Keep Your Baskets Hanging

What's the best way to improve the performance of your hanging baskets? These researchers' findings should answer your questions.

by BILL ARGO and JOHN BIERNBAUM

FLOWERING hanging baskets have greatly increased in popularity because they provide a splash of color in a small space. According to USDA statistics, at least 18.7 million flowering hanging baskets were produced in the U.S. in 1989. At an average wholesale price of $5.31 per basket, that's $100.4 million in sales.

That doesn't mean that consumers are always satisfied with the hanging baskets they buy, however. A survey of consumer satisfaction with flowering hanging baskets was completed in the fall of 1990 by Mary Zahner and Dean Krauskopf for the Western Michigan Bedding Plant Association. The greatest problems the consumers cited was keeping the baskets adequately watered. Depending on the species, between 22% and 44% of the respondents indicated that their baskets had to be watered daily.

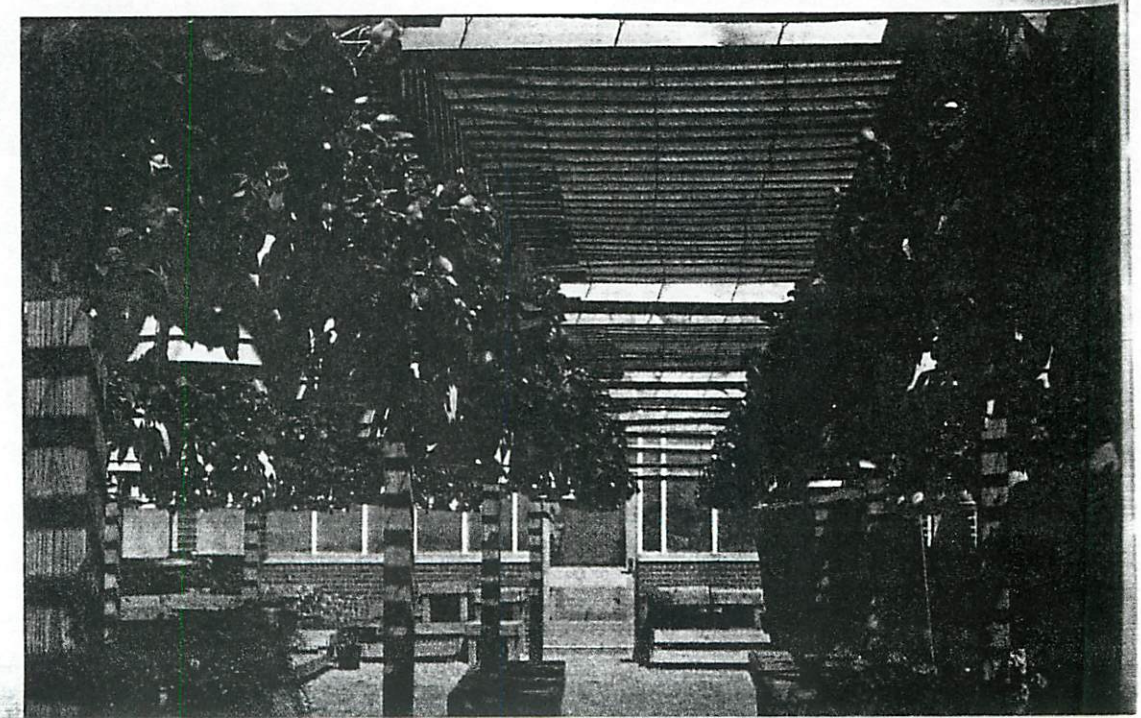
Their other complaints — yellowing with loss of foliage and discontinued flowering — are usually symptoms of low fertility. That is not surprising since 43% of those surveyed never fertilized their hanging baskets.

Consumers aren't the only ones who want longer lasting baskets. One major retailer has notified growers it will no longer accept baskets that will not last more than 1 day without water in a retail display area.

At the request of the Western Michigan Bedding Plant Association, we conducted several experiments to test whether different media components and amendments could improve the performance of hanging baskets.

The basic components tested were polystyrene, perlite, vermiculite, and rockwool mixed with Fisons Grower Grade Canadian sphagnum peat (60% peat/40% component). We also tested a superabsorbent gel as a way to extend the time between waterings. Finally, resin-coated fertilizer was compared to liquid fertilizer as a method of supplying nutrients over the life of the crop.

We used 10-inch fluted, saucerless baskets with an internal volume of 1.2 gallons. With no media, the in-



Consumers' biggest gripe about flowering hanging baskets is keeping them watered.

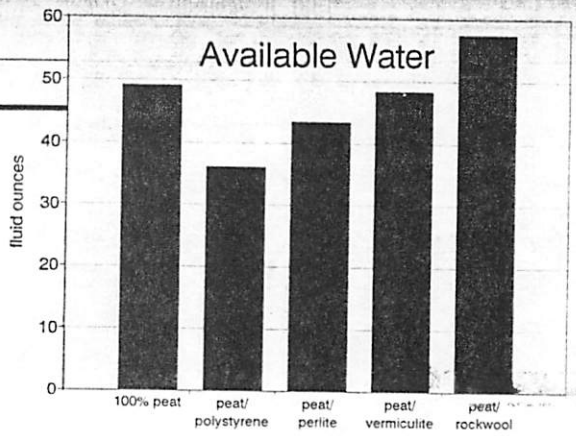


Figure 1.

Amount of available water in a 10-inch basket with mature impatiens depends on the media components.

ternal reservoir held 8.5 fluid ounces of water. These baskets were planted with impatiens, produced in a greenhouse for 65 days, and maintained outside for 80 days.

Water Holding Capacity

Available water-holding capacity is the best measure of a growing medium's ability to extend the time between watering. Available water-holding capacity was determined by first watering an established, well-rooted plant so that approximately 10% of the water leached from the basket. Once the container stopped dripping, it was weighed with a gram scale. We assumed that this was the maximum amount of water that the medium could hold in the container being used. However, normal watering does not bring some media to container capacity.

The medium was allowed to dry until the plant showed signs of wilting and then was weighed again. The difference between the watered weight and the wilt weight in grams was used as a measure of available water (Figure 1).

The peat/polystyrene medium held the least available water — about 34 fluid ounces — and went an average of 3 days between watering during the 2-month period outside. Under high water use conditions, the plants needed water in 1 day.

The peat/rockwool medium held the most available water, approximately 57 ounces. This combination went an average of 6 days between watering over 2 months. Under high water use conditions, plants needed water in 3 days.

For maximum foliar and root growth, air space must be in balance with water-holding capacity. The five basic media were determined to have between 10% and 30% air space in the 10-inch basket. Straight peat had a high level of available water but

> *"One major retailer has notified growers it will no longer accept baskets that will not last more than [illegible] without water."*

there may have been some limitation to growth due to low aeration. When mixed with peat, polystyrene produced a medium with lots of air space that is good for controlling growth and hard to overwater. Growers need to be aware that media with high water-holding capacity need to be watered less in the greenhouse. Newly planted baskets need to be watered lightly, not saturated, for the first 1-2 weeks to promote root development.

Effect On Fertilizer

With the fertilization methods used in this test, root media components had little impact on the total amount of fertilizer required. The total volume of fertilizer solution applied was measured and multiplied by the N concentration (300 ppm) to determine the total N applied.

The polystyrene medium was fertilized more often but with less volume of solution. The rockwool medium was not fertilized as many times, but more solution was applied each time. The total amount of nitrogen fertilizer applied worked out to be about the same.

What About Superabsorbents?

Superabsorbent polyacrylamide gel has been offered as an amendment that will increase the amount of water held by the media and extend the time between waterings. The cost of the gel is said to be offset by reduced watering requirements; sometimes less media is needed since the media with gel can increase in volume. The gel used in this experiment was Supersorb® C by Aquatrols.

Under the conditions of our experiment, the gel increased the average days between watering by 25%

(approximately 1 day) compared to the same four media without gel. There was no increase in the minimum days between watering under conditions of high water use. There was also no increase in the amount of available water held by the media with gel. There are at least two important factors that can help explain these results.

The first is that with our watering methods, the amount of time the gel had to absorb water was limited. Superabsorbent polyacrylamide gels can take up to 8 hours to fully expand. That would mean that only the water being held in the media after watering would be available for the gel to absorb. The lower the water-holding capacity, the less water that is available for the gel to absorb.

The greatest benefit was in the medium that already had a large amount of available water (rockwool) and the least effect in the polystryene medium. Since the gel increased the average time between watering, but not the amount of water being held by the media, the way the water was released by the media to the plant must have been different.

"Growers need to be aware that media with higher water-holding capacity need to be watered less in the greenhouse."

High salt concentration from fertilizer and/or poor water quality may also significantly reduce the amount of water that can be absorbed by the gel. Perhaps these observations explain why some growers have had success with superabsorbents, and others have not. To see the benefit of gels may require multiple or pulsed applications of water and low soluble salts.

Fertilizer Question Not Answered

We incorporated Osmocote 13-13-13 resin-coated fertilizer 8-9 months prior to planting at a rate of 7 pounds per cubic yard. Our goal was to test if the long-term release rate would extend fertilization through greenhouse and garden performance. It was shown in a separate experiment that resin-coated fertilizer at a shorter term release rate (Osmocote 14-14-14, 3-4 months, incorporated at a rate of 6 pounds per cubic yard) would last while the plant was in the greenhouse, but run out shortly after the plants were hung outside.

The resin-coated fertilizer produced slightly larger plants compared to the plants grown with water soluble fertilizer in the greenhouse. Once outside, however, these plants did not grow and declined in quality.

The plants supplied with water soluble fertilizer when needed continued to grow rapidly through the experiment. We applied liquid fertilizer every 3-4 weeks outside (300 ppm

N, ?)-10-20). On average, we applied equal amount of nitrogen with both types of fertilizer. Most likely, with the long-term release rate (8-9 months), adequate nitrogen was present, but was not released quickly enough over the 5-month period of the experiment.

The recommended rate for a greenhouse crop is 15 pounds per cubic yard. Based on previous research with impatiens, this rate seemed too high. We estimated that 7 pounds per cubic yard or a doubling of the rates used in our previous research would work. More work is needed to determine the best concentration and release rate. Either a 5-6 month formulation or formulations based on days rather than months are currently available.

Incorporating resin-coated fertilizers before planting is the easiest method of application. However, since the release rate of these types of fertilizers is solely dependent on greenhouse temperatures (which vary greatly in the spring), alternative methods like top dressing prior to shipping, need to be looked at for the post-production environment.

What About Baskets?

Conversations with growers about basket selection have elicited several opinions about whether the type of basket has any effect on available water. We have not found any growers who have actually done a careful test to measure the difference.

In one quick test at MSU, we found no difference between the media volume and water reservoir volume for a fluted saucerless basket and a rounded basket with a saucer. Take time to measure before you decide.

This spring, consumers and retailers will be looking for flowering hanging baskets that keep well in the marketplace. Make sure that those plants are yours by using this information. **GG**

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What Is The Cost?

Media costs for our treatments varied 12¢-28¢ per basket. Polystyrene is very inexpensive — about $5.40 per cubic yard. Rockwool costs about eight times more ($43 per cubic yard) or about the same as vermiculite. Rockwool or vermiculite increases the amount of water held and makes a lower maintenance plant for the retailer or the consumer.

Supersorb® C applied at the recommended rate of 1.5 pounds per cubic yard will add about 6¢-7¢ to the cost of a 10-inch basket.

Resin-coated fertilizer costs about $1 per pound. A rate of 7 pounds per cubic yard will add 45¢ to the cost of a 10-inch basket. This is about five times the cost of the same amount of water soluble fertilizer, but it is a simpler way for consumers to improve garden performance.