PRODUCTION OF HARDY ROSES BY SOFTWOOD CUTTINGS

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INTRODUCTION

Our nursery is located in Hardiness Zone 4 in the province of New Brunswick, bordered on the south by the cool waters of the Bay of Fundy and by the relatively warmer waters of the Gulf of St. Lawrence to the east. To the north and west, in a straight line to Alaska, 4000 miles of arctic highs. Our site has an average minimum winter temperature of -30° C with a record low near us of -50° C.

Growing roses commercially in such a place may seem a daunting prospect to those of you familiar with the vagaries and uncertainties of rose growing. Certainly if we were attempting a crop of hybrid teas we might well be carted off to the jails we call mental institutions. But the roses we grow are quite special. I like to think of them as masters of supercooling, that amazing talent possessed by hardy plants which enables them to transfer all water outside the cell walls except a thin pliable film of water which protects the cell's vital components until spring.

Our interest in roses happily coincides with the recent release of many new roses, the results of efforts by breeders to introduce longer flowering period, disease resistance, and flower form into the hardier species of roses. These are roses that will soon transform northern rose gardens into visions only dreamed of by generations of frustrated growers. There is also a tremendous resurgence of interest in roses, such as the hybrids with *Rosa* × *alba* and *Rosa gallica* parentage that graced many gardens of the past. It is exciting to witness these roses, new and old, blossom into well deserved recognition.

With some exceptions, most roses today are propagated by budding. It is our contention that, aside from the usual disadvantages of rootstock suckering, and occasional graft incompatibility, budded roses are not as desirable in northern areas. The commercial rootstocks, such as *Rosa multiflora*, are not reliably hardy in Hardiness Zones 4 and colder. Hardy species that can be used for rootstocks, such as *Rosa rugosa*, can cause suckering nightmares. With this in mind, we have tried to devise a system of producing, by softwood cuttings, the many different roses we grow. Although each cultivar is a completely different case and may require variations in method, most rose cuttings need similar conditions to root in economically acceptable percentages.

PREPARATION OF CUTTINGS

As in all cases, healthy rooted cuttings come from healthy cutting material. We endeavor to grow our stock plants under the best of conditions for balanced, vigorous growth, for a cutting that is low in essential nutrients is much less likely to survive. We have recently begun to establish stock blocks of our key cultivars. These mother plants are kept under growing conditions as good as any plant receives in the nursery.

We never take cuttings which show signs of disease. Fungal diseases, such as blackspot, will find conditions ideal in the greenhouse and can wreak havoc. As well, insect pests do not belong on the cutting bed. We soak our cuttings for one minute in a 1 to 50 solution of insecticidal soap. The cuttings are then rinsed and readied for sticking. Great care is taken during this process to avoid bruising or injuring the leaf or stem tissues.

Our best results come from cuttings taken just prior to flowering. We begin gathering cuttings as soon as the first flower buds begin to form, which for us is not until early June. From then on cuttings are cut from stems about to flower. Hybrids with *Rosa rugosa* parentage in particular show a noticeable drop in rooting percentages when taken from stems which have finished flowering. We feel that timing is one of the more critical factors for successful rooting.

Generally, the larger the cutting, the more vigorous the rooting and subsequent aftergrowth. We are careful, however, particularly with hybrids derived from *Rosa rugosa*, to avoid using large caliper vigorous shoots which often emanate from the base of the plants. These are usually watery, with a proportionately lower level of carbohydrates available for rooting. We have found these less likely to root than lateral shoots.

Our cuttings are taken from both stock blocks and field plants until late July. Cuttings taken after this date generally are not ready to set into the field until after September 1. If we set out cuttings after this date we increase the risk of having them heaved by frost during the winter.

After being gathered and washed, the cuttings are cut into 2 to 4 node sections, depending upon the cultivar and the availability of wood. All flower buds are removed. Once prepared, the extreme base of the cutting is dipped into a #2 IBA talc preparation and any excess shaken off. The cuttings are placed in trays of 32 individual 1½ x 1½ x 2½ in. pots. The medium consists of coarse perlite and peat moss (5:1, v/v). Although a light mixture by most standards, we have found larger percentages of peat moss will keep the mix too moist and will cause the cutting bases to rot. Pure perlite will work, however the presence of some peat moss stimulates root hair

production, enabling the cutting to establish itself faster in the field.

We use a small amount of slow-release fertilizer in the mix. The last two years we have used a Nutricote 14-14-14, 70 day release formula. We use one litre per cubic yard of rooting mix. Directly after sticking there are few available nutrients to encourage the growth of fungi on the injured portions of the cutting. However, by the time that root initiation has begun there is a level sufficient to stimulate growth. When we first began using slow-release fertilizers in our rooting medium we noted a substantial increase in both the quality of the rooted cuttings and in the percentage of successful takes. Without the fertilizer many cuttings would form roots, but before any appreciable growth could take place the leaves would drop and the cutting would eventually die. Now our cuttings often put on several nodes of growth before they are removed from the beds.

ROOTING CHAMBER ENVIRONMENT

Our trays of cuttings are placed directly on the ground in the greenhouse. The more difficult-to-root subjects are placed on beds heated by hot water pipes. The temperature of these beds is kept at 25 °C (approximately 78 °F). At present we employ an Agritech fogger to provide humidity in the house. Earlier attempts to root roses with overhead misters were often unsuccessful because the medium tended to be too wet and the large amounts of water tended to leach nutrients from the leaves, causing them to drop prior to rooting. We are considering purchasing a high pressure fog system, as we feel the smaller droplet size will further minimize these problems and will create a better rooting environment.

As all of our cuttings are taken between June 1 and July 30, the temperatures within the greenhouse can become quite high. We provide just enough ventilation to keep the temperature at ground level from exceeding 32 °C (90 °F). We have, however, allowed the temperature to rise as high as 40 °C (104 °F) with no perceptible damage, but such high temperatures slow the rooting process.

We do not use fungicides in the greenhouse with the exception of wettable sulphur on cultivars which are particularly susceptible to blackspot infection. When fungal problems occur in the cuttings the cause can often be traced to either high or low humidity levels. If placed in wet areas such as near the actual humidification unit or under a drip, both cuttings and medium can become waterlogged and subject to fungal attack. If placed in a "shadow" area which receives too little humidity or in a draft, the cuttings will dry out. Once wet again, the dead leaf tissue becomes a perfect medium for many fungi. We have found that close attention to humidity levels and the placement of the cuttings prevents problems from

developing. Most cultivars we are dealing with are quite resistant to blackspot and mildew and this aids us considerably. When working with disease susceptible cultivars preventative measures do become necessary.

We humidify the house from approximately 9:00 a.m. to just before sunset. Our units can deliver from one to 40 gal per hour. This level is adjusted during the day according to both the time of day and the intensity of sunlight. During an average sunny day both units will be delivering 30 gal per hour during the middle of the day. On a cloudy day we may only use 10 gal per hour per unit. Our humidifiers are located at each end of a 20 x 100 ft coldframe. They are placed 6 to 7 ft above the floor and to one side. With both units operating, a circular air flow is created which distributes humidity evenly throughout the house.

Although some cultivars may show root initiation in as little as 10 days, most will show root initials by 14 days. Some may not root for 20 days or longer. Roots of most cultivars will reach the pot edges and emerge from the bottom of the pots within 30 days. When they have reached this point we remove the rooted cuttings from the humidity chamber and place them in a shaded greenhouse for a period of hardening off. Careful attention is paid to watering. The first three days are critical, and the rooted cuttings are watered lightly and frequently. As the leaf stomata strengthen and the cutting is better able to handle the drier air, the frequency of watering is decreased, while the amount each receives is increased so that the roots have plenty of water available to them.

TRANSPLANTING

After one week the rooted cuttings are transferred to an outside area to await transplanting or, depending upon their condition, are brought directly to field beds. These field beds are 4 ft wide. A device which is hauled directly behind the rototiller creates four-rows 3-in. deep. Cuttings are brought to planters who place them 12 in. apart in the rows. Although labor intensive, the careful attention given to each cutting assures that the soil is carefully compressed around the very fragile roots. Directly behind the planters a crew places shredded bark 2-in. deep around the cuttings. Once the beds are barked we irrigate them for four hours or until they are saturated. Unless we experience severe drought conditions, irrigation is not required again. If water is available, we try to water at least once again within the week to insure that plenty of moisture is available to the establishing roots. By freeze-up (in our location November 15) the cuttings have put on approximately two nodes of growth, with corresponding root growth, and are established enough to withstand the frost heaving

process. The roses are fed and watered according to need the following year and are ready to dig by early November. Cuttings that are not ready to set out by September 1 are transplanted into 4 in. pots and overwintered under thermal blankets in poly houses covered in opaque plastic. These are either potted directly into 2-gal. pots for sale the next spring or transplanted into field beds.

Roses grown from cuttings generally have a smaller and more fibrous root system than the older root systems of budded roses. Depending upon the vigor of the cultivar, the tops can be equally as large as a budded rose, but are usually smaller. Slow growing cultivars can be quite small by budded rose standards. It is important that your market understand that these size differences are related to the propagation process and do not have any bearing on the quality of the plant or its ability to grow in the future. Once established, an own-rooted rose will often be less trouble to maintain and will bring to its owner that which we all desire in a rose—rainbows of sun-washed petals and evenings filled with exquisite perfume.