GrowerFacts

Matthiola Katz

(*Matthiola incana*)

Germination

Approximate seed count (raw): 15,300 to 18,100 S./oz. (540 to 640 S./g)

Media
Use a well-drained, disease-free, soilless medium with a pH of 5.5 to 6.2 and a medium initial nutrient charge (EC less than 0.75 mmhos/cm with a 1:2 extraction).

Sowing
Matthiola (stock) can be produced in 406-cell or similar plug trays. For Northern Europe use 600-cell Euro plug trays. Cover seed with a light to medium covering of coarse vermiculite to keep the seed moist. Allow 3 to 4 days for germination.

Germination takes approximately 3 to 4 days.
Germination temperature: 68 to 72°F (20 to 24°C). Avoid temperatures higher than 75°F (24°C), as this will produce soft, stretched seedlings which are susceptible to damping off.

Light: Not required.

Moisture: Keep the media medium wet (level 4) during Stage 1.

Humidity: Maintain 95 to 97% relative humidity (RH) until radicle emergence.

Plug Production

Media
Use a well-drained, disease-free, soilless medium with a pH of 5.5 to 6.2 and a medium initial nutrient charge (EC less than 0.75 mmhos/cm with a 1:2 extraction).

Sowing
Matthiola (stock) can be produced in 406-cell or similar plug trays. For Northern Europe use 600-cell Euro plug trays. Cover seed with a light to medium covering of coarse vermiculite to keep the seed moist. Allow 3 to 4 days for germination.

Stage 1 (Sow to radicle emergence) – Germination takes approximately 3 to 4 days.

Germination temperature: 68 to 72°F (20 to 24°C). Avoid temperatures higher than 75°F (24°C), as this will produce soft, stretched seedlings which are susceptible to damping off.

Light: Not required.

Moisture: Keep the media medium wet (level 4) during Stage 1.

Humidity: Maintain 95 to 97% relative humidity (RH) until radicle emergence.

Stage 2 (Radicle emergence to cotyledon expansion)

Temperature: 60 to 70°F (15 to 21°C) days; 55 to 60° F (13 to 15°C) nights.

Light: Up to 2,500 f.c. (26,900 Lux) during Stages 2 and 3.

Moisture: Keep the media medium (level 3) to medium wet (level 4) during Stages 2 and 3.

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. Maintain a media pH of 5.8 to 6.2 and EC at 0.5 to 0.7 mS/cm (1:2 extraction).

Stage 3: (Cotyledon expansion to growth of all true leaves)
Temperature: 60 to 70°F (15 to 21°C) days; 55 to 60°F (13 to 15°C) nights.
Light: Up to 2,500 f.c. (26,900 Lux)

Moisture: Allow media to dry until the surface becomes light brown (level 2) before watering.
Fertilizer: Increase fertilizer to rate 2 (100 to 175 ppm N/0.7 to 1.2 mS/cm EC). Maintain a media pH of 5.8 to 6.2 and EC at 0.7 to 1.0 mS/cm (1:2 extraction).
Plant Growth Regulators: Not recommended.

Stage 4 (Growth of all true leaves to toning/transplant)

Temperature: 60 to 70°F (15 to 21°C) days; 50 to 55° F (10 to 13°C) nights.

Light: Up to 5,000 f.c. (53,800 Lux) if temperatures can be maintained.

Moisture: Keep the media medium (level 3) wet. Do not let the seedlings wilt as they will not recover favorably.

Fertilizer: Same as Stage 3.

Seedling Selection: Seedling double selection is possible. With experience, Katz varieties can be selected but it is not recommended due to increased labor cost involved. The following two procedures can be used.

1) Double selection by cotyledon leaf color – doubles will have lighter green and singles will have slightly darker green cotyledons.

Once the cotyledons have fully expanded (approximately 11 to 12 days from sowing), the seedlings can be moved into a cold chamber/storage set at 40 to 45°F (4 to 7°C) for a period of approximately 3 to 4 days, after which they can be grown at cool temperatures (50 to 60°F/10 to 15°C) in a greenhouse until selection. Make sure to moisten the trays well before they go into the cool chambers. Lights are not required in chambers during this period. Monitor the plug trays for any color differentiation beginning at Day 2 in the chamber, and bring them out accordingly. It is possible to differentiate the seedlings once they come out of the cold chamber. Avoid direct sun/high light levels during sorting, as this can make the cotyledon color differences less obvious. Typically early mornings are best for this procedure. With experience, crops containing 75 to 85% doubles can be achieved with this method.

If cold chamber space/facility is not available to cool the plugs, then the seedling selection can also be done by growing the plugs at cool temperatures (50 to 60°F/10 to 15°C) under greenhouse/outside conditions, provided the conditions are cool enough. The timing and ease of the selection process will depend on the cool temperatures provided.

Unlike European Greenhouse Selectable Stock, the differences in color of singles and doubles are very slight, so selection cannot be done using automated selection machines for Katz Stocks.

2) Double selection by shape, color and size. Seedling selection is also done based on the seedling size, color and shape of the cotyledons. When the seedlings are 7 to 10 days old from sowing, first discard the very small seedlings. Next, sort for doubles which have lighter green color and oval shaped cotyledons; singles will have slightly darker green color and round-shaped cotyledons. Generally, crops containing 80 to 85% doubles can be achieved with this method, as a greater number of seedlings are discarded in the selection process.

Growing On to Finish

Media
Stocks should be produced in a disease-free soil with a medium initial nutrient charge and a pH of 5.8 to 6.5. Keep the media moist. Avoid conditions that are either too wet or too dry. Wet conditions can cause diseases including Root Rots, Downy Mildew and Bacterial Blight. Dry conditions can cause wilting and lower leave chlorosis, which makes the crop susceptible to other infections. It is critical to differentiate between lower leaf chlorosis symptoms caused by nutrient deficiency/drought stress or Downy Mildew.

Planting Density and Netting
120 to 150 plants/m2 (11 to 14 plants/ft2). Use the higher density when planting non-selected plugs.

One layer of support netting (4 x 6 in./15 x 20 cm) is recommended.

Temperature
Nights: 45 to 55°F (7 to 13°C)

Days: 60 to 75°F (15 to 24°C)

If optimal production temperatures are maintained, plants can be grown under tunnels, plastic hoop houses, greenhouses, or even outside. Stocks in South America are not grown outside because of rain. In high land tropics, Stocks can be grown year- round if the above night temperatures are maintained. Cooler temperatures will increase the production time.

Irrigation
Use overhead irrigation after transplanting, then switch to drip irrigation 2 to 3 weeks later. Keep the media moist. Allow the media to dry slightly between watering cycles.

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Fertilization
Fertilize twice a week at rate 3 (175 to 225 ppm N/1.2 to1.5 mS/cm EC) from a nitrate-form fertilizer with low phosphorus. Maintain EC at about 1.5 to 2.0 mS/cm (1:2 extraction) and pH at 5.8 to 6.5. Continue fertilizing until harvest.

Crop scheduling
Sow to planting: Approximately 4 weeks

Planting to finish: 7 to 11 weeks

Total crop time from sow: 11 to 15 weeks
Crop time is primarily dependent on production temperature. It will be longer under cooler temperatures and shorter days, and shorter under warmer temperatures and longer days.

Common Problems

Insects: Aphids, Thrips, Caterpillars

Diseases: Downy Mildew, Botrytis

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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