

## Nemesia Troubleshooting

Brian E. Whipker and W. Garrett Owen  
North Carolina State University  
([bwhipker@ncsu.edu](mailto:bwhipker@ncsu.edu))

*The major pests and disorders of Nemesia are discussed in this e-GRO Alert, which includes: Iron Chlorosis, Low EC, Western Flower Thrips, Botrytis, Bacterial Leaf Spot, Water Stress, Ethylene, Phytophthora, and Fungus Gnats.*

This spring we grew a crop of nemesia (*Nemesia fruticans*) for a research project. This spurred our interest in the plant and made us take special interest of other growers' crops. This has allowed us to observe and photograph a number of production issues with nemesia. Many of the production issues are documented in the cultural guides provided by the propagation companies. This e-GRO Alert highlights these disorders with actual photographs.

### Issue 1. Iron Chlorosis of the Young Leaves

Nemesia can develop interveinal chlorosis (yellowing) of the new growth (Figure 1). This is typically the result of excessively high substrate pHs. Also note overwatering, cold growing, and root rot can also hinder iron uptake and result in iron deficiency symptoms even though iron is provided at adequate levels.

Substrate pH recommendations vary slightly from company to company and cover the range of 5.5 to 6.2. It is recommended to target the lower end

of the range to avoid iron deficiencies (interveinal chlorosis of the new leaves) and fungal root rots. Therefore it may be better to target the narrower range of pH 5.8 to 6.0. If interveinal chlorosis starts to develop, lower the substrate pH with the use of an acidic fertilizer (but the disadvantage is acidic fertilizers typically contain high levels of ammoniacal-nitrogen and/or phosphorus) or acid injection.



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**Figure 1. Interveinal chlorosis (yellowing) of the new growth caused by excessively high substrate pHs.**



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**e-GRO Alert**

**Volume 2, Number 14**  
**March 2013**

[www.e-gro.org](http://www.e-gro.org)

**CONTRIBUTORS**

Dr. Nora Catlin  
Floriculture Specialist  
Cornell Cooperative Extension -  
Suffolk County  
nora.catlin@cornell.edu

Dan Gilrein  
Entomology Specialist  
Cornell Cooperative Extension -  
Suffolk County  
dog1@cornell.edu

Dr. Brian Krug  
Floriculture Ext. Specialist  
Univ. New Hampshire  
brian.krug@unh.edu

Dr. Joyce Latimer  
Floriculture Extension & Research  
Virginia Tech University  
jlatime@vt.edu

Dr. Roberto Lopez  
Floriculture Extension Specialist &  
Research  
Purdue University  
rglopez@purdue.edu

Dr. Paul Thomas  
Floriculture Extension & Research  
University of Georgia  
pathomas@uga.edu

Dr. Brian Whipker  
Floriculture Extension & Research  
NC State University  
brian\_whipker@ncsu.edu

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**Figure 2. Lower leaf yellowing and purpling from insufficient fertilization.**

**Issue 2. Lower Leaf Yellowing and Purpling**

Lower leaf yellowing and purpling results when the fertilization levels are too low (Figure 2). The overall symptoms are from the lack of nitrogen that results in a complete yellowing of the lower leaves. Also because many of the nemesia cultivars have reddish pigmentation of the leaves and stems, nitrogen deficiency can also appear as a lower leaf purpling (which can be confused with phosphorus deficiency).

To avoid this situation provide ample nitrogen. In NC State University trials, growth was similar for plants fertilized with 150 or 250 ppm N. Ball Horticulture recommends supplying 175 to 225 ppm N to the Nemesia Aromatica plant series. They also suggest avoiding excessive ammoniacal-nitrogen and phosphorus as a method of controlling excessive growth.



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**Figure 3. Western flower thrips feeding damage to leaves.**

The substrate EC values recommended by Proven Winners for the Juicy Fruits® Ciruela series are 0.6 to 0.9 mS/cm (2:1 method) or 1.8 to 2.2 mS/cm (saturated media extract method) suggested by Syngenta Flowers for the Confection™ series.

### Issue 3. Western Flower Thrips

The feeding of western flower thrips results in a tan scarring of the leaves (Figure 3) and a white scarring of the flowers (Figure 4). Early detection and control is needed to avoid heavy infestations.

### Issue 4. *Botrytis*

*Botrytis* can be a major disease of nemesia. Two different variations of *Botrytis* symptoms were observed this spring. The normal grayish-brown fuzzy growth occurred when mature plants were allowed to become slightly over grown (Figure 5). Also the white fuzzy growth form of *Botrytis* was observed when the plants were overhead irrigated (Figure 6). Avoid overhead irrigation, excessive irrigation, high humidity, lack of airflow, and a tight plant canopy. These all result in environmental conditions conducive for *Botrytis* growth.

### Issue 5. Bacterial Leaf Spot

We observed an unusual grower situation of lower leaf, black greasy spots (Figure 7a&b). Over time the symptoms moved from the lower leaves up the plant when overhead irrigation was used. The problem was confirmed by the North Carolina State University Plant Disease and Insect Clinic



**Figure 4. Western flower thrips feeding damage to flowers.**



**Figure 5. The normal grayish-brown fuzzy growth of *Botrytis*.**



**Figure 6. White fuzzy growth of *Botrytis*.**



**Figure 7a. Lower leaf, black greasy spots caused by a bacterial leaf spot.**

as a bacterial leaf spot caused by *Pseudomonas cichorii*. Avoid overhead irrigation and apply a copper based fungicide at the first sign of leaf spots.

#### **Issue 6. Tip Burn Caused by Water Stress**

Nemesia are sensitive to drying out. Water stress will result in a whitish-tan tip burn (Figure 8). Monitor the plants to determine their irrigation requirements to avoid the disorder.

#### **Issue 7. Ethylene Sensitivity**

At North Carolina State University we wanted to determine the sensitivity of nemesia 'Nemo Ruby' to ethylene. We placed blooming plants in 2 separate boxes, with one box containing only plants and the other having five ripe apples to provide ethylene. It turns out that nemesia is sensitive to ethylene which resulted in flower drop (Figure 9, right). Therefore avoid exposing nemesia plants to ethylene during growing, shipment and displaying.

#### **Other Problems**

There are a number of other problems which can occur with nemesia. Root rots caused by *Pythium*, *Phytophthora* (Figure 10), *Rhizoctonia* and black root rot are common. INSV can be spread by western flower thrips feeding.



**Figure 7b. Advanced symptoms of lower leaf, black greasy spots caused by a bacterial leaf spot.**

Poor branching can result due to low fertility or low light conditions, Excessive stretch caused by warm growing, insufficient PGRs or excessive fertilization can also occur. Other insect pests, which find nemesia tasty include aphids, leafminers and fungus gnats (Figure 11).



**Additional Resources.**

There are a number of cultural guides about nemesia culture online, links are below for a few of them.

**Ball Hort**

[http://www.ballhort.com/Growers/plant\\_info.aspx?phid=043902764004763](http://www.ballhort.com/Growers/plant_info.aspx?phid=043902764004763)

**Proven Winners**

<http://www.provenwinners.com/plant/273956/culture>

**Syngenta Flowers**

<http://www.syngentaflowersinc.com/pdf/cultural/ConfectionNemesiaCulture.pdf>

In addition, there is a chapter about nutrient disorders in the **Nutrient Deficiencies in Bedding Plants** book by Gibson et al. (available at <http://www.amazon.com/Nutrient-Deficiencies-Bedding-Plants-Identification/dp/1883052610>).



Figure 8. Water stress resulted in tip burn.



Figure 10. Stunted plant growth and leaf discoloration caused by *Phytophthora* root rot.



Figure 9. Exposure to ethylene will result in flower loss (plant at right).



Figure 11. Skeletonized lower leaves resulting from fungus gnat larva feeding.