Using the PourThru for Nutrition Management of Perennials

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The PourThru method for extraction of the root-zone substrate solution is an effective tool for monitoring pH and electrical conductivity (EC). The technique has been adapted by researchers at North Carolina State University for use on greenhouse-grown floriculture pot crops and bedding plants. The Floriculture research group at Virginia Tech is working to provide PourThru pH and EC ranges for greenhouse and nursery production of herbaceous perennials. These recommended ranges correspond to fertilizer levels that give the best growth response (quality and dry weight).

First, Do the PourThru

Instructions and details for the PourThru method can be found at the NC State Floriculture website:

http://www.pourthruinfo.com/

In summary:

The PourThru results in the displacement of the root-zone solution. One hour after applying liquid feed, place a vinyl saucer under the container/pot, add enough distilled water to the surface of the media to produce around 50 ml of leachate (the solution displaced from the media). Collect this solution and measure pH and EC.

Specifics for Perennials

The size of the container determines the amount of water necessary to produce 50 ml of leachate. Most perennials are produced in quarts, "trade" gallons, or true gallon containers. Simply adjust the amount of distilled water to get about 50 ml of leachate. We found the following amounts were necessary to produce sufficient leachate from a bark/sphagnum peat moss/perlite substrate:

Container Size*	Water to add to produce 50 ml leachate
Quart (0.8– 0.9 L)	75 ml
Trade Gallon (2.5– 2.7 L)	100 ml
Gallon (3.5-3.7 L)	125-150 ml

*actual volume of the pot differs among manufacturers

Interpretative Ranges

pH

Substrate pH ranged from 5.3 to 6.2. We experienced pH "creep" over time as most commonly-used water soluble fertilizers such as 20-10-20 and 15-16-17 will acidify substrate pH. However, most species tested seemed to tolerate the lower pH levels.

EC ranges for use with the PourThru method for several herbaceous perennials.

Lower Fertility	Moderate Fertility	Higher Ferti
PourThru EC (mS/cm)*		
0.75 – 2.00	**2.00 – 3.5**	**3.6 - 5.0**
	Astilbe chinensis	
	Achillea millefolium	
Heuchera sanguinea	*Campanula carpatica*	
Physostegia virginica	*Coreopsis verticillata*	*Penstemon x* 'Sour
Scabiosa columbaria	*Gaura lindheimeri*	*Salvia nemerosa*
Dianthus plumarius	*Lamium maculatum*	
	Perovskia atriplicifolia	

	Veronica x ‘Goodness Grows’	

** millisiemens per centimeter; mS/cm = mmho/cm*

Note: These recommendations extend only to the species or hybrids used in this study and cannot be made for the entire genus.

Some notes on our materials and methods

- Our plants were potted into trade gallons with a commercial perennial mix consisting of 65% composted bark , 20-25% sphagnum peat moss, and 9-15% perlite; then grown on in the greenhouse for 11 weeks with a range of fertilizer rates from 50 to 350 ppm N from 15-16-17, constant liquid feed.

- Perennial cultivars used in research: *Achillea millifolium* ‘Red Beauty’, *Astilbe chinensis* ‘Purpurkerze’, *Campanula carpatica* ‘Deep Blue Clips’, *Coreopsis verticillata* ‘Golden Gain’, *Dianthus plumarius* ‘Oakington’*, Gaura lindheimeri* ‘Siskiyou Pink’, *Heuchera* ×‘Mt St. Helens’, *Lamium maculatum* ‘White Nancy’, *Penstemon* × ‘Sour Grapes’, *Perovskia atriplicifolia* ‘Longin’, *Physostegia virginica* ‘Summer Snow’, *Salvia nemerosa* ‘Blue Hill’, *Scabiosa columbaria* ‘Pink Mist’, and *Veronica* × ‘Goodness Grows’

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