

Matthiola Hot Cakes

(*Matthiola incana*)

Germination

Use a well-drained, disease-free media with a pH range of 5.5 to 6.0 and EC less than 0.75mS/cm (2:1 extraction). Germination takes approximately 3 to 4 days.

Plug Production

Media

Use a well-drained, disease-free media with a pH range of 5.5 to 6.0 and EC less than 0.75mS/cm (2:1 extraction).

Plug Tray Size

Can be produced in a 392, 288 or a similar size plug tray with 1 seed per cell. Any other tray used for cut flower Matthiola can also be used (e.g. 600-cell tray in Europe with dimensions 40 by 60 cm).

Stage 1- Germination takes approximately 3 to 4 days.

Germination temperature: 68 to 72°F (20 to 22°C).

Light: Not required but beneficial during germination.

Media moisture: Keep the media medium wet (level 4) during germination.

Relative humidity: Maintain 95 to 97% relative humidity until cotyledons emerge. Avoid excess humidity later in the plug production, as this will create conditions favorable for disease incidence.

Stage 2

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.

Media 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) with a nitrate-form fertilizer 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

Beginning at late Stage 2 and Stage 3, they can be held/grown at the recommended cool temperatures for

differentiating the seedlings of singles and doubles based on cotyledon leaf color.

Note: Refer to the **Seedling Selection Guidelines** for the recommended temperatures during this stage.

Fertilizer: Increase the fertilizer rate to 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).

Stage 4

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.

Media 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.

Plant Growth Regulators: Not required.

Under North European conditions: foliar sprays of B-Nine/Alar (daminozide) at 600 to 1,200 ppm (0.7 to 1.4g/l 85% formulation or 0.9 to 1.8g/l 64% formulation) worked well in toning the plugs.

Guidelines for selecting seedlings of double flowering plants during plug production: Seedlings of double-flowering plants can be selected during plug production based on their cotyledon leaf color (lighter green/yellowish green) when grown under appropriate cool temperatures, compared to those of singles which have dark green cotyledons.

Option 1: 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. Make sure to moisten the trays well, before they go into the cool chambers. Lights are not required in chamber during this period. Monitor the plug trays for any color differentiation beginning at day 2 in the chamber, and can bring them out accordingly. Hold them in the chamber for a maximum of 4 days, after which they can be grown at cool temperatures (50 to 60°F/10 to 15°C) in a greenhouse until selection. 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.

In European trials where the sorting is automated, the camera eye of the machine was also able to see/ sort the cotyledon color differences for the singles and doubles. In these trials, the plugs were held for 5 days in the cold chamber set at 41°F (5°C), and the selection was done by the machine 3 days after they came out of the cold chamber and moved into the greenhouse.

Option 2: 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.

Growing On to Finish

Container Size

Can be produced in 4-in. (10-cm) or similar size containers.

Media

Use a well-drained, disease-free media with a pH of 5.8 to 6.2, and a medium initial nutrient charge.

Temperature

Hot Cakes Matthiola can best be produced under cooler temperatures for uniformity/quality of flowering and plant habit. The optimal recommended production temperatures are;

Night: 50 to 55°F (10 to 13°C)

Day: 60 to 70°F (15 to 21°C)

Note: Plants can also be produced under less optimal conditions, but the quality may not be the best.

Light

Keep light levels as high as possible while maintaining appropriate temperatures.

Fertilizer

Starting a week after transplant, apply fertilizer at rate 3 (175 to 225 ppm N/1.2 to 1.5 mS/cm) using predominantly nitrate-form fertilizer with low phosphorus. If needed, a balanced ammonium and nitrate-form fertilizer may be used as needed to encourage growth and balance the media pH. Maintain the media EC at 1.50 to 2.00 mS/cm and pH at 5.8 to 6.2. Excessive fertilizer levels will result in large and lush leaves, while fertilizer stress will cause very small leaves, and yellow lower leaves.

Plant Growth Regulators

PGRs are generally not required.

Under North European conditions, 1 to 3 foliar applications of B-Nine/Alar (daminozide) at 3,200 ppm (3.8 g/l 85% formulation or 5g/l of 64% formulation), or Cycocel (chlormequat) at 375 ppm (0.5 ml/l 75% formulation or 3.1ml/l 11.8% formulation) gave optimal growth control.

Crop Scheduling

Sow to transplant (392, 288 size tray): 4 weeks

Transplant to flower: 4 to 7 weeks

Total crop time (sow to flower): 8 to 11 weeks Crop time is temperature dependent and can finish as early as 8 weeks from sowing if grown during periods of high temperatures/Summer.

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.

