

The Harvester

Volume 1, Issue 1



Winter 2014

The Newsletter of the Department of Crop Science at North Carolina State University



Two new high oleic peanut varieties to be released by Tom Isleb's breeding program in Crop Science - page 4

Welcome to the 'New' Harvester



We are excited to bring back the “Harvester”, the newsletter from the Department of Crop Science at NCSU!

The Harvester newsletter will highlight departmental news such as recent innovation and discoveries, awards and recognition, stories about our great students, alumni spotlight, new crop science programs, faculty information, and much, much more. We will produce two newsletters a year (late fall, late spring) and we are open to stories or photos you want us to include in future issues (especially from our alumni).

Our department has a long, rich history of delivering outstanding educational programs in crop science. We are a preeminent department focused on food and fiber production, sustainable agriculture, and healthy turfgrass for sports and recreation. Some of our recent innovations and discoveries include plant resistance to environmental stresses such as heat, drought, pests and atmospheric pollutants; new summer turfgrass varieties for N.C.; understanding cell wall (i.e. fiber) formation in cotton plants; management strategies for herbicide resistant weeds in row crops; reduced nicotine levels in tobacco; production of organic grains; and locally grown food and sustainable food systems. Our scientists are working to feed, fuel, and clothe our world’s growing population.

We continue to offer 2-yr (Ag Institute) and 4-yr degrees (B.S. degree) in agriculture. Our graduate student programs are very popular among today’s students. We provide scholarship opportunities for undergraduate and graduate students, internships for real world experience, student clubs so students can network with other students, and research experiences in the lab and field.

We look forward to reconnecting with our internal and external stakeholders (especially our incredible alumni) through the “Harvester”. I hope everyone has a healthy and prosperous 2014.

Happy Trails,

Jeff Mullahey

Head, Department of Crop Science

*In this issue: Fulbright Fellowship in Croatia - 3
New peanut cultivars - 4
Recent Awards and Recognition - 5
Winter 2014 Graduates - 6
Crop Science - “Army Strong” - 7*

Reach us by mail at:
Department of Crop Science
North Carolina State University
Campus Box 7620
Raleigh, NC 27695-7620

Reach us by phone at:
919.515.2647
or on the internet at:
<http://www.cropsoci.ncsu.edu>

Fulbright Fellowship in Croatia

By Dr. J. Paul Mueller

During May and June of 2013 I had the great honor and pleasure to participate as a Fulbright Senior Specialist with the University of Zagreb, Faculty of Agriculture (FAZ) in Croatia. The Specialist Program is one of several available from the Fulbright Scholars Program for US Scholars <http://www.cies.org/>. This opportunity came about because of contacts made when I was serving as CALS Assistant Dean for International Programs (2007-2011).

During my time at FAZ I was able to travel



Vineyards and wine making are an important part of Croatian culture and horticulture. (Professor Mesic and I visiting a commercial vineyard)

across Croatia visiting research sites and farms as well as providing lectures for undergraduate and graduate students. FAZ which is equivalent to CALS is made up of 27 Departments.

Croatia is a beautiful and fascinating crescent-shaped country with continental and Mediterranean

climates and a population of about 4.25 million people. The Mediterranean region includes a beautiful coast and several thousand islands that are important tourist attractions. Croatia is one of several countries (Serbia, Montenegro, Slovenia, Bosnia-Herzegovina, and Macedonia) that prior to 1991 made up the former Socialist Federal Republic of Yugoslavia. Croatia became the 28th member state of the European Union 1 July 2013.

Croatian farms are mostly small and fragmented but at the same time there exist some very large capital intensive, market-oriented farms that were formerly state-owned collectives, but are now leased by the government to private companies. A little over one-half of the farmland is owner-operated and the rest operated by tenant farmers or leased by companies. The region of Slavonia in eastern Croatia has the most fertile soils with the largest farms; Crops include maize, wheat, potatoes, sugar beets, barley, soy bean, sunflower, tobacco, oats, rye, millet, rice, peas, beans. Grapes (vineyards), plums, apples, tomatoes, as well as olives and tangerines in the Mediterranean region. About 2/3 of the land considered arable is in cereal crops.

There are many similarities between CALS and FAZ and I believe there are many opportunities for collaborations between our faculties in the future. In fact there is already a history of collaborations between our faculties. The most recent example was Dr. Ramsey Lewis who served as an external referee on a PhD candidate in plant breeding at FAZ. In 2012 CALS and FAZ collaborated in a student exchange and this year, 2013, there will another student exchange.

New Employees

Miguel Sebastian Castillo - Assistant Professor

Susan Wassmer - Business Services Coordinator

Chernell Jones - Student Services Assistant

Lori Unruh Snyder - Undergraduate Coordinator

Two New Peanut Cultivars released by Crop Science

By Dr. Thomas Isleib

The Department of Crop Science has plant breeding programs in corn, soybean, cotton, small grains, tobacco, peanut, and turfgrass. Some of these programs are responsible for variety (we call them “cultivars” for “cultivated varieties”) development, so periodically, a program will release a new cultivar.

In the spring of 2013, the peanut breeding program released two new large-seeded, Virginia-type cultivars, ‘Sullivan’ and ‘Wynne’. Both of the new cultivars have the patented high oleic fatty acid trait in their seed oil. Both are closely related to the widely grown normal-oleic cultivar ‘Bailey’. According to area shellers, Bailey is on the small side for pod and seed size although it is similar to ‘NC V 11’ and ‘VA 98R’, each of which in its day dominated the Virginia-Carolina area’s production. Sullivan is similar in size to Bailey; Wynne is larger.

The high oleic character will require the grower to pay an additional 2.6¢ per pound of seed royalty that goes to the University of Florida, at least until their patent on the trait expires in about 2020, but the trait gives peanuts extended shelf life. Elevated oleic acid content is accompanied by a corresponding reduction in linoleic acid, the fatty acid in peanut oil that is most prone to oxidation and generation of rancid flavor. High oleics have a profound improvement in delay of the onset of rancidity in roasted peanuts, particularly those salted in the shell. Because purity of the seed has been an issue, not only here but also in the Southwestern production area where they have succeeded in releasing



Example of the pods on a peanut plant

only high-oleic runner-type cultivars, we need to have only high-oleic Virginia-type cultivars released and grown in our area. If we have a mixture of types, they are bound to get mixed in trade. Even if we are successful in providing growers with an array of high yielding, disease-resistant, high-oleic cultivars, we will have to keep working on the peanuts in the seed chain (breeder, foundation, registered, and certified) to make sure they are purely high oleic.

In developing Sullivan and Wynne, we used “shuttle” breeding, going back and forth between North Carolina and our winter seed nursery in Puerto Rico (the “PRWN”). We made the crosses at the greenhouse on the NCSU campus in Raleigh, then sent the hybrid or “F1” seeds to the PRWN. The second-generation (“F2”) plants were grown at the NCSU’s Peanut Belt Research Station (PBRS) at Lewiston where we selected for plants with good-looking pods and seeds. The F3 progeny of F2 selections (“F2:3” families) were again grown at the PRWN where we harvested enough seed to plant four disease trials back in North Carolina the following generation. We tested F2:4 families’ reactions to leaf spot, *Cylindrocladium* black rot (CBR), *Sclerotinia* blight, and tomato spotted wilt virus (TSWV).



A flower from a peanut plant

(Continued on page 5)

Recent Awards and Recognition

Dr. Jose De Jesus Sanchez Gonzales who presented the Calvin Sperling Memorial Biodiversity Lectureship - Jesus received his Ph.D. with Major Goodman.

Dr. Corley Holbrook received a CSSA Fellows Award, He received his Ph.D. degree in the soybean program with Joe Burton and Tommy Carter.

Stine Petersen received the best poster award in CSSA Division C01. She is a Ph.D. graduate student with Paul Murphy.

Keith R. Merrill received one of the Gerald O. Mott Scholarships. He is a Ph.D. student with Gina Brown-Guedira and Paul Murphy.

David Eickholt received one of the two United Soybean Board Fellowships (\$25,000 per year for 3 years). He is a Ph.D. student with Tommy Carter, and received his M.S. with Ramsey Lewis.

Leah Ruff received the second United Soybean Board Fellowship (\$25,000 per year for 3 years). She received her M.S. with Tommy Carter in May, 2013 and is now working on a Ph.D. in soybeans at the Univ. of Nebraska.

Ansilta Zulima De Luca-Westrate was one on the Golden Opportunity Scholars, and is an undergraduate with Michelle Shroeder-Moreno.

Congratulations to **Dr. Rich Zobel** for receiving a 2013 President's Volunteer Service Award.

Congratulations to **Lewis Braswell, Matthew Inman** and **Charles Cahoon** for their awards at the 2014 Beltwide Cotton Conference

(Continued from Page 4)

Having identified the most resistant families, we selected F4 plants within them and sent the F4:5 families back to the PRWN to do it all again. After selecting the best looking F6 plants in the most disease-resistant F4:6 families in our disease trials here, we grew the F6:7 families at the PRWN, then tested the F6:8 families in North Carolina trials not only for the four economically important diseases, but also for yield and grade at PBRS and the Upper Coastal Plain Research Station (UCPRS) at Rocky Mount. The F6-derived families are sufficiently genetically stable that we do not select within the families again. The most disease resistant families "graduated" to a series of trials for disease while the highest yielding and best grading moved on to a test series for yield and grade, our Advanced Yield Trial (AYT) program at PBRS,

UCPRS, and the Border Belt Tobacco Research Station at Whiteville.

The families that became Sullivan and Wynne did both. After two years of AYT testing, we continued testing the lines in that series after they graduated to the three-state Peanut Variety and Quality Evaluation ("PVQE") program run by Dr. Maria Balota of Virginia Tech's Tidewater Agricultural Research and Extension Center in Suffolk, VA. After three years in the PVQE trials (five in the AYT series), the lines were considered candidates for release. Along the way, we checked them for flavor profile and tested them in the Uniform Peanut Performance Test. Upon release, the cultivar names were chosen to honor Dr. Gene Sullivan the former peanut extension specialist in the department, and Dr. Johnny C. Wynne, formerly our peanut breeder, department head, director of research, and dean.

Meet the Graduates of Winter 2014

Bachelors of Science - Natural Resources

James Richard Leathers II
Zachary Ryan McNeill

Bachelors of Science - Turfgrass Science

John Evan Blankenship
Parker Sulivane Henry

Bachelor of Science - Plant and Soil Sciences

Henry Matthews Edmondson
William Carson Hildreth III

Whitney Duncan Phillips
John Robert Suggs

Masters of Science - Crop Science

Angel Elisa Cruz
Alexandra Marie Knight
Paul Andrew Ruddle
Leah Anne Ruff

Mitchell Kevin Williams
Mai Xiong
Linglong Zhu

Doctor Of Philosophy

Bridget Robinson Lassiter
Sarah Louise True Meadows
Williams Casey Reynolds
Priyanka Tyagi
Michael Scott Wells

Crop Science “Army Strong”

By Steve Hoyle

It’s not every day that doing your job in Crop Science requires a security clearance! But recently, Aquatic and Non-Cropland Plant Management Program personnel needed just that!

In 2011, Dr. Rob Richardson; Associate Professor and Extension Specialist, was contacted by Environmental Specialists from Fort Bragg. The specialists needed assistance and recommendations regarding nuisance aquatic plants in several “mission critical” water bodies at the U.S. Army John F. Kennedy Special Warfare Center and School (SWCS), Camp MacKall. It seemed that several nuisance aquatic plant species were inhibiting exercises including special operations training. Following a site visit, Richardson saw an opportunity to partner with SWCS to develop a research project. Richardson and others provided a demonstration on the effectiveness of proper aquatic herbicide application for the control of the nuisance plants. In early 2012, Steve Hoyle; Research Specialist, Justin Nawrocki; PhD Student, and Cody Hale; Research Assistant of NCSU met with Captain Jason D. Schwarz, Special Warfare Construction Officer and Shannon Weston, Environmental Specialist and the group identified several objectives. First and foremost, the group wanted to facilitate training operations by opening clear swimming/boating channels that would be actively managed on an as needed basis. Secondly, the group wanted to manage the lake to have approximately 35-40% coverage of native aquatic vegetation. This native vegetation would both support and promote sport fish for recreation as well as aid in producing a healthy aquatic ecosystem for all other species. The group from NCSU surveyed each impassable water body and provided information on critical areas for plant removal, a demonstration plot was put out in Little Muddy Lake, an infested lake at Camp Mackall using labeled aquatic herbicides that were, in turn, evaluated during the fall and following spring.

The treatments were extremely successful in controlling the problem plants and provided valuable information on herbicide application and rates for the staff at the SWCS. The applications were so successful that the partnership was continued for another year and expanded to a larger demonstration area in 2013. This area was treated in the early summer and again evaluated for several months. Excellent control was achieved for yet another year. The work of the individuals from the aquatic and non-cropland weed science group will allow the US Army managers to provide better training while also protecting the environment in these multiuse water bodies.



In appreciation of the efforts of the Aquatic and Non-Cropland Plant Management Program, Dr. Richardson, Steve, Justin and Cody were each presented with a Certificate of Appreciation from the Special Forces and U.S. Army John F. Kennedy Special Warfare Center and School and a Unit Medallion.

If you would you like to receive further editions of The Harvester please contact us at:

The Harvester

Department of Crop Science

Campus Box 7620

Raleigh, NC 27695

or by email at: Contact_cropsci@ncsu.edu

Any research, event, awards or other information that we should know about?

Please contact the Department of Crop Science so we can feature it in a future edition of the Harvester.



You can find us on Twitter and Facebook -



Help Support Crop Science

Become a Friend of the NCSU Crop Science Program!

Supporting The Department of Crop Science financially is an important way in which you can advance the work of the department and in turn the profession of crop science. As a member of our community, you can help us to build a stronger future for Crop Science. Much of the success of the Department of Crop Science is already due to your support. Donations can be made to directly to individual faculty programs or to specific areas within Crop Science.

Thank you for your continuing support!