The Use of Stolon Pieces to Propagate Roses and Other Material©

Robert Osborne
Corn Hill Nursery Ltd., 2700 Rt. 890, Corn Hill, New Brunswick, E4Z 1M2 Canada

INTRODUCTION

At the 1998 Eastern Region meeting I gave a paper that outlined our attempts to propagate difficult-to-root roses from stolon pieces (Osborne, 1998) (Editor's Note: In the earlier paper the author used the terminology root pieces which are anatomically stolons). This paper is a report on our subsequent investigations into the use of stolon pieces as a system for propagating roses and other genera. We have refined and changed our system since our initial attempts and would like to describe the process we currently use.

MATERIALS AND METHODS

Most of our roses are produced from softwood cuttings taken in June. They are stuck into sand beds in coldframes. When rooted, they are planted into the fields or held in the sand till late fall, when they are placed in sealed polyethylene bags and frozen at -2 ºC (29 ºF). Slightly damp cedar shingle tow (produced by shingle mills) is used inside the bags to prevent drying of the cuttings. These cuttings are planted in early spring.

The rose beds are harvested in November and brought to the grading area. It is here that the stolon-piece process begins. Many roses produce horizontal suckers (stolons) that make the bundling and shipping of the roses awkward. These suckers are removed and placed into baskets that are labeled and put into the cold storage unit to prevent drying. The true roots are not pruned unless unusually long, so there is little appreciable root loss to the plants. The plants also become much easier to handle.

When the grading process is done, usually by early December, the suckers are brought out of cold storage and cut into 5-cm (2-inch) sections and gathered into bundles of 25 cuttings. Unless material is very limited, we use only those stolon pieces with a diameter of 6 mm (1/4 inch) or better. Smaller material is not as successful.

We used to dip the stolon pieces in hydrogen peroxide to sterilize the surfaces. We no longer do this. We have seen no losses due to fungal damage and feel that the soil residue on the surfaces may contain mycorrhizae and beneficial bacteria valuable to root development. The stolon pieces are packed in layers in baskets separated by cedar shingle tow. These are kept barely damp at 1 ºC (34 ºF).

In March, the stolon pieces are brought out for planting in the coldframes. The coldframes have closed loop zones of heating pipes. We use the same material that is commonly used for in-floor heating of homes. Insulation is placed under the pipes to minimize heat loss. Digital controls allow us to regulate the temperature of each zone to within 2 ºC. The pipes are encased in cement or limestone fines depending upon the building. Over this is placed 6 inches of washed, graded sand.

At one time we used silica sand, however we have seen no advantage to this more expensive option. Once the sand is in place, we put 2.5 cm (1 inch) of screened peat on the surface, spread as evenly as possible. We also broadcast a light application of slow-release fertilizer. We use Nutricote 14N–14P–14K, 100 day. The peat and fertilizer are tilled into the sand with a rototiller until a uniform mix is achieved. The surface is screeded flat with a 2 × 6-inch piece of lumber.

Trenches are pressed into the sand mix using a 1 × 6-inch board with the edge cut in a wedge shape. The depth of this trench is 5 cm (2 inches) deep. The stolon pieces are laid horizontally in the trench with a 1-cm (3/8 inch) gap between each piece. When the next trench is made, the former trench is covered. After each section is completed a small cement lawn roller is used to compact the sand and create good contact with the medium.

Temperature has been one of our biggest concerns in the process. Originally we kept temperatures near 20 ºC, but we felt that many of our losses might be attributed to the higher temperatures because roses begin growth at much lower temperatures. We think the higher temperatures encouraged rotting and forced shoots before secondary roots could form.

We now start our beds at 10 ºC. When shoots begin to appear we raise the temperature to 15 ºC. By this time of year temperatures in the house will rise higher and there is a good diurnal fluctuation, simulating spring conditions. We think the lower temperature regime and subsequent slower shoot development, has been an important factor in our increased success rate.

Moisture is delivered from an overhead irrigation system that is turned on manually when necessary. We are watering, not misting. Because these are shoots emerging with roots, they do not need constant humidity, as do softwood cuttings. Indeed, we want to keep the shoots dry to prevent fungal infection. When temperatures outside allow, we open the house to create good air circulation and to help in the hardening off process.

Because spring frosts occur at our site until late May, we keep the cuttings in the house till early June. By this time roots and hair roots have developed on the original stolon pieces and considerable growth has taken place on the tops. Tops are trimmed prior to planting to encourage basal shoot development. This makes a stockier plant with more stems, resulting in a better grade-out at harvest. Once the stolon pieces are moved out of the house, a crop of softwood cuttings can be stuck in the house.

We have used this system to produce shoots on *Syringa vulgaris* (common lilac) cultivars as well. Root pieces are gathered in spring rather than fall as we generally dig them at that time. They are cut and stuck in exactly the same manner as roses.

We have also experimented with other material including *Aristolochia macrophylla* (syn. *A. durior*) (Duchman's pipe vine) and *Comptonia peregrina* (sweet fern).

RESULTS

We have used this system for numerous rose cultivars and a limited number of lilac cultivars, amongst others. It is interesting to note that success rates for rose cultivars generally correspond to success rates for conventional softwood production, although some roses that are difficult to root respond better to stolon piece propagation. This leads one to speculate that the successful propagation of a cultivar is due as much to internal physiology as to the propagation technique. Below is a list of roses that we have successfully propagated using the stolon-piece technique (Table 1). We have listed only those cultivars that have a success rate of 75% or better.

Table 1. Roses successfully propagated using the stolon-piece technique.

Rosa rugosa cultivars
'Jacpico', Pristine rugosa hybrid rose
'Rotesmeer', Purple Pavement rugosa hybrid rose

Rosa gallica cultivars
'Cardinal de Richlieu'
'Madame Plantier'

Rosa pimpinellifolia (syn *R. spinosissima*) cultivars
double pink (syn. *R. spinosissima* 'Double Scotch Pink')
double white (syn. *R. spinosissima* 'Double Scotch White')

Other shrub rose hybrid cultivars
'Agnes'
'Alain Blanchard'
'Blanche Double de Coubert'
'Captain Samuel Holland'
'Charles Albanel'
'Charles de Mills'
'Dart's Dash'
'David Thompson'
'Delicata'
'Doctor Merkeley'
'Doorenbos Selection'
'Fru Dagmar Hastrup'
'George Vancouver'
'Hansa'
'Henry Hudson'
'Henry Kelsey'
'Hope for Humanity'
'Jens Munk'
'John Cabot'
'John Davis'
'Karl Foerster'
'Königin von Dänemark'
'Magnifica'
'Martin Frobisher'
'Max Graf'
'Metis'
'Minette'
'Moje Hammarberg'
'Morden Snowbeauty '
'Paullii'
'Pierette Pavement'

'Pink Pavement'
'Polstjärnan'
'Scabrosa'
'Snow Pavement'
'Souvenir de Philémon Cochet'
'Stanwell Perpetual'
'Stronin', Polareis rugosa hybrid rose
'Thérèse Bugnet'
'Tuscany Superba'
'Wasagaming'
'William Baffin'
'William Booth'

Rose species
Rosa carolina
Rosa glauca (syn. *R. rubrifolia*)
Rosa ×*harisonii* 'Harison's Yellow' (syn. *R. spinosissima* 'Harison's Yellow')
Rosa majalis (syn. *R. cinnamomea* var. *plena*)
Rosa virginiana

The success rate with lilac has not been as dramatic as with roses and has varied each year and with each cultivar. We are still trying to assess how we can improve. Shoots often develop, then collapse when secondary roots fail to develop in time to support the tops. Collection in fall may help. Rose stolon pieces develop callus tissue and even bud extension during winter storage. This seems to give them an advantage over spring collected stolon pieces. Our problem is that we harvest lilac in spring to prevent any hardening of the buds that may occur in cold storage. Below is a list of *Syringa vulgaris* (common lilac) cultivars we have tried with approximate success rates (Table 2).

Table 2. *Syringa vulgaris* (common lilac) cultivars we have tried with approximate success rates.

Cultivar	Success (%)
Agincourt Beauty	40
Edward J. Gardner	40
Krasavitsa Moskvy	60
Madame Lemoine	40
Monge	50
Rochester	30
Sensation	50

Other material is listed below with approximate success rates (Table 3). The use of root pieces to propagate many of these is well documented in the literature.

Table 3. Other plants we have tried with success rates.

Species	Success (%)
Aristolochia macrophylla (Dutchman's pipe vine)	90+

Comptonia peregrina (sweet fern)	90+
Robinia pseudoacacia (black locust)	90+
Rhus typhina (staghorn sumac)	90+

DISCUSSION

This system allows us to produce a crop in early spring before our regular crop of softwood cuttings is stuck. We are able to more fully utilize our propagating structures and can provide employment for several people in the slow period proceeding the intense spring rush.

Collection of stolon pieces ties in nicely with our grading process. The suckers that were once a nuisance have become valuable propagation material. Very little extra time is required to collect this material and storage is simple. Thousands of stolon pieces take very little space in the cold storage unit.

Other than providing bottom heat, there are no complex or expensive systems needed. A simple coldframe, inexpensive sand, and a means of watering are all that is required. We use no pots or flats in the process.

Refinements in storage of the stolon pieces and temperature regulation during shoot development have led to increased success rates for this technique. What started as a research project has become an integral part of our propagation program. Stolon-piece propagation now accounts for one quarter of our rose production and we intend to expand further.

LITERATURE CITED

Osborne, R. 1998. Propagating difficult-to-root roses from root pieces. Comb. Proc. Intl. Plant Prop. Soc. 48:324-26.