- The next time the top will be pruned would be the following year in March and once more during the growing season—depending on the cultivar. Plants are saleable by mid summer of the 2nd year.
- The taxa that we are currently producing with the most success are *S. caprea* 'Kilmarnock' (syn. *S. caprea* 'Pendula') (weeping pussy willow), *S. purpurea* 'Pendula' (weeping purpleleaf willow), and *S.* integra 'Hakuro-nishiki' (variegated pussy willow).

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Gisela® Series: Dwarfing Cherry Rootstocks

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The Gisela® series of rootstocks are important dwarfing cherry rootstocks for sweet cherry and have limited use for sour cherry and Japanese flowering cherries. The initial crosses that lead to the development of these rootstocks started in the early 1960s at Justus Liebig University in Giessen, Germany. The Gisela® series of rootstocks have gone through extensive testing in Germany where they first originated and in Michigan at Hilltop Orchards and Nurseries Inc. for almost 20 years. In addition, for the past 10 years tests as part of the North Central 140 trials (NC-140 rootstock trial plantings) have occurred at 16 locations throughout the U.S.A. and Canada.

The Gisela® rootstocks produce sweet cherry trees which are 45% to 70% or 80% the size of those on mazzard understock. Scions grafted on Gisela® understocks are very precocious and crop in their 3rd year with full crops in the 4th. Typically, in a side-by-side comparison, sweet cherry on Gisela® 12 rootstock will have a heavier bloom and will be in its 4th cropping season whereas grafts on mazzard will just be starting to flower. This earlier and heavier bloom on Gisela® rootstocks has created interest among ornamental nurseries on the potential of grafting Japanese flowering cultivars on these dwarfing cherry rootstocks.

We currently have a 3-acre high-density planting of sweet cherry on Gisela® at Niagara-on-the-Lake with a 6 ft × 14 ft spacing and are planning a 2-acre planting at a 4 ft × 12 ft spacing this coming spring. Rain and hail can be a problem for us with sweet cherries. Because of the dwarfing habit on the Gisela® rootstocks we are working on a simple easy-to-build covering to manage these problems.

Hardiness of the Gisela® rootstocks is good. I have observed damage in a nursery in Washington State where sweet cherry grafted on mazzard cherry showed damage from severe winter cold of -18F with no snow cover. In the same field no damage was observed on Gisela® 6 rootstock.

Gisela® rootstocks will definitely change the production of sweet cherries in Canada, U.S.A., and around the world. The greatest problem is the propagation of these rootstocks in satisfactory quantities. They have been quite difficult to produce in large quantities on a consistent basis. Tissue culture has worked reasonably well

but it to has not been able to provide sufficient numbers. Softwood cuttings have also done reasonably well. This year we took 3-inch softwood tips in June, two-bud cuttings, and 10-inch cuttings. We found that by putting these cuttings all in a polyhouse with extra shading, keeping high humidity with as little watering or misting as possible, keeping the house closed tight with temperatures reaching 110F and higher gave a greater success than by keeping the temperature down with ventilation and more misting. We used a peat and perlite medium for the larger cuttings and a cocoa-mulch medium for the tip cuttings. Gisela® rootstocks are currently propagated in California, Oregon, Washington, Michigan, and Ontario with varying success.

Innovation in Perennial Propagation

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Propagation of perennials by seed is nothing new or innovative. Plugs and plug seeders are not new to the industry either. Many of the large annual plug growing operations around the nation seed bedding plants with highly sophisticated seeding lines. They typically contain automatic flat fillers, dibblers, high-speed drum seeders, watering tunnels, conveyors and sometimes, robots to move plug trays to the bench or the cracking chamber. This equipment is very well suited to bedding material as trays are seeded in lots of several hundred trays. These systems are very fast, very accurate, very sophisticated, and very expensive to set up. Anywhere from $30,000 for the seeder alone to a few hundred thousand for the entire set-up. Only a few perennial plug producers, that I am aware of, utilize this equipment.

If you are a smaller plug producer and typically seed in lots of 5 to 50 plug flats per taxa, the expense of such an elaborate seeding set-up can usually not be justified. Until a few years ago, the next most viable option was a plate seeder. These are very simple pieces of equipment consisting typically of a tray holder, an airtight box holding the seeding plates and a vacuum cleaner with a regulator valve. The plates have holes drilled into them corresponding with the selected plug tray size. Usually three or four plates with different hole sizes are used to cover most seed sizes. Accuracy of seeding depends significantly on the skill of the operator and the number of flats that have already been done that day. Typically the first 20 or 30 are quite good, by the time you hit number 200, your back aches, your wrists are sore, and you are ready to strangle the inventor of this contraption. Of course you conveniently forget the days when plug trays were seeded with a vibrator seeder or a salt shaker.

A decade and a half ago needle seeders made their entrance into the market. Initially rather prone to plugging and somewhat difficult to control, the concept none the less was sound. You put a vacuum across some hypodermic needles to pick up a defined number of seeds from a seed tray, move the needles over a plug tray, release the vacuum and the seed is seeded. In theory you can seed practically any type of seed from cyclamen to walnuts by this method. In practice it was found that more sophisticated controls were needed. Several companies took the initial seeders and added vacuum controls, blow-off switches, vibrating seed trays, and seed retrieval