GRAFTING *VIBURNUM CARLESII* 'COMPACTUM'

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Viburnum carlesii 'Compactum' was discovered several years ago in our nursery by my father, Case Hoogendoorn, in a block of *V. carlesii*. It is a slow grower with distinct dark green shiny leaves that develops into a very compact plant; it is ideal for use in foundation planting. It buds up heavily when mature. The size, color, and fragrance of the flowers are exactly like those of *V. carlesii*.

Viburnum dentatum is used as the understock. We have experimented with other types of understock, *V. lantana* for example, but we found *V. dentatum* to be far superior (1). When purchasing understock make sure that you find a reputable seedling grower that understands your needs. We use a one-year seedling approximately 3/16 in. caliper. We receive our understock in February before the busy spring season begins. The buds are removed from the lower third of the stem to help control suckering, a common problem in grafting this species. The roots are trimmed and the seedlings are potted into 2¼ in. clay pots. After potting, the plants are trimmed to a uniform height (usually 12 in. above the pot) and placed pot to pot in a ground bed of a poly house with a 1-in. covering of sand placed over the top of the pot to increase moisture retention and minimize watering. Plants are watered-in thoroughly and checked for moisture content periodically. The plastic is removed completely around April 15th when the threat of a hard freeze has subsided. Plants remain in this location until approximately September 10th when the grafting procedure will take place and there will be a good established understock.

Stock plants are cut back and fertilized with a side dressing of 15-15-15 in early March. Strong vigorous growth usually develops when good cultural practices are administered.

The peat moss should be shredded and put in the greenhouse bench several days prior to the actual grafting operation. This enables us to turn over and uniformly dampen the peat in order to attain the best possible results. The peat moss can be put in a windrow and sealed with water until time of use.

We usually start grafting *V. carlesii* 'Compactum' around the second week of September. Scions are harvested from our stock plants one to two days prior to their actual use.

We select the heaviest current year's growth possible in order to insure a stong plant from the start. Scion material is cut and kept moist in refrigerated storage at 45°F. This will ensure that scions will be in a turgid, workable condition at the actual time of use.

Scions are made to a length of approximately 12 in. with at least two sets of leaves remaining on the upper portion and the lower leaves trimmed flush with the stem in order to allow a sufficient surface for the grafter to make his cuts. Larger leaves may have to be trimmed in half at the discretion of the propagator as the foliage may be too dense under a high humidity environment. Flower buds should also be eliminated at this time.

The understock is watered one day prior to grafting to insure proper moisture levels. However, all external surfaces should be dry at grafting time.

The conventional side veneer graft is used in all our grafting operations. An extremely sharp grafting knife is required for this process. The understock is cut off 2 in. above the pot. We make approximately a 1½ in. long cut in the understock on the straightest side and as close to the pot as possible. The scion is cut slightly more than 1½ in. on one side and slightly less on the parallel side in order that a fresh angle cut can be made on the scion. Understocks and scions of approximately the same caliper should be used in order to match up the cambium layers on two sides. However, this is not always possible, but it is essential to line up cambium layers on one side to insure good results. The scion is inserted into the understock with the lip covering the outside cut. A budding strip (¼ x 4 in.) is used with medium tension. It is applied from the top of the union down leaving enough space for callus tissue to form. The bottom lip should be left completely open as this is where the majority of the callus formation occurs. We use a half hitch in the final turn of the budding strip in order to simplify its removal at the time of planting.

When a flat of grafts has been completed it is immediately taken to the greenhouse and the potted grafts are set on the bed. The peat is leveled off and a trench is made so that the unions are buried. The grafts are placed on an approximate 60° angle to insure that they fit under the glass sash. Bottom heat may become necessary at night depending on varying temperatures associated with that time of year. We keep the bench temperature at a minimum of 68 to 70°F. Depending on size and fullness of the scions we may want to open the rows a little to help eliminate fungal problems. We apply Benlate and captan on an alternating spray schedule at the rate of 1 tbls/gal water. The solution is applied with an Ortho Spray-ette proportioner (a portable sprayer that connects to a garden hose). The fungicide must have sufficient time to dry before the sashes are put down. Once the grafts have been set in the bench they are syringed on sunny or bright days and the sashes are put down. A linen cloth is rolled over the sashes to protect the grafts from direct sunlight. On dark days the grafts are aired with no syringing and the sashes put down in place without the linen.

Approximately 4 weeks after the grafts have been placed in the

sweat box or grafting case, the callus should be fully developed. It is now time to set them on top of the peat and begin hardening them off. As soon as they are brought up they are watered as the pots may be getting dry and also to keep some moisture around the callus tissue. The sashes are gradually left open a longer period each day to allow more air circulation. After 4 days we put a 2 in. block under the sash. After approximately 6 days they are kept completely open. After the 7th day they are ready to be moved to a new environment.

Potted grafts are then moved to our deep pit storage house for the winter. They are set pot to pot and covered with approximately ½ in. peat moss and watered in. This process enables potted grafts to hold adequate moisture levels for extended periods of time. We find that 2 or 3 waterings are usually all that is necessary during the winter months under normal conditions. We like to keep dormant plants on the dry side. We reach a minimum temperature of 28°F in our deep pit storage house which is ideal for sensitive plants. The pit house provides the proper dormancy period and the plants respond by breaking extremely well in the spring. We open the door during mild periods to air the house. The potted grafts are periodically checked for proper moisture content.

As the days lengthen and the outside temperatures rise, it is necessary to increase ventilation procedures. We have a 3 ft fan set in one end of the house for this purpose. However, it is necessary to remove four staggered filon panels on each side of the storage pit to increase air circulation. They are replaced with 50% lath shades. The remaining filon panels are sprayed with shading paint to reduce the sun's intensity. This enables the grafts to be properly hardened-off prior to transplanting.

The grafts remain in the deep pit storage house until the early part of June. At his time it is essential that the budding strip be completely removed. If the budding strip is not removed before planting, it will not deteriorate and girdling will result. Grafts are now planted in nursery beds 7 in. apart with approximately 8 to 10 in. between the rows. The grafts are planted with the top of the union approximately 1 in. below the soil surface in order to protect against breakage. After planting, a granular herbicide (Ronstar) is applied at the rate of 200 lb/acre. The beds are mulched, watered in, and covered with a 50% lath shade. The newly planted grafts remain in this location for one year and are then harvested for our lining-out stock trade. The remaining plants are transplanted into field rows or containers.

In conclusion, I would like to say that our summer grafting program has been very beneficial to our operation. While minimizing our heating requirements, we consistently achieve a high percentage (95%) of successful grafts. We are able to utilize our propagation facilities more efficiently as our winter grafting schedule is

very demanding. This method adapts to our total production cycle.

LITERATURE CITED

1. Hoogendoorn, C. 1971. *Viburnum dentatum* as an understock for *Viburnum carlesii* or *V. carlesii* 'Compactum'. Proc. Inter. Plant Prop. Soc. 21:384–385.

VOICE: Have you tried *Viburnum lantana*?

DIXON HOOGENDORN: We do not use it because it is susceptible to a leaf spot disease that weakens the plants in late summer.

ABNORMAL GROWTHS ON MICROPROPAGATED RHODODENDRON

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At last year's IPPS meeting in Chicago I participated in a panel discussion focusing on industry sensibilities from the perspective of a new plant introducer. We considered the values of new introductions along with potential problems, especially in relation to tissue culture propagation. My part of the presentation also outlined my views of the propagator's particular obligations relative to new plant introductions.

During the past year I find that my situation as an introducer of new rhododendron cultivars has become affected by an alarming development. Micropropagation of many of the cultivars my nursery has introduced is apparently producing significant numbers of plants that have characteristics different from those of the parent plants.

Let me first note that the vast majority of micropropagated plants now in the market appear to be normal. It is not my intent to discredit responsible use of the micropropagation technique. However, I am very concerned that the problem of abnormal plants produced during micropropagation, now very evident among some growers, be addressed immediately.[1]

[1] Knuttel Nurseries, East Windsor, CT grows over 90 rhododendron cultivars on 57 acres and produces 100,000 plants a year. In 1985 Anna Knuttel was forced to quickly rebuild her supply of plants after experiencing a problem with incorrectly manufactured fertilizer that destroyed much of her crop. She chose to rely upon micropropagated plants as a major source of stock because of the large numbers she needed on short notice. She estimates that she has lost to date over $59,000 in revenues on the plants that are abnormal and cannot be sold.