Sideslit or Airslit Containers
By Thomas D. Landis

Spiraling and other types of root deformation have been one of the biggest challenges for container growers. Chemical root pruning with copper coatings was the first innovation and is still being used in some nurseries. Concerns about copper leaching, toxicity, and induced deficiencies of other micronutrients have limited their use, however. The next feature to help control roots was the sideslit or airslit container which was introduced by Carl Whitcomb in the late 1980's. The original RootMakers® were single containers and large in volume, but multicell trays came out in 1996. In the early 1990s, the Accelerator® was developed which featured round, removable sideslit containers that fit in a rack. Since then, a number of companies have developed containers that featured air slits on their sides (Table 1).

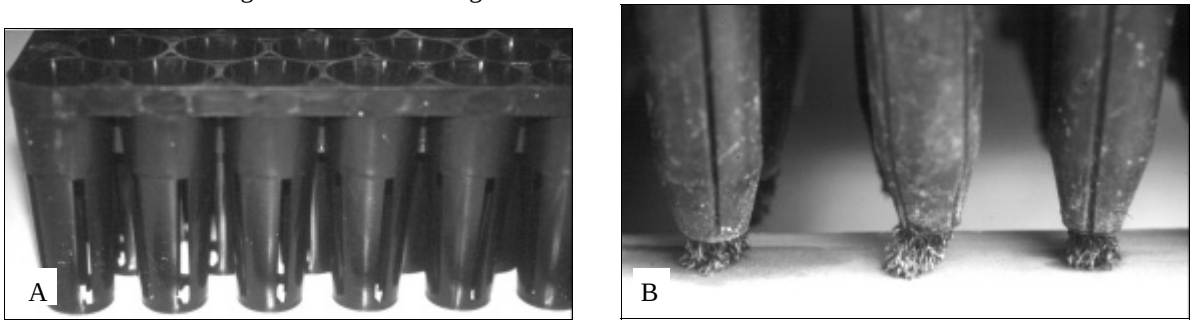

Figure 1 - Using the concept of "air pruning" (A), the lateral slits in sideslit containers (B) control spiraling and other root deformities.

The basic principle behind the sideslit container is simple. Just like when plant roots "air prune" when they hit the bottom drainage hole (Figure 1A), they stop growing and form suberized tips when they hit the lateral slits when in sideslit containers (Figure 1B). When they first came out, many nurseries bought a few of these new sideslit containers and set them out in the greenhouse with their regular containers. It soon became apparent, however, that these containers dried-out much quicker than solid wall containers and so quickly fell out of fashion. Growing a few new containers in the midst of another container type is not a fair comparison, but few growers wanted to gamble on converting over completely. The nurseries that tested sideslit containers found two drawbacks: 1) roots sometimes bridged between containers, and 2) seedlings in sideslit containers dried out much faster than in those with solid walls. The bridging was minimized by increasing the taper of the cells and staggering the location of the airslits. The drying was most rapid around the perimeter of the block and so containers on the perimeter of the growing area dried-out much faster than those in the middle.

Table 1. Types of slideslit containers for forestry and conservation nurseries.

Company	Container	Range in Cell Volumes		Features
		in^3	ml	
Accelerator®	APL2	13.7	225	Soft plastic round cells, removable
BCC™	Sideslit	3.4 to 7.3	55 to 120	Hard plastic blocks, square cells
Hiko™	V Series	3.1 to 9.2	50 to 150	Hard plastic blocks, round or square cells
Lannen™	Plantek®	3.1 to 16.8	50 to 275	Hard plastic blocks, square cells
Panth™	Starpot©	3.0 to 7.3	50 to 120	Hard plastic blocks, round cells
IPL	Rigi-Pots™	4.9	80 to 350	Hard plastic blocks, square cells
RootMaker®	RootMaker I & II	6 to 930	98 to 15.31	Hard plastic trays and containers, round or square

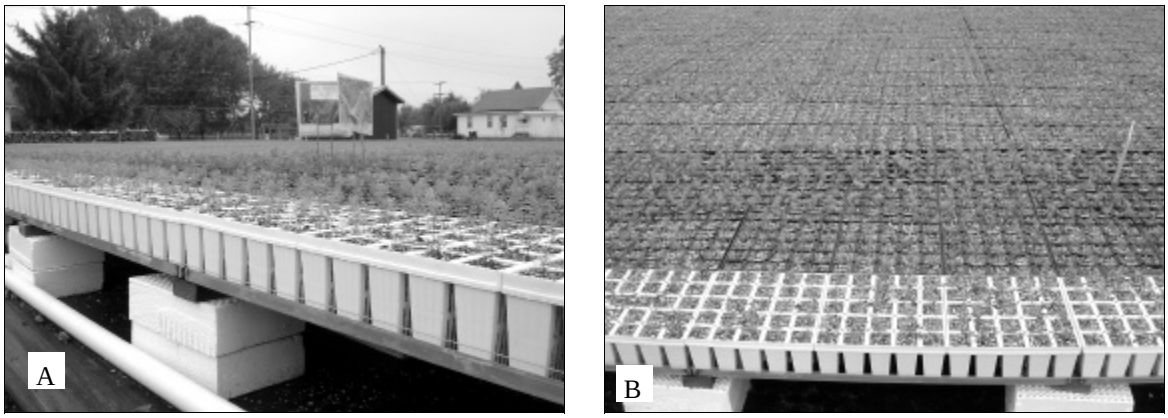

Figure 2 - IPL solved the problem of excessive perimeter drying (A) by manufacturing special white RigiPot™ 25-350 containers without air slits on the outer sides (B).

The challenge was to create a container that would not dry out the root system but still enable air pruning. IPL took an innovative approach: change the design of the perimeter containers. They created RigiPot™ 25-350 block containers without side slits on the outside walls (Figure 2A). This new "perimeter tray" is constructed of white plastic to differentiate it from the black "inside trays" with slits on all four sides. The white perimeter containers also prevent root damage from direct sunlight. This new innovative container system is currently being used operationally at Microseed Nursery in Ridgefield, WA (Figure 2B).

Sideslit containers are extensively used in Quebec, Canada due to their innovative nursery research. They have dealt with the more rapid drying by adapting a soil moisture monitoring instrument that is based on time domain reflectometery (TDR). Sensor probes are inserted through the sideslits of the containers and gives an instantaneous, non-destructive measurement of percent moisture in the growing media. With this technology, growers can quickly and accurately adjust their irrigation from germination through the hardening phase (Figure 3). This not only saves water but decreases fertilizer leaching.

Summary

Sideslits or airslits are the most recent design feature to help control root spiraling in containers and develop a multi-branched and fibrous root system. Before testing these containers, growers must realize that they need to grow them together in a area where the irrigation can be managed separately from other container types. Containers around the perimeter of the growing area will dry out much quicker than those in the interior.

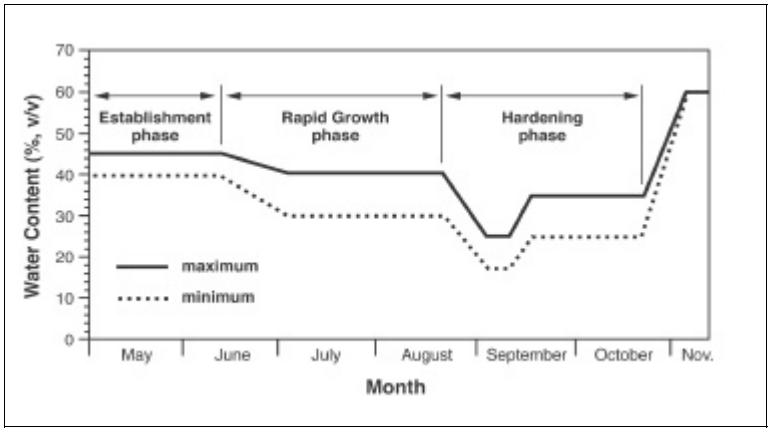

Figure 3 - Quick and precise monitoring of the water content in the growing media allows container growers in Quebec to regulate seedling growing and development throughout the growing season (Lamhamedi and others 2001).

If you would like to try sideslit containers, the best single source of information is Eric Stuewe and his staff at Stuewe and Sons:

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