GrowerFacts

Kieft-Pro-Seeds

PowWow™ Echinacea

E. purpurea
Approximate seed count (raw): 7,400-7,600 S./oz. (260-270 S./g)

Key flowering facts:

- First year-flowering perennial.
- Photoperiod response: intermediate-day plant will flower most rapidly and uniformly at 13-14 hours daylength.
- Vernalization: not required but beneficial as flowering will occur two to three weeks earlier following a minimum of ten weeks cold treatment.
- Flower timing:
  - Sown in January as Spring production will flower naturally in middle to late June.
  - Sown from July to early September for overwinter production; will flower late May to early June of the following year.

Plug Production

Media

Use a well-drained, disease-free, soilless media with a pH of 5.8 to 6.2 and a medium initial nutrient charge (EC 0.75 mmhos/cm).

Sowing

Sow 1 seed per cell in 288 or larger plug tray. In Europe, 264-cell trays can be used. Covering seed with vermiculite is recommended.

Stage 1 – Germination begins at day 4-5 continuing through day 14
Soil temperature: 71 to 76°F (21 to 24°C)
Light: Optional.
Moisture: Keep soil wet (level 4) during Stage 1.
Humidity: Maintain 95%+ relative humidity (RH) until radicles emerge.

Stage 2
Soil temperature: 71 to 73°F (21 to 22°C)
Light: Up to 2,500 f.c. (26,900 Lux)
Moisture: Reduce soil moisture slightly (level 3 to 4) to allow the roots to penetrate into the media.
Fertilizer: Apply fertilizer at rate 1 (less than 100 ppm N/less than 0.7 mS/cm EC) from nitrate-form fertilizers with low phosphorous.

Stage 3
Soil temperature: 68 to 70°F (20 to 21°C)
Light: Up to 2,500 f.c. (26,900 Lux)
Moisture: Allow media to dry further until the surface becomes light brown (level 2) before watering. Keep the moisture level to wet-dry cycle (moisture level 4 to 2).
Fertilizer: Increase fertilizer to rate 2 (100 to 175 ppm N/0.7 to 1.2 mS/cm EC). If growth is slow, apply a balanced ammonium and nitrate-form fertilizer with every other fertilization. Maintain medium pH of 5.8 to 6.2 and EC between 1.0 and 1.5 mS/cm (1:2 extraction).
Growth Regulators: Generally not needed

Stage 4
Soil temperature: 65 to 67°F (18 to 19°C)
Light: Up to 5,000 f.c. (53,800 Lux) if temperature can be controlled.
Moisture: Same as Stage 3.
Fertilizer: Same as Stage 3.

Growing On to Finish

Container Size

4.5-in. (11-cm) square/quart pots: 1 plug per pot
6-in. (15-cm) or gallon (18-cm) pots: 1 plug per pot

Media

Use a well-drained, disease-free, soilless media with a pH of 5.5 to 6.2 and a medium initial nutrient charge (EC 0.75 mmhos/cm). For overwinter production, bark media is recommended for better drainage purpose to protect plants from root rot due to too wet.

Temperature

Nights: 50 to 60°F (10 to 15°C)
Days: 60 to 75°F (15 to 24°C)

Note: To keep plant growing, keep daily average temperature above 55°F (13°C). Otherwise, plants will stop growing.

Light

Maintain light levels as high as possible while maintain moderate temperature.

Photoperiod
It is an intermediate-day plant and flowers most rapidly and uniformly at 13-14 hours daylength. Under daylength 12 hours or shorter, flower can be initiated but will not elongate and develop more slowly. Daylength 16 hours or longer including night interruption causes flowering sporadically or unpredictably. **When forcing crop, use 14 hours instead of 16 hours daylength or night interruption to promote flowering.**
Once plant has begun to flower, it will keep blooming regardless of the daylength.

Irrigation
Maintain media moisture. Avoid both excessive watering and drought.

For overwinter production, keep plants on the dry side during cold period as overwatering could result in plant loss from root rots.

Fertilizer
Apply fertilizer at rate 3 (175 to 225 ppm N/1.2 to 1.5 mS/cm) using predominately nitrate-form fertilizer with low phosphorus and high potassium. Maintain the media EC at 1.5 to 2.0 mS/cm and pH at 6.0 to 6.5.

For constant fertilizer program, can apply fertilizer at rate 2 (100 to 175 ppm N or 0.7 to 1.2 mS/cm) while maintaining the above recommended EC and pH ranges.

Growth Regulators
For height control: Echinacea is responsive to tank mix of B-Nine/Alar (daminozide) 2,500 ppm (3.0 g/l 85% formulation or 4.0 g/l of 64% formulation) mixed with Cycocel (chlormequat) 500-750 ppm (4.2-6.4 ml/l 11.8% formulation or 0.67-1.0 g/l of 75% formulation). PGR application can be applied at the point when stem starts elongation, about 4 weeks after transplant. If necessary, repeat the application two weeks later.

Optional PGR treatments: 1-2 applications of B-Nine at 3500 to 5000 ppm (4.1-5.9 g/l 85% formulation or 5.8-7.8 g/l of 64% formulation) or Sumagic (uniconazole) at 20 ppm (36.4 ml/l 0.055% formulation) spray also work well.

Note: Higher PGR rates may cause plant height to be less uniform. It is recommended using lower rate with multiple applications.

For branching: Configure (active ingredient N-phenylmethyl-1H-purine-t-amine, commonly called benzyladenine or 6-BA) will promote echinacea branching. Configure can be applied at 300ppm two weeks after transplanting and repeated two weeks later.

In northern Europe conditions: 3,200 ppm B-Nine/Alar (3.8 g/l 85% formulation or 5.0 g/l of 64% formulation) works well.

Pinching
Pinching is not needed.

Spacing
Space plants when foliage is touching.

Crop Scheduling

Sow to transplant (288 cell plug): 5 to 6 weeks

Transplant to flower: 13 to 17 weeks
Under proper daylength and temperature range from 60°F (15°C) to 68°F (20°C)

Total crop time: 18 to 23 weeks
Under proper daylength and temperature range from 60°F (15°C) to 68°F (20°C)

Spring Production: Sow in January for natural flowering in middle to later June.

Note: Since daylength of 16 hours or longer will cause non-uniform flowering (see photoperiod section), please refer to the following sowing schedule for different regions to insure uniform flowering:

Recommended Sow Dates:
Latitude lower than N35^{o}: no limits
N36^{o} – N40^{o}: no later than week 9
N41^{o} – N45^{o}: no later than week 8
N46^{o} – N50^{o}: no later than week 7
N51^{o} – N55^{o}: no later than week 6

When sowing later than the latest sowing date above, treat the plants with short day (10 hours) for about 6 weeks after transplanting for flower uniformity.

Overwinter Production: Sow in July to early September for natural flowering later May to early June of the following year.

Note: Plants from overwinter production will flower slightly earlier than spring production with better branching and shorter flower stems.

Common Problems
Insect: Aphid, Fungus gnat, etc.
Disease: Powdery Mildew

Garden and Landscape Information

- PowWow Echinacea is first year-flowering perennial in USDA Hardiness Zones 4 to 10.
- Plant in full sun after all danger of frost has passed.
- Space plants at 12 to 18 in. (30 to 45 cm) apart in well-drained soil.
- After plants are established, PowWow echinacea is quite drought tolerant.
- Garden height is shorter than other seed propagated echinacea at 16 to 20 in. (40 to 50 cm) tall and a spread of 20 to 22 in. (50 to 55 cm) in the first year.

Note: Growers should use the information presented here as a starting point. Crop times will vary depending on the climate, location, time of year, and greenhouse environmental conditions. Chemical and PGR recommendations are only guidelines. It is the responsibility of the applicator to read and follow all the current label directions for the specific chemical being used in accordance with all regulations.

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