



Making More of a Favorite Plant

Slide Notes



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Slide Notes:

1. Peonies: Making More of a Favorite Plant. Quick guide to propagating peonies.
2. Image: Fernleaf hybrid seedling. Propagation is that act of increasing the numbers of something. In this case we would like to increase the numbers of favorite plant, a peony. A number of methods can be used to propagate peonies, each has its merits and some are difficult or complex. All require patience, as peonies are slow growers compared to many other plants. However, peonies require minimal care in most instances and are very long lived, making them an excellent choice for the garden (reason to propagate).
3. Image: Herbaceous hybrid seedling. For most gardeners, sharing or perhaps selling a division of a herbaceous peony with someone else is the goal. For the nursery industry it is important for their company's ability to prosper through the propagation practices of division and sometimes tissue culture. Hybridizers grow seed for the development of new cultivars, but this can also be done by the home gardener for enjoyment. Those that grow woody (tree) peonies, grafting is the primary mode of propagation. Whatever the needs, propagation is interesting and many of the more involved methods can be learned and practiced by the average gardener.
4. Image: *Paeonia tenuifolia* seedlings. Each cultivar (individual variety) and type of peony has its own characteristics and this extends to propagation. It is far to simple to say 'all peonies can be propagated the same way successfully'. The reality is that some are best started from seed, others through division and yet others by grafting. Furthermore, each individual variety will have its own quirks, making any recipe for propagation a bit more complex. Certain peonies can also be increased by simply growing new plants from 'blind roots'.
5. Image: *Paeonia mairei*. Species peonies (genus *Paeonia*) are the original plants that grow/grew in the wild and are the ancestors of the more common types we grow in our gardens. Interest in growing these rare plants has become greater in recent years and propagation may require some special considerations and techniques.
6. Image: *P. lactiflora* cultivar 'Anne Oveson'. Most gardens containing peonies have *lactiflora* cultivars in them. They are the most common group of peonies and are valued for their ease of growth, often scented flowers and good cut flower properties. Many thousands of unique named cultivars are available and were developed from the single species *Paeonia lactiflora*. The herbaceous hybrids were developed by cross pollinating two or more species and then further work was done through intercrossing generations thereafter. The herbaceous peonies all produce large fleshy roots with crowns that contain buds for growth in future years. Their propagation is commonly and quite successfully done through division.
7. Image: 'Angel Choir'. Woody peonies are not yet common in American gardens, but are beginning to show up in greater numbers. These plants produce persistent woody stems that elongate with each year of growth. They are not trees, but rather woody shrub-like plants with other worldly flowers. The primary method to propagate this group is through grafting, but some cultivars and subgroups are suitable for division. Plants are bit slower growing than herbaceous peonies, but they can be quite successfully grown in Wisconsin (certain cultivars more easily than others).
8. Image: 'Bartzella'. This group of peonies is derived from crossing the herbaceous *lactiflora* with a woody peony. Plant characteristics lie someplace between the herbaceous and woody. Plants in Wisconsin are cultivated and treated as herbaceous peonies and are propagated similarly. However, since they have some woody peony characteristics, plants often require the use of a saw during division due to extremely hard crowns and roots. They are easy to grow and usually make wonderful looking plants throughout the growing season.
9. Image: Herbaceous peony divisions. Peony division: a portion of a peony plant that includes dormant buds, crown and roots. Older clumps of peonies must be divided when dug in order to reinvigorate the plant. If division or too large or the clump is simply left intact, the plant will likely go into decline for a number of reasons.

10. Image: 'Blood Moon' clump that has been broken in half. Herbaceous peonies are excellent candidates for division. Some are more easily divided than others and how to actually divide them often takes some creative thinking. Plants like the one in this image may cause many problems due to the close fit of all of the structures. Much cutting will be required to make divisions.
11. Image: Divisions of herbaceous cultivar '*Tranquil Dove*'. The roots supply the plant with water and nutrients when in the ground, but also serve as storage vessels and stabilization structures. Peony roots are fleshy and often have large diameters (old roots). Divisions of plants that have large (old roots) are not desired due to their stage in life. Large roots have reached maturity and serve as storage vessels, but generally do not produce new root branches. Furthermore, they often have reached their end of usefulness to the plant and often rot. Divisions with large roots often produce nice looking plants the first year after planting and then go through a number of years of recovery. Divisions with smaller roots are more vigorous, youthful growers and produce smaller plants the first season, but you will be rewarded with better growth in subsequent years. When dividing older clumps, the owner often has no choice in the size of roots attached to the division. Reducing the size of these roots by cutting away much of the root mass is a good practice to encourage the division to grow new ones. Never dig a large clump and leave it in tact, old roots are an impediment to new root growth and often introduce disease to the entire plant after it has been disturbed. Division is a best practice.
12. Image: Divisions of herbaceous cultivar '*Tranquil Dove*'. The crown is an area of the peony in which new buds and roots are produced. It can compare to animal 'stem cells' in that this is the area that cells differentiate to create different structures within the plant. This area is an important part of the peony, but does not look much different than the root itself. A crown will often have nearly invisible dormant buds, which serve as 'backups' to the more prominent initiated buds. Loss of the more prominent buds is not unusual after division and the crown will supply new growth in case of loss. The most vigorous and useful new roots will also be produced from this area as well.
13. Image: Divisions of herbaceous cultivar '*Tranquil Dove*'. Dormant buds are produced late in growing season (late August and September in Wisconsin) and contain the next year's stems and flowers. These buds are often referred to as eyes. Most trustworthy growers sell 3 to 5 eye (bud) divisions with the correct amount of root mass attached. Some cultivars will produce an abundance of dormant buds, while others less. Species and some hybrids will have less than the advertised 3 to 5 eyes due to their genetic makeup, this is not something to be upset with unless the division is very small (incomplete). Normally, 3-5 eye divisions do not initiate the growth of all of these eyes anyway and the gardener can usually expect to only see only a couple of stems the year after planting. Example: The cultivar '*Manitowoc Maiden*' often produces 5 to 7 eyes per division, but the following year 2 to 3 stems will be produced and most do not bloom. In the second year an small increase in stems occurs and flowering can be expected. By the third year of growth more stems will be grown and the plants will produce more normal abundant bloom.
14. Image: Friends helping to prep plants. In early September through early October peonies can be divided successfully and reliably in Wisconsin. While many gardeners would like to do their work at other times of the year, peonies have a highly defined growing cycle that should be considered. During the month of August peonies will begin to develop their dormant buds and these should be well developed before division takes place. If dug a bit too early, buds will be small or nonexistent and the plants will respond poorly to division. Peonies respond to cooling soils by producing new roots and next year's buds in September through October. If dug too early the plants will not have been stimulated to the proper stage of growth in their yearly cycle. In During drought years, new bud development is often retarded due to high soil temperatures and division may need to wait until soils begin to cool. Consideration of this yearly cycle is an important part of the decision of when to dig and divide. As a side note: Many nurseries sell peony roots at other times for planting (containerized in spring, bagged dormant divisions in winter and spring). These plants will be planted in the garden and no root growth will occur until the falling soil temperatures of fall. Peonies planted in the spring

and summer months must rely on stored energy to get them through the growing season and often fail or are set back with this practice.

15. Image: Clumps ready for division in September. In Wisconsin, peony plants usually need to be at least 3 or 4 years of age before division can occur, but this will depend upon growing conditions during that period and the specific cultivars vigor. Most clumps this age will yield 3 to 5 good divisions and a number of small 'stubs'. Remember, anything that has a crown and buds may grow a new plant. The crown is capable of growing new roots and will do so if treated well.
16. Image: Root stubs from herbaceous peony '*Edulis Superba*'. These might also be crown divisions. Many gardeners might discard divisions that lack roots as seen in this image, but these often grow into outstanding plants. Due to minimal root tissue, these 'stubs' will actively grow new vigorous roots from their crowns and the resulting plants will have a complete and healthy beginning. This type of division is often what we are left with after filling orders with better looking stock, but are quite acceptable for our purposes.
17. Image: Blind root from cultivar '*Viking Valor*'. Some herbaceous hybrids can be grown from leftover roots that do not have crowns. Typically the more common cultivars will not do this, but it is worth noting that a number can be propagated in this manner. Hybrids that have the species *P. officinalis*, *P. peregrina* and *P. tenuifolia* in their genetic heritage the most likely candidates. Growth from roots which have no crown tissue at the time of division are called 'adventitious'. Cultivars that express this trait can be treated as follows. Save the blind roots in a bag filled with nearly dry peat after division. Store these in a shed or garage until freezing weather begins and then put them in a cool location for the winter. A basement or garage that does not freeze, but has temperatures in the 33 to 42 degree Fahrenheit range. A refrigerator works well also. Unfortunately, they need to be planted in spring and will suffer through their first year due to improper rooting cycle. We found that planting as early as possible helps survival, but some losses can be expected. The following cultivars are easily started with this method: Viking Valor, *P. officinalis*, Pink Hawaiian Coral, Coral Charm, Coral Supreme and Abalone Pearl-there are more. Attempting this method with other cultivars is recommended, since little time and monetary outlay is needed.
18. Image: *Paeonia intermedia*. Not all peonies can or should be divided. Species peonies and some hybrids are extremely difficult to divide. *Paeonia intermedia* is one that is a tough customer due to its crown being neck shaped. The roots are short, brittle and attached by a thin structure that is easily broken. Producing divisions from plants like this are nearly impossible.
19. Image: *Paeonia mlokosewitschii*. Some species can be easily divided, but are difficult to establish after division. Reasons for this are not completely understood, but this knowledge may prevent the loss of a valued plant. *Paeonia mlokosewitschii* is a perfect example. We've grown this plant to large size and have been able to harvest 5 nice divisions from a single plant, however, the following year nearly 50% of the divisions failed to grow. This has been repeated a number of time with the same results and other growers have reported similar results. This plant is easier to grow from seed and that form of propagation should be selected over division.
20. Image: Peony divisions on picnic table. After peonies have been divided it is important to let the wounded areas dry and scab over. This prevents fungus and bacteria from entering the plants. They can be allowed to dry for 4 or 5 hours and be allowed to dry longer in humid weather conditions. Divisions often look rather dried out and become softer after this treatment, but there should not be concern.
21. Image: Divisions in bags and tubs. Divisions are then stored for two or more weeks in containers packed in peat. The peat is rather dry and is prohibits disease agents from attacking the peony. This procedure allows the divisions to firm their tissues from the drying process and become ready for planting and shipping. It is not a necessary step, but is helpful if the gardener cannot plant divisions immediately after drying. Roots should be kept at room temperature, out of sunlight during this stage of storage. At one time it was a common practice to refrigerate divisions during this period, but further research has proven this to be detrimental to the plants by reducing their dormancy and causing them to move into bud initiation early.

22. Image: Labeled roots. The roots in this image were stored in peat for more than 3 months. The order was sent overseas and returned due to improper import procedure by a customer. The plants were in good condition and re-exported to the customer who reported excellent growth the following year. Of course, this is not an optimum situation, but is testament to storage in dry peat.
23. Image: Cultivar '*Ann Berry Cousins*' in background. There are many reasons to divide a peony. Digging a plant because it is old and has been growing in the same place for a long time is not a good reason if the plant is growing well. Peonies can grow in a single place for many decades without being disturbed. Some good reasons for division might be: to share with a friend, a household move, correct a growing issue, create more to plant elsewhere or to sell. One consideration needs to be the siting of new divisions. The site will need to be a new one, since replanting peonies in the same location is ill advised. Peonies use many micronutrients in soils and may even produce chemicals that retard growth of newly planted divisions. A new place for the peony divisions will certainly be needed. Long and the short of it is: If you want a peony where one is growing now, don't dig it up!
24. Image: Cultivar '*Echo*' in background. Another consideration will be the time, effort and tools you have available. Peonies make extensive root systems and digging an old clump can be more than is bargained for. A solid shovel will be needed to dig the entire plant. A strong back (or youthful helper) aids in getting the large plants out of their hole. Cleaning the clump out of soil is helpful to plan for careful division. Shears and sturdy knives are required for division.
25. Image: Tools for division. While not all of these tools are necessary, having a variety of them available is helpful with the varied configurations that peonies present. Our most useful items include: a nearly unbreakable shovel, sharp knife, shears, hose and jet nozzle, and pruning saw. Pruning saws are especially helpful when dividing older plants that have become woody.
26. Image: A visitor showing his sense of humor. Peonies certainly should be dug in the fall, so don't let the image mislead you. Scott Parker will be presenting a demonstration aimed at the finer points of actually dividing a peony on Saturday.
27. Image: Cultivars '*Mary Jo Legare*' and '*Avis Varner*'. Peonies are long lived plants and any mistake in their identification can also be long lived. Example: The cultivars '*Mary Jo Legare*' and '*Avis Varner*' were divided many years ago by an unknown party who inadvertently misidentified them. Divisions of these plants were propagated by a number of growers and were distributed worldwide. Unknowing consumers purchased the incorrectly labeled/identified plants and further exacerbated the issue. The cultivars are quite different and even bloom during different periods. A simple google search for images of the two cultivars will produce a mixture of the two afore mentioned cultivars. Had labels been correctly applied many consumers would be happier today and some rather large propagators of peonies would not have had their name dragged through the mud.
28. Images: Woody peony cultivars '*Iphigenia*' and '*Kronos*'. There a tremendous number of other examples that persist, with new confusion being added each year due to poor labeling. If a gardener chooses not to label distributed divisions or plants in their own garden, there is a good chance the plant may be the subject of this discussion in the future. With 7000 or more registered peony cultivars and countless other garden named plants dating back to the Chinese Dynasties, identification can be quite challenging. The above images are more recent woody peony cultivars that are commonly mixed up in commerce. These two plants are easily identified when grown in the same garden, but not so easily through a photo.
29. Images: Markers, labels and garden marker. The American Peony Society and many commercial growers all agree that misidentified plants are problem in commerce and that the simple practice of labeling all divisions in the garden is a good practice. While some gardeners will note that they do not care what the name is, someone 10 or even 100 years later may want to know. Labeling can be quite a simple practice. We recommend that each plant have a plastic or vinyl label attached to their roots when planted. The label may be

written on with a Sharpie marker or grease pencil and buried with the plant. These labels will remain with the root system and the writing will be preserved, as it is not exposed to the sun. Impression type labels made of soft aluminum also work quite well. We have dug up 20 year old plants with labels on them and have been able to identify them with this type of I.D. Garden markers are also quite useful, but are more costly and will not likely last 20 years. New technology in U.V. resistant printing has allowed these labels to become more useful and long lived. Simple printers can be purchased with tape cartridges that print these long lasting labels. See Brother printers and tapes for a variety of options.

30. Image: Woody peony cultivar '*Coral Nebula*'. Woody peonies are a group of lesser known plants that are quickly gaining popularity in the United States. They are characterized by woody persistent stems that are an extension of the crown. In Wisconsin the group may lose stems during severe winters, but are quickly replaced if initial planting was deep enough. Propagation of these plants is somewhat different than their herbaceous cousins. They can often be purchased as grafted plants and sometimes own root plants.
31. Image: Woody peony cultivar '*Savage Splendor*'. Cultivars such as '*Savage Splendor*' are easily divided due to their multiple stem growth habit. This type of plant is more likely to produce additional roots on separate stems, allowing them to be cut away from the main plant as divisions. Own root plants are desirable since they are not foreign tissue and are more closely aligned with the plant's long term needs and ultimately health. The negative side of own root divisions is that they are slower to establish in cold climates, making grafted plants more reliable for transplant.
32. Image: Woody peony cultivar '*Antigone*'. Another example of a woody peony that can be depended upon to produce own root divisions. Notice that the stems are trimmed back heavily, causing the plant to produce new growth from buds that will be buried when planted. A common myth and practice is to leave the stems on the plants. This ill-advised practice places extra strain on an already compromised root system to produce growth it cannot support. If the stems are left on the plant, they often die or short lived anyway, only to be replaced with below ground buds.
33. Image: Woody peony '*Moonlit Castle Ruins*' The image (left) is of a nine year old plant that was originally the product of grafting, the most common form of propagation for woody peonies. Plants like this are too large to ship and must be divided. At right are two of the divisions that were from this project. These were divisions from the nurse root being cleaved in half with a pruning saw. These two divisions have both nurse root and own root remaining. Other divisions with own roots (woody peony roots) were also produced from this division and a total of 8 good plants was had. Like herbaceous peonies, the division should be dried before storage in peat.
34. Image: Woody peony '*Xue Hai Bing Xin*'. Many of the *P. suffruticosa* cultivars and rockii hybrids are plants that grow on nearly singular stems or small diameter trunks. The plant on this slide is an example of one that is not easily divisible, if at all. This plant requires the use of grafting to propagate it.
35. Images: Woody peony cultivar '*Aegean*' (lower left), nurse root and scion (center), herbaceous peony '*Dr. Alexander Fleming*' (right). The practice of grafting is the technique whereby tissues of plants are joined so as to continue their growth together. Usually a desirable plant is joined to a hardy and vigorous rootstock. In the case of the image, we want to have more of the woody peony '*Aegean*' and are using the healthy growing rootstock of the herbaceous peony '*Dr. Alexander Fleming*'. The rootstock is only a 'nurse' until the woody peony can grow its own roots, which may take anywhere from 2 to 6 years.
36. Image: Woody peony scions from cultivar '*Shima-tsubeni*'. Grafting begins with the collection of scions (stems with buds) in mid-August. Buds should be well formed as seen in the image at lower right. Some cultivars do not produce nice budded scions and are more challenging to grow from this form of propagation. Buds contain key chemicals that help the scion grow/join with the nurse root.
37. Image: Herbaceous peony roots from lactiflora cultivars. Before scions are collected from woody peonies, clumps of 3 to 5 year old herbaceous lactiflora clumps are dug. Roots are 'robbed' from these clumps and the crown stubs are saved (previously seen) for replanting. These roots are soaked in bleach solution (10 parts

water to 1 part bleach) for 20 to 30 minutes. The root surfaces will change color from tan-brown to cream, indicating they have been cleaned. Roots are then washed in clean water and then allowed to dry slightly. They are then stored in a clean plastic tub or bucket that is covered with a bag to prevent further drying. Note: It is important to use non-adventitious rooting cultivars (see next slide).

38. Image: Adventitious root stock in bloom. Sometimes nurse roots are used from peonies that have adventitious characteristics. This is to be avoided. Often these nurse roots begin to grow a plant of their own and energy is directed away from the desired woody peony grafted to it. When this happens the woody peony is weakened and will be overtaken by the more vigorous herbaceous peony. Many of the grafted plants available in retail nurseries not specializing in peonies are imports that have this characteristic. Roots originating from hybrid peonies growing in our gardens should be avoided, as they are sometimes adventitious. Examples of hybrids that are adventitious can be found in earlier slide.
39. Image: Grafting tools and supplies. 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.
40. Images: Views of scion cuts. Using the razor utility 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.
41. Image: Making the cut in the nurse root. Using the utility knife make a single cut completely through the 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.
42. Image: Scion being fitted to nurse root. The scion is pushed into the single cut in the nurse root. The nurse root is often larger than the scion. Align one of the edges of the scion with one of the edges of the nurse root. This is done due to the area in which vascular bundles of the nurse root and scion is located. The center of the nurse root and scion are pithy and no vascular bundles that will grow 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 they 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.
43. Image: Graft with rubber budding strip. 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.
44. Image: Grafts wrapped with Parafilm. 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.
45. Image: Grafts planted in garden. A 3 inch trench or hole is dug in the garden 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 grafting bed or planting location needs to be sunny location that does not become wet.
46. Image: Rows of Grafts. 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 mounds slump a bit.
47. Image: Covered grafting beds. Plastic sheeting is then pulled over the entire grafting 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.

48. Image: Partially mulched graft bed. After plastic is removed, 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.
49. Image: Graft bed in winter. Before the ground freezes the plastic layer that was removed for healing purposes is reapplied to the grafting bed. The plastic sheeting covers the mulch that was applied earlier and its edges are buried to seal the bed from winter precipitation. The plastic sheet will remain until the ground is thawed in the spring.
50. Image: Grafting bed in spring after removal of plastic sheeting. Removal of the plastic sheeting must occur before temperatures warm and the sun begins heating the graft bed. 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. Grafts will begin to emerge over the next month and a half at rather uneven rates. Be patient, there are always late arrivals.
51. Image: Grafts emerging in their first spring. 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!
52. Image: Young grafts in bloom. It is not unusual to see first year grafts bloom. 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.
53. Image: 2nd year grafts in spring. 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.
54. Image: 3 year grafts in bloom. In third spring the young grafts will begin to bloom more normally and most have reached a size perfect for transplanting. 3 year grafts are extremely vigorous and are the best choice for transplanting to the garden.
55. Image: Newly grafted plants buried in sand. There are other less space consuming methods of healing grafts. Placing newly grafted plants in a container of sand and heating it on a seed starting mat is another option for those that have few grafts and do not want to make a grafting bed. Plants healed in sand will need to be transferred to the garden or containers after this process, but this process has proven quite acceptable.
56. Image: Divisions of the cultivar 'Bartzella'. Intersectionals can be divided similarly to herbaceous peonies. They are the product of a cross between herbaceous and woody peonies and this can give the propagator some important insights. The root system is intermediate between the parents, but the crown is extremely woody. The use of a pruning saw is a necessity to cut through crowns.
57. Image: Divisions of the cultivar 'Hillary'. Division from the use of saw can appear rather odd compared to herbaceous divisions. Flat and sharp angles will be created in the crown due to saw cuts, but divisions do quite well with type of treatment. As long as there are crown, roots and buds, the division will grow given proper care.
58. Image: Graft. Intersectionals can be grafted in the same way as woody peonies. These plants often produce buds at the bases of their stems that can serve as scion material for grafting. Some cultivars in the intersectional group of peonies are better candidates than others and many do take to this practice well. Trial and error is needed to determine the best time for harvesting scions and which cultivars are most likely to prove successful. We do not generally graft these plants because they are dependable increasers for division purposes.
59. Images: Woody peony seedlings. Perhaps you have a special peony in your garden that you would like to have serve as a parent? Growing seeds from peonies is an interesting and fun task that will provide years of

enjoyment. Peonies from seed are like children, each is different and will have some of the characteristics of the parents, but will not be copies.

60. Image: Nate pollinating a flower. Pollination is a fairly easy task, and one that is carried out by insects in the natural world. Some consideration should be given to the parent plants. The pollen donor needs to be compatible with the receiver. Not all plants produce pollen or are fertile, thus some experimentation will be needed. The easiest plants to start out with are lactiflora (herbaceous) cultivars or suffruticosa (woody) cultivars. Crossing a lactiflora cultivar with another lactiflora cultivar is among the easiest ways to make seeds. Crossing a suffruticosa cultivar with another suffruticosa cultivar is also easy. Crossing lactiflora with suffruticosa is very difficult. Cross similar with similar to start out with and your chances will be better at producing seed.
61. Image: Pollen and Stigma. The male cells in a flower are pollen and the female structure is the stigma. To cross a peony, simply rub some pollen from one flower on to the stigma of another. The stigmas are minute ribbon-like structures which are often surrounded by a ring or buff of pollen.
62. Image: Carpels of *Paeonia delavayi*. In peonies, the seed pods are called carpels. If pollination was successful in spring the carpels will begin to show swelling by midsummer. Seeds will reach maturity sometime during the months of August through September. This is dependent upon the type of peony that is producing the seed.
63. Image: Woody peony seeds. When seeds are ready to harvest they will turn color from cream to brown, black or even blue. The carpels will begin to split, also an indicator that seeds are ready for harvest. Collect the seeds at this time. Keep careful watch over plants in August through September because carpels often open quickly and the seeds drop to the ground, making harvest more difficult.
64. Image: Seeds ready for planting. The biggest mistake most people make is to not plant their seeds immediately. Peony seeds can easily be planted and grown outdoors in good garden soil. They can set about an inch deep in the soil and space an inch or two apart. Keep the soil damp and mulch lightly in the fall. No other special treatment needs to be given, but it is advised that you label and mark the planting place of the seeds. We often build a wooden frame box around our seedling beds to mark their edges and for ease of weeding.
65. Image: First year peony seedlings. In a peony's first year of existence it will produce one leaf, perhaps two. It is important to keep them protected from damage weather at this age, as they need the first leaf to build energy for future growth.
66. Image: *P. tenuifolia* seedlings. After two or three years the seedlings will have attained a size that will enable you to easily transplant them. The medium sized plants can be easily removed from their nursery bed and more space can be given to them for expanded growth.
67. Image: 5 year old seedlings. During their 4th through 6th year most of seedlings will bloom for their first time. It is an exciting time to see the variability in the plants and flowers. Three more seasons of bloom are required to observe mature flowering habits. Some seedlings will never look as good as their first bloom, while others will increase in bloom size beauty. Select the best seedlings and compost the lesser plants after this time.
68. Image: Woody peony seeds in vermiculite. Some people will start their seeds in the house using a variety of methods. Further information can be found online if you would like to try this. Our experience with indoor seed germination has had mixed results. Mother nature's temperature changes will need to be simulated and then a variety of aftercare steps need to be taken for success. If careful handling and treatment is given, success can be experienced, but more often out door planting has produced better results.
69. Image: Woody peony seedlings in wooden flats. A twist on indoor seed germination is to plant the seed in wooden boxes filled soil in the fall. The wooden boxes are kept damp and warm for 3 months, then cooled for 3 months and finally warmed again. The young plants emerge in the spring and then are planted into the garden during the summer season. This method works well, but some seedlings are lost to disease and other growing errors by the owner. Wooden boxes are better than plastic or other materials because they allow the soil to breath from all sides.

70. Image: Tissue culture images. A number of companies have begun micro-propagation of peonies. While this is something that we cannot do at home, we are likely to see the product of this procedure in stores. Peony cells are grown and multiplied in large volumes on sterile lab mediums. When tiny plants begin to form they are removed from the cell masses to grow on as singular plants. The plants are in theory clones-identical copies of the cell donor. Problems with procedure have been noted in the plants produced in the past. Some tissue culture plants show mutations and still others show problems with growth later in life. This process may become more common place over time and procedures may become more reliable making peonies less costly and more available. At this time it is best to take on a 'buyer beware' perspective until further long term trials can be evaluated.
71. Images: Division, Graft, Seedlings, Tissue Culture Plants. Propagation of peonies is a challenging, but interesting activity in which nearly any gardener can partake in. Each group of peonies has its own requirements that need to be considered. Experimentation with other forms of propagation may be beneficial, but further refinement of current procedures will likely bring new and better ways of making more of this favorite plant. Gardeners need not be invest heavily in most propagation methods and can make breakthroughs of their own, given a bit of imagination and time. Go forth and multiply.