

FORCING PERENNIALS

– Crop By Crop –

Species: *Sedum spectabile* x *telephium* 'Autumn Joy'

Common name: Sedum 'Autumn Joy'

Editor's note: Michigan State University and GREENHOUSE GROWER bring you our second series on forcing perennials. This group of articles will be bound into another GG Plus booklet: Firing Up Perennials II. Part nine of the series features sedum 'Autumn Joy.'

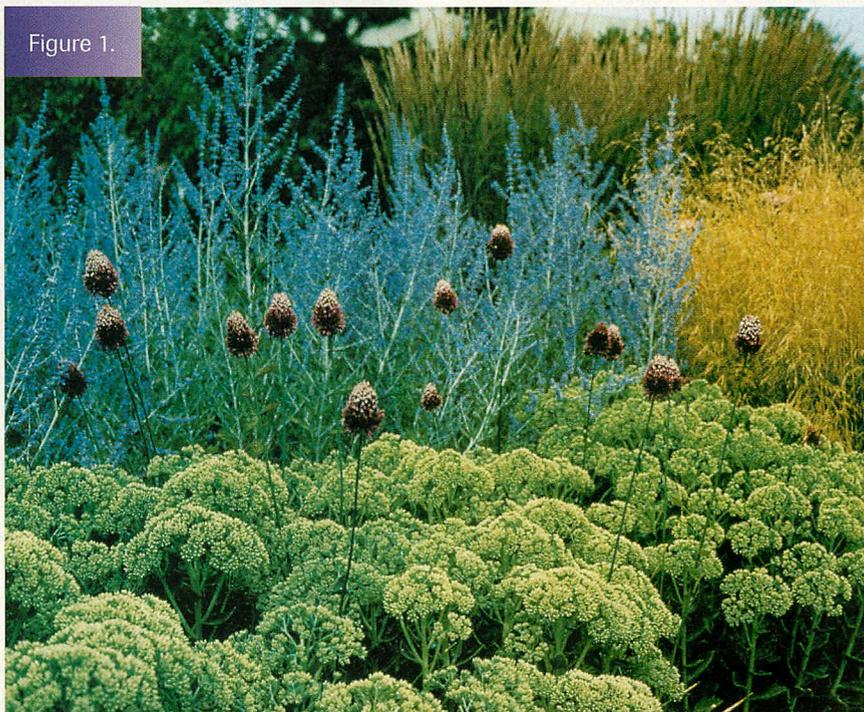


Figure 1. Sedum 'Autumn Joy' is a great garden plant that combines well with a range of textures and colors. Photo courtesy of Laura Coit.

by LOUIS E. SMITH, PAUL KOREMAN, ALISON FRANE, ROYAL D. HEINS, ARTHUR CAMERON, and WILL CARLSON

THE succulent dark green leaves and delicate pink flowers of sedum 'Autumn Joy' have made this tough, drought-resistant, and easy-to-grow

plant a favorite with gardeners throughout the world. It fits nicely into rock gardens, as an edging, or as a border plant (Figure 1) and has great potential for both spring and fall sales (Figure 2).

This perennial will grow in climates ranging from USDA zones 3 to 10 and is winter hardy to -40°F (-40°C).

Sedum 'Autumn Joy' will grow 12-36 inches tall in full sun or partial shade.

Sedum 'Autumn Joy' is part of the Crassulaceae or Stonecrop family. Originally the result of a cross between *S. spectabile* and *S. telephium*, 'Autumn Joy' is commonly listed as a cultivar of *S. spectabile*. It naturally blooms from late summer until early

PRODUCTION

FORCING PERENNIALS

fall, giving the garden a wonderful last splash of color at season's end.

In early to midsummer, the flower buds have a delightful broccoli-like appearance, with clusters approximately 3-4 inches across. By mid-August, the flower buds swell and develop a light pink color that deepens as the flowers open.

As the flower clusters mature, they become a brick red color and eventually dry to a nice dark wheat in the beginning of winter. The dried flower heads are present throughout the winter season, which make for great winter interest.

A true perennial, sedum 'Autumn Joy' persists for decades – even in abandoned gardens. Plants form thick root masses from which the new shoots grow. This root mass spreads, slowly increasing the width of the plant every year.

The plants do not need any division to maintain their appearance. But for propagation purposes, the plants can be divided in either the fall or spring.

Sedum is a large group of plants, many of which have ornamental value. Some of the more closely related plants include: sedum 'Brilliant,' with light pink flowers, *Sedum maximum* 'Atropurpureum,' with dark purple foliage, and the more compact sedum 'Vera Jameson.'

Our research has principally focused on sedum 'Autumn Joy,' so the following tips may not work for other sedum.

1. Propagation

Sedum 'Autumn Joy' is a sterile plant, so it must be asexually propagated. In the garden, this can be accomplished by dividing the root mass in the fall or spring. Commercially, sedum 'Autumn Joy' is propagated via tip or leaf/stem cuttings during the growing season.

Terminal cuttings taken in May or later already contain flower buds, and these flowers continue to develop during the rooting process. Leaves and subterminal cuttings also root easily but do not immediately develop flowers. Therefore, when mixed cuttings are used, plugs can be quite variable.

It is fairly easy to produce high-quality plugs of sedum 'Autumn Joy.' Tip-cuttings should be stuck in plug trays with a well-drained plug medium and rooted under light mist for 2 weeks at 78°F (25°C).

Figure 2.



Figure 2. Sedum 'Autumn Joy' makes a wonderful potted plant, shown here in a 5-inch square pot.

Figure 3.



Figure 3. Sedum 'Autumn Joy' requires a photoperiod of 16 hours or longer for fastest flowering, but a 4-hour night interruption is as effective as a 16-hour photoperiod for flower initiation and development. Plants grown under 14-hour photoperiods have an extended vegetative phase before flowering.

The plugs can be hardened off for 1-2 weeks before transplanting or cold storage. Vegetative cuttings root more quickly than reproductive cuttings, produce a higher number of longer, healthy roots, and yield an even, consistent crop.

Keeping the stock plants under a 14-hour photoperiod is one way to increase the number of vegetative cuttings because more vegetative growth develops before the plants become reproductive. Under longer photoperiods, the plants will be induced to flower in about 3 weeks (Figure 3).

But even under 14 hours, sedum 'Autumn Joy' will initiate flower buds after 100 days at 68°F (20°C) if plants are left to grow without taking cuttings.

Buds arising at the base of the stems after flowering make excellent propagules. These plantlets can be removed in mid to late fall and stored for months at 28°F (-2°C) in plastic bags to prevent desiccation.

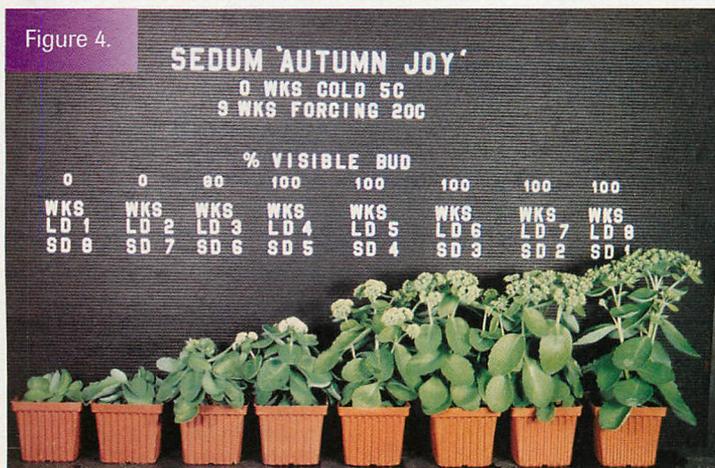


Figure 4. Sedum 'Autumn Joy' plants were forced under long-day durations (LD) varying from 1 week to 8 weeks, then switched to 9-hour short days (SD) until flower. S. 'Autumn Joy' initiated flowering with as few as 3 weeks of LD.

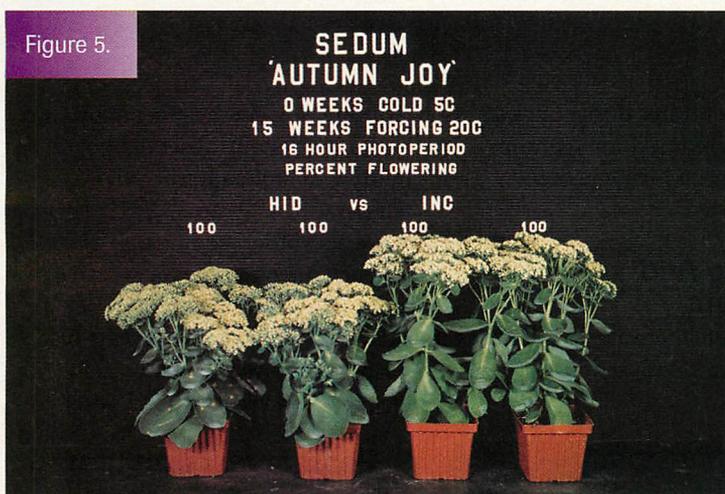


Figure 5. Comparison of plants grown with 9 hours of high-intensity lighting provided by high-pressure sodium (HPS) lamps and those grown with 16 hours of high-intensity lighting. Plants grown under 9 hours of light from HPS lamps and 7 hours of low-intensity lighting from incandescent bulbs were taller and faster to flower. Plants grown under 16 hours with HPS lamps were darker green with smaller leaves and brighter pink flowers.

2. Plant Size

Juvenility has not been a problem for us in flowering sedum 'Autumn Joy.' All rooted cuttings have flowered under long-day conditions, regardless of starting size.

Sedum 'Autumn Joy' is well-suited for a 5-inch pot with one plug per pot. It also can be an attractive plant in a 1-gal- lon pot using three plugs per pot or a bare-root plant.

3. Photoperiod

For rapid and uniform flowering, sedum 'Autumn Joy' is an obligate long-day (LD) plant and flowers similarly with or without a cold treatment. Plants forced under photoperiods of 10, 12 or 13 hours had very little growth and remained in a rosette form (Figure 3). All plants grown under photoperiods

of 14, 16, or 24 hours or a 4-hour night interruption (NI) from 10 p.m. to 2 a.m. flowered.

The most rapid flowering (30-35 days for flower bud initiation) occurs when the plants are placed under a 16-hour or longer photoperiod or a 4-hour night interruption (Figure 3). As the daylength increases, the time to flower decreases, and the final number of inflorescences slightly increases.

Either high-pressure sodium (as a 16-hour day-extension) or incandescent lamps (as either a 16-hour day-extension or a 4-hour NI) successfully promoted flowering for sedum 'Autumn Joy.' We recommend 16-hour day-extension lighting or a 4-hour NI for consistent and uniform flowering.

Time to flower and height can be reduced by moving the plants after flower initiation from LD to short days (SD). We forced plants under a 4-hour night interruption LD for 1-8 weeks and then switched the plants to a 9-hour SD until they flowered.

The fastest combination – 4 weeks of LD followed by about 5 weeks of SD – reduced the time to flower by more than 2 weeks and plant height by nearly half (Figure 4). Providing 5 weeks of LD before transferring to SD reduced time to flower by 8-10 days and plant height by 2-3 inches.

4. Lighting And Spacing

Sedum 'Autumn Joy' thrives when it is grown under high-light conditions in the garden. The quality of greenhouse-grown plants is dramatically improved during the winter months when they are grown with 16 hours of supplemental lighting with HID lamps at 400-500 footcandles (Figure 5).

But supplemental lighting may be cost prohibitive. Sedum 'Autumn Joy' is a good candidate for summer production, since plants will benefit from the naturally high light levels.

The spacing of sedum 'Autumn Joy' should be wide enough to allow for light to penetrate into the lower part of the plant. This should reduce stretching and minimize disease. Spacing 5-inch pots on 7-inch centers and 6-inch pots on 8-inch centers works well.

5. Media, Fertilization, And Irrigation

In the garden, sedum 'Autumn Joy' tolerates poor soil and some drought stress. Commercially, it grows best in well-drained, evenly moist soil with a pH range of 5.5-6.0. A constant feed of 100 ppm of a balanced fertilizer such as 20-10-20 is adequate for good growth.

Although sedum 'Autumn Joy' should not be overwatered, we did not observe crown or root rot during our experiments.

6. Plant Height Control

In our greenhouse environment, sedum 'Autumn Joy'

Table 1.

***Sedum spectabile* x *telephium* 'Autumn Joy' Production Schedule**

Growing time	Cultural practice	Temperature	Photoperiod
	Stock plant growth	68°-74°F (20°-23°C)	14 hours of light or natural days
2-4 weeks	Take cuttings ↓ root	Media temperature 78°F (25°C)	14 hours of light
- OR - Purchase plugs			
	Begin forcing		≥ 16 hours of light or a 4-hour night interruption
↓ ↓ ↓ ↓ ↓	↓ ↓ 68°-74°F (20°-23°C) Flower in 12 weeks	↓ ↓ ↓ ↓ ↓	Number of days from visible bud to flower 64°F (17°C) - 58 days 68°F (20°C) - 52 days 74°F (23°C) - 49 days 84°F (29°C) - 54 days
64°F (17°C) Flower in 13 weeks		84°F (29°C) Flower in 13 weeks	

grew 12-14 inches under LD greater than 16 hours or a NI. Under 14 hours, the plants will grow much taller before flowering (Figure 3).

Height control has not been a major concern in our studies. To encourage branching and keep a crop at an even, attractive height, a hard pinch 4 inches (10 centimeters) above the pot 4 weeks after the start of forcing produced excellent plants that averaged 14 inches (35 centimeters) tall. Flowering was delayed about 4 weeks.

The onset of SD after flower initiation also can reduce final plant height (Figure 4). In fact, 6-inch tall plants can be produced that would be saleable in a 2¹/₂-inch pot by using only 4 weeks of LD followed by 4-5 weeks of SD. These compact plants could be an interesting product for unique markets.

7. Temperatures And Crop Scheduling

Under long-day conditions, average daily temperatures in the 64°-84°F (17°-29°C) range did not greatly influence flower development.

The time to flower was about 12 weeks at 68°-74°F (20°-23°C) and 13 weeks at 64° and 84°F, respectively.

Plant height and general plant quality were largely unaffected by production temperatures. Using specific pro-

duction temperatures doesn't appear to be as critical for sedum 'Autumn Joy' as it has been for some of the other perennials.

8. Disease And Insect Pests

In the garden, there are few diseases or pest problems with sedum

'Autumn Joy.' In the greenhouse, we have occasionally observed powdery mildew in high humidity and cool temperatures.

We also observed one case of *Rhizoctonia* on the lower stems of the plant. When sedum 'Autumn Joy' stems were harvested from the field, thrips were present. In the greenhouse, we have observed no other pests.

9. Postharvest Concerns

Sedum 'Autumn Joy' can be shipped at any stage of development, but plants are most attractive just as the first flowers are opening. The plants will continue to bloom for at least 2 weeks.

After all the flowers have opened, the plants will still be attractive as the flowers darken during maturation. Sedum 'Autumn Joy' is very drought-tolerant and should withstand a range of retail conditions. They can even survive a Michigan winter outdoors in a 5-inch container – as we learned by accident. This tough plant definitely deserves its place in the garden. **GG**

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Formula For Success:

Sedum 'Autumn Joy'

1. Grow individual plants in a 5- or 6-inch pot (one plant per pot) or a 1-gallon pot (three plants per pot).
2. Use uniform plugs for a more uniform crop.
3. Provide plants with a long-day treatment by natural or extended photoperiods of 16 hours or by night interruption from 10 p.m. to 2 a.m. with a minimum light intensity of 10 foot-candles.
4. Force in the summer or consider providing supplemental lighting from high pressure sodium lamps during the dark winter months to increase branching and overall plant quality.
5. When possible, shift plants to short days after flower buds are visible to reduce the time to flower and plant height.