



The Corn Growers' Association of North Carolina Invites You to Participate in Growing Our Industry

A wet, cool (cold) April and May with hot weather in late June and July has resulted in another challenging season for North Carolina corn growers. As you reflect on your corn production practices remember you have a resource that can help you solve problems or enhance current opportunities. The Corn Growers Association of North Carolina is ready to help you in your business of growing and marketing corn. Why not take a few moments to let us know what problems you would like to see resolved. If you think present or past projects have been successful in improving your farming operation, let us know that as well. Working together we can be successful!

Rhonda Garrison is the new Executive Director for the Corn Growers Association of North Carolina. Contact her at 919-803-4778, or email at rhonda_corngrowers@yahoo.com Drop by the new office at 1306 Annapolis Dr. Suite 107, Raleigh, NC 27608.

**2019 North Carolina Commodities Conference
January 9 - 11 in Raleigh, North Carolina**

The Joint Conference of Corn, Cotton, Soybean Producers and Small Grain Growers will be held at the Sheraton Imperial Hotel and Convention Center in Durham on January 9-11, 2019. Watch your mailbox for information and registration materials, or visit <http://www.nccommoditiesconference.com/> to pre-register. As always, attendance is free!

**Notice of Annual Meeting
January 10, 2019**

The Corn Growers Association will have their annual meeting in conjunction with the 2019 Commodity Conference at the Sheraton Imperial Hotel and Convention Center in Durham on Thursday, January 10th. All corn growers are encouraged to attend. Refer to your Commodity Conference registration materials for exact time and room location.

Organizations Supported by the North Carolina Corn Growers

US Grains Council - The Corn Growers Association of North Carolina is an important member and supporter of the U. S. Grains Council. Founded in 1960, the US Grains Council is a private, non-profit corporation with nine international offices and programs in more than 50 countries. Its unique membership includes producer organizations and agribusinesses with a common interest in developing export markets.

Darren Armstrong, Hyde County North Carolina farmer, is the Vice Chairman of the Board of Directors of the U.S. Grains Council and has served as the Chairman of the Trade Policy Action Team dealing with issues such as TPP, T-TIP, and others. Guy Davenport also serves the North Carolina Corn Grower's as a representative on the US Grains Council.

National Corn Growers Association – The Corn Growers Association of North Carolina is proud to be a part of the National Corn Growers Association which is the largest trade organization in the United States representing approximately 36,000 corn growers and the interests of more than 300,000 farmers who contribute through corn check-off programs in their states. The NCGA and its 48 affiliated state associations and checkoff organizations work together to help protect and advance corn growers’ interests. The NCGA is the voice for the corn growers’ concerns in national legislative, judicial and regulatory agencies’ decisions affecting agriculture. NCGA Corn Congress delegates from North Carolina are Ronnie Burlison, Guy Davenport, Franklin Lee, Ervin Lewis, and Maurice Smitherman. Alternative are Wade Byrd, Gerald Fryar, Jay Sullivan Dennis Waller and Jeff Sparks.

North Carolina Department of Agriculture and Consumer Services and North Carolina State University – The Corn Growers Association of North Carolina works with representatives of NCDA&CS to promote and enhance the critical services that NCDA&CS provides in the areas of soil and tissue testing, grain marketing, and in the promotion of North Carolina products. The Association is also working with NCSU in supporting the North Carolina Plant Sciences Initiative. The Board knows that agribusiness is the number one sector in the state’s economy and is projected to exceed \$100 billion in revenue by 2020. Every dollar spent on agricultural research in North Carolina returns \$19.90 in economic benefits to the state.

Research Results from Projects Conducted in 2017

BREEDING AND GENETICS

TROPHY: A New Resource for US Corn Breeding Developing GLS-Resistant Female Lines

MM. Goodman, M.D. Karkowsky, and D. Dowden

The objective of the TROPHY breeding project is to develop new sources of germplasm for corn which have improved disease and pest resistance and yield potential. This is being accomplished through the TROPical HYbrid (TROPHY) synthetic which is a unique source of all-tropical germplasm. In the project for improving Gray Leaf Spot resistance the objective is to introduce this resistance into stiff stalk inbreds which are the foundation for hybrids with high yield potential. **RESULTS:** The current NC lines being developed from the TROPHY synthetic such as NC358 are among the most resistant lines to Maize Lethal Necrosis (MLN) which is a devastating disease in Africa and Europe. Because MLN is such a threat these resistant lines were increased in 2017 for release to develop new hybrids. In addition to this work Dr. Goodman has improved GLS resistance in stiff stalk (female) lines that are being used by several companies to produce commercial hybrids. Lines developed and released using unique germplasm have made NC State the leading public institution in the world for new, useful sources of corn germplasm. Support from the NC Corn Grower’s Assn has allowed corn germplasm development to persist at NC State; while at most land grant universities it has all be evaporated.

Selection for Improved Resistance to Fusarium Ear Rot and Fumonisin Accumulation in Corn

J. Mullahey and J.B. Holland

The objectives of this project are to develop new breeding populations from inbred line crosses to combine resistance genes from different sources with genes for good agronomic performance and to investigate the potential of genomic selection to improve corn ear rot and fumonisin contamination resistance **RESULTS:** 100 progenies from populations which were created by crosses between inbred lines with some level of resistance to Fusarium and lines with good agronomic potential were evaluated for disease tolerance and yield potential. In addition 250

untested lines were inoculated with disease and evaluated to see if DNA markers could be used to predict disease resistance.

INSECT MANAGEMENT

Improving Stink Bug Management in Corn

D. Reisig and H. Mehl

The objectives of this project were to 1) determine the most accurate and precise scouting techniques at growth stages when stink bugs injure corn, 2) determine efficacy of insecticides and explore possible interactions with fungicides, 3) develop a management system to reduce stink bug damage. **RESULTS:** This study found that stink bugs aggregate at the growing points of the corn plant and that scouting techniques must change based on the growth stage of the plant and that bifenthrin is the most effective insecticide for killing sting bugs. A new partial plant sampling plan that prevents damaged ears from occurring is 30% more efficient to implement and 99% accurate in identifying threshold levels of stink bug.

PHYSIOLOGY AND CROP MANAGEMENT

Understanding the Impact of Uniform Emergence on Corn Growth and Yield and the Use of Early Fertility in Managing Emergence and Growth

R.W. Heiniger

The goals of this project are to quantify the impact of late emerging seedlings on corn growth and yield and to identify fertility or other management practices that enhance uniform, rapid emergence and early growth. **RESULTS:** This study found that even a short delay in emergence among plants (some plants emerging hours or days later than the others in the same field) impacted corn plant development and yield. Analysis found that for each percent increase in plants emerging 24 hrs after first observance of spiking there was a 0.3 bu per acre decrease in corn yield. Three management factors – hybrid, seeding depth, and seed treatment - were identified that influenced emergence. The most important of these were the selection of a hybrid with high emergence rating and planting corn deeper – 2.5”.

Corn Problem Diagnosis Support for Cooperative Extension Agents

C.R. Crozier, S. Koenning, R.W. Heiniger and B. Cleveland

Funding was provided to Cooperative Extension Agents for vouchers that allowed them to send plant tissue samples and diagnostic soil samples to the NCDA&CS Agronomic Division Laboratory. This type of diagnostic sampling is critical to determining what is causing problems in corn growth and development and to help farmers take corrective action.

FERTILITY AND IRRIGATION MANAGEMENT

Testing an Alternative Drainage System for Corn Production in NC to Maximize Crop Yield and Water Use

G.M. Chescheir and C. Poole

The objectives of this project are to 1) Test a new drainage system design that has the potential to greatly reduce both drought stress and excessive water stress, 2) document yield and water conservation benefits of this new system, 3) reduce the cost of ditch maintenance, and 4) conduct a cost-benefit analysis to assess the feasibility of this new system. **RESULTS:** A site near Bath, NC was instrumented for data collection on corn. Early results showed promise for increasing yield with proper water management with yield increases of 19 bu per acre.

Evaluating Irrigation Strategies for Water-Efficient Corn Production in Eastern North Carolina – G. Payne, M. Youssef, G. Wilkerson, R. Heiniger, J. White, and M. Kudenov – Some of the objectives of this project are to 1) evaluate two irrigation regimes – irrigation applied to meet crop evapotranspiration demands for the entire growing season or only during the critical growth stages, 2) evaluate a “smart” irrigation technology based on monitoring water in the root zone, and 3) evaluate hyperspectral imaging for irrigation management. **RESULTS:** Data showed that both the conventional and crop demand irrigation schedules increased corn yield by 23%. Using the crop demand strategy resulted in similar yield with less water used. These results are being used along with new technologies to develop automated irrigation systems.

Starter Fertilizer: Is Nitrogen, Phosphorus or Both Needed – C. Crozier, D. Osmond, and S. Tilley – The objectives of this project are to 1) determine if nitrogen alone or N and phosphorus starter fertilizers are necessary for corn, and 2) determine if the placement (surface dribble or a banded 2 x 2 placement) of either N or N and P affects the efficacy of starter fertilizer. **RESULTS:** This study found that starter fertilizer increased yield on some, but not all, fields (1 out of 5 in 2017) and that when a starter response occurred it resulted in a substantial 18 bu per acre increase in yield. Both N and P in combination and a 2 x 2 placement provided the greatest yield response.

Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Corn Yield in North Carolina Cropping Systems – C. Crozier, D. Hardy, K. Hicks, and J. Smyth - The objectives of this project are to 1) characterize the yield response of corn to soil test potassium (K) in different soil types representative of NC under no-till and conventional tillage practices at sites with irrigation and a history of high yield, 2) correlate the relative yield and ear-leaf K concentration at VT with soil test results, 3) determine the accuracy of existing soil test K recommendations to maximize yield and revise as necessary, and 4) identify the critical leaf K concentrations used to identify K deficiency at V5 and VT and revise plant sufficiency ranges accordingly. **RESULTS:** There was a significant yield response to K fertilizer at sites with low (< 25 K index) K levels in the soil. At these sites an application of 100 lb of K₂O per acre was sufficient to obtain maximum crop yield. Tissue samples at VT were consistent with published sufficiency range guidelines.

Are Nutrient Deficiencies Limiting High Yield? Tissue and Soil Analyses of NC Corn Yield Contest Entries – J.G. White, R.W. Heiniger, and G.G. Wilkerson – The objective of this project is to determine whether macro and/or micronutrient deficiencies are apparent at the high yield levels achieved by growers entering the NC Corn Yield Contest and to explore the extent to which these deficiencies may be placing a limit on corn yield. **RESULTS:** Corn growers who consistently enter the NC Corn Yield Contest were contacted about participating in this study and methods were developed to test sites where high corn yields were anticipated. Results suggest that multiple nutrients may be limiting with work being conducted to determine the key nutrient elements involved.

New Research Projects Funded for 2018

Novel Agricultural Water Management Systems for Increasing the Production and Consistency of Corn Yields in North Carolina – M. Youssef, C. Poole, L. Negm – The objective of this project is to evaluate and demonstrate an economical system to automatically manage agricultural drainage and sub-irrigation to maximize corn yield, water conservation, and minimize user management.

Developing Techniques for Measuring Emergence and Early Growth on Corn Hybrids in North Carolina – R.W. Heiniger and R. Heiniger – The objective of this project is to develop tools

for phenotyping multiple hybrids for emergence and rate of early growth and to use those tools in the NCOVT program to rate hybrids for emergence and growth.

Validation, Characterization and Precise Mapping of Genes Associated with Resistance to Multiple Diseases in Maize – P. Balint-Kurti and E. Davis – The objective of this project the validation, characterization, and precise mapping of genes associated with resistance to multiple diseases in maize.

Measuring Rate and Efficacy of Fungicides Using Traditional vs. Under Canopy Placement – S. Tilley, L. Theissen, and R. Gurganus – The objective of this project is to compare over the top spray application to a new system designed to spray into the corn canopy at a more consistent rate and to determine if better placement and timing of fungicides can lead to greater corn yield potential.

Selected County Extension Agent Projects Funded in 2018

The Corn Growers Association of North Carolina provides funding to county extension programs to enhance educational activities and county extension trials. Fifty-three counties received funding for a wide range of projects ranging from hosting grower meetings to putting in demonstration and research trails. The following are examples of the impacts of this funding.

Granville/Person County – Gary Cross, agent – Funds used to buy pheromone traps and to monitor incoming moth flights to measure corn borer, armyworm, and corn earworm pressure.

Sampson County – Della King, agent – Funds were used to support county field corn variety test.

Forsyth, Stokes, Surry and Yadkin Counties – Tim Hambrick, agent – Funds were used to support a corn field day event at two locations.

Pamlico County – Daniel Simpson, agent – Funds were used to support grower production meetings and to help host the annual farm tour event to showcase local research projects.

Lincoln and Cleveland Counties – Andrew Scruggs, agent – Funds were used to support trials evaluating drought tolerant varieties, winter cover crop residue effects on corn, and the use of in-furrow biologicals on corn.

Craven and Carteret Counties – Mike Carroll, agent – Funds were used to support a multicounty corn and soybean meeting and to support sampling of corn to quantify early season corn fertility status.

Buncombe, Haywood, and Henderson Counties – Ethan Henderson, Noah Henson, and Steve Duckett, agents – Funds were used to test nutritional status of 30 corn silage varieties. Funds paid for laboratory and digestibility analysis.

Corn Growers Association of North Carolina is now Digital!

The Corn Growers website has been updated and is now current, please visit at www.nccorngrowers.com! All the above research projects and grant information can be found there, as well as a section called “Useful Resources” with links to several helpful websites, including Dr. Ron Heiniger’s digital Corn Production Guide. We also send out monthly newsletters via email. If you’d like to be added to that list, please email Rhonda at rhonda_corngrowers@yahoo.com.

We’re also on social media! Visit us on Facebook at <https://www.facebook.com/Corn-Growers-Association-of-North-Carolina-184110285439453> or on Twitter at <https://twitter.com/NCCornGrowers> and see what’s going on around the state.