Hydrangea production in tunnels as a system to generate floral cut stems

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Material and Methods. ***Hydrangea macrophylla*** **buds produced during late summer have the potential of producing flowering stems the following year. Plants grown in the Ohio River Valley fields do not flower consistently because of bud loss due to cold temperatures during the winter or early spring. Firms desiring to produce cut stems for the florist industry or farmers' markets need to insure flower bud survival by protecting plants. Steel frame tunnels 4.9 x 29.3 meters were constructed and covered with 6 mil white poly during winter months. Six plants each of ten cultivars were planted into each of four replicated tunnels. During early winter, plants were pruned back to approximately 25 cm of the ground. An additional layer of 6 mil poly was placed directly over the plants during the coldest winter weather. Plants were fertilized in the spring with a controlled release fertilizer. Tunnels were covered with shade cloth rated at 55% shade (Figure 1). System was watered naturally and supplemented with drip irrigation. Stems were harvested from 12JUN06 to 03NOV06 and rated for number, length, width, flower color and quality. Statistical analysis was completed using SAS.**

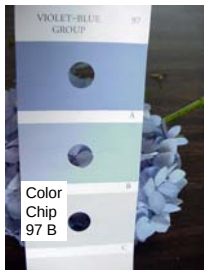
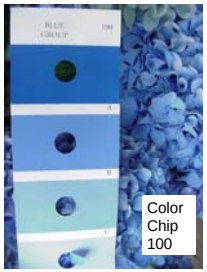
Results and Discussion. Stems per plant varied from 5 for 'Harlequin' to 26–31 for 'Endless Summer', Decatur Blue' and 'Oak Hill' (Table 1). Percentage of stems longer than 30 cm were significantly greater for 'Endless Summer', 'Decatur Blue' 'Oak Hill', 'Penny Mac', and 'Mme Emile Mouillèré'. Percentage inflorescence width greater than 12 cm varied from 75 % for 'Harlequin' to 85 % for 'Nikko Blue'. Flower quality rating, based on a scale of 1-5, ranged from 3.7 for 'Harlequin' to 4.3 for 'Endless Summer'. Harvest season ranged from 135 days for 'Oak Hill' to 13 days for 'Harlequin'. Using the Royal Horticultural Society Colour Chart, a color was assigned to each flower (Figure 3). 'Mme Emile Mouillèré' was the least variable with eight colors (Table 1. This contrasted with 'Decatur Blue', 'Endless Summer', 'Oak Hill' and 'Penny Mac' with each recording over 40 colors. Colors were in the blue range except for white associated with 'Mme Emile Mouillèré' and red shades associated with 'Westfalen' and 'Harlequin'. Flower bud protection is possible. Acceptable cut stems for the floral trade were produced.

Figure 1. Tunnels with 55% summer shade

Figure 2. Tunnel with 72 plants spaced 1.2 X 1.2 m

Figure 3. Individual flowers and color range

Table 1. Evaluation of stems, flowers, & colors on *Hydrangea macrophylla* cultivars grown in a tunnel during 2006.

Cultivar	Stem Count per plant[x]	Stem Length > 30 cm (%)	Floral Width > 12 cm (%)	Floral Rating Scale 0-5	Harvest Length (days)	Mid-Harvest Date	Total Number Color Chips	Chip colors with three greatest frequency over 10% per treatment. Most frequent on left.		
All Summer Beauty	13.8 d	72.0 b	84.1 a	3.8 cd	92 d	19JUL	25	100C	97B	100D
Decatur Blue	27.0 b	91.0 a	81.4 a	4.2 ab	130 ab	12AUG	47	97B		
Mme Emile Mouillèré	14.1 d	90.0 a	75.5 a	4.1 abc	118 bc	10AUG	8	WHITE	N155A	
Endless Summer	26.6 b	91.9 a	81.8 a	4.3 a	133	18AUG	50	100C		
Harlequin	5.0 e	71.7 b	75.1 a	3.7 d	12.8 g	11JUL	12	63B	63A	
Mathilda Gútges	5.9 e	59.3 c	76.9 a	3.9 cd	36.8 f	17JUL	30	93D		
Nikko Blue	8.2 e	71.1 b	85.3 a	4.0 bcd	66.3 e	21JUL	26	100C	97B	100D
Oak Hill	31.9 a	89.2 a	77.4	4.2 ab	135	10AUG	45	100C	97A	97B
Penny Mac	21.3 c	88.7 a	85.0 a	4.2 ab	106 cd	01AUG	40	100C	97B	97A
Westfalen	6.6 e	73.3 b	84.8 a	4.1 abc	21 g	28JUN	17	63A	64B	63B

[x] Values within column followed by a different letter are different at $P = 0.05$ using Waller-Duncan K-ratio t Test.