



Grafting Woody Peonies

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Division of woody (tree) peonies is often not easily performed or too few plants are produced, thus a more productive method is used. The most commonly used form of propagation in woody peonies is the process of grafting. Grafting by definition is the technique used to join parts from two or more plants so that they appear to grow as a single plant. In the case of woody peony grafts, a scion from a woody peony is harvested and joined to a herbaceous peony's root, which serves as a nurse root. Grafted woody peonies are what most consumers will have available for purchase and are excellent plants to start with in the garden.

Timing. Grafting in Wisconsin is performed in mid-August to early September for best results. In warmer regions grafting may be performed later in the season, as temperatures dictate. Careful timing is important for correct bud development and root growth after grafting procedures have been performed.

Scions. Scions are stems with buds harvested from older woody peonies. They will supply the upper part of the graft, which will grow into a copy of the donor plant. Scions are harvested as they develop well-formed dormant buds. Each cultivar will produce suitably mature scions for grafting at different points during a four week period in late summer- early fall. Close observation of bud size on the stems will indicate proper timing. Look for large well-formed buds that have completed growth for the following growing season. The best scions are those that have terminal buds, which presumably have greater amounts of hormonal chemicals that assist in joining scion to root. Stems with side or secondary buds may be used, but expect less success. If the summer growing season has been dry, extra applications of water to the donor plants will help mature buds more quickly.



Cut scions that are 2 or 3 inches long, preferably with a terminal bud and at least one side bud. Cut or bend the leaf petioles backward to remove them. Store the scions in a plastic bag immediately, to prevent drying. Scions may be stored for a week or two in a cool location (not refrigerated) before grafting, but best results will be attained from quick use.

Nurse roots. A nurse root will serve as a temporary root system for the graft and are harvested from herbaceous peonies, preferably *P. lactiflora* cultivars. Use of hybrid roots will work, but should be avoided due to possible adventitious growth later on. Herbaceous roots that produce adventitious growth will compete with the joined woody peony for as long as the graft retains the nurse root. Nurse roots are gathered by digging 3 to 5



year old clumps of herbaceous peonies and cutting off entire roots from the crown. The best roots for grafting are between 3/8" and 1" in diameter and are free of disease. Large, old roots should be avoided as they lack vigor and are difficult to work with. All that will remain of the clumps after harvesting roots is often only crown material. The left over crowns can be cut up, replanted and expected to grow well for future root harvest, in 3 to 5 years.

Disinfection. Scions are relatively free of disease organisms, but harvested herbaceous roots are often burdened by fouling organisms due to their contact with soil. The harvested roots should be thoroughly washed with clean water and then placed in a water-bleach solution for disinfection. A 10 parts water to 1 part bleach solution works well for this procedure. Soak the roots for 30 to 45 minutes in the bleach/water solution and wash the roots again with fresh water to remove any residual bleach and soil. The roots will appear lighter in color after this, indicating they are clean and ready for use in grafting.

Allow the roots to lightly dry. Then place them in a closed container, so no further drying occurs. A number of other guides suggest allowing the roots to dry further, so that they become rubbery. This is not necessary or recommended, as we have observed poor results with the use of roots in this condition. Roots may be stored in a cool location for up to a month for grafting purposes. If roots that have been held for an extended period have mold growth on them, repeat the entire disinfection process before using them for grafting.

Nurse roots can be cut into sections 4" to 6" in length. Keeping track of the top of the root is important since this is the end that will receive the scion in the grafting process. Most grafters cut the down ends of the roots with an angle cut and the top with a simple flat cut, so that the ends can later be identified.

Grafting. Few tools and supplies are required for grafting woody peonies. A good utility knife with a new razor blade is used to make cuts, budding strips (rubber bands) are used to bind the scion to the nurse root and Parafilm (special tape) is used to seal the wounded area.

1) Using the utility razor knife make two cuts to form an elongated 'V' shaped end to the scion base (opposite the bud). Avoid 'whittling', it is best to make each cut with a single stroke. Cuts must be flat so that they make even contact with the receiving nurse root. This is the most difficult part of the grafting process, practice and acquired skill is needed in order to create even surfaces.



2) Use the utility knife to make a single cut completely through the top of the nurse root (parallel to the sides). The cut should be slightly longer than the 'V' cuts on the scion. This cut should allow the scion to be slid into it, covering the cut surfaces of the scion.



3) The scion is pushed into the single cut in the nurse root. The nurse root is often larger than the scion, but this is of no consequence. Align one of the edges of the scion with one of the edges of the nurse root. This is done for the purpose of matching the vascular bundles of the nurse root to those of the scion. The center of the nurse root and scion are pithy and no vascular bundles are located in these areas, thus the scion is not centered in the nurse root. Check the fit, all cut edges should match easily. If not, pinch the nurse root lightly to see if the surfaces will match with pressure. If the edges match with pressure, the graft is likely to grow. If gaps show up or the edges do not match, further remedial cuts to the scion will likely be needed.



4) The grafted scion and nurse root are then bound together tightly with a budding strip or rubber band. It is not necessary to purchase budding strips, as rubber bands can be substituted. The purpose of the budding strip is to bring and hold the cut surfaces together firmly. This allows the two plant parts (scion and root) to grow together and become one.



5) Parafilm is a nursery tape that is elastic, self-adhesive and semi-permeable. The tape is stretched and wrapped around the graft to cover all cut surfaces. This practice prevents water and disease organisms from entering the graft. This step completes the grafting process.



6) Grafts should be placed in plastic bags immediately after completion to conserve moisture. They may be held in this manner for a couple of days, but it is recommended that the healing process be started as soon as possible. Hold the bags in a warm dark place, but never refrigerate.

Healing Grafts

Now that the scion and nurse root have been bound in proximity to one another, they must now be encouraged to grow together or knit. Grafts must be warmed for two weeks to accomplish this process. **Healing is at least, if not more important than physical grafting of scion to nurse root.**

Many grafters fail to recognize the importance of good technique in healing woody peony grafts and end up with poor take rates.

Outdoor Healing.

1) Select an area for a grafting bed (this should probably be done well in advance of grafting). The grafting bed or planting location needs to be sunny location that does not become wet. Soil should



be moist. Overly dry soil is as detrimental to growth as wet soil. Rototill or work the soil to a fine texture in the bed to approximately 6" in depth.

2) Trenches or holes of 3" in depth are dug in the bed and grafts are laid their sides. Laying the grafts on their sides requires less effort in planting and encourages grafts to root later on. The buds will orient themselves as they begin to grow. Grafts are spaced 4" to 5" apart, which is enough room for them to grow for their first 3 years.

3) 3 to 4 inches of soil is then mounded over the grafts and firmed. This places the grafts approximately 6 or 7 inches below the ground, but soil settles and the mounds slump a bit.



4) Plastic sheeting is then pulled over the entire graft bed. The edges are buried to prevent the plastic from being blown away by wind and to seal the bed. Soil temperatures will rise to around 75 to 85 degrees under the plastic makeshift greenhouse-key to healing the grafts. Temperatures within this range encourage callus growth and joining of scion to nurse root. If too cold the grafts will fail. The protective cover will stay over the grafts for two weeks, after which time it will be removed for cooling until late fall. Plastic sheeting must be removed in a timely manner or the young grafts will begin growing and become out of synchronization with the season. Grafts that begin growth in the fall often are killed by winter conditions.

5) After plastic is removed and sometime before the ground freezes, the beds are covered in 1 to 2 inches of wood chip or bark mulch. This is an insulator for their remaining years in the graft bed.



6) Before the ground freezes the plastic layer that was removed for healing purposes is reapplied to the graft bed. The plastic sheeting covers the mulch that was applied earlier and its edges are buried to seal the bed from winter precipitation and rapid temperature changes. The plastic sheet will remain until the ground is thawed in the spring.

7) Removal of the plastic sheeting must occur before temperatures warm and the sun begins heating the graft bed in early spring. If allowed to remain too long, the young grafts will begin to emerge under the plastic. Early emergence of grafts under the plastic is unwanted, as they are not acclimated to the temperatures and air qualities of the environment. After the plastic is removed, grafts will begin to emerge over the next month and a half, at rather uneven rates. Be patient, there are always late arrivals.



Once the weather begins to warm, grafts will begin to grow rapidly. No further care for the young plants will be needed until the end of their 3 year of life. Note: Restrain yourself from digging in grafting beds looking for plants that did not come up. All too often there will be late comers and the activity of soil removal usually results in the breakage of new growth. This is a mistake I have made many times and there is nothing as frustrating as seeing your good work wrecked!



First year grafts often produce blooms and this is nothing out of the ordinary. Their flowers are generally small and not characteristic of what a mature plant will look like. If time permits, the practice of disbudding should be practiced to assist the young plants in energy conservation. . During the second season in the grafting bed few plants will bloom. This is the year that the plants will increase

rapidly in size and build energy reserves. During third spring of growth the young grafts will begin to bloom more normally and most will have reached a size perfect for transplanting. 3 year grafts are extremely vigorous and are the best choice for transplanting to the garden. Transplanting from the grafting bed should occur in the fall of the season for best results.

Indoor healing. Another method of healing may be of interest for those that lack a good location for outdoor healing. This method will require a cat litter pan, coarse sand, plastic sheet or bag large enough to enclose the cat litter pan, a seed starting mat and a thermostat for the mat.



1) Place grafts in shallow containers, such as cat litter pans, filled with moist sand. The entire graft is suspended in damp sand (depth is not important-grafts only need to be covered). Grafts may be placed on their sides for ease. Bags are used to cover/enclose the containers to eliminate evaporation. Due to time constraints involved in late August, this is a good choice for late season grafting and healing.

2) Place the shallow containers on a seed-starting heating pad. This supplies bottom heat, but warms the entire container through conduction. An inexpensive thermostat can be purchased to control the heating pad's output and is recommended. A thermostat setting of approximately 80F has proven successful. The containers could also be placed in a warm location instead of using a heating pad.

Check the moisture of the sand occasionally, as some drying, using bottom heat occurs. If the sand is showing signs of drying, carefully add small amounts of water along the edges of the healing containers.

3) Once two weeks of heating/healing time has been completed, the grafts are planted in the garden as in method 1 or held over winter packed in peat, for spring planting. Note: Spring planting is problematic due to lack of root growth in the grafts and many young grafts may be lost due to poor climate synchronization.

This method works well for gardeners that have fewer grafts to deal with and should provide good results.

In closing, grafting woody peonies is not difficult and a rather high rate of success can be experienced with a little practice. On average, our success rates have averaged 75% to 90% and I've learned a great deal from failures. Further experimentation will likely produce more information toward even better results. Anyone that is willing to put in a little time will quickly become adept at the entire process and can increase their tree peony collection quickly. Go forth and propagate!