

Herbaceous Perennials: Heuchera

Part four of our 12-part series on herbaceous perennials takes a look at heuchera.

by **BETH FAUSEY, ERIK RUNKLE, ART CAMERON, ROYAL HEINS, and WILL CARLSON**

HEUCHERA, commonly known as coralbells, have become mainstays of the North American perennial garden. Once grown exclusively for their showy flowers, an almost bewildering number of cultivars combining interesting foliage and flower forms are now available. Heucheras are members of *Saxifragaceae* and are hardy from USDA zones 4-9.

Plants form tufts of evergreen foliage topped by clusters of small bell-like flowers in late spring and summer (Figure 1a). Flowers are typically white or varying shades of red, coral, and pink. Smaller cultivars are often

used in borders and grouped en masse for dramatic displays (Figure 1b).

Approximately 50 to 60 heuchera species are native to North America from Western Canada across much of the United States and down to Mexico. Many western species are adapted to arid and alpine climates and are best suited for rock gardens. Eastern species can thrive in moist, shaded climates.

Heuchera americana (American alum root), *H. x brizoides*, *H. micrantha* (small-flowered alum root), *H. sanguinea* (coralbells), and *H. villosa* (Hairy alum root) are among the most commonly grown garden species. The parentage of many commercially available cultivars is complex, yet numerous selections are thought to have originated from *H. x brizoides*, *H. micrantha*, *H. sanguinea*, and a hybrid of *H. americana*.

Until the 1980s, *H. sanguinea* hybrids with showy flowers and green foliage were the most popular coralbells in North American gardens. However, *H. micrantha* 'Palace Purple,' a bronze to purple-leaf selection with relatively insignificant flowers, took the gardening public by storm and was named

Schedule

Michigan State University researchers' 12-part series on herbaceous perennials covers topics from light to plant growth regulators to various species.

January: Light

February: Series Did Not Run

March: Noteworthy plants

April: Propagation

May: Series Did Not Run

June: Heuchera

July: *Scabiosa/Phlox subulata*

August: Garden performance

September: Ground covers

October: Quick-cropping

November: *Hemerocallis*

December: Postharvest

January: *Tiarella/Heucherella*

the Perennial Plant Association's Plant of the Year for 1991.

A new breed of heuchera, combining fantastic foliage with profuse flowering, has recently emerged in the horticulture trade. Lesser-known species are being utilized to improve the flowering characteristics, foliage quality, and summer and winter hardiness of existing cultivars. These efforts have resulted in a substantial number of cultivar introductions featuring improved performance.

We have trialed both seed- and vegetatively-propagated cultivars in our program and have found some to be perfect for container culture (Table 1).

Propagation

Heucheras can be propagated from seed, by division, or by tissue culture methods. Although

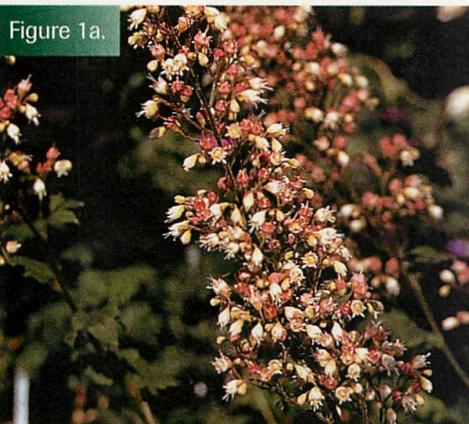


Figure 1a. Heuchera 'Champagne Bubbles' inflorescence with small, bell-shaped flowers. Photo courtesy of Beth Fausey.

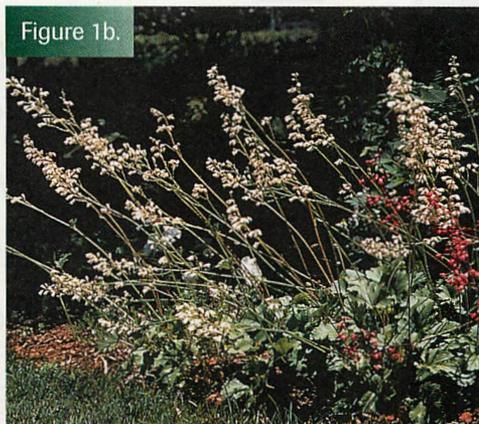


Figure 1b. Heuchera 'White Cloud' plants flower profusely in the border of this perennial bed. Photo courtesy of Marlene Cameron.

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they readily produce seed, a mere handful of commercially available heuchera cultivars are propagated by seed mainly due to problems with variability. Therefore, most are produced by division, or more commonly by tissue-culture methods.

Seed propagation. Several *H. sanguinea* cultivars, such as 'Bressingham Hybrids' and 'Splendens,' are solely produced from seed. Heuchera seeds are relatively small, and multiple seeds are sown per cell. According to the *Ball Perennial Manual*, *H. sanguinea* seed germinates in 21 to 30 days at 68° to 75°F (20°-24°C) and is grown for nine to 15 weeks, depending on plug-cell size.

Plug trays of seed-propagated 'Palace Purple' often contain a mixture of seedlings with varying degrees of purple and green foliage. The green off-types must be carefully rogued, as they are not characteristic of the true cultivar form. Despite this variability, 'Palace Purple' continues to be commercially propagated by seed and from division.

Vegetative propagation. Due to the inherent variability of seed propagation, the majority of heucheras are propagated vegetatively by division or tissue culture. Heuchera crowns can easily be divided then rooted. In the garden, crowns can be divided every three to five years to rejuvenate aging plants. Many cultivars are also available as bare-root divisions that are typically potted in the fall and overwintered for spring sales.

An increasing number of specialty cultivars are propagated exclusively

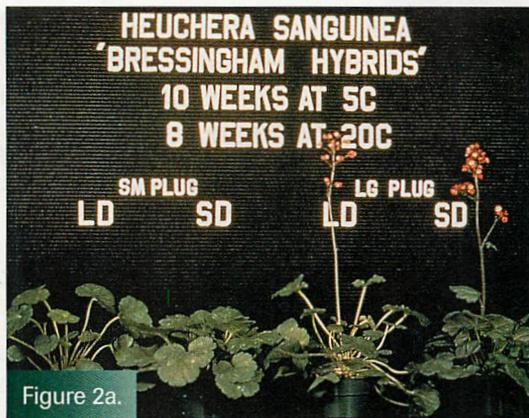


Figure 2a.

Figure 2a. 128-cell plugs of *H. sanguinea* 'Bressingham Hybrids' with six leaves failed to flower following cold treatment (left). Larger 50-cell plugs with 16 leaves flowered completely (right). Photo courtesy of Beth Engle.

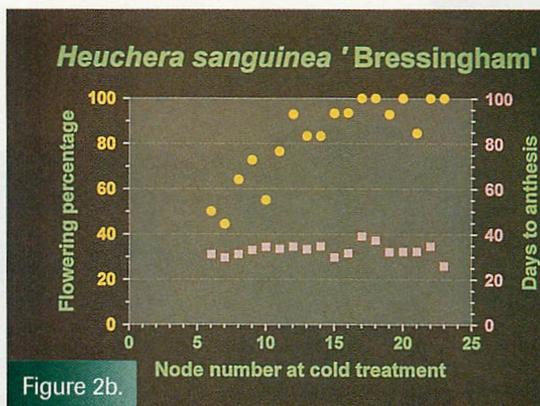


Figure 2b.

Figure 2b. The effect of leaf number at the start of cold treatment on *H. sanguinea* 'Bressingham Hybrids.' Plants with 16 to 19 leaves flowered completely while plants with fewer leaves failed to flower. Figure courtesy of Mei Yuan.

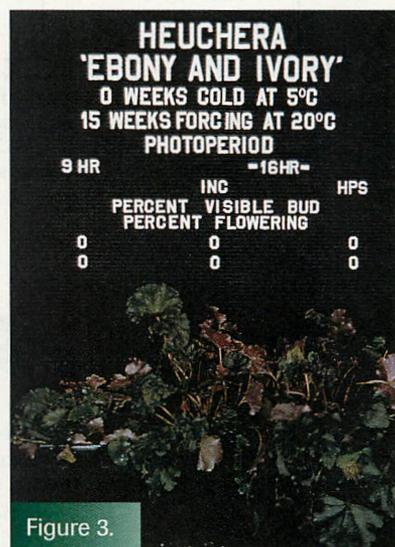


Figure 3.

Figure 3. Influence of supplemental lighting on bulking of heuchera. The addition of supplemental lighting increased leaf number for noncooled heuchera 'Ebony and Ivory' plants. Photo courtesy of Beth Fausey.

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by tissue culture. Tissue-culture propagation has enabled a large number of cultivars to become widely available to the horticulture industry in a relatively short amount of time. Although tissue-cultured plants are very uniform, they are relatively expensive compared with seedlings.

Plant Size And Maturity

Many seed- and vegetatively-propagated cultivars will not flower completely when plants are immature. The size of a plant (often determined by the number of leaves formed) can indicate plant maturity. The specific number of leaves required before plants are capable of flowering varies by species and cultivar.

'Bressingham Hybrids.' During initial studies, seed-propagated

'Bressingham Hybrids' plants from 128-cell plugs with six to seven leaves failed to flower when grown under long days (LD) or short days (SD) regardless of cold treatment. Nearly all (>90%) plants from larger 50-cell plugs with 13 to 17 leaves flowered following at least 10 weeks of cold at 41°F (5°C) (Figure 2a).

In a similar study, 128-cell plugs of 'Bressingham Hybrids' were transplanted into four-inch containers and bulked under 12-hour photoperiods until plants had eight, 12, 16, or 20

leaves. Plants were then cooled for 10 or 15 weeks at 41°F and forced under LD and SD. The juvenile phase of 'Bressingham Hybrids' ended and complete flowering occurred once plants had developed approximately 16 to 19 leaves (Figure 2b). Many plants with fewer leaves failed to flower.

Other cultivars. Although the exact leaf number required for flowering of many cultivars is unknown, low to moderate flowering percentages (0% to 70%) were achieved when seed-propagated 'Splendens' had 10 to 20

Table 1.

Heuchera Cultivar Comparisons

Cultivar	Flower and foliage characteristics	Propagation method	Recommended cold treatment duration at 41°F (5°C)	Weeks to flower at 68°F (20°C)
<i>H. sanguinea</i> 'Bressingham Hybrids'	Pastel mix of red, pink, and coral flowers above green foliage	Seed	10 weeks	5
<i>H. sanguinea</i> 'Chatterbox'	Large rose-pink flowers and green foliage	Division	12 weeks	8
<i>H. 'Champagne Bubbles'</i>	White flowers deepening to rose above green foliage	Tissue Culture	15 weeks*	5
<i>H. sanguinea</i> 'Splendens'	Salmon scarlet flowers with green foliage	Seed	Complete flowering was not achieved for these cultivars.	
<i>H. 'Cherries Jubilee'</i>	Cherry red flowers above chocolate brown foliage	Tissue Culture		
<i>H. 'Ebony and Ivory'</i>	Ivory flowers above ruffled ebony foliage	Tissue Culture		

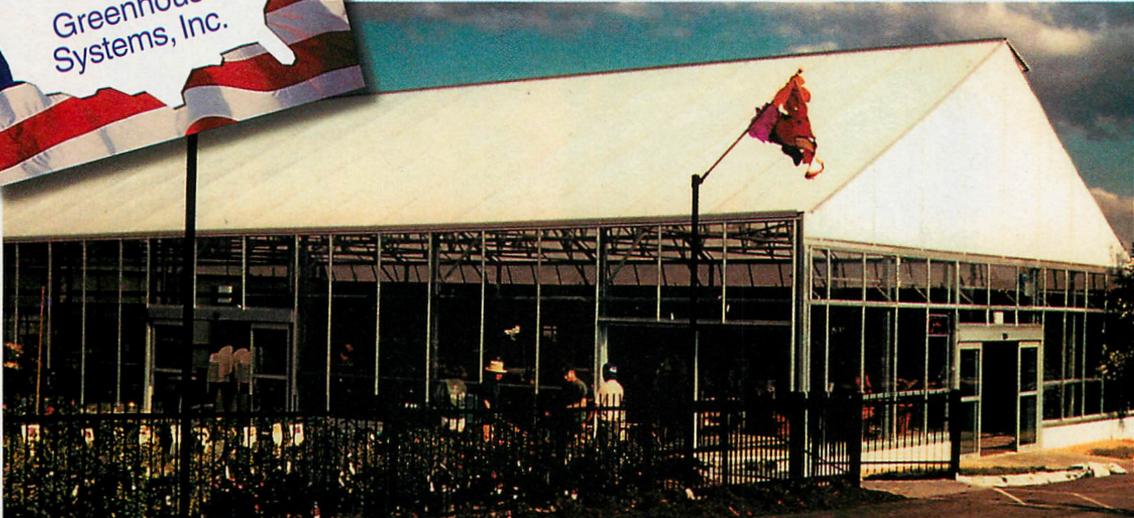
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leaves; tissue-culture propagated 'Ebony and Ivory' had 13 leaves; and tissue-culture propagated 'Cherries Jubilee' had five leaves. However, complete flowering occurred when tissue-culture propagated 'Champagne Bubbles' had as few as six leaves prior to a 15-week cold treatment.

Thus, to produce a crop of heuchera, we recommend bulking plants prior to cooling. Plants can be successfully bulked under any photoperiod although plants are more compact under SD. Photoperiod had no effect on the number of leaves formed on noncooled 'Cherries Jubilee,' 'Ebony and Ivory,' and 'Champagne Bubbles' plants without supplemental light. However, when natural light levels were low, plants grown with 500 footcandles of



Figure 4a.

Figure 4a. Noncooled *H. sanguinea* 'Splendens' failed to flower under SD and LD after 15 weeks at 68°F (20°C). Plants were grown under a nine-hour short day (SD) or two long day (LD) treatments – nine hours of natural light with night interruption lighting from 10 p.m. to 2 a.m. (NI) or extended to 16 hours (INC). Both treatments used incandescent lamps. Photo courtesy of Catherine Whitman.

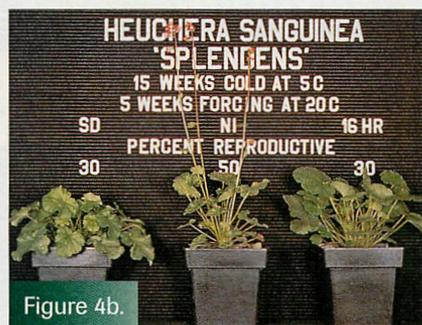


Figure 4b.

Figure 4b. Although flowering percentages were low, mature *H. sanguinea* 'Splendens' plants flowered following a 15-week cold treatment at 41°F (5°C). Photo courtesy of Catherine Whitman.

supplemental lighting produced up to twice as many leaves as those without the extra light (Figure 3).

Cold Treatment

A cold treatment has been required for flowering of all heuchera cultivars that we have studied (Figures 4a and b). The duration of cold required for complete flowering has varied from 10 to 15 weeks at 41°F, depending on cultivar. However, for several cultivars ('Champagne Bubbles,' 'Cherries Jubilee,' and 'Ebony and Ivory'), only 0 and 15 weeks of cold were tested.

When 'Bressingham Hybrids' plants with 10 leaves were cooled at -2.5°C, 0°C, 2.5°C, 5°C, 7.5°C, 10°C, 12.5°C, and 15°C (27.5°F to 59°F) for zero, three, six, 12, or 15 weeks, the greatest flowering percentage (80%) was achieved for plants cooled at 7.5°C for 15 weeks.

It should be possible to successfully cool heuchera in minimally heated greenhouses set at 32°F to 45°F. Plants

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will continue to develop during the cooling process if provided with sufficient light. A minimum of 100 to 200 footcandles provided by cool-white fluorescent lamps is needed when vernalizing plugs in coolers. Allen Pyle of Raker's Acres, a large commercial plug producer in Litchfield, MI, has achieved good flowering of 'Bressingham Hybrids' plugs with approximately 10 leaves when vernalized for 10 weeks in a greenhouse.

Photoperiod

All heuchera cultivars tested have behaved as day-neutral plants following a cold treatment; photoperiod had no effect on time to flower or inflorescence number following cold. All plants flowered under SD and LD (Figure 5), although some plants grown under LD were slightly taller (five to 10 centimeters) compared with

those grown under SD. Therefore, photoperiod manipulation is not necessary when producing heuchera.

Light Intensity

Heuchera 'Cherries Jubilee' and 'Ebony and Ivory' failed to develop deeply-colored foliage when grown under moderate greenhouse light levels of 8 to 10 mol·m⁻²·d⁻¹. Foliage color was enhanced when plants were given an average of 3 to 4 mol·m⁻²·d⁻¹

additional light from high-pressure sodium lamps when natural light levels were low. Supplemental lighting also improved flower quality and enhanced flower color of 'Cherries Jubilee' and 'Champagne Bubbles.' Therefore, when natural light levels are low, consider providing supplemental lighting to achieve maximum plant quality.

(Continued on page 61)

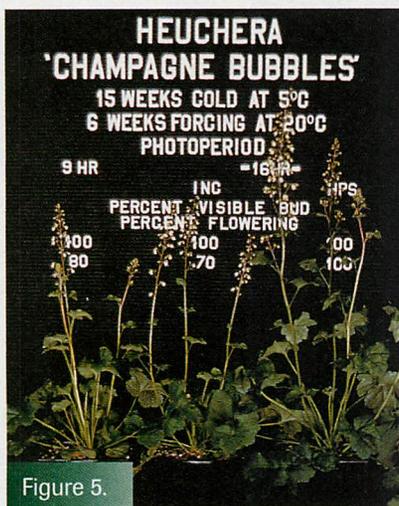


Figure 5.

Figure 5. All heuchera 'Champagne Bubbles' plants flowered in six weeks at 68°F (20°C) under both SD and LD. Photo courtesy of Beth Fausey.



Figure 6.

Figure 6. Botrytis damage to heuchera plugs during the cooling process. Fungicide applications prior to cooling are recommended to reduce losses. Photo courtesy of Beth Fausey.

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All heuchera cultivars have performed well in our experiments when grown in a well-drained, peat-based media at a pH between 5.8 and 6.2. Heuchera benefits from moderate fertility levels of 100 to 150 ppm N, 10 to 20 ppm P, and 100 to 150 ppm K delivered at each watering. Plants require adequate moisture levels to prevent marginal leaf burn under higher light intensities.

Temperature And Crop Scheduling

Garden performance of heuchera is most impressive in early to mid-summer when temperatures are relatively cool and moisture levels are consistent. All cultivars were grown at 68°F (20°C) in our trials. We recommend that heucheras be grown at cool temperatures (<68°F) for best ornamental quality, although we have not specifi-

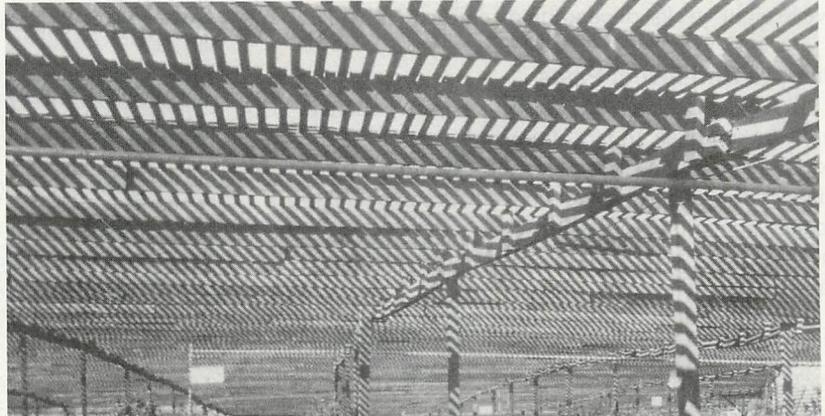
**Formula For Success:
Heuchera**

1. Seed- and vegetatively-propagated heucheras have a juvenile period. Bulk plants under natural daylengths before cooling until plants have developed more than 15 leaves. While bulking, provide supplemental lighting with high-pressure sodium lamps when natural light levels are low.
2. Once plants are mature, cool for 10 to 15 weeks at 41°F (5°C) in a minimally heated greenhouse or in a cooler with 100 to 200 foot-candles of light.
3. Before cooling, apply a fungicide to the foliage canopy to prevent Botrytis.
4. Grow plants under natural daylengths at temperatures less than or equal to 68°F (20°C). Quality will be improved if plants are provided with supplemental lighting from high-pressure sodium lamps when natural light levels are low.

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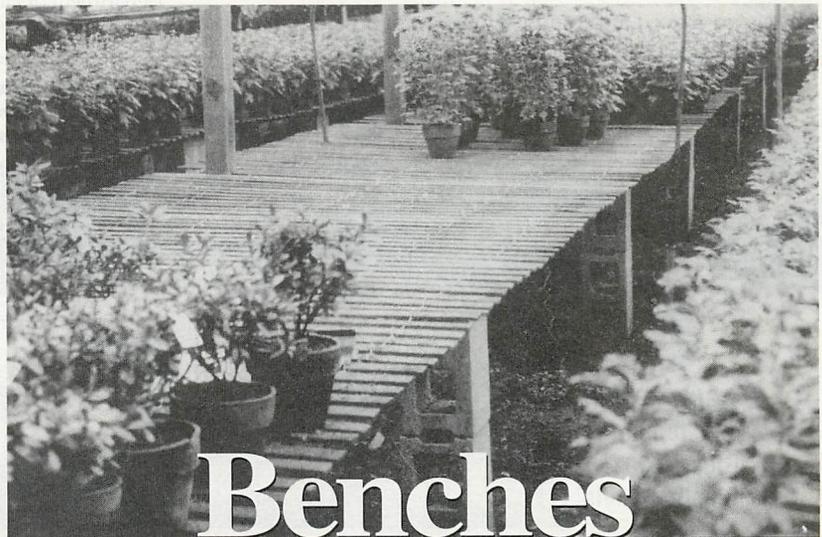
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cally tested other temperatures. Following cold treatment, flowering of all cultivars studied occurred in five to eight weeks, depending on cultivar (Table 1).

Disease And Insect Pests

We have experienced no insect pests on heuchera in the greenhouse. In fact, many cultivars show considerable resistance to spider mites, whiteflies, and slugs. In the garden, however, weevils can be a particular problem. Both the strawberry root weevil and the black vine weevil larvae infest and damage foliage stems and crowns.

Well-drained media is essential for the prevention of Rhizoctonia crown rot. Crowns are particularly susceptible to Rhizoctonia when dormant during the cooling period. Botrytis can also be problematic during vernalization because plants retain much of their foliage during the winter months. Botrytis can proliferate in dense, moist foliage canopies, resulting in substantial losses (Figure 6). A fungicide application to the foliage and crown prior to cooling plants and careful watering practices can reduce disease incidence on large plants or tightly-spaced plugs.

Postharvest Concerns

Heuchera flowers bloom up to several weeks. Flower quality is improved and longevity prolonged when plants

Table 2. **Heuchera Production Schedule**

Growing time	Cultural practice	Temperature	Photoperiod
3 to 4 weeks	Sow seeds	68°F to 75°F (20°C to 24°C)	Natural daylengths
10 to 15 weeks, depending on plug size	Bulk in plug trays	65°F to 70°F (18°C to 20°C)	
-OR-			
Purchase mature divisions or plugs			
10 to 15 weeks	Cold treatment	35°F to 45°F (2°C to 7°C)	Natural daylengths or 9 hours of light in a cooler
	Begin forcing		Natural daylengths (minimum of 500 footcandles)
	68°F (20°C) Flower in an average of 5 to 7 weeks (2 to 3 weeks from visible bud to flowering), depending on cultivar		

are grown under high light intensities. Plants can produce a second flush of flowers if cut back following first flowering.

Many heuchera cultivars are suitable for cut flower production. Inflorescences should be cut when flowers just begin to open. Silver thiosulfate (STS) followed by placement in sucrose solution effectively delays bud and flower abscission. **GG**

About the authors: Beth Fausey is a graduate student and technician, Erik Runkle is an assistant professor and extension specialist, and Royal Heins, Arthur Cameron, and Will Carlson are professors, Department of Horticulture, Michigan State University, East Lansing, MI 48824.

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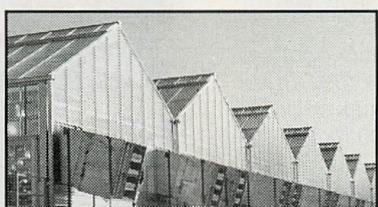


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