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MODERATOR DUGAN: Our next subject is the grafting of junipers by Mr. Andrew Klapis, Jr. of Raytown, Missouri.

GRAFTING JUNIPERS

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Originally this material on pot grafting of Junipers was to be centered around the Bard-Parker surgical knife and its use as a grafting knife. Since my original training in the business world was in the pharmaceutical industry as a medical detailer, I couldn't see why a modified Bard-Parker knife wouldn't be an ideal grafting knife. I had a dentist friend who obtained the first two handles for me and a varied supply of blades. These two original knives proved to be too fragile for some of the heavier scions and understock and about four years ago I found the heavier handle which you see displayed on the tables. The knife handles and blades can be purchased at any good surgical supply house. The #6 Bard-Parker handle is the heavy grade, and blades numbering #20 through #24 are the series which fit the #6 handle. The price is about $3.00 each for the handle and $1.50 per dozen for the blades. We have found these satisfactory even for Blue Spruce and other heavy understock. In our experience, the blades retain their keen edges for about 200 grafts, and then they need to be changed.

Probably the first consideration in a discussion concerning Juniper Grafts is one of what understock to use. At Raytown Nursery for the past several years we have used both Hetzi Juniper and J. Virginiana with the heavier burden going to Hetezi — when we can get enough. The Hetzi understock we try to keep supplied from our own propagation. These cuttings are taken in the winter from the first killing frost on. We use fruit boxes as flats and horticultural perlite as the rooting medium. This gives us about 6 inch depth to the rooting medium, and we take cuttings of approximately 12 inch length. The ideal diameter of understock is somewhat smaller in our thinking than is held by many others. We graft on understock from $\frac{3}{8}$″ on down, but we feel the ideal is $\frac{1}{4}$″ down to 3-32″. We have proven to our own satisfaction and the satisfaction of our customers that these lighter understock and scions *in our operation* exhibit greater vitality and a much better survival percentage than when heavier understock is used.

The hormone used for these J. Hetzi cuttings is Indole butyric acid in talc in the strength of 20 mg/gm. We put 150 cuttings to each box and the boxes are placed in a small fiberglass greenhouse which is heated by a small gas furnace circulating hot air through downspout piping under and over the bench.

The thermometer is kept at 65°. Last winter we stuck about 7000 cuttings. These were potted off into square plastic rose pots 2½″ and plunged in sand in cold frames. They grew throughout the summer, were fed two or three times with liquid fertilizer and shaded when necessary. About November 1st we brought the J. Hetzi understock into the greenhouse on a warm bench, and when root growth is reactivated, grafting can begin — usually about December 1st. Our Virginiana understock is purchased from one of the seedling growers in our area. Specifically, Forrest Keeling in Elberry, Mo., Skinner in Topeka, Kans., and Plumfield in Freemont, Nebraska have been our sources. About November 15 when we receive the J. Virginana understock, it is potted in 2½″ square rose pots and stored on a warm bench to reactivate root growth. When the white indicator tips of roots show up, grafting can be started.

Our grafting case is a variation from the normal set up, too. We use an ordinary greenhouse bench 6 ft. wide and 45 ft. long. This is of redwood construction with bottom heat and is cleaned thoroughly and then treated with Morton's Soil Drench "C" before the case is set up. Next a skeleton framework 16 inches high is built along each side of the bench, and this is covered with a double layer of polyethylene. Drawn tightly over the center of the bench for its entire length is a heavy guage wire. This wire is 3 ft. from the floor of the bench. Sheets of 4 mil. polyethylene film are draped over the wire in a tent-like fashion so that they hang down to the lower edge of the bench on either side. This gives a wall-tent effect over the whole bench. The individual sheets of plastic are 8-10 ft. long and overlap 18″ to reduce moisture loss to a minimum. Finally, a skirt of polyethylene is suspended from the edge of the bench to the greenhouse floor, thus trapping the heat under the bench and keeping it more constant. The floor of the bench is next covered with clean, new polyethylene and stapled in place. Now we fill the bench with sphagnum peat preferably the longer fibered German type. This is wet down and tossed and then re-wet several times until water can be squeezed out. We feel it is important to make sure that the peat is uniformly wet.

We graft a good many varieties of upright juniper. This includes J. v. Canaerti, J. v. glauca, J. v. burki, J. v. Hill's Dundee, J. v. glauca improved, J. v. globosa, etc. Juniperus chinensis keteleeri and several of the scopulorum varieties such as J. s. Welchii, alba and Sutherland complete the list of grafts we make. Occasionally we do small amounts of hard to obtain spreader type of juniper by grafting, but this is a small quantity proposition for our own landscaping use.

The greatest demand for grafts in our area as to variety has been for J. v. Canaerti and Keteleeri — with Keteleeri slowly creeping up on Canaerti over the past two or three years. Kets are very versatile and will stand more abuse and adverse circumstances than any of the other upright junipers.

In collecting scions, we try to use local sources either from our own nursery or other local nurseries' trees. We believe along with many others that fresh scions are very important to good vital pot grafts. The scions collected are from 12 to 16 inches in length and will range from 1/8" to 3/8" in diameter at the base. Even within our own nursery there is a difference of opinion on the length and taper of the base of the scion. Suffice it to say that the length of the base-taper to the scion is about 1¼" and we tend to keep the taper rather thick; though the diameter of the understock governs, how heavy the base-taper of the scion can be.

After the side-cut is made in the understock, and the tapered scion is inserted; the graft is secured by a rubber budding strip and placed in a flat. When each flat is filled, the grafts are taken to the grafting cse and placed upright on the bottom of the bench. Here is where the thin-walled plastic square pots show their worth. We are able to put almost half again as many grafts into the case than we could when we used clay pots. There doesn't seem to be any detrimental effect on the root system, callus activity, etc., in the use of plastic pots. It saves time in storing, handling and shipping. In our hands we have had fine success using the plastic pots. The pots are placed side by side across the 6 ft. width of the bench and then the wet peat is pulled up around the graft union so that the rubber bud strips are covered. The polyethylene tent-like cover allows easy access for putting grafts in or for spraying or ventilation. In six to eight weeks the grafts are callused and can be taken out of the case. The understock is cut off at the graft union and the pot grafts are taken to a cooler greenhouse for hardening off. This is usually the latter part of February, possibly into March. By mid April, the pot grafts are ready for pick-up or delivery.

In our experience, we feel that pot grafts should be potted off into larger pots during Spring or Summer, or be plunged into beds or cold-frames until the following late Winter or early Spring. Some of our customers feel that this increases the survival rate considerably. What has been outlined here is rather basic to the grafting of upright junipers. I hope there may have been some innovations of value in our use of the Bard-Parker knife and the grafting case for some of you. In our hands at Raytown Nursery, we have had good success with this method.

MODERATOR DUGAN: Next we will have a paper by Dr. E. T. Anderson of the University of Minnesota.