Use of Ground Wheat Straw in Container Nursery Substrates to Overwinter Daylily Divisions

Pine bark and sphagnum peat moss are the primary components of substrates used in production of containerized herbaceous perennials. Over the years the costs of these materials have risen and availability fluctuates depending on the market. A study was designed to determine if other, lower cost, locally available resources such as ground wheat straw and horse manure compost could be replace a significant portion of the volume of pine bark or sphagnum peat moss in container media used to establish and overwinter daylily.

A standard commercial, sphagnum peat-based substrate was amended with either wheat straw, horse manure compost, or a combination of the two and evaluated. Stella D'Oro (*Hemerocallis fulva* cv.) daylily divisions were grown in each substrate mix and overwintered in an unheated structure for eight months.

Physical properties of the mixes were determined to be within production standards and media shrinkage was minimal. Plants growing in all substrates were at, or above, the recommended range for each of the three macronutrients (Table 1). Daylilies in all substrate combinations were of comparable vigor to the non-amended substrate when growth resumed in the spring. The study demonstrated that successful daylily propagation and overwintering could be achieved in non-traditional growing media utilizing locally available components to substitute for more expensive components such as pine bark and peat moss. Results indicated that although production procedures may need to be modified slightly, the success of the approach warrants further evaluation for the production of herbaceous perennials.

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Table 1. Foliar nutrient levels, beginning and ending EC and pH of substrate solution, shrinkage over the course of the experiment and mass of daylily grown in an 85:15 spahgnum peat:perlite (v/v) substrate amended with wheat straw or horse manure compose.

Sampling date	Wheat straw	Horse compost	N	P	K	Ca	Mg	S	Fe	Mn	B	Cu	Zn
October 5, 2010	0	0	5.9	0.82	2.8	0.63	0.30	0.66	82	242	50.4	6.4	61.3
	40	0	5.6	0.66	2.9	0.75	0.31	0.45	113	183	46.0	10.6	38.5
	0	10	5.8	0.70	2.7	0.31	0.16	0.47	90	106	38.7	7.9	47.7
	40	10	5.5	0.70	3.3	0.56	0.27	0.41	86	166	49.7	6.1	49.2
	$LSD_{0.05}$[z]		0.2	0.05	0.3	0.1	0.06	0.08	20	44	6.8	1.8	7.2
	Wheat straw		NS[y]	*	NS	***	***	***	NS	***	NS	*	NS
	Compost		***	***	**	***	**	***	*	NS	NS	NS	***
	Interaction		NS	***	*	NS	*	**	*	***	**	***	***
April 26, 2011	0	0	5.0	0.59	3.5	0.46	0.30	0.34	52	93	34.3	5.3	50.2
	40	0	5.1	0.59	3.4	0.49	0.27	0.29	60	49	20.1	5.5	44.6
	0	10	4.7	0.67	4.0	0.45	0.27	0.33	57	119	37.0	4.3	49.0
	40	10	4.0	0.57	3.8	0.49	0.27	0.29	56	54	30.6	3.2	44.6
	$LSD_{0.05}$		0.7	0.07	0.6	NS	NS	0.03	NS	25	7.4	1.9	NS
	Wheat straw		*	NS	*	NS	NS	NS	NS	NS	*	*	NS
	Compost		NS	NS	NS	NS	NS	***	NS	***	***	NS	NS
	Interaction		NS	*	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Recommended		3.79	0.33	2.77	0.69	0.38	0.24	167	126	24.0	4.0	38.0

		Electrical cond.		pH			
Wheat straw	Horse compost	Fall[z] (dS/m)	Spring (dS/m)	Fall	Spring	Shrinkage (mm)	Shoot mass (g)
0	0	1.9	4.4	6.3	5.0	0.4	0.9
0	10	1.8	3.7	6.7	5.2	0.6	1.2
40	0	1.6	1.9	5.8	5.4	4.2	1.1
40	10	2.3	1.7	6.0	5.6	3.7	2.0
$LSD_{0.05}$[y]		NS	0.7	0.2	0.2	2.3	NS
Wheat straw		NS[x]	***	***	***	***	NS
Compost		NS	NS	**	**	NS	NS
Interaction		NS	NS	*	NS	NS	NS

[z]Sampling times were October 5, 2010, and April 26, 2011, for Fall and Spring, respectively.
[y]Least significant difference determined by Fisher's test where $\alpha = 0.05$.
[x]NS, *, **, *** represent non-significant, significant at 0.05, 0.01, and 0.001 probability levels, respectively.

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