

Butterfly F₁ Series Pentas

Versatile, Large-Flowered Series Is Great for the North

■ The first F₁ hybrid pentas on the market, the **Butterfly** series is superior to other commercial seed varieties available today: **larger flowers** and umbels, **withstands stressful conditions**, and shows off **better garden performance**. With its hybrid vigor, the **Butterfly** series offers a whole **new opportunity for northern growers and gardeners**.

■ Growers will find the versatility of **Butterfly** pentas a production “plus” – plants can be grown and marketed in **4-in. (10-cm) pots, up to 1 to 2-gallon containers (8 to 10-in. / 20 to 25-cm standard pots)**. This is a series that can definitely command a premium price!

■ **More vigorous and better matched** than the current market standard, **Butterfly** pentas stand out in both **northern and southern gardens**. Trials show **Butterfly** plants to be about 20% larger in 4-in. (10-cm) pots.

■ Outdoors, **Butterfly** pentas grow into a **much larger and fuller plant** – in just 4 weeks, they can be double the size or more of the competition. With their faster growth rate and better “fill power,” southern plantings of **Butterfly** pentas have produced plants 4 to 5 times larger.

■ The **Butterfly** series is well-named for its ability to **attract butterflies and hummingbirds** – the large, star-shaped flowers on large umbels up to 3 in. (7 cm) across are the perfect resting and dining location. Consumers will appreciate this wherever they place **Butterfly** pentas – they perform well in garden beds and containers.

■ **Butterfly** pentas are available as pelleted seed. Order today! Contact your local distributor or call PanAmerican Seed at 800 231-4868 for ordering information.

P. lanceolata

Approximate pelleted seed count: 31,900/oz. (1,125/g)

Plug Production

Plug Tray Size

Butterfly pentas plugs are best produced in 392/406-cell or larger plug trays.

Sowing

Use a well-drained, disease-free seedling medium with a pH of 6.5 to 6.8 and EC about 0.75 mmhos/cm (1:2 extraction). Do not cover the seed.

Temperature

Germination: 74 to 80°F (23 to 26°C)

Cotyledon emergence: 68 to 72°F (20 to 22°C)

True leaf expansion: 65 to 68°F (18 to 20°C)

Plugs may be held at 60 to 65°F (15 to 18°C) from maturity until transplant.

Light

Light during germination (10 f.c./100 Lux) will improve germination uniformity and seedling quality. Pentas have high light requirements. Seedlings must receive higher light levels immediately after germination to avoid elongation and promote rapid growth. After germination, maintain light levels between 1,000 and 2,500 f.c. (10,000 to 30,000 Lux). As seedlings mature, light levels may be increased up to 5,000 f.c. (54,000 Lux) if temperature is controlled.

Humidity

Maintain 100% relative humidity until cotyledons emerge. Avoid keeping the flats wet. Reduce the humidity to 50% as plugs mature to control foliar diseases.

Fertilization

Fertilize with 50 ppm nitrogen from 15-0-15 or 15-5-15 as soon as radicles emerge. When cotyledons expand, increase fertilization to 50 to 75 ppm nitrogen. Use 20-10-20 with every other fertilization only if growth slows. During Stage 3, increase fertilizer to 100 to 150 ppm to promote rapid plug growth. Maintain medium EC between 1.0 and 1.5 mmhos/cm (1:2 extraction). If the pH drops below 6.0 in the soil, plants will show severe iron toxicity and growth will slow or stop. Periodic feedings with CaNO₃ will help avoid pH drop.

Growth Regulators

Control plug growth first by environment, nutrition management and irrigation management (keep plants on the dry side). Minimize phosphorus fertilizer to avoid elongation of seedlings. Temperature differential (DIF) can also be used to minimize height. If necessary, Cycocel spray can be applied at 500 ppm about 5 to 6 weeks after sowing.

Growing On to Finish

Container Size

Butterfly pentas are well-suited to 4-in. (10-cm) pots up to 1 to 2-gallon containers. Use 1 plug per 4-in. (10-cm) pot, 1 to 2 plugs per 6-in. (15-cm) pot, and 2 to 3 plugs per 1 to 2-gallon container.

Media

Use a well-drained, disease-free soilless medium with a medium initial nutrient charge and a pH of 6.5 to 6.8. If the pH drops below 6.0, severe marginal burn of leaves due to iron toxicity may occur and plants will stop growing.

Temperature

Butterfly pentas benefit from warm temperatures and high light conditions. Maintain minimum night temperatures of 62 to 65°F (17 to 18°C) and minimum day temperatures of 72 to 75°F (22 to 24°C).

Light

Keep light levels as high as possible to promote compact growth. **Butterfly** pentas will tolerate higher temperatures than other crops.

Humidity

Maintain low relative humidity during production to reduce foliar diseases.

Water

Avoid both excess watering and drought, which will stress the plants and cause severe yellowing and necrosis.

Fertilization

Fertilize every irrigation at 150 to 250 ppm with 15-0-15 or 15-5-15; apply 20-10-20 as needed to promote leaf expansion. Maintain medium EC around 1.0 mmhos/cm (using 1:2 extraction).

Growth Regulators

Effective height control of **Butterfly** pentas can be accomplished with environmental manipulation. Height can also be controlled by withholding fertilizer, especially phosphorous and ammonium-form nitrogen. Pentas are responsive to day/night temperature differential (DIF), and are shorter with a negative DIF. A Cycocel spray of 1,000 to 1,500 ppm at visible bud can be used. Higher rates may cause phytotoxicity. Always follow current manufacturer label instructions. In-house trials are recommended to determine the best rate for your location.

Common Problems

Insects: Aphids, thrips, whitefly.

Diseases:

Pythium root rot: Soft, brown, mushy roots. Drench with Subdue, Banrot, Truban or similar compound.

Rhizoctonia: Tan, brown or black lesions on the stem at the soil line in conjunction with good root development. Drench the soil with Chipco 26019, Cleary's 3336, Banrot or Terraclor.

Botrytis blight: Will usually show up in a wound to the plant on the stem or parts where the air is stagnant. If undetected, this blight will form a canker that will girdle the stem, thus wilting and killing that part of the plant. Treatments include increased air circulation and Daconil fungicide spray applications. Refer to the Daconil label for the specifics.

Iron toxicity: Excessive iron levels or pH below 6.2 will cause marginal burn on leaves in upper foliage. Raise pH by adding limestone.

Iron/Manganese toxicity: Extremely low pH can induce iron and manganese toxicity, indicated by brown or tan lesions on the foliage. Switch to a base-forming fertilizer, such as 15-0-15. If symptoms do not improve, or if the pH is below 6.0, irrigate the crop with a hydrated lime solution. Be sure to rinse foliage after application to avoid phytotoxicity.

Note: To increase soil pH, apply 12 oz. hydrated lime per 100 gal. water (90 g. per 100 l) as a soil drench. Follow up with 1 tablespoon of limestone (dolomite or calcium carbonate) per pot. Do not apply hydrated lime if the medium ammonium level is above 10 ppm (1:2 extraction).

Magnesium deficiency: If magnesium is not used in the fertilization program, magnesium deficiency (lower leaf interveinal chlorosis) can develop at the time of flowering. Use fertilizers that contain magnesium during early crop development.

Poor flower development: Low temperatures will prevent uniform flower development or slow flower opening.

Note: Chemical recommendations are only guidelines. Follow national and state regulations.

Crop Scheduling

Sow to transplant: 8 to 10 weeks in a 392/406-cell plug tray.

Transplant to finish (flower first umbel) in 4-in. (10-cm) pots: 10 to 12 weeks in the North, 8 to 10 weeks in the South.

Under high light, long days and warm temperatures (Summer production), **Butterfly** pentas can be produced in 12 to 13 weeks from seed.

In the Garden

Butterfly pentas will flourish when planted in full-sun garden beds and patio containers. In northern gardens, use a spacing of 10 to 12 in. (25 to 30 cm); southern gardeners can space **Butterfly** plants a little farther apart – 13 to 15 in. (33 to 38 cm) is ideal. Keep plants well watered and feed regularly with an all-purpose fertilizer following package directions. This is important as pentas can suffer from too little feed.

PanAmerican Seed

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