

# Field Crops Newsletter

Granville and Person County  
Mikayla Berryhill

## Tobacco Greenhouse Reminders



Good water quality and adequate nutrient levels for tobacco transplant float beds is incredibly important. The success of this year's tobacco crop starts with timely tests, plan adequately to get both your **source water** and **nutrient solutions** tested this season.

The most common water quality problems for float bed source water in North Carolina are alkalinity, pH, sodium, and chloride. Having a timely source water sample can allow grower to address the issues early, before the quality of your transplants is impacted. This will be a *source water* sample, using the code ST on your sample form. Make sure to run your water for a good 5 to 10 minutes before collecting your sample. Use a clean, plastic bottle, like a cleaned-out soda or water bottle. Before filling the bottle, rinse it with the water being collected.

*Nutrient solution* samples should be taken after fertilizers have been mixed into the bays. Growers should send samples to ensure that target nutrient levels have been reached. When taking this sample, make sure that fertilized has been completely dissolved and is thoroughly mixed within the bay. Collect the sample from the emitter, NOT the stock tank. Use the code NT on your sample form (unless you are using an ORGANIC nutrient solution - then use the code NG on the form). The cost is \$5 for North Carolina residents and will return results 3-4 days from the receiving the sample. Come by the extension office to bring your samples and get the solution sample form.

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This newsletter is designed to give you up to date information on crops from NC State University and other sources. For more information:

### Contact

#### PERSON COUNTY

304 S Morgan Street  
Room 123  
Roxboro, NC 27573

PH: 336.599.1195  
person.ces.ncsu.edu

#### GRANVILLE COUNTY

125 Oxford Outer Loop  
Oxford, NC 27565

PH: 919.603.1350  
granville.ces.ncsu.edu

#### MIKAYLA BERRYHILL

mikayla\_graham@ncsu.edu

# Tobacco Greenhouse Reminders (continued)

Here are some greenhouse fertility guidelines from NC State:

1. You should not fertilize floatbed water with NPK products ahead of seeding. Nutrients applied before seeding should ONLY be in rare situations where there has been a history of something like low calcium or low boron. This is why getting your water tested is so important.
2. A split application of nitrogen is recommended. The target total nitrogen application should be 250 ppm:
  - a. 150 ppm nitrogen should be added to the float water 7-10 after trays are floated.
  - b. 100 ppm nitrogen should be added to the float water 3-4 weeks later.

There are examples and records of this in the 2023 Flue-Cured Tobacco Guide (which you can come and pick up if you haven't already), but below are some important calculations for determining fertilizer calculation.

## Float Water Volume:

$$\begin{aligned}\text{Float Bed Volume (cubic feet)} &= \text{bed length (ft)} \times \text{bed width (ft)} \times \text{water depth (ft)} \\ \text{Gallons of water} &= \text{Float Bed Volume (cubic feet)} \times \frac{7.48 \text{ cubic feet}}{\text{gallon}}\end{aligned}$$

**Example:** Float bed that is 100 ft X 16 ft and 4 inches deep.

$$\begin{aligned}100 \text{ feet long} \times 16 \text{ feet wide} \times 0.33 \text{ feet deep} &= 528 \text{ cubic feet} \\ 528 \text{ cubic feet} \times \frac{7.48 \text{ cubic feet}}{\text{gallon}} &= 3949 \text{ gallons of water}\end{aligned}$$

## Nutrient Calculation:

$$\text{Fertilizer added per 100 gallons of water} = \frac{\text{Desired water concentration}}{\% \times 0.75}$$

**Example:** Targeting 150 ppm of nitrogen using a 16-5-16 fertilizer.

$$\frac{150}{16 \times 0.75} = \frac{12.5 \text{ ounces}}{100 \text{ gallons of float water}}$$

## Total Fertilizer Calculation:

$$\text{Pounds of fertilizer} = \frac{\text{Ounces of fertilizer}}{100 \text{ gallons of float water}} \times \frac{\text{Gallons of water in float bed}}{100} \times \frac{1 \text{ ounce}}{16 \text{ pounds}}$$

**Example:** Finding the pounds of fertilizer needed in a float bed with 3949 gallons of water (examples from above).

$$\frac{12.5 \text{ ounces}}{100 \text{ gallons of float water}} \times \frac{3949 \text{ gallons of water}}{100} \times \frac{1 \text{ ounce}}{16 \text{ pounds}} = 30.85 \text{ pounds of fertilizer}$$

If you have any questions about greenhouse management or fertilizer recommendations, please let me know!

# Soil calcium, magnesium, and potassium

David H. Hardy, NCDA&CS



RALEIGH, N.C. – Now that harvest is complete, the focus for many growers turns to soil sampling and formulating nutrient management plans for next season. For some, it is a time to reflect on yields and if goals were not met, ponder different strategies.

One concept that farmers may hear about and be enticed to implement is supplying soil with a balanced ratio of calcium, magnesium and potassium. These nutrients are called bases in soils as opposed to soil constituents that are acid- hydrogen and aluminum. Hence, the basic cation saturation ratio (BCSR)

concept recommends an ideal balance of calcium, magnesium and potassium to achieve maximum yield.

Recommendations are made to keep these ratios at optimum or ideal levels no matter what traditional soil test levels are. Over the past 50 to 70 years, varying ratios have been proposed by different soil scientists but there is not universal agreement about what is best. For growers considering this concept, this lack of agreement might best be taken as a red flag to proceeding in this direction.

A 2017 American Society of Agronomy (ASA) journal article titled, “Historical Perspective of Soil Balancing Theory and Identifying Knowledge Gaps: A Review,” summarizes that seven peer-reviewed research publications (1980s – late 2000s) on study and evaluation of specific ratios to optimize crop yields or positive impacts on crop production refute the concept as valid.

Additionally, according to Dr. Luke Gatiboni, an associate professor in Crop and Soil Science at N.C. State University, “it is well known that nutrient interactions occur in soils, meaning that the amount of one nutrient such as potassium if in excess can negatively impact root uptake of other nutrients such as calcium and magnesium; research has validated this. However, supplying calcium, magnesium and potassium in ideal ratios that exceed plant requirements may indeed create nutrient imbalances and deficiencies.”

Lastly, there is a physical component of soils that farmers think about referred to as soil structure. Good soil structure is achieved by maintaining organic matter that is often referred to as the “glue” that forms stable aggregates with sand, silt and clay soil mineral particles.

The BCSR concept asserts better soil structure is achieved by maintaining higher levels of calcium than magnesium. Undoubtedly, good soil structure is needed for optimum entry of water into soils, supply of plant-available water to crops, and maintenance of adequate drainage. However, the ASA article reports research showing that good soil structure can be maintained over a wide range of ratios of calcium to magnesium, with no scientific evidence to support a specific balance. Some North Carolina growers have embraced the use of gypsum, a calcium supplement, for this purpose but no research supports this use in our soils.

As growers consider their yields this year and strive for higher yields ahead, it is important to remember that soil fertility is just one component of yield. Growers know that variety selection, planting dates, weather and many other factors determine final yield.

“Use our Agronomic Division’s traditional soil testing service as a solid foundation for lime recommendations to correct soil acidity and to supply calcium and magnesium along with potassium fertilizers based on soil test levels and crop needs,” said Agriculture Commissioner Steve Troxler. “This will help keep our No. 1 industry – agriculture – profitable.”

# Upcoming Events:

## NE Piedmont Grains Meeting

**Tuesday, February 28<sup>th</sup> @ 4PM**

- IN PERSON at the Warren County Armory (501 US Hwy 158 Bus E, Warrenton, NC)
  - Meal will be provided.
  - N, D, O, and X pesticide recertification credits offered.
  - Registration required: go to <https://go.ncsu.edu/nepiedmontgrainmeeting2023> or call your local extension office.
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## 2023 Small Grains Field Day

**March 1<sup>st</sup>, 2023 @ 11:30PM**

- IN PERSON at the Piedmont Research Station (8350 Sherrills Ford Rd. Salisbury, NC)
  - Meal will be provided.
  - N, D, O, and X pesticide recertification credits offered.
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## Upper Piedmont Grain Meeting

**Wednesday, March 15<sup>th</sup> @ 9:30AM**

- IN PERSON at the Rockingham County Center (525 NC-65, Reidsville, NC)
  - Snacks and drinks will be provided.
  - 2 hours of N, D, O, and X pesticide recertification credits offered.
  - Registration required: go to <https://go.ncsu.edu/upperpiedmontgrain2023> or call your local extension office.
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## Upper Piedmont Corn Meeting

**Thursday, March 23<sup>rd</sup> @ 8AM**

- IN PERSON at the Granville County Expo and Convention Center (4185 US-15, Oxford, NC)
- Snacks and drinks will be provided.
- N, D, O, and X pesticide recertification credits offered.
- Registration required: go to <https://go.ncsu.edu/upperpiedmontcorn2023> or call your local extension office.

### ABOUT N.C. COOPERATIVE EXTENSION

North Carolina Cooperative Extension is a strategic partnership of NC State Extension, The Cooperative Extension Program at N.C. A&T State University, USDA-NIFA, and 101 local governments statewide. Extension professionals in all 100 counties and the Eastern Band of Cherokee translate research-based education from our state's land-grant universities, NC State and N.C. A&T, into everyday solutions. Extension specializes in agriculture, youth, communities, food, health and the environment by responding to local needs.