Understanding the NCDA&CS Plant Tissue Report

NCDA&CS Agronomic Division
Plant/Waste/Solution/Media Section

July 2012

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Client: Farmer, J
c/o Nash Farm
8046 Red H Road
Nash

Sample Information:
Sample ID: T1
Crop: Tomato, Trellis
Growth Stage: F
Week: 0
Plant Part: M
Plant Position: U
Plant Appearance: Leaf cupping/curled

Nutrient Measurements:
- N: 4.77%
- P: 0.26%
- K: 1.78%
- Ca: 2.71%
- Mg: 0.56%
- S: 0.60%
- Fe: 60.3 ppm
- Mn: 65.2 ppm
- Zn: 26.0 ppm

Interpretation Indexes:
- N: 95
- P: 107
- K: 45
- Ca: 32
- Mg: 80
- S: 74
- Fe: 58
- Mn: 62
- Zn: 57

Other Results:
- Na: 0.02
- Cl: 
- C: 
- DW (g): 
- NO3-N (ppm): 
- Ni (ppm): 
- Cd (ppm): 
- Pb (ppm): 
- Al (ppm): 
- Se (ppm): 

Agronomist's Comments:
Cupped, curled leaves for 3 weeks; hot, dry conditions; irrigated through drip tape.

Nitrogen (N) is very high and potassium (K) is marginally low. Deficient K causes marginal yellowing to scorched leaves. Do not apply excess N as it can lead to disease and insect infestations; it also results in poor fruit development and quality and poor adaptation to changing conditions could lead to cupped, curled leaves especially under the hot, dry weather that you noted. Please contact me or your assistance.
NCDA&CS plant reports are posted online about two working days after samples are received.

Visit www.ncagr.gov/agronomi to search.
Plant Report Data

- Can be used to monitor plant nutrient uptake
- Can be helpful in fine-tuning a fertilization program
- Can be used to diagnose whether symptoms are due to poor nutritional status
Plant Tissue Report has five main sections:

### Diagnostic

**Plant Tissue Report**

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**Interpretation Indexes**

- N: 95, P: 57, K: 45, Ca: 92, Mg: 80, S: 74, Fe: 58, Mn: 62, Zn: 57, Cu: 78, B: 60, Mo: 60

**Other Results**

- Na (%): 0.02
- Cl (%): 0
- C (%): 0
- DW (g): 0
- NO₃-N (ppm): 0
- Ni (ppm): 0
- Cd (ppm): 0
- Pb (ppm): 0
- Al (ppm): 0
- Se (ppm): 0
- As (ppm): 0
- Li (ppm): 0
- Cr (ppm): 0
- Co (ppm): 0

**Agronomist’s Comments:**

Cupped, curled leaves for 3 weeks; hot, dry conditions; irrigated through drip tape.

Nitrogen (N) is very high and potassium (K) is marginally low. Deficient K causes marginal yellowing to scorching. Low K could be related to a heavy fruit load. Verify that you have applied adequate K and that soil moisture is good. Be careful not to apply excess N as it can lead to succulent vegetative growth that is easily susceptible to disease and insect infestations. It also leads to poor fruit development and quality and poor adaptation to changing environmental conditions. Excess N and low K can sometimes be a good combination.

**Client:** Farmer, Joe
c/o Nash Farms
8046 Red Hills Rd
Rocky Mount, NC 27807

**County:** Nash

**Advisor:**

**Sample:** 07/04/2011
**Received:** 07/07/2011
**Completed:** 07/11/2011
**Farm:** Nash
The last page of every report has explanatory information with hyperlinks to more in-depth material.
**Plant Tissue Report**

**Section 2: Sample Information**

- **Sample ID:** T1
- **Crop:** Tomato, Trellis
- **Growth Stage:** F
- **Week:** 0
- **Plant Part:** M
- **Plant Position:** U
- **Plant Appearance:** Lvs cupped/curl

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| Other Results | Na (%) | Cl (%) | C (%) | DW (g) | NO₃-N (ppm) | Ni (ppm) | Cd (ppm) | Pb (ppm) | Al (ppm) | Se (ppm) | As (ppm) | Li (ppm) | Cr (ppm) | Co (ppm) |
|---------------|--------|--------|-------|---------|-------------|----------|----------|----------|----------|----------|----------|---------|---------|
|               | 0.02   |        |       |         |             |          |          |          |          |          |          |         |         |

**Agronomist’s Comments:**

Cupped, curled leaves for 3 weeks; hot, dry conditions; irrigated through drip tape

Nitrogen (N) is very high and potassium (K) is marginally low. Deficient K causes marginal yellowing to scorched. Low K could be related to a heavy fruit load. Verify that you have applied adequate K and that soil moisture is good. Be careful not to apply excess N as it can lead to succulent vegetative growth that is easily susceptible to disease and insect infestations; it also leads to poor fruit development and quality and poor adaptation to changing environmental conditions. Excess N and low K could both lead to cupped, cupped leaves especially under the hot, dry weather that you noted. Please contact me or your crop consultant if you would like further assistance.
Sample Information

This section contains identifying information provided by the client.

Sample Information
Sample ID: T1
Crop: Tomato, Trellis
Growth Stage: F
Week: 0
Plant Part: M
Plant Position: U
Plant Appearance: Lvs cupped/curled

good detail
# Plant Tissue Report: Section 3: Laboratory Results

## Diagnostic

### Plant Tissue Report

**Sample Information**
- **Sample ID:** T1
- **Crop:** Tomato, Trellis
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- **Week:** 0
- **Plant Part:** M
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### Nutrient Measurements

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**County:** Nash  
**Advisor:**

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**Links to Helpful Information**
Data Accuracy

Depends largely on the sample

- **Quality**
  - representative of field conditions
  - collected & handled according to recommended practices

- **Quantity**
  - sufficient tissue for testing
Laboratory Results: Nutrient Measurements

1) Includes concentrations of 11 of the essential plant nutrients plus sodium
   - Macronutrients as % values
   - Micronutrients as ppm
2) May include petiole nitrate N (NO₃-N), Mo & Cl values based on crop and/or additional fee paid
Laboratory Results: Interpretations Indexes

- **50 to 74** = nutrient level is sufficient for plant growth
- **< 25** = nutrient deficiency
- **< 50** = reduced yield possible
- **> 74** = additional fertilizer provides no benefit
- **> 99** = excess nutrients present; may be toxic

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**Nutrient Ratios**

- N:S 7.89 : 1
- N:K 2.67 : 1
- Fe:Mn 0.93 : 1
Index Values vs. Yield

- Deficient
- Sufficient
- Low
- High
- Excess
- Critical Value
- Mild Toxicity

Growth or Yield (%)

Nutrient Index Value
Laboratory Results: Nutrient Ratios

- indicate relative balance between nutrients
- may indicate problems with nutrient assimilation when values are not within normal ranges

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Brenda R. Cleveland, Agronomist
Completed: July 10, 2011
Agronomist’s Comments:

Cupped, curled leaves for 3 weeks; hot, dry conditions; irrigated through drip tape. Nitrogen (N) is very high and potassium (K) is marginally low. Deficient K causes marginal yellowing to scorching. Low K could be related to a heavy fruit load. Verify that you have applied adequate K and that soil moisture is good. Be careful not to apply excess N as it can lead to succulent vegetative growth that is easily susceptible to disease and insect infestations; it also leads to poor fruit development and quality and poor adaptation to changing environmental conditions. Excess N and low K could both lead to curled, cupped leaves especially under the hot, dry weather that you noted. Please contact me or your crop consultant if you would like further assistance.

Brenda R. Cleveland, Agronomist
Completed: July 10, 2011

This section may provide nutrient management advice and suggestions for corrective action.
The last page of every report has a general explanatory section called “Understanding the Plant Report” with hyperlinks to more detailed information.
Things to Remember:
Essential Nutrients

- There are 16 essential plant nutrients.
- These nutrients are supplied by the soil, air, commercial fertilizers and amendments such as waste material.
- Plants take up essential nutrients in predictable concentrations.

N  P  K  Ca  Mg  S  Fe  Mn  Zn  Cu  B  Mo  Cl  C  H  O
Things to Remember: Nutrient Levels in Tissue

- Optimal concentrations (or ranges of concentrations) vary by crop.
- Tissue analysis is a tool that measures nutrient concentration and, therefore, plant uptake.
- The Plant Tissue Report indicates if concentrations are within ranges that lead to optimum growth and yield.
Things to Remember: Reasons for Monitoring

- Best way to detect hidden hunger
  - The earlier a nutrient problem is detected, the easier it is to correct.
  - The sooner a nutrient problem is corrected, the lower the subsequent drop in yield.

- Best way to obtain the information needed to help manage fertilization program more efficiently
Questions?

Please contact

- Email: Brenda.Cleveland@ncagr.gov
- Phone: 919.733.2655
- Website: www.ncagr.gov/agronomi/
- Address: NCDA&CS Agronomic Division
  Plant/Waste/Solution/Media Section
  1040 Mail Service Center
  Raleigh NC 27699-1040