



How to Transplant a Cactus

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Planting or transplanting a cactus can appear challenging. Most landscape cacti are spiny. Larger cacti are heavy and tall specimens are awkward to balance. Using the following techniques, cacti can be moved and planted with minimal hazard to plant and planter.

When properly handled, cacti can be moved in a landscape with greater success than is seen when transplanting most other desert landscape plants. Cacti do not suffer from loss of root hairs, and may tolerate loss of large portions of their root system. Cacti possess abundant internal water reserves which sustain the plant during the growth of new roots.

Transplanted cacti will prosper when moved to a new location similar to the original site, with regard to sun exposure, heat and cold, soil type and texture, irrigation method and schedule, and other abiotic factors. Cacti may be transplanted at any season in Arizona's warm desert regions, however quickest reestablishment can be expected with spring and early summer transplants. Winter transplants experience delayed root growth due to cool soil temperatures. Mid-summer transplants face a greater risk of sunburn and heat stress. Unlike most plants, cacti should be transplanted during dry conditions and planted into dry soil.

Heavy-duty leather or welding gloves offer protection when handling cacti. Keep in mind cactus spines can penetrate and ruin many kinds of gloves. Heavy-duty gloves will resist the onslaught of spines. All gloves will have a certain lifespan before they accumulate a discomfiting number of broken spines embedded in the material. Smaller cacti are safely handled using metal barbecue tongs. Prickly pears and cholla cacti possess barbed spines and loosely attached pads or joints. These cacti should be approached with extra caution. Do not

handle these cacti with gloves. Instead use strong metal tongs or hose fragments as shown in Fig. 4.

Arizona nurseries grow and sell a wide selection of cacti. Nursery-grown cacti originate from many different habitats beyond the Sonoran Desert, and only a minority are well-suited for use in Arizona landscapes. The rest will be more successful as container plants. Cacti intended for landscape use are often maintained in their own area in the nursery. Usually these are presented as medium-sized to larger plants grown outdoors in full sun. Small cacti, both small-growing species and seedlings of larger species, are unsuited for planting into the landscape. They tend to be delicate, lightly-armed with juvenile spines, and vulnerable to becoming buried in leaf litter or damaged by foot traffic. For landscape applications, look for cacti growing in a #1 container (1 gallon) size or larger.

Cacti raised in nursery containers should usually be planted bare-root. The nursery planting medium should be dislodged from the cactus root system if it is considerably different from the site soil where the cactus will be planted. Many nursery cacti are grown in media which is high in organic matter. Some nurseries will offer landscape cacti grown in mineral media closer to the nature of Arizona soils, making such plants reasonable for planting into the landscape with soil ball intact. The disadvantage of growing in mineral media is the resulting weight of the potted plant.

Cacti planted with soil ball intact should follow the procedures for planting woody landscape plants, with the exception that cacti should be planted dry. Cacti planted bare-root can follow the instructions below for transplanted cacti. The following instructions detail the technique for transplanting cacti which may be bulky and heavy, such as barrel cacti or hedgehog cactus clusters.

Transplanting Heavy Or Bulky Barrel And Clustered Cacti

Step 1

Transplants will be most successful when a healthy plant is being moved (Fig. 1). Desiccated or diseased plants should be remedied in their present location before moving. Plants in less-than optimal health due to poor location can warrant a move to a more suitable site.



Figure 1

Step 2

Mark one side of the plant so you may replant the cactus facing in the same compass direction. Tie a string around the cactus, making a knot on the south side (Fig. 2). Nurseries often mark the south-facing side of containers with a paint mark, or provide other indicators of compass direction.



Figure 2

Step 3

Carefully dig out the roots about 6 inches around the plant (Fig. 3). The roots of cacti are often fleshy, brittle, and located close to the soil surface.



Figure 3

Step 4

Once the plant is loose, carefully remove soil from under the cactus until it can be rocked side to side, helping to access the remaining roots beneath. A section of old garden hose should be wrapped around the cactus to assist in manipulating it safely.

Step 5

Large or heavy cacti may require two people for this step. Wrap the hose section around the center of the cactus, slightly below the mid-section of the plant. Lift the freed plant from its hole (Fig. 4). The root base can also serve as a spine-free handhold. Do not lift a cactus solely by its roots. Take care not to damage spines, spine clusters or ribs – they will not grow back.



Figure 4

Step 6

Place the plant on its side, either on soft ground or on a cut section of carpet, which can later assist in moving the plant. Knock away any remaining soil from the roots. Cleanly trim away any broken or frayed roots (Fig. 5). Cacti can withstand considerable loss of roots, but it's best to not remove healthy undamaged roots.



Figure 5

Step 7

Cacti may be replanted immediately into dry soil, but allowing cut roots time to dry thoroughly before replanting can offer additional protection against root infections. Dusting sulphur may be applied to the roots to deter infection, however the effectiveness has not been studied. Cacti may also be stored for several days or weeks before replanting, as long as the cactus is kept dry and in the shade. Do not leave an uprooted cactus unattended for long. After some weeks the cactus may begin to produce uncharacteristic shade-adapted growth prone to sunburn when finally planted.

Step 8

Move larger barrel cacti using a hand dolly or a cart with adequate padding, such as a piece of carpet or moving blanket. Take care not to bruise the stem or break the spines (Fig. 6).



Figure 6

Step 9

Determine the new location for the plant. Ensure there is room for growth to maturity. The site soil must be well-draining sandy, silty or gravelly soil. If the site soil is poorly draining or is clay, consider planting the cactus on a mound built higher than the surrounding soil. If a better-draining soil mix is available in sufficient quantity, create a mound over the site soil and plant into the top of the mound. Plant in dry soil. Dig a shallow wide hole to accommodate the root spread, but no deeper.

Step 10

Place the cactus in the planting hole. Ensure that the cactus is oriented facing the same compass direction it faced at the previous site, otherwise the plant is at risk of sunburn (see step 2 above). Use a hose fragment to manipulate the cactus into position (Fig. 7). Plant the stem to the same depth it had originally grown at.



Figure 7

Step 11

Backfill with soil from the site, without amendments. Tamp the soil under the plant using the shovel handle or other blunt instrument (Fig. 8) to eliminate cavities in the soil, which could later settle.



Figure 8

Step 12

Mulch the soil surface with gravel. Do not water immediately. Wait a week for any roots damaged during transplant to dry. Establish the cactus with irrigation once every other week if transplanting was done when nighttime temperatures are above 60°F (16°C). If nighttime temperatures are cooler, do not irrigate at all unless there is an extended period (two to four weeks) without rain. Soil should dry between watering. Irrigation must be adjusted to fit the local situation (Fig. 9).



Figure 9

Step 13

Cover the plant with shade cloth blocking no more than 30% of sunlight (Fig. 10) or with cut branches of a desert shrub such as creosote bush. Leave the shade material on the plant for several weeks while acclimating to the new site. Transplants in the winter, early spring, or late fall may not require shading. If transplanting in early summer, consider leaving the shade on through the summer solstice, until days are shortening again.



Figure 10

Moving Oversized Cacti

Moving very large cacti is best left to professional cactus movers who possess the experience and tools required. Two people are needed to move cacti beyond moderate size (Fig. 11). Cacti possessing arms or forming clusters will have an uneven weight distribution which complicates the move (Fig. 12). Cacti are mostly water. Imagine the weight of a jug or barrel of water the size of the cactus. Cactus weight increases substantially with larger specimens. Don't underestimate the weight of a large cactus. A clustered barrel cactus (Fig. 12) can weigh more than 200 lbs (90 kg). At a certain point the weight of the plant poses a risk of bruising or breaking sections of the cactus during transport.

The burden of the plant's own weight creates risks both to the plant and to those moving it. One could imagine that a dry and desiccated cactus would weigh less and be easier handled. While this may be true, a desiccated plant will be in a stressed condition and will lack internal water reserves to be drawn upon for reestablishment.



Figure 11



Figure 12

Moving Saguaro And Other Large Tall Cacti

Small saguaro cacti up to three feet tall can be moved with relative ease. Saguaro weight increases substantially as plants exceed five feet in height. Plants of this size or larger should be moved by experienced professionals. For small saguaros, the procedure follows that for barrel cacti outlined above. A notable difference is the usual presence of one or a few vertical tap roots on saguaro (Fig. 13).

When moving a small saguaro, first mark the south side of the plant. Begin digging about one foot out from the trunk of the cactus. Dig down and sever the lateral roots and scoop out the soil between them. A second person should hold the saguaro so it does not topple over as the roots are cut. Now cut across the bottom of the hole and sever the tap root. Carefully lie the cactus on its side, preferably on a cushioning section of carpet or blanket. Trim away any frayed or broken roots cleanly with pruners. The Arizona Game and Fish Department (2019) recommends applying both a bactericide and a fungicide to the roots as an extra precaution against root rot, for which saguaro are vulnerable. Use a carpet or blanket to carry the saguaro to a shaded site in order to air dry the roots for two to four days. Do not leave the saguaro on its side in the sun. This orientation under the sun creates a great risk of sunburn.

To replant the saguaro, dig a customized hole which will accommodate the shape of the tap root and side roots but is no deeper or wider than this. Doing so preserves the site soil in its undisturbed condition, which is less likely to shift than loose soil. This offers greater soil stability around



Figure 13

the saguaro roots. Refill the hole with site soil or with pea gravel as recommended by the Arizona Game and Fish Department (2019). Add no fertilizer or soil amendments. Pack the fill material in tightly to support the saguaro.

Do not water the saguaro for several weeks. After this time, the transplanted saguaro should be provided regular irrigation. Rainfall is seldom adequate to provide for establishment. Allow soil to dry between irrigations. The amount and timing of irrigation will differ on the basis of soil type and season. Irrigate lightly and no deeper than the depth of the roots. Do not heavily saturate the soil as this could promote rot and also makes the plant prone to toppling from the softened soil.

One of the common pitfalls when transplanting saguaro occurs from planting too deep. It is tempting to do so, as deep planting would seem to offer the plant greater stability. It probably does - while usually dooming the plant. Saguaro should be transplanted to the same depth they originally grew at in the soil and no deeper. This depth is easily ascertained when observing the stem of the uprooted plant. Saguaro can only grow roots from the region where roots are already present. If planted too deeply, this root zone is placed deeper than the depths to which the desert soil is commonly saturated by rainfall. It also buries green stem tissue, which becomes vulnerable to rot. Taller saguaros may require stabilizing support provided by cables (Arizona Game and Fish Department



Figure 14

2019) or by a trio of wooden bracing supports, padded with carpet where they contact the stem (Fig. 14). Supports must remain in place for several years until a root system is formed. This emphasizes the rationale for planting much younger saguaros, which are less prone to topple. Large saguaros with arms are expensive to purchase and move, and also face greater challenges of stability and establishment.

A fallen saguaro is a poor prospect for replanting. The fall alone can fatally crack or bruise the plant. Sun exposure on a horizontal saguaro may irreparably sunburn the upturned side of the plant. The weight of a saguaro is a safety concern for its handlers, even when re-righting a plant with a partial root system remaining in the soil.

Other tall cacti such as organ pipe and cereus can be approached in the manner of saguaro. Strain on the arms of these cacti is a risk when laying down large specimens for transport. Here too, moving large plants should be left for professionals.

Legal Aspects Of Moving Cacti

All wild native cacti in Arizona are protected under provisions outlined in the Arizona Administrative Code, Chapter 3. Department of Agriculture – Environmental Services Division, Title 3, Article 11, Arizona Native Plants. In addition, several Arizona cacti are afforded additional protections by Federal Laws governing Threatened and Endangered Species.



Figure 15

Under special permits from the Arizona Department of Agriculture, certain wild cacti may be removed from designated sites, transported and sold. This has been arranged by some cactus and succulent societies and certain plant salvage operations. Typically the cacti are removed from construction sites where they would otherwise be destroyed. A protected native plant tag (Fig. 15), or a saguaro tag (for saguaro only) is affixed to these cacti and should remain with the plant through the process of initial transport, sale, transport to the new site and planting into the final location. The tag signifies that the plant is being moved legally and has not been poached from a wild population. Look for these tags when purchasing bare-root native cactus plants as an indicator of legal provenance. The tag may be removed after the cactus is planted in the landscape, but it is advisable to save tags for record keeping purposes.

If wild Arizona native cacti are to be destroyed, moved off one's property, or offered for sale, Department of Agriculture regulations will apply. Check with the Arizona Department of Agriculture for current permit regulations, as rules are subject to change. These regulations apply to wild growing cacti and cacti previously sourced from the wild in Arizona. These regulations do not apply to cacti produced under cultivation, such as those grown in containers, and to species not native to Arizona.

In addition to statewide regulations concerning the movement of native plants, Scottsdale and other Arizona cities and municipalities have local regulations. Check with your local native plant ordinance, as cacti are typically covered as protected native plants.

References

- Arizona Administrative Code, Chapter 3. Department of Agriculture – Environmental Services Division, Title 3, Article 11, Arizona Native Plants. https://apps.azsos.gov/public_services/Title_03/3-03.pdf. Accessed 6 July 2020.
- Arizona Game and Fish Department. 2019. Best Management Practices for Saguaro Translocation and Replanting.
- Breslin, P., Romero, R., Starr, G., and V. Watkins. 2017. Field Guide to Cacti & Other Succulents of Arizona (Second edition). Tucson Cactus and Succulent Society.
- Tucson Cactus and Succulent Society – Publications. https://www.tucsoncactus.org/pdf_files/TCSS_Cactus_Planting.pdf. Accessed 6 July 2020.

Note

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