# Laboratory No. 12 – Grafting and Budding

Required reading: Text, pp. 461-511 (464-509); see page 463 (466) for the different types of grafts
Required reading: pp. 514-538 (512-536)

**This lab is to be done individually.** Every student will need to demonstrate proficiency with grafting. The purpose of this lab is to acquaint the student with the techniques used in grafting. Since grafting (and budding) is an art as well as a science, it will take some practice before acceptable proficiency is reached. Make sure the instructor or T/A checks and approves your grafts before leaving the lab. Do not be discouraged if it takes several tries to get it right. There several things that should be kept in mind while grafting.

1. The scion and stock must be compatible.
2. With temperate woody plants, the scion must be dormant. The exception to this would be systems where grafting is done under mist.
3. Cambium to cambium contact must be made.
4. The proper polarity must be maintained.
5. The graft must be protected and given appropriate aftercare.

**Technique 1. Side-Veneer Graft** - see page 477-478 (481) for explanation and diagram

Introduction:

Side grafting is a common technique used for grafting scions to pot-grown stock material. It is different from techniques such as cleft grafts or whip grafts because it does not replace the apical portion of the stock. With side grafting, the terminal of the stock is left in place, and the scion is grafted into the side of the stem. One possible benefit may be maintaining sap flow past the graft union from the root system to the existing terminal bud. If a dormant scion replaces the terminal, sap flow is limited into the scion, and excessive amounts can "flood" the union. If the sap is able to flow past to the existing terminal, then there is less problem with excess sap at the graft. After the union is formed, the terminal is then gradually cut back until only the scion is left. Leaving the existing terminal on may also help in callus formation at the graft union. The side tongue graft has the added advantage of providing additional cambial contact, as compared to other grafts such as the side veneer graft. We do not have potted stock, so we will just practice this technique.

Materials and Methods:

*Cornus sericea* (red-stem dogwood)- used for rootstock and scion
Practice materials.

Procedure:

1. The techniques will all be demonstrated in lab. After the demonstration, practice until you are proficient. The TA must check-off and approve your practice grafts before working with potted material.
2. Graft red-stem dogwood scions onto red-twig stock using a side-tongue graft.
3. Technique.

   Stock: Cut a thin strip about 1-inch long down the side of the stock as shown in the

illustration. The cut should include bark and a sliver of wood, and should not go deeper than about 1/4-1/3 the way into the stock.

Scion: Cut a piece of scion wood about 3-4 inches long, and the same diameter as the stock. Make slanting cuts about 1-inch long on opposite sides of the scion base. These cuts should be sized so that they will match the cambium on the stock. The cuts should taper slightly.

Tying: Place the scion into the slit cut on the stock so that the cambium matches on the inside and on the outside (with the strip). Wrap carefully with Parafilm or grafting tape.

**Technique 2. Whip-and-Tongue Graft -** see pages 465-467 in your book for diagrams

Introduction:

The purpose of this lab is to acquaint the student with the techniques of whip and tongue grafting. This graft is used because of its strength, and the large amount of cambium to cambium contact it provides. It is primarily used as a bench grafting technique.

Materials and Methods:

*Cornus sericea* (red-stem dogwood) stock (in 6-inch pots).
*Cornus sericea* scions.
Practice materials.

Procedure:

1. The techniques will all be demonstrated in lab. After the demonstration, practice until you are proficient.

**Technique 3. Splice Graft**

Introduction:

The splice graft is used as a bench or field grafting technique. While easy to do, it does not have the stability and strength of a whip and tongue graft. Splice grafts are used with plant material that is too 'pithy' to do a whip and tongue graft.

Materials and Methods:

Rose wood
Knife
Grafting rubber bands
Parafilm

Procedure:

1. The techniques will all be demonstrated in lab. After the demonstration, practice until you are proficient and can demonstrate an effective graft. Have your final practice graft passed off.

**Lab 12 Report**

Instructor approval of practice grafts (as shown by initials):

1. Side-veneer graft _____.
2. Whip-and-tongue graft _____.
3. Splice Graft _____.

# Budding

Introduction: Budding is a type of grafting where the scion (upper part of the plant) is a single bud, rather than a branch or twig. The rootstock (lower portion of the plant) is usually a seedling or a clonal rootstock with specific characteristics. Budding is popular because only a small amount of wood (a single bud) is required for the scion, and it can be done very quickly on small rootstocks.

Budding is used to propagate clones of woody plants such as shade trees and fruit trees where the propagator wants all the daughter plants to maintain a particular characteristic such as red fall color or fruit quality. It is used because these woody plants rarely produce seedlings that are true to the parent type. Seedlings of such plants are usually different from the parent plant, and different from each other. Another purpose of budding is to take advantage of rootstocks. By placing a desirable cultivar on a specific rootstock, qualities of dwarfing, disease resistance, etc. can be obtained.

There are several things that should be kept in mind while budding:

1. The *scion* and *stock* must be *compatible*.
2. The *bud* must be *dormant*.
3. *Cambium* to cambium contact must be made.
4. The proper *polarity* must be maintained.
5. The bud must be protected and given appropriate *aftercare*.
6. *T-buds* require that the bark of the stock be in a *slip stage*.

The purpose of this lab is to acquaint the student with the techniques used in budding. Since budding is an art, it will take some practice before an acceptable proficiency is reached. You must pay close, careful attention during the demonstration to learn the technique. **This lab is to be done individually.** Every student will need to demonstrate proficiency at budding. In order for you to get full credit for this lab, you must have the TA check and approve your buds before leaving, and you will need to show the TA a success bud by the due date. It will take several tries to get it right so do not be discouraged.

**Technique. T-bud and Chip bud.**

Introduction: T-budding is used for the propagation of fruit trees, ornamental trees, roses and some ornamental shrubs. It is usually done on wood 1/4-1 inch in diameter that is in an actively growing state. T-buds are a scion that is reduced to s single bud. Chip budding consists of a scion that is reduced to one bud with a small piece of wood still attached. It is used in areas with cool, short growing seasons and can be done when the bark is not slipping. Chip budding is slower to form a union than T-budding, but it is also thought to produce a stronger union in many cases.

Materials and Methods:
Grafting Tape
Other plant material as available in lab.
Budding knives.
Parafilm.

Procedure:

1. After the T-bud technique is demonstrated, complete at least two T-buds on crabapples and two T-buds on some other plant material.
2. After the chip bud technique is demonstrated, complete one chip bud on crabapple and one on some other plant material.

Results: For all techniques, after three weeks unwrap the buds and check for callus formation and successful "take" as evidenced by petiole *abscission* and healthy bark on the scion).

Terms to know:

| | | |
|---|---|---|
| abscission | compatible | slip stage |
| budding | dormant | stock |
| callus | grafting | T-bud |
| cambium | polarity | union |
| chip bud | scion | |

.....

**Lab 2 Report - Due tonight (This is an individual lab).**

1. Approval of practice budding (certified by initials of teaching assistant):
    1. T-bud _____.
    2. Chip bud _____.
2. Successful bud take (a minimum of one successful bud is required for full credit):
    1. Certified _____.