❑ A shallow downward and inward cut of about 3-4 cm length is made 15 cm above the ground on rootstock.
- ❑ A long cut is made on one side of the scion.
- ❑ Then scion is placed into the rootstock and tied with 300 gauge polythene tape.

E.g.- **Mango.**

- ❑ Ideal time- **August- September**

3. Cleft Grafting:

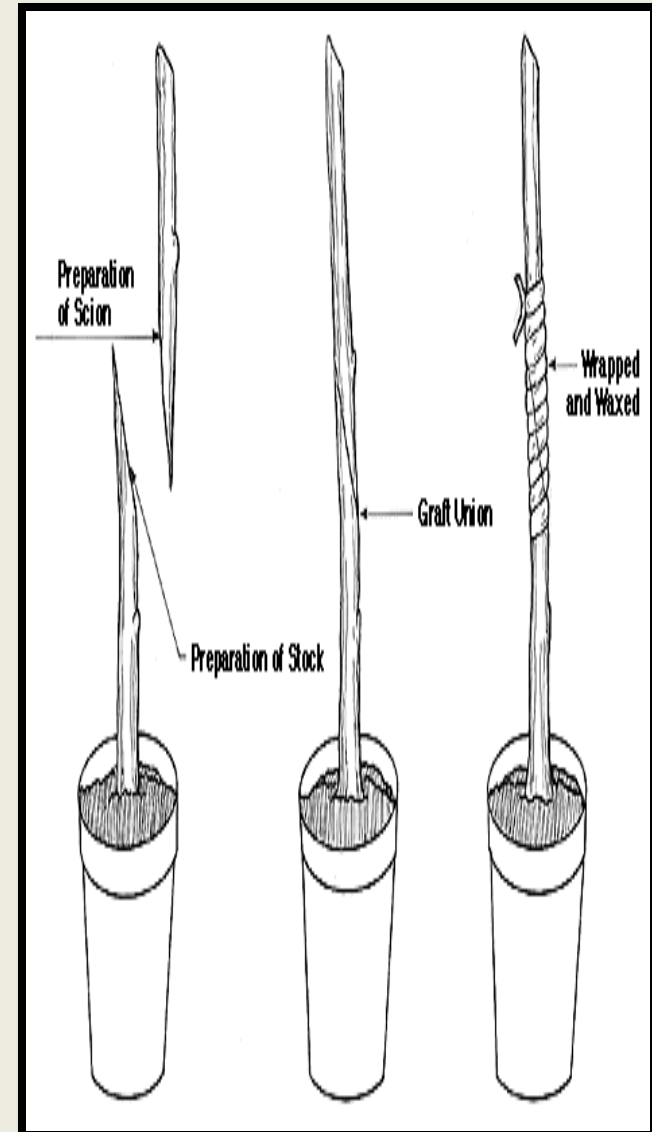


- Also called **Wedge grafting**.
- It is a method for top working in order to change varieties.
- Wedge shaped incision of about 5 cm length is prepared on the stub of the plant.
- Similar matching incision is prepared on lower portion of scion.
- The scion is inserted in root stock firmly and waxed.
- E.g.- **Mango, Hazelnut, Pecanut, Apple.**

4. Whip Grafting:

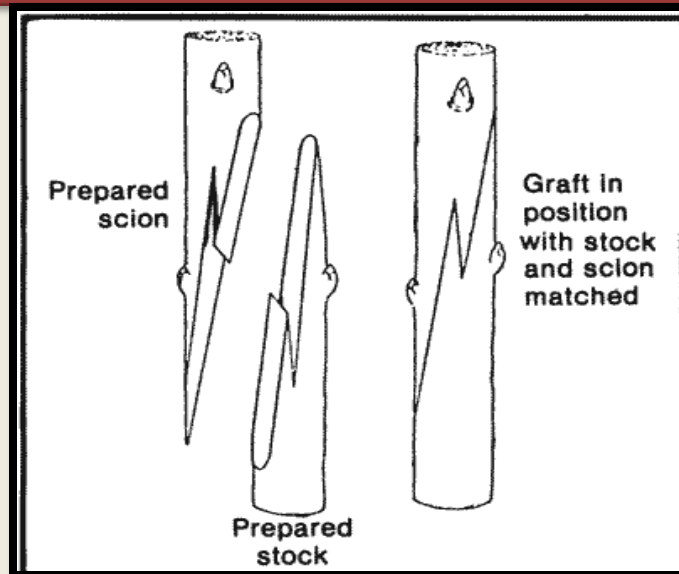
- ❖ A plant graft made by cutting both stock and scion across obliquely, fitting the cut surfaces so that the cambiums are in contact, and tying.
- ❖ Also called **splice grafting**.
- ❖ In splice grafting, both the stock and scion must be of the same diameter.
- ❖ It is highly successful due to considerable cambial contact.

E.g.- **Walnut, Pecanut, Hazelnut.**



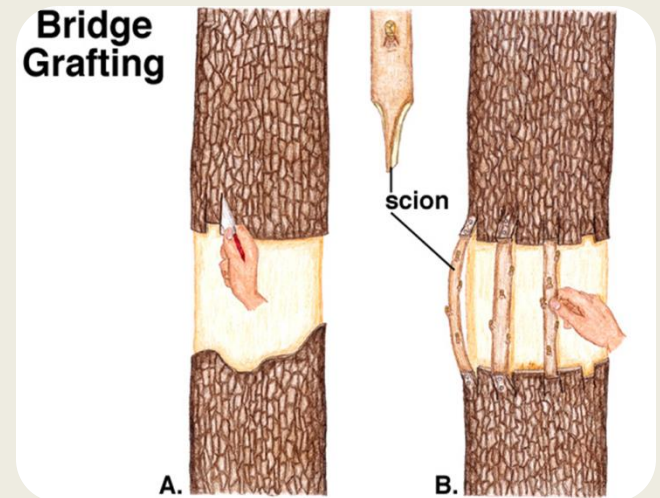
5. Tongue Grafting:

- ✓ Diagonal cuts on stock and scion showing the position of tongue are made.
- ✓ Complete graft is wrapped with grafting tape.
- ✓ It is done in **apple, apricot, peach and pear.**
- ✓ It is done during **Feb-March.**



6. Bridge Grafting:

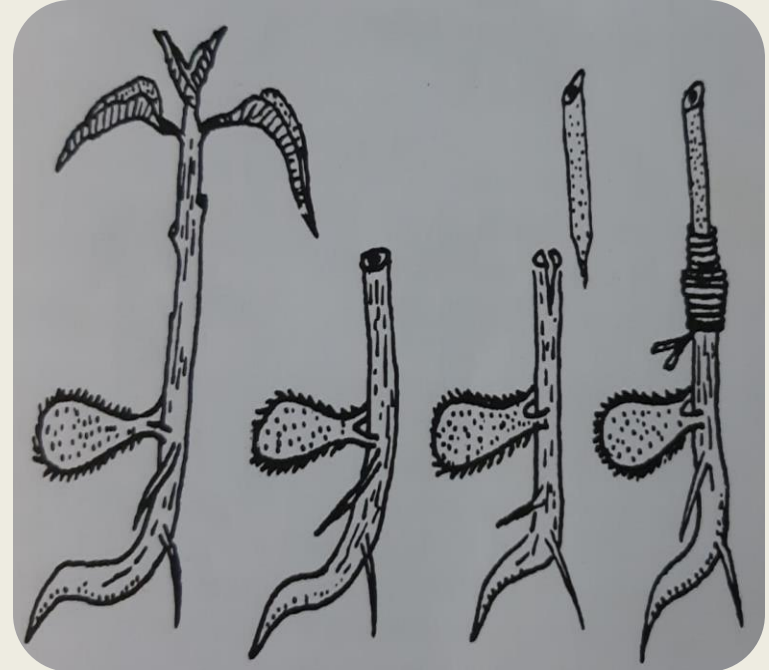
- ❑ It is a form of repair grafting.
- ❑ This method is practiced in plants in which scion is healthy and some portion of rootstock near collar region is diseased or damaged.
- ❑ The damaged portion of the rootstock is scratched and incision is made on top and bottom portion of healthy portion of stock.
- ❑ The scion of suitable length is inserted into incision and fixed using nail and then sealed.



7. Epicotyl Grafting:

- ❖ Also known as **Stone grafting**.
- ❖ Epicotyl portion of rootstock seedling is replaced by a young shoot tip.
- ❖ Conducted with 2-3 months old scion on 7-10 days old germinated seedlings (**Singh, 2015**).
- ❖ Ideal time- **Rainy Season**.

E.g.- **Mango**.



8. Soft-wood Grafting:

- ❖ This is very successful method of *in-situ* grafting.
- ❖ The grafting is done in the permanent site of planting in the field itself.
- ❖ 3-5 month old scion shoot are grafted on 1 year old rootstock.
- ❖ Ideal time:- July-August.

E.g.- **Mango, Cashew, Tamarind.**



Thank You

