Keys to *Cyclamen* Production

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Introduction:

Commercial cyclamen are in the Primulaceae family. *Cyclamen persicum* Mill. Is the predominant flowering potted plant. However, *C. coum* Mill., *C. hederifolium* Ait., and *C. purpurascens* Mill. Are hardy in zones 5-9 and can therefore, be grown as a perennial plant.

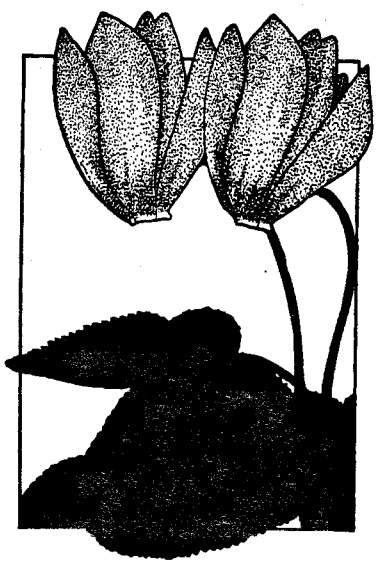
Propagation:

Cyclamen are commercially propagated from seed. Significant considerations when germinating cyclamen are outlined below:

1) Sow seed on the media surface approximately 1/2 to 2/3 covered in a media with a pH of 6.0-6.5.

2) Germinate at 65-68°F in a germination chamber maintained at 100% humidity using a mist or fog system in the dark.

3) Seed will germinate in 3-4 weeks.



Flower Induction/Initiation:

Factors that affect flowering of cyclamen are outlined below:

1) Cyclamen initiate flowers in the 6th leaf axil when 10-13 leaves have unfolded.

2) Cyclamen will continue to produce a flower, then a leaf, then a flower in an alternating fashion for up approx. 3 months.

3) Cyclamen are not photoperiodic, however, the total amount of light delivered daily affects earliness of flowering and development.

4) Optimal light intensity and photoperiod is 500 footcandles for 16 hrs/day prior to flower initiation. Optimal light intensity after flower initiation is 850-1,000 footcandles for 16 hrs/day.

Nutrition:

Grow cyclamen with a pH between 6.0-6.5. Cyclamen are not 'high feed' requiring crops. Feed cyclamen 100 ppm N and K starting 2 weeks after germination every other week. Use a nitrate-based fertilizer. Increase ppm N from 100 to 200 using a constant liquid feed program starting 2 weeks after transplanting. Alternate after transplanting with a feed that is composed of 150 ppm N and 300 ppm K. Increase P feeding during the last 4-6 weeks of production.

Nutritional problems encountered in cyclamen production are outlined below:

1) Iron Deficiency—Interveinal chlorosis on youngest leaves due to high pH or insufficient iron in media. Decrease pH and supply iron by applying an acidic fertilizer as an overhead feed.

2) Ammonium Toxicity—General leaf edge yellowing of lower leaves. Occurs when ammonium-based fertilizers are used during low light/cool periods of the year. Leach and switch to a nitrate-based fertilizer.

3) Boron Deficiency—Young leaf distortion. Overhead water with fertilizer containing boron and/or apply Borax (0.5 oz/100 gal, or Solubor 0.25 oz/100 gal.).

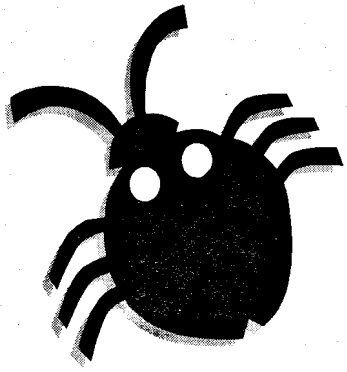
4) Calcium Deficiency or Excess—Upper leaf chlorosis, necrosis or leaf edge burn. Switch to a calcium nitrate-based fertilizer. Excessive calcium (>300 ppm Ca in media) can result in general leaf yellowing. Reduce amount of calcium nitrate in fertilizer.

Table 1. Important points to remember when producing cyclamen!

Germinate cyclamen seed at temperatures between 65-68oF.
Cyclamen initiate flowers when 10-13 leaves have unfolded.
Keep pH between 6.0-6.5!
Apply overhead source of micronutrients.
Apply periodic (monthly) applications of fungicide for root rot control.
Fertilize with nitrate-based fertilizer and alternate with a higher K than N fertilizer after transplanting.
Control thrips!

Growth retardants are used to control peduncle/pedicle elongation and excessive leaf expansion. B-9 (1,500 ppm) and A-Rest (50 ppm spray) are marginally effective. I have not seen tests on effectiveness of Bonzi or Sumagic on cyclamen. Many growers will use DIF in combination with cool growing temperatures to naturally limit elongation.

Cyclamen can develop thrip, fungus gnat and/or mite infestations. Of significance is the spread of tomato spotted wilt virus (TSWV)/impatiens spotted wilt virus (INSV) by Western flower thrips. Control is achieved by removing infected plants and controlling thrips. Control thrips by using the following rotation: 1) Tank mix of Avid (8oz/100 gal.) + Azatin (10-16 oz/100 gal) or Neemazad (2.5



oz/100gal) twice, five to seven days apart. 2) Apply a tank mix of Thiodan + a Pyrethroid (Decathlon, Talstar, Tame, Topcide) twice, five to seven days apart. 3) Apply Mesurol 75WP (8-16 oz/acre) twice, five to seven days apart. 4) start over.

Cyclamen mites can cause significant leaf distortion. These mites are difficult to see. Two-spotted spider mites will cause a general bronzing of foliage and webbing on new growth. Control cyclamen mites by applying Thiodan (50WP) at a rate of 1 Tbsp/gallon. Control spider mites by applying Avid, Azatin, Talstar, Pentac, Mavrik, PT1600 X-clude.

Fungus gnat larvae can attack roots and provide a point of entry for root rot pathogens. Use a raw potato to test for the presence of larvae and/or effectiveness of insecticide. Control larvae using Azatin, Gnatrol, Duraguard, Citation, Knox Out, Adept, Precision, or Distance.

Diseases:

Cyclamen a susceptible to TSWV/INSV, root rot pathogens, *Fusarium* wilt, Bacterial wilt (*Erwinia* spp.) and *Botrytis*.

TSWV/INSV symptoms include a general stunting of plant growth and/or spotting of foliage turning from yellow to brown spots with concentric rings. There is no cure for these viruses.

Root rot pathogens are *Pythium*, *Rhizoctonia* and *Thielaviopsis* species. Control *Pythium* with Subdue (1/2 oz/100 gal) or Banrot (8 oz/100 gal). Control *Rhizoctonia* with Cleary's 3336 (8oz/100 gal), Banrot (as above) or Chipco 26019. Control *Thielaviopsis* with Cleary's 3336 (as above) or Terraguard.

Fusarium wilt is characterized by a sudden wilting of leaves. *Erwinia* (bacterial wilt) has similar symptoms. However, the corm on *Fusarium* infected plants is firm. In contrast, the corm on *Erwinia* infected plants is soft and mushy. Controls for either bacterial soft rot or *Fusarium* wilt have little effect. Minimize splashing water and crowding of plants.

Postharvest:

Harvest cyclamen when 3-5 florets have opened. Application of a spray of 0.25 mM silver thiosulfate (STS) 5 days prior to harvest will increase postharvest life.

Table 3. Sample Schedule for 4" Cyclamen Crop for Christmas.

Time	Cultural Procedure	Environment
4 weeks	Sow to germination	65-68°F in dark
4 weeks	Germination to transplant stage	68°F, approx. 500 footcandles light for 16 hours/day.
8 weeks	To the 5-6 leaf stage	68°F, approx. 850-1,000 footcandles for 16 hours/day
8-12 weeks	To flowering	60-65°F, approx. 850-1,000 footcandles for 16 hrs/day.

Table 2. Recommended cyclamen for use for each type and/or finishing size.

Type	Cultivar	Source
Minis	Marvel Red	PanAmerican
	Miracle Scarlet	Goldsmith
	Miracle White	Goldsmith
	Minimate Series	De Ruiter
	Dixie Series	Vaughan's
Intermediate 4-5"	Laser Scarlet	Goldsmith
	Latinia	Ch. Morel
	Rondo	Vaughan's
Intermediate 4"	Novella Series	PanAmerican
	Intermezzo Series	De Ruiter
Standards	Romeo	Pannevis
	Sierra Scarlet	Goldsmith
	Halios Series	Ch. Morel
	Royal Purple Rex	PanAmerican
	Royal White	PanAmerican
	Sierra White	Goldsmith
	Concerto White Apollo	Novartis