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Use of the High Performance Growth Mat Hydro-Switch™ in Ornamental and Forestry Nurseries in Quebec®

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INTRODUCTION

One of the most important environmental challenges of the modern grower will be the optimal use of water, fertilizers, and pesticides. For this, new water management approaches need to be developed. The actual project focused on methods to reduce water and fertilizer use in nursery production. During summer and fall 2004, 11 nurseries have tried the new capillary mat Hydro-Switch™ growth mat in their own growing conditions. These trials gave the opportunity to see how the capillary mat performed under different water management and crops. The first goal of these trials was to measure plant growth under conventional water managements compared with the growth with the new capillary mat Hydro-Switch growth mat. The second goal was to compare the water use with different water treatments.

MATERIALS AND METHODS

For the purpose of the poster session, only four species have been selected among the nurseries. All experimental designs were carried out by Quebec Institute for the Development of Ornamental Horticulture (IQDHO). Because there were many crops in each nursery, all experimental designs were conducted from April to the end of October. Nursery species selected were *Prunus ×cistena*, *Thuja occidentalis*, *Aster dumosus*, and *Larix laricina*. Growth measurements made: heights of the plants, root dry matter, stem dry matter, and water use. Irrigation by hand or overhead irrigation was the two control treatments in all nurseries.

RESULTS AND DISCUSSION

Thuja occidentalis grown on the capillary mat Hydro-Switch were higher than the control plants (Fig. 1). The higher growth observed with Hydro-Switch mat was related to the higher root and stem dry matter as shown in Table 1. The increased growth on *L. laricina* was obviously seen with the use of the Hydro-Switch mat (Table 1; Figs. 2 and 3). Highest height values were calculated with Hydro-switch mat and the same results were correlated on the root and stem dry matter. From June to August 2004, *A. dumosus* showed the highest growth rate when grown on the capillary mat (Table 1 and Fig. 4). When compared to the control treatment, root and stem dry matter were significantly higher with Hydro-Switch. *Rudbeckia* 'Goldsturm' reacted the same way with the capillary mat. The stem dry matter was higher with Hydro-Switch but no difference was noticed on root dry matter.

One grower watered 2 days out of 5 instead of 5 days out of 5 in control treatments. *Prunus ×cistena* grown on Hydro-Switch needed 2.5 times less water than those watered conventionally (Table 1). For *A. dumosus* a water economy of 500% was observed with the use of the capillary mat Hydro-Switch.

CONCLUSION

Thuja occidentalis, *L. laricina*, and *A. dumosus* growths reacted positively to the use of Hydro-Switch mat. Plants were larger than the plants watered with conventional watering methods. *Prunus ×cistena* and *A. dumosus* grown with the capillary mat required 2.5 to 5 times less water during the trials.



Figure 1. *Thuja occidentalis* growth comparison.



Figure 2. *Larix laricina* root growth.



Figure 3. *Larix laricina* plug root growth.



Figure 4. *Aster dumosus* plant growth comparison.

Table 1. Growth response to different modes of irrigation of nursery and pot plants. Comparison of water usage during trial.

Species	Dry matter (g)		Height (cm)		Water usage (compared to standards)	
	Standard	Hydro-Switch	Standard	Hydro-Switch	Standard	Hydro-Switch
<i>Prunus × cistena</i>	N/A	N/A	N/A	N/A	250%	100%
<i>Thuja occidentalis</i>	3.41	5.21	2.22	8.94	N/A	N/A
<i>Larix laricina</i>	0.68	0.87	0.49	10.5	N/A	N/A
<i>Aster dumosus</i>	71.2	115.6	12.4	15.5	500%	100%