e-GRO Alert




Brian E. Whipker[1] bwhipker@ncsu.edu
Josh Henry[1]
Paul Cockson[1]
W. Garrett Owen[2] wgowen@msu.edu

Volume 8 Number 2 January 2019

Lower Leaf Interveinal Chlorosis:

Magnesium Deficiency of Tomato

American Floral Endowment
Funding Generations of Progress Through Research and Scholarships
eGRO Electronic Grower Resources Online
Project Sponsor

Tomatoes commonly develop symptoms of interveinal chlorosis (yellowing) on the lower leaves due to magnesium (Mg) deficiency. This e-GRO Alert highlights the symptomological development of Mg deficiency to help you identify the problem and discusses management procedures.

Often times, lower leaf interveinal chlorosis appears on tomato plants (Fig. 1), which is a classical symptom of a magnesium (Mg) deficiency. Tomatoes commonly develop symptoms over time because they have a high demand for Mg and the high levels of calcium (Ca) supplied to plants to avoid blossom end rot can limit (antagonize) the plant's ability to acquire adequate levels of Mg.

Figure 1. Typical symptoms of a magnesium deficiency include interveinal chlorosis (yellowing) of the lower leaves of tomatoes. Photo by: Brian Whipker.

Symptomology of Mg deficiency on tomatoes occurs on the lower, older leaves. That is because Mg is a mobile element, and if Mg is limited in the plant, it will be translocated from the mature leaves to the new tissue. Typical initial symptomology is lower leaf interveinal chlorosis (yellowing). Next, a few areas of the leaves develop a slight interveinal chlorosis (Fig. 2), which intensifies over time (Fig. 3). With advanced symptoms, necrotic spotting (Fig. 4) and dark purplish black spotting (Fig. 5) will develop. In general, the leaf tissue sufficiency range for Mg with tomatoes should be between 0.25 to 0.50%.

[1]NC State University
bwhipker@ncsu.edu
[2]Michigan State University
wgowen@msu.edu

Magnesium deficiency can be confused with another problem common on the lower leaves of tomatoes. Tomatoes can also develop lower leaf necrosis as a result of excessively low substrate pH. Generally, when the substrate drops below pH 5.5, both iron (Fe) and manganese (Mn) can be taken up by the plant in toxic quantities (Fig. 6). Thus, it is important to confirm your diagnosis with a substrate and/or foliar tissue test.

Corrective Procedures

The correction for a Mg deficiency is easy. Epsom salts (magnesium sulfate) can be applied at the rate of 2 pounds per 100 gallons of water (2.4 kg/1000L). Apply this as a 10% flow through leaching irrigation. This will stop the progression of symptoms but will not reverse any necrotic spotting. For areas which lack sufficient Mg in their irrigation water and Mg is not part of the regular fertilization program (e.g. 20-10-20 does NOT contain Mg), monthly applications of Epsom salts at a rate of 1 pound per 100 gallons of water (1.2 kg/1000L) is the common production practice to 'green up' plants and avoid deficiencies.

Magnesium deficiencies commonly occur on tomatoes. Knowing how to identify the disorder will improve crop management.

Figure 2. The initial symptom of a magnesium deficiency begins as faint interveinal chlorosis (yellowing) of the lower leaves. Photo by: Brian Whipker.

Figure 3. Interveinal chlorosis (yellowing) expands between the veins of the older leaves and tan spotting develops as magnesium deficiency symptoms progress. Photo by: Brian Whipker.

Figure 4. Necrotic (brown) spotting on the lower leaves is observed under advanced magnesium deficiency. Photo by: Brian Whipker.

Figure 5. On tomatoes, spotting can appear as a dark purplish-black coloration. This can be confused with low substrate pH induced iron and/or manganese toxicity symptoms. Photo by: Brian Whipker.

Figure 6. Low substrate pH induced iron and/or manganese toxicity mimics an advanced magnesium deficiency problem. Photo by: Brian Whipker.

e-GRO Alert

www.e-gro.org

CONTRIBUTORS

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

Dr. Chris Currey
Assistant Professor of Floriculture
Iowa State University
ccurrey@iastate.edu

Dr. Ryan Dickson
Extension Specialist for Greenhouse Management & Technologies
University of New Hampshire
ryan.dickson@unh.edu

Nick Flax
Commercial Horticulture Educator
Penn State Extension
nzf123@psu.edu

Thomas Ford
Commercial Horticulture Educator
Penn State Extension
tgf2@psu.edu

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

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

Heidi Lindberg
Floriculture Extension Educator
Michigan State University
wolleage@anr.msu.edu

Dr. Roberto Lopez
Floriculture Extension & Research
Michigan State University
rglopez@msu.edu

Dr. Neil Mattson
Greenhouse Research & Extension
Cornell University
neil.mattson@cornell.edu

Dr. W. Garrett Owen
Floriculture Outreach Specialist
Michigan State University
wgowen@msu.edu

Dr. Rosa E. Raudales
Greenhouse Extension Specialist
University of Connecticut
rosa.raudales@uconn.edu

Dr. Beth Scheckelhoff
Extension Educator - Greenhouse Systems
The Ohio State University
scheckelhoff.11@osu.edu

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

Dr. Ariana Torres-Bravo
Horticulture/ Ag. Economics
Purdue University
torres2@purdue.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Dr. Jean Williams-Woodward
Ornamental Extension Plant Pathologist
University of Georgia
jwoodwar@uga.edu

Cooperating Universities

Cornell University
Iowa State University
University of New Hampshire Cooperative Extension
Penn State Cooperative Extension, College of Agricultural Sciences
Virginia Tech
Michigan State University
UConn
Purdue University
The University of Georgia
The Ohio State University
NC State University
University of Arkansas System Division of Agriculture Research & Extension

In cooperation with our local and state greenhouse organizations

Maumee Valley Growers — Choose the Very Best.
Metro Detroit Flower Growers Association
NC Flower Power
Western Michigan Greenhouse Association
Connecticut Greenhouse Growers Association
Indiana Flower Growers Association
lifga
New Hampshire Plant Growers — Quality Garden Centers & Growers
Michigan Floriculture Growers Council
Virginia Flower Growers Association — Since 1954