

TURNING PERENNIAL PENNISE

This last article in a seven-part series from Michigan State University discusses how *Pennisetum setaceum* 'Rubrum' (purple fountain grass) can be commercially grown as an indoor flowering plant that can then be moved outdoors and planted in the garden.

By Art Cameron, Beth Fausey, Bridget Behe, Kevin Kern, Liz Moore and Will Carlson

The ability to program flowering of floral crops on a certain date has been revolutionary to the floriculture industry. Poinsettias and chrysanthemums are economically significant flowering pot plant crops because breeders and researchers created a forcing program for flowering.

Growers can capitalize on the popularity of perennials by forcing them to flower on a specific date. This could lead to some garden



Photo by Beth Fausey

Pennisetum setaceum 'Rubrum' combines well with annuals and perennials in containers and garden plantings.

perennial favorites being introduced as indoor potted flowering plants.

With a grant from American Floral Endowment, researchers at Michigan State University investigated postharvest life and garden performance of programmed herbaceous perennials. The study was developed to provide garden performance data that growers and retailers could use to help them properly value and price products, while providing information on the post-sale nature of the plants. Specific objectives were to quantify performance of programmed perennials as indoor potted plants followed by their performance in the garden and compare this to perennials grown and transplanted in a more traditional manner.

Production and postharvest treatments

Eleven perennial species were included in this study based on their popularity and successful programming qualities. *Pennisetum setaceum* 'Rubrum' (purple fountain grass) was programmed to flower in spring 2000 and evaluated for one season. Plants were also forced in

Photo by Art Cameron



Its deep-burgundy foliage and attractive flowers make *Pennisetum setaceum* 'Rubrum' a warm-season grass that has become a favorite of both Southern and Northern gardeners.

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2001, planted outdoors weekly for a four-week period, and evaluated for one season.

'Rubrum' is a tender warm-season grass that has long been planted in Southern gardens. Though hardy only to USDA Hardiness Zone 9, 'Rubrum,' when sold in flower, has captured the hearts of Northern gardeners. The plant makes a fantastic accent in a container planting or in the garden.

In 2000, plants were forced to flower in the greenhouse with half of the plants programmed to flower on May 15, and the remaining half programmed to flower on June 1.

An additional 10 plants were used as a comparison or control group to the programmed plants and were grown in a 62°F greenhouse with natural light. All plants programmed to flower on May 15 were subjected to a postharvest treatment consisting of a three-day shipping simulation where plants received no water or light followed by two weeks of in-store display simulation where plants were held at 72°F under fluorescent lights. The postharvest treatment ended when the remaining group of forced plants flowered on June 1.

In 2001, plants were forced to flower and planted directly outdoors without postharvest treatment or foliage removal.

All plants that were forced to flower in both years were installed on 1-foot centers in full-sun beds with sandy-loam soil on the Michigan State University campus. Typical landscape maintenance activities were performed including weed removal, supplemental irrigation and mulching. A slow-release fertilizer was applied at planting followed by an additional application in the second year. 'Rubrum' requires relatively little supplemental water when planted in the Michigan landscape.

Indoor postharvest performance

Indoor postharvest performance was monitored for 14 days by measuring flower and plant quality. Overall, 'Rubrum' plants performed well in the postharvest environment. At room temperature (72°F) and under light levels that would

be encountered indoors, 'Rubrum' grows quickly.

Newly developed growth and flowers lacked pigmentation and were green in comparison to the purple growth that developed in the greenhouse. In some cases, flowers did not fully emerge from buds but overall remained ornamental and did not detract from plant quality.

We are testing plant growth regulator applications to limit the amount of new growth during shipping, retail display and indoor use. Plants are fairly drought tolerant, and overall appearance in postharvest conditions should remain acceptable for at least two weeks.

Garden performance

Garden performance data were collected in 2000 on several key features of the plant including flower, foliage and overall plant quality. Quality data were rated on a five-point scale and were based on All-America Selections' standards (5=excellent, 4=good, 3=average, 2=poor, 1=unacceptable).

Plants cut back at planting in 2000 took approximately six weeks to reflower in the garden, and many of the plants failed to flower by the end of summer. Plants that underwent the postharvest treatment, but did not have their foliage removed at planting, also took several

When planted in flower, *Pennisetum setaceum* 'Rubrum' will bloom throughout summer until first frost.



Photo by Art Cameron

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Pennisetum setaceum 'Rubrum'

PRODUCTION SCHEDULE

Schedule date	Production activity
Week 52	Bring in stock material from field, other propagator or own production area. Follow protocol for receiving material in the research greenhouses, which includes: <ul style="list-style-type: none"> • Spray with 8 ounces of Avid per 100 gallons. • Drench with Marathon 60WP. • Drench with 8 ounces Truban/Cleary's 3336 per 100 gallons.
Week 52	Divide stock plants into two- or three-tiller (shoot) divisions and cut back shoots to 6 inches. Cut back roots as well, leaving 2-3 inches of actively growing root intact.
Week 52	Stick divisions into 38-cell plug trays using a peat-based growing mix. Place under short days. Maintain temperature at 73°F.
Week 9	Transplant one rooted plug per 5½-inch pot using a high-porosity growing mix. Place under 14-hour photoperiod or longer for nine to 10 weeks. Maintain 68°F average daily temperature.
Week 52-18	Begin an adequate application of fertilizer at each watering. Maintain growing medium pH between 5.8-6.2 and electrical conductivity between 0.5-0.8 (EC measured using 2:1 distilled water:media method). Adjustments may be made, depending on plant performance. Plant growth can be graphed weekly along with pH* and EC.**
Week 52-18	Monitor for insect and disease problems. Use yellow sticky cards. Treat with appropriate insecticides if: <ul style="list-style-type: none"> • Five thrips are found on one card in one week. • Whiteflies are found on one card in one week. • Five leaf miners are found on one card in one week. • Any aphids are found in the greenhouse. Every month, drench plants with a preventive fungicide treatment.
Week 52-18	Plot graphs of plant height vs. week number to monitor growth. Apply Sumagic as needed for height control. Research has shown 5 ppm of Sumagic applied as a foliar spray three weeks after planting is effective. Additional 5 ppm Sumagic applications can be made if needed.
Week 18	Ship to market.

* pH was controlled by incorporating sulfuric acid into the irrigation water. Water pH was kept between 5.8-6.2. The growing media pH was controlled mainly by this method.

** EC was controlled by altering fertilizer concentrations. If the EC was lower than 0.5, fertilizer was applied on the higher end of the 100-200 parts per million range. If the EC was higher than 0.8, fertilizer was applied on the lower end of the 100-200 ppm range, depending on how much greater the value is than the target value of 0.8.

Photo by Beth Fausey



Beige inflorescences tinged with red contrast dramatically with deep-burgundy foliage.

weeks to recover once planted outdoors.

Etiolated growth that developed on plants during the postharvest treatment turned purple when planted in full sun outdoors. Foliage and overall plant quality of all treatments peaked for several weeks at the end of July through the first few weeks of August.

'Rubrum' is sensitive to temperatures below 50°F and can be quickly killed by frost injury. Recovery of cold-damaged plants can take several weeks. In Michigan, we strongly advise that 'Rubrum' be planted outdoors after June 1, essentially at the same time as tomatoes and other crops sensitive to chilling injury.

When placed outdoors in June, 'Rubrum' planted in full flower performed very well in the garden and bloomed continuously throughout the summer until first frost. When planted in the garden without flowers, 'Rubrum' requires several weeks to produce the first bloom.

Marketability

With deep-burgundy foliage and soft-beige plumes, *Pennisetum setaceum* 'Rubrum' is a dramatic, eye-catching ornamental grass that will sell itself in a retail setting. Challenges in producing and marketing 'Rubrum' lie in maintaining the burgundy foliage color and overall plant compactness during shipping and retailing.

Although mature plants form compact clumps 2-3 feet tall and wide, 'Rubrum' can be successfully grown and forced to flower in any size container. It will flourish and flower in 4-inch to 5-gallon or larger containers, although plant size is greatly restricted in smaller containers resulting in shorter, more compact plants.

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