Common/Uncommon Sense Ideas: From Concept to Reality

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INTRODUCTION

My job as a scientist deals with new ideas and innovations. Turning them into practical reality for the nursery industry is a continuing challenge. My investigations cover a broad range of topics — from propagation, container and shade tree culture, composts and wastes in potting mixes to nutrition and nutrient recycling (Chong and Hamersma, 1995). Most ideas I pursue originate initially from industry members who, to a large extent, provide financial and other support needed to pursue them.

In the few minutes allotted to me, I will introduce two innovations and outline how I improved them. Also, I will describe some unproven, untried or "wild" ones that continue to intrigue me and make me continue to think about them. While many ideas seem to appear by "accident", accidents only happen to those in a position for them to happen to. In other words, the process of thinking about an idea or problem makes it more likely to come up with new ones.

THE STYROGRAFT IDEA

Many nurseries routinely propagate hard-to-root species by graftage. Traditional procedures of side-grafting scions of hard-to-root species to rootstocks established in pots require considerable expenditure in time, labor, and greenhouse space, since rootstocks must first be rooted as cuttings or grown from seed and maintained until used for grafting.

In the early 1980s, I experimented with the simultaneous grafting and rooting procedure for speeding production of upright junipers. This procedure, also referred to as the paired-cutting technique, was first described over 60 years ago by Halma and Eggers (1936) and later in the text book by Hartmann and Kester (1968). Although not widely practiced, the technique has been used by several members (Brix and Barker, 1967; Dillon et al., 1962; Teuscher, 1962).

Matched juniper cuttings of scion (slower rooting) and rootstock (easier rooting) grafted along the basal 3 to 4 cm and held together with rubber bands, resulted in successfully rooted paired grafts under mist (Chong 1981a). Depending on the grafter, success varied between 20% and 100%.

The procedure required that both scion and rootstock be of similar size and it was somewhat time-consuming to make, match, and tie the grafts. Therefore, I modified it by using conventional side-grafts (Chong, 1981b). The side graft was held together by inserting it into a styrofoam block (3 cm × 3 cm × 5 cm), prepunched in the center with a nail to facilitate entry of the rootstock. The base of the rootstock was allowed to protrude 0.5 cm out of the styroblock to facilitate growth hormone application.

Insertion of the graft into the styroblock was less time consuming than tying with rubber band. The stryoblock exerted sufficient pressure to keep scion and rootstock

together, and the graft union seemed to heal better than when the rubber band is used. Since the new roots penetrated quite freely through the styroblock, it was unnecessary to remove the block, a feature that facilitated transplanting.

In my comparative trial, I obtained successful grafting and rooting of 75% with stryrograft, 57% with conventional rubber-banded side graft, and 46% with the paired cutting procedure (Chong, 1981b).

During the intervening years, several nurseries had indicated to me only a moderate degree of success in using the simultaneous grafting and rooting technique. Because of the very large cuttings that I used (up to 30 cm in length), I estimate that the procedure could save as much as 1½ to 2 years in production time. The technique deserves a closer examination by propagators.

THE ULTIMATE NON-CHEMICAL, NO-WEED IDEA

Weeds have been one of the biggest problems facing the container nursery industry in Canada. Unlike the U.S., where container nursery growers have a wide assortment of effective herbicides, Canadian nurseries have not been allowed to use any of these chemicals, that is, until quite recently when Devrinol and Ronstar became licensed for container use. However, these two herbicides are only partially effective. Therefore, by necessity our industry was forced to develop nonchemical methods of controlling weeds in containers:

In the early 1980s, Art Vanderkruk of Connon Nurseries (AVK), Rockton, Ontario, was perhaps the first to introduce the weed disc (Weed Guard). The disc is made of a semi-rigid plastic similar to a 45 rpm record. It has a slit so that it can be fitted around the stem of the plant on top of the container mix; small holes allow water to penetrate.

In the late 1980s, limited studies indicated a potential for controlling weeds about 85% (Chong et al., 1989) using weed discs constructed from fabric (Mori Nurseries, Niagara-On-The-Lake, Ontario) or from foam. [We are presently conducting similar tests on "new-generation" weed discs constructed from materials such as pressed peat and cardboard].

In the late 1980s, Braun Nurseries, Hamilton, Ontario, introduced the use of an insulated (THERMAT) blanket cover around the ball of above-ground container-grown trees, both for protection against cold during winter and for preventing weed growth during summer (Chong et al., 1990).

In the early 1990s, Mori Nurseries introduced another method of weed control using a black polyethylene sleeve (weed bag), which is placed around the pot in the same fashion that a florist plant is prepared for market. Small prepunched holes allow water to penetrate. We investigated different ways of applying fertilizer and different ways of applying the sleeves.

During the 1990s, we conducted a variety of investigations (Murray et al., 1996; 1997) with above-ground container (pot-in-pot system) shade tree culture. Producers such as Willowbrook Nurseries, Fenwick, Ontario, began using large plastic weed discs with container-grown trees. Putzer Nurseries, Hornby, Ontario, started to produce trees pot in pot (Chong and Hamersma, 1994).

Based on our experiences with the above innovations, Technician Bob Hamersma (now retired) and I designed the "ultimate" no-weed pot-in-pot tree culture system, which we illustrated previously in a poster display (Chong and Hamersma, 1995).

Somewhat similar to the Mori Nurseries weed bag, we placed a large black garbage

bag around and over the inner 25-gal container of the pot-in-pot grown shade tree (Chong and Hamersma, 1995). The trickle irrigation line and emitter are tucked under the sleeve and held in place by two clothes pins.

The garbage bag (1) was very effective in suppressing weeds, and (2) drastically reduced evaporation of water from the medium and frequency of irrigation. Weeds growing around the containers, or in or between the tree rows, had no effect on the growth of the potted trees. These weeds were periodically cut back with a mechanical trimmer. Furthermore, if the garbage bag (sleeve) is made sufficiently long, it can be pulled upwards and fastened to the trunk (perhaps 30 to 50 cm above the container mix) to prevent against possible rodent or animal damage to the lower trunk during the winter.

In the future, this no-weed technology may become useful for other jurisdictions should herbicides be restricted for use in containers as in Canada.

"WILD" IDEAS

I have had many uncommon or "wild" ideas that are unproven such as this one [rationale and explanation in brackets]:

Give Cuttings Aspirin to Cure Rooting Problems! [Aspirin is derived from salicylic acid which is found in willow, *Salix* sp. (Lord, 1998), known to be easy rooters. Water extracts from *Salix* twigs can enhance rooting (Daigneault and Chong, 1985). Although I did not show that cuttings treated with aspirin solutions rooted better (unpublished results), the idea of giving aspirin to plants — though seemingly preposterous — continues to intrigue me].

Similarly, there are untried ideas that I would like to pursue such as this one:

Shake Your Cuttings Before You Stick Them! [Research has shown that tomato transplants shaken as little as 30 seconds per day over a period of time drastically reduced height. This phenomenon has been observed with trees and greenhouse crops, including chrysanthemums (Hammer et al., 1974; Kellogg and Steucek, 1977). I also have observed it with chrysanthemums grown in pots by students in my floriculture laboratory. Shorter transplants or potted crops are more desirable for marketing and, in these situations, would eliminate the use of growth retardants. The diminutive effect appears to be related in some way with ethylene, which interacts with other plant growth hormones. Could shaking result in better rooting of cuttings than with unshaken ones? Or, could it effectively substitute for certain rooting hormone treatment of cuttings?]

CONCLUSION

It is perhaps "fortunate" that there are restraints on my time and resources. This helps me to focus on developing or improving a few good and innovative ideas, and also to document them carefully for others to use, or build upon in the future.

In the meantime, until I am able to pursue, prove, or disapprove some of the "wild" (uncommon) sense ones, it is very pleasant to dream about turning them into reality.

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