

Grafting of Junipers

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INTRODUCTION

I am going to talk about the grafting of junipers. As you know, certain cultivars of plants cannot be propagated economically by seed, layering, cuttings, or tissue culture. As a last resort they are grafted. In the past juniper seedlings of *Juniperus virginiana*, *J. communis*, and *J. scopulorum*, were used. They were disease prone and erratic in seed bed stands. We now use rooted cuttings of *J. 'Hetzii'* as rootstocks. 'Hetzii' has proven to be compatible with all cultivars of *J. virginiana*, *J. communis*, *J. scopulorum*, and *J. chinensis*.

UNDERSTOCK PRODUCTION

We have a stock block of 'Hetzii' plants that we spray and fertilize faithfully so a clean healthy batch of cuttings can be taken in December after some sharp frosts. Cuttings are gathered on a frost-free day, put in poly bags with some snow or water added, and placed in our cold storage. Cuttings are made before December 25 in a normal fashion and stuck in a bottom-heated bench in our greenhouse.

After rooting, they are hardened-off and field planted about the end of May or 1st week in June. The tops are pruned back before the planting material arrives in the field. Snow fence shades are placed over the beds immediately after the planting machine. Normal spraying and cultivation of the plants continue throughout the summer.

In September, the understocks are pruned back. Taking care to make a flush cut (no coat hanger stubs are left), side branches along the main stem are removed for 5 to 6 in. above the soil level. We do this in advance of digging so that wounds on the plants are healed. The rootstocks are dug the last week in October, placed in plastic boxes in cold storage at +2°C for 3 to 4 weeks, and then potted up in clay pots (2¼ × 3¼ in.). Before potting the roots are trimmed and some of the top growth is removed. The roots are swirled into the clay pot and firmly packed with potting soil. Our mix is 3 peatmoss : 2 coarse sand (v/v) and it has some lime, superphosphate, and trace elements in it.

We prefer clay pots because plastic pots need more careful attention – they do not breathe or take up water from the sides as a clay pot does. This is critical because at grafting time no watering takes place.

The potted 'Hetzii' understocks are placed on the greenhouse benches with approximately 4-in. peatmoss underneath the pot and some peatmoss between the pots. The peatmoss in the benches is prepared in advance and wetted thoroughly. The peatmoss is moistened to the point where it is possible to squeeze a little water from a handful of it. After plunging the plants are sprayed with Botran which is then washed into the pots. About the 1st of January the plunged plants have enough root action and we start grafting.

An insertion bulb thermostat with a 2-degree differential is used to monitor bench temperature. Buy the best thermostat — we use Honeywell. Thermostats

get lazy (react slowly) after a while, and too much depends on this instrument. We throw them out after five years. The sensor of the thermostat is placed just under the pots.

GRAFTING

The potted understocks are brought to the grafting area. Choose the straightest and smoothest place on the stem for the graft and make a cut close to the soil and into the stem at a 45 degree downward angle. Then a lengthwise slice is taken out downward to the previous cut. The downward slice is 1¼ in. long. Make sure the vertical cut is straight, not bowed.

We gathered our scions a week to ten days before we started grafting. Fresh scions are best but you can only collect when temperatures are above freezing. The scions are cut 10 to 12 in. long. We put 200 scions in black plastic bags with approximately two cups of water, seal each bag, and then place in refrigerated storage at 32°F until needed. The scions of the desired cultivar are trimmed to 10 in. and lower side branches are removed. A flat cut of 1-3/8 in. long is made and followed by a 45 degree cut on the base. The scion is placed against the cut on the understock, taking care to match the scion and rootstock on both sides. This means that the cambium layers of the stock and the scions match on both sides. One side is sufficient but two is better. The scion is held in place and tied with a rubber band. Then the grafts are returned to the bench and plunged into the peatmoss so the graft union is covered.

The bench is covered with clear plastic suspended over steel bows spaced at 3-ft intervals. This arrangement keeps the plastic off the plants and directs condensation to the sides of the bench. The plastic is sealed tight on both the sides and the ends. The grafts remain covered at least 4 to 6 weeks. During sunny days a white shade cloth is pulled over the plastic. The air temperature must not exceed 100°F because you can cook them at high temperatures even with plenty of moisture. The thermostat for the bottom heat is set at 68 to 70°F and a good soil thermometer is used to monitor soil temperature at the bottom of the pot. A thermometer is also hung inside the plastic structure through a hole to monitor soil temperature.

After 4 to 5 weeks, the plastic is lifted off and the plants are inspected. By this time a callus has developed along the cut edges. At this time, spraying is started with Benlate or ferbam on an alternate basis every three weeks. Airing is begun—just a crack every 8 ft—on sunny days. The moisture content of the peatmoss and soil in the pots must be watched at this point. Water maybe given after the 5th week if needed; however, water only on a sunny day and let the foliage dry off in the afternoon. Covering and shading will now be more frequent as the sun is getting stronger at the end of February and March. After 10 weeks, the 'Hetzii' tops are removed, the grafts are returned to the bench, and the union again covered with peatmoss. The plastic covering and shade cloth are both put back on to reduce shock. Be careful when handling the graft unions, they are still very fragile!

After approximately 15 weeks, the plastic is removed and the shade cloth is left. At this time the bench temperature is lowered to 60°F and then reduced to 50°F by May 1st. By May 15th the heat is turned off, the shade cloth is removed, and more air is given.

FIELD AND CONTAINER PLANTING

The grafts are field planted or containerized the 1st week of June. Grafting rubbers are removed before planting and care is taken to keep the rootballs intact. The plants are set out with the graft union well below the soil level. After planting the grafts are covered with shading for 4 to 5 weeks until new roots grow out into the soil.