Technical Guide
PENTAS

Variety Info
- Monarch™ series is bred for 4" and 6" or gallon production.
- Monarch™ series is seed produced and does not require pinching, as plants are self branching.
- Great landscape or patio container plants for summer flowering.

Handling Upon Receipt
- Unpack at once and place in greenhouse.
- Check plugs for dryness, especially around the edges of the tray and water as needed.
- Leave in plug tray for one or two days for plugs to adjust from shipping stress.
- Plugs should be potted into the final container size within one week of receiving. Plant growth can be stunted with premature flowering if plugs are left too long in the plug tray.

Planting
- Plant slightly deeper than the original root ball. This will anchor the plug in the medium and prevent unstable plants.

Root Medium
- Pentas need a soil medium that drains well and has excellent aeration. Good root medium aeration is critical to prevent soil diseases, such as Pythium.
- Both peat-lite mixes and bark mixes work fine, although each needs to be treated with different fertilizer applications. (See Fertilization section.)
- Maintain pH at 6.2 to 6.6. This is slightly higher than some crops, but Pentas prefer higher pH. Low pH will cause iron toxicity, which results in leaf edge burn and black dots on edge of leaves. High pH, 7.0 or above, will cause growing points to turn yellow.

Irrigation
- Water quality (e.g., alkalinity, nutrient content, etc.) should be known to evaluate the potential effects on pH and plant nutrient availability. Irrigate early in the morning, so foliage is dry by late afternoon.
- Plants need to dry out between irrigations. It is ok if plants slightly wilt. This produces stronger plants that will ship better.
- Plants that are constantly moist develop poor roots systems, especially during cool low-light periods.

Fertilization
- If growing in a peat-lite mix, alternating between a Hi-Cal fertilizer (15-0-15) and an acid fertilizer such as 20-10-20 works well.
- If growing in a bark mix, use more Calcium-based fertilizers and less acid fertilizers. Maintain pH at 6.2 to 6.6. This is slightly higher than some crops, but Pentas prefers higher pH.
- Low pH will cause iron toxicity, which results in leaf edge burn and black dots on edge of leaves. High pH, 7.0 or above, will cause growing points to turn yellow.
- Rates of fertilizer to use are in the range of 250 ppm every third irrigation. During extremely warm temperatures in the summer, fertilizing every other watering may be needed to keep plants lush and green. If plants are grown under cool conditions (50°F nights and 60° to 70°F days), lower frequency of fertilizer applications will be needed.
- Slow release fertilizers such as Osmocote or Nutricote can be used at low to moderate rates for the size of container. See label for usage rate.

Light
- Pentas need high-light levels for optimum production: Full sun during winter and spring and 30% shade during summer months as long as temperatures do not exceed 90°F in the greenhouse.
- The range of light intensity should be around 4,000 to 7,000 footcandles.
- Plugs can be grown outside in warmer climates even in full sun, although the most rapid production is obtained under 30% shade outdoors.

Temperature
- For production, temperatures should be maintained at 60 to 65°F nights and 75 to 85°F days.
- Landscape performance is best at 50 to 60°F nights and 75 to 85°F days.

Spacing
- 4½": 8" to 9" centers
- 6" or gallon: 10" to 12" centers

Height Control
- Use of growth regulators depends on cultivars being grown. Some varieties require less growth regulators than other varieties. Monarch™ Pentas are semi-dwarf varieties and require little, if any, growth regulation. Taller varieties within the series may need one to two applications, depending on growing conditions (light intensity). See list below for taller varieties.
- If growth regulation is required, B-Nine at 2500 to 3750 ppm **OR** a combination of B-Nine at 2500 ppm plus Cycocel at 500 to 750 ppm is recommended.

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Insects

- Mites can attack Pentas in the greenhouse. Applications of miticides, such as Pylon at 2.6 oz. per 100 gal., can be used.
- Whiteflies and aphids can be controlled with Tristar at 2 to 4 packets per 100 gal.

Disease

- Pythium can occur, especially if soil does not have good aeration. A drench with Banrot or Subdue will prevent this problem.
- Rhizoctonia can occur especially during warm periods. Drenching with Banrot at 8 oz. per 100 gal. or Medallion at 2 oz. per 100 gal. will control this disease. ***Before using any pesticides, be sure that they are registered for use in your state. Check with your local county extension agent or state university extension service. See label for use rates and application methods. Always follow label directions. The label is the law.***

Marketing Finished Plants

- Plants can be shipped at first flower.
- Pentas do not tolerate being ship in a closed box. Plants will drop their flowers, as they are very sensitive to ethylene. Must be shipped on open racks. Temperatures can range from 45 to 80°F during shipment, with 55°F being optimum.
- **Retail Care:** Plants need to be placed in an area that receives natural sunlight either direct or in-direct. Indoor lighting is not sufficient to keep plants flowering.
- **Consumer Tips:** Pentas offer consumers great performance with little care. They will keep growing and flowering in the landscape or patio containers under adverse conditions such as extreme heat or drought. They are one of the few bedding plants that can be planted in the garden in May and look even better in September. Pentas can be planted in full sun to partial shade.

Cultivar	Height at First Flowering	FInished Height in Landscape
Monarch™ Petite Scarlet	6"	18-24"
Monarch™ Petite Violet	6"	18-24"
Monarch™ Petite White	6"	12-18"
Monarch™ Bright White	8"	30-36"
Monarch™ Fuchsia	8"	24-30"
Monarch™ Lilac	6"	8-24"
Monarch™ Neon Magenta	6"	18-24"
Monarch™ Scarlet Eye	8"	24-30"
Monarch™ Violet	8"	24-30"

Crop Planning

Weeks to finish under average conditions. Pentas will flower under long days or short days, so extending the daylength or night interruption is not necessary.

Plug Size	Plugs per pot	Late Spring & Summer	WInter & Early Spring
72, 128	1 per 4½"	6 weeks	9 weeks
	1-3 per 6" or gallon*	6 weeks	9 weeks
288	1 per 4½"	7 weeks	10 weeks
	1-3 per 6" or gallon*	7 weeks	10 weeks

* For 6" or gallon production, 1 to 3 plugs can be used. If 3 ppp are used, production time will be reduced by one to two weeks.

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