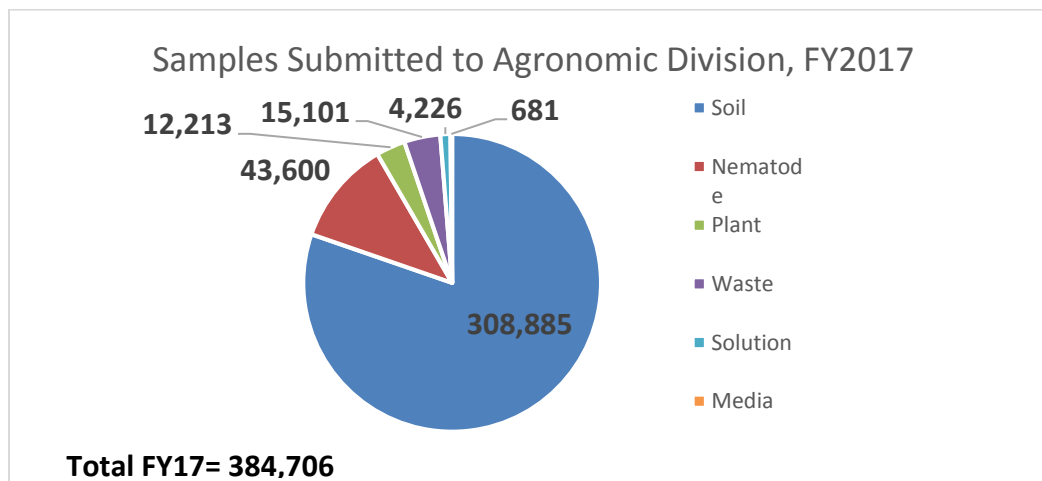


Agronomic Division — 2017 Annual Report

Colleen Hudak-Wise, Ph.D., director, (919) 733-2655

The Agronomic Services Division's mandate is to provide all North Carolina residents with diagnostic and advisory services that increase agricultural productivity, promote responsible land management and safeguard environmental quality. The Agronomic Services Division is the largest publicly operated agronomic laboratory in the country, offering the following laboratory services: soil testing, plant tissue analysis, waste analysis, solution analysis, soilless media analysis and nematode assay. The Division has 57 full-time permanent positions: 16 office positions, including administrative support, information technology, maintenance and leadership positions; 28 laboratory staff distributed among three laboratories (Soil Testing, Nematode Assay and Plant/Waste/Solution/Media) and 13 regional agronomists who make up the Field Services Section. Regional agronomists are assigned to territories consisting of 5 to 11 counties; they conduct grower consultations to help diagnose nutrient and/or nematode problems and to offer expert advice regarding plant nutrient management for waste management plans.

The Agronomic Division's laboratories processed 384,706 total samples during FY2017. Other accomplishments include performing at least 10,800 consultations with producers, including approximately 500 environmental consultations. Four major field research projects to validate the Division's recommendations were conducted by staff. In addition, the Agronomic Division educated N.C. citizens regarding its mission by hosting 35 laboratory tours and preparing 12 news releases.



Other notable milestones for 2017 include

- 1) Hiring of two new regional agronomists, Tyler Whaley for Region 4 and Brandon Poole for Region 8.
- 2) Purchase of a second pH robot and a new automated dispenser for the pH area of the Soil Testing Laboratory
- 3) Purchase of two semi-automatic elutriators for the Nematode Assay Laboratory
- 4) Purchase of an Elementar rapid N exceed for analysis of liquid waste samples by the Plant/Waste/Solution/Media (PWSM) Laboratory
- 5) Purchase of two CEM MARS microwaves for closed vessel digestion by the PWSM Laboratory
- 6) Completing the readoption of 02 NCAC 37 .0201 (Soil Testing Service) and 02 NCAC 37 .0203 (Nematode Advisory Service). In addition, 02 NCAC 37 .0202 (Plant Analysis Service) was amended to include new services.
- 7) Participation in the NC Star Public Sector Safety Program for the eighth year

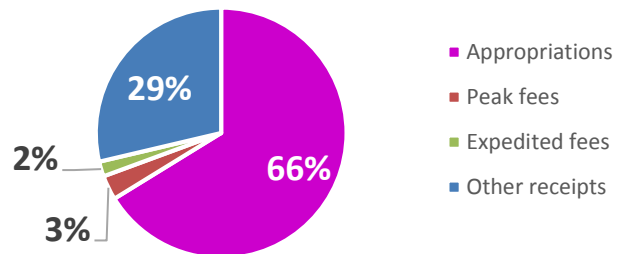
Funding

FY2017 Sources of Funding

State Appropriations, \$3,425,667 (66%)
Peak-season Soil Fees, \$163,684 (3%)
Expedited Soil Fees, 100,000 (2%)
Other Receipts, \$1,483,640 (29%)

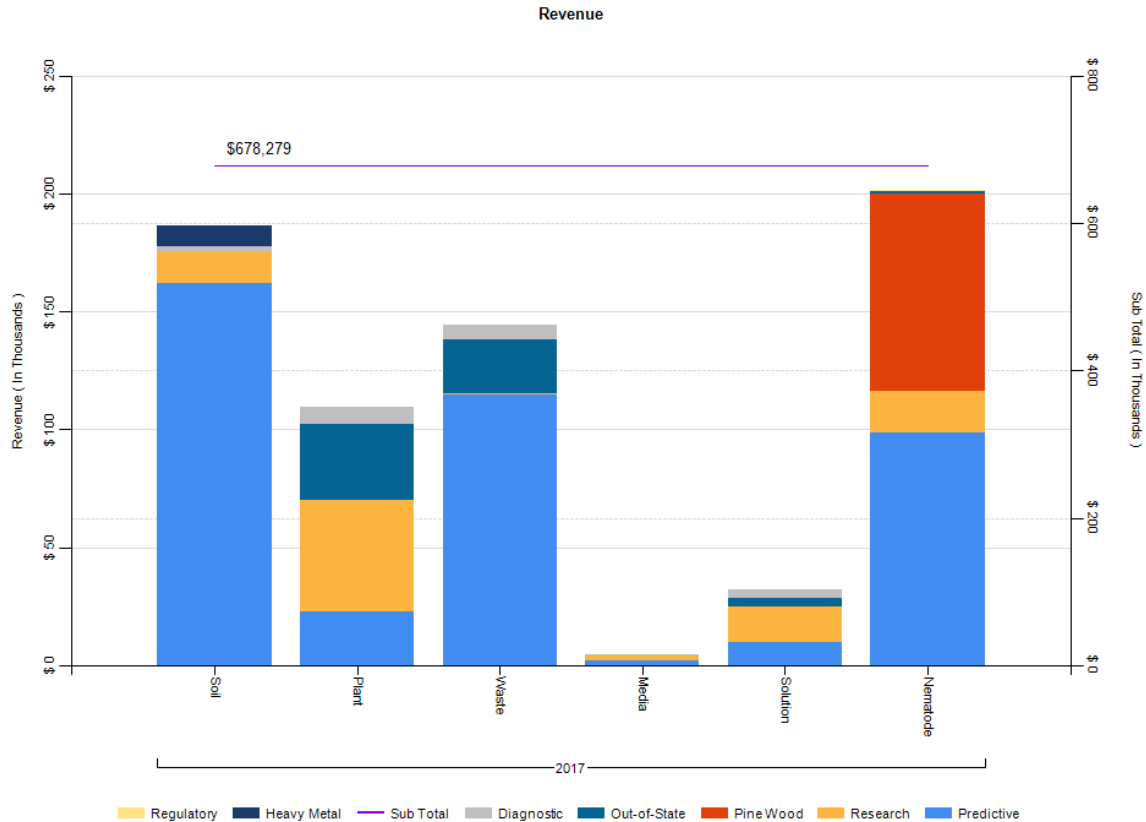
Total Budget: \$5,172,991

Agronomic Division Funding, FY2017



“Other receipts” include a percentage of the fertilizer and lime tonnage taxes collected in North Carolina. The tonnage assessment for fertilizers and lime sold in North Carolina is set at \$.50/ton. The Agronomic Division received \$777,690 in fertilizer and lime tonnage tax receipts in FY2017.

“Other receipts” also include routine sample fees in FY2017. The chart below shows the revenue generated by routine sample fees and peak-season fees in FY2017.



Laboratory Services

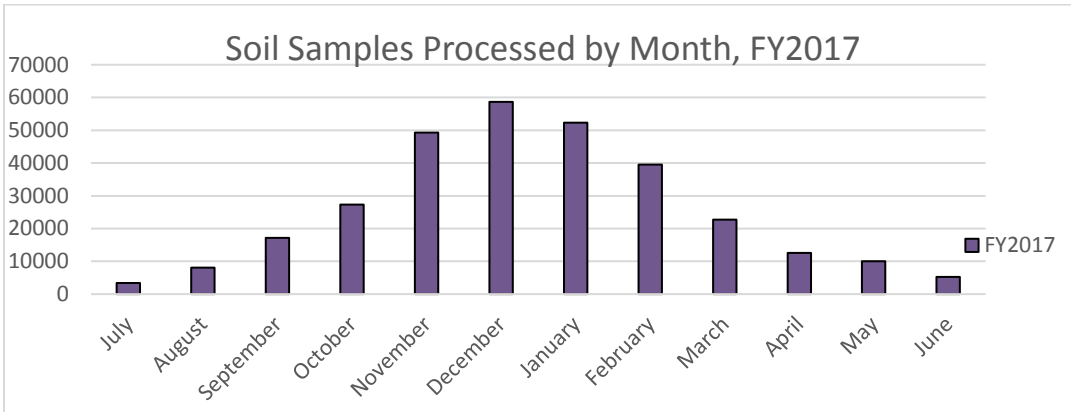
Quality Analysis/Quality Control

The Soil Testing and Waste Analysis Laboratories continued to operate under the N.C. Department of Environmental Quality (DEQ) Division of Water Resources' laboratory certification program and are qualified to provide critical testing for animal waste permits and nutrient management compliance. The Soil Testing and Plant Analysis Laboratories continue to meet the requirements of the North American Proficiency Testing (NAPT) program. The Waste Analysis Laboratory participated in the national Manure Analysis Proficiency (MAP) Program and earned certification in manure testing for all parameters attempted. The Soil Testing Laboratory participated in the Agricultural Laboratory Proficiency Program for the third year; this new program allows the lab to critically examine its within laboratory performance for self-auditing purposes and to compare its results to those produced by other participating laboratories.

The **Soil Testing Section**, under the direction of David H. Hardy, Ph.D., analyzed 308,792 soil samples in FY2017: 284,628 predictive; 16,320 expedited; 2,182 diagnostic; 2,542 research; 272 from witchweed-infested areas; 2,496 from internal and 352 heavy metals. The Soil Testing Lab issued 36,747 reports for fertilizer/lime recommendations.

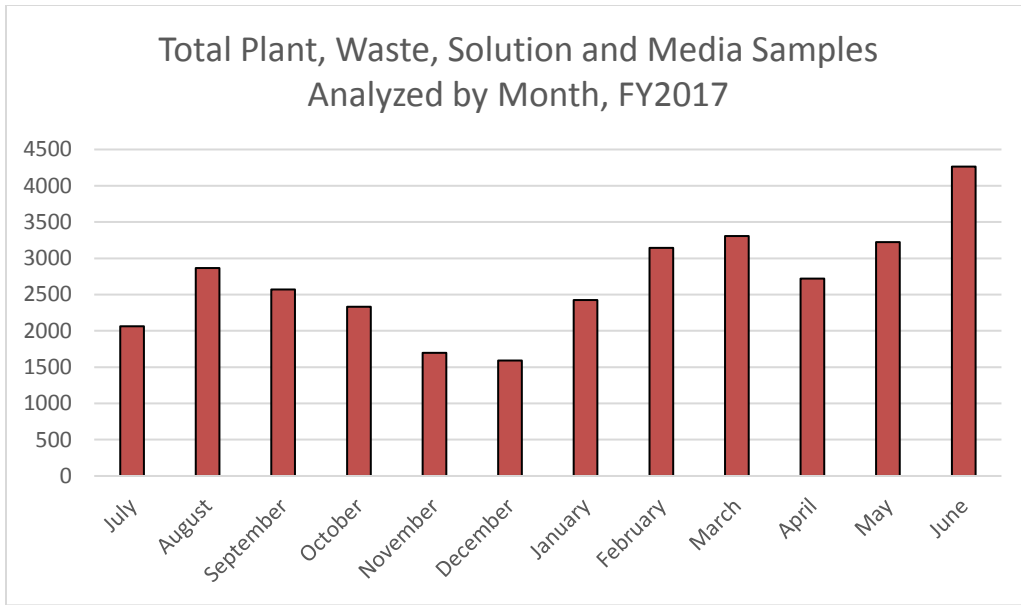
A total of \$163,684 was collected in peak-season soil testing fees (\$4.00/sample) for samples submitted December 1, 2016 through March 31, 2017. The peak-season fee has achieved its

intended purpose, to distribute the workload for the Soil Testing Lab more evenly across the year. It has also help hold turnaround times in check. Soil sample turnaround plateaued at nine weeks on December 1, but then dropped back down to two weeks by February 19. December 2016 was the busiest month of FY2017, with 58,712 soil samples being analyzed. The Soil Testing Lab sold 500 expedited shippers at \$200 each to high-volume customers desiring turnaround time of 7 to 10 business days.

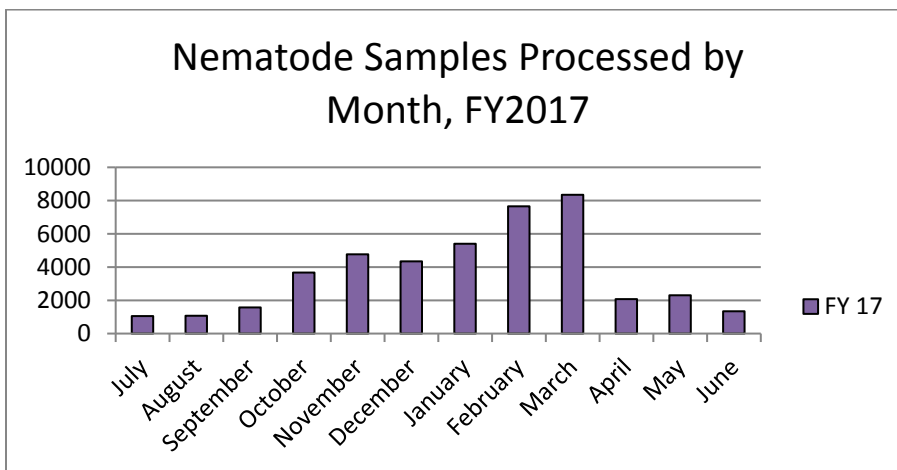


The **Plant/Waste/Solution/Media (PWSM) Section**, under the direction of Kristin Hicks, Ph.D., issued a total of 11,515 reports during FY2017. These reports gave recommendations for 12,791 plant tissue samples; 15,101 waste samples; 4,636 solution samples; and 681 soilless media samples in FY2017. Of these, 5,454 were research samples. Due to the time-sensitive nature of PWSM samples, the following turnaround times were adhered to: plant, 2 days; media and solution, 3 to 4 days; and waste, 7 to 10 days.

Although the PWSM Laboratory had a large number of samples submitted year-round, the busiest month for the PWSM Section was June, with 4,263 samples analyzed. In total, 32,207 samples were processed during FY2017, making this the largest sample volume handled by the PWSM Lab since FY2007.

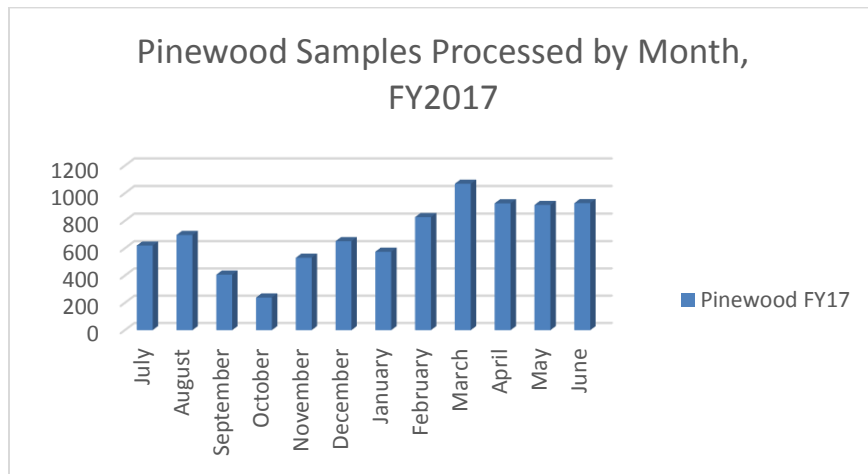


The **Nematode Assay Section**, under the direction of Weimin Ye, Ph.D., processed 43,545 samples and issued 5,834 reports in FY2017, making this a record-breaking year with at least 1,100 more samples processed than the next highest year (FY2014). March was the busiest month for the lab, with 8,339 samples processed. Most samples (32,855) were predictive in nature; other types included 1,745 research samples, 158 diagnostic samples, 73 out-of-state samples (excluding pinewood), 79 samples from the NCSU Plant Disease and Insect Clinic and 42 regulatory samples from the NCDA&CS Plant Industry Division. The crop with the largest number of submitted samples was sweet potato, with 13,862 samples (32% of total sample volume) followed by soybean (9,017 samples and 21% of total). Crop consultants submitted at least 76% of the total sample volume in FY2017.



In addition, 8,387 samples (565 reports) were specifically tested for the presence of pinewood nematode so shipments of lumber and wood products could be cleared for export

from the United States. Pine wood nematode was detected in 122 samples, but this was only 1.45% of the total pine wood samples assayed.



From April through September, samples were processed in about 5 business days. During the busy season of October through March, turn-around time increased to as long as eight weeks.

Field Services Section personnel, under the direction of Michelle McGinnis, Ph.D., made about 10,800 grower consults in FY2017, primarily to help diagnose nutrient and/or nematode problems. Regional agronomists handled more than 500 inquiries regarding environmental issues in FY2017— primarily waste management plan clarifications, regulatory updates and river basin oversight reviews — and participated in county Soil & Water local advisory committees.

- Jacob Searcy served as advisor to the Beaufort County Farm Bureau Board
- Chris Jernigan served as an advisor to the Greene County Farm Bureau Board
- Tim Hall and Chris Jernigan served on the 1217 Interagency Guidance Committee
- Georgia Love served as Chairman on the Robeson County Extension Field Crops Advisory Committee
- Georgia Love served on the Robeson County Crop Promotion Association Board
- Mike Wilder and Josh Mays served an advisor to the NC Strawberry Growers Association Board
- Don Nicholson served as an advisor to the Corn Growers Association of North Carolina Board
- Josh Mays served on the Green Fields Sandhills Board
- Josh Mays served as an advisor to the Lee County Extension Field Crops Advisory Committee
- Josh Mays served on the Chatham Community Food Council
- Chris Leek served as an ex-officio member to the North Carolina Tomato Growers Association Board
- Chris Leek served on the Mountain Research Station Field Day Planning Committee

- Chris Leek served on the Buncombe County FARMS Board
- Chris Leek served on the Madison County Ag Agencies Board
- Steve Dillon served as an advisor to the NC Raspberry and Blackberry Growers Association Board
- Michelle McGinnis served on the NC Certified Crop Advisors Board
- Michelle McGinnis served on the NC Certified Crop Advisors Exam Committee

Safety Program

The Agronomic Services Division maintains a very active, employee-led safety program and is recognized as a Public-Sector Star site by the North Carolina Department of Labor (NCDOL). All in-house employees serve on one of seven safety teams: Safety Inspection & Compliance; Safety Program & Policy; Safety Information & Communication; Job Safety Analysis; Housekeeping and Wellness; Ergonomics and Field Services. The Agronomic Services Division prepared a detailed annual report on its 2017 safety program and submitted it to NCDOL on February 15, 2018.

Education & Outreach (calendar year summary)

Agronomic Division staff, especially the **Field Services Section**, reach thousands of growers, homeowners and agricultural professionals through a wide range of educational activities. Honeywell provides funding for the distribution of a limited number of vouchers to cover the cost of plant tissue analysis as a means to introduce growers to this service. Regional agronomists play a key role in spreading the word about tissue testing and offering the free vouchers to interested growers.

In-house staff conducted at least 35 laboratory tours for farmers, master gardeners, agribusiness groups, scientists and students, with at least 589 participants (Appendix A.). Information on agronomic services was disseminated through more than 22 educational exhibits displayed at farm shows, field days, training events and professional meetings (Appendix B).

Outreach also included twelve news releases and eight interviews and/or tweets (Appendix C). Many presentations on agronomic services were made to master gardeners, growers, commodity associations, conservation groups, and county and state organizations as well as to regional, national and international meetings (Appendix D). At least 15 external professional publications were published by staff in 2017 (Appendix E).

Research (calendar year summary)

Division staff routinely engage in cooperative studies with university personnel, farmers and industry specialists. In FY2017, cooperative research included the processing of 2,542 soil samples; 5,454 plant/waste/solution/media samples; and 1,745 nematode samples.

The **Soil Testing Section** cooperated in the following research projects during 2017:

- 1) Evaluation of NCDA boron sufficiency ranges for flue cured tobacco in cooperation with N.C. State Crop Science Department, Year 3 – Dr. David Hardy.
- 2) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Soybean Yield in North Carolina Cropping Systems, Year 2 – Dr. David Hardy
- 3) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Corn Yield in North Carolina Cropping Systems, Year 1 – Dr. David Hardy.

The **Plant/Waste Solution/Media Section** cooperated in the following research projects during 2016:

- 1) Evaluation of NCDA boron sufficiency ranges for flue cured tobacco in cooperation with N.C. State Crop Science Department, Year 3 – Dr. Kristin Hicks.
- 2) Nitrogen Rate Management for Malting Quality Barley in North Carolina in cooperation with N.C. State Small Grains Cooperative Extension, Year 1 – Dr. Kristin Hicks (NCDA&CS); Scott Tilley (NCSU); Kyle Crump (NCDA&CS)
- 3) Establishing an Aluminum Tissue Sampling Criteria for Ensuring Blue Color in Hydrangeas in cooperation with N.C. State Horticulture Department, Year 2 –Hunter Landis (NCDA&CS); Dr. Kristin Hicks (NCDA&CS); Dr. Brian Whipker (NCSU)
- 4) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Soybean Yield in North Carolina Cropping Systems, Year 2 – Dr. Kristin Hicks
- 5) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Corn Yield in North Carolina Cropping Systems, Year 1 – Dr. Kristin Hicks

Dr. Weimin Ye and the **Nematode Assay Section** participated in the following research projects (2017):

- 1) Lab assay for soybean cyst race survey by Dr. Michelle McGinnis and Chris Jernigan – Dr. Weimin Ye
- 2) Molecular diagnosis of plant-parasitic nematodes for various customers – Dr. Weimin Ye

The **Field Services Section** conducted or participated in at least seven research and demonstration projects in 2017. These projects were designed primarily to optimize crop-fertilization and nematode-management efforts. Field Services staff indicated in italics below.

- 1) Evaluation of NCDA boron sufficiency ranges for flue cured tobacco – David Hardy, Matthew Vann, *Michelle McGinnis, Chris Jernigan, Mike Wilder, Josh Mays, Don Nicholson, and Jacob Searcy*
- 2) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Soybean Yield in North Carolina Cropping Systems. Project leaders – Carl Crozier, T. Jot Smyth, Jim Dunphy. RA field assistance provided by *Chris Leek*

- Dwayne Tate, Daniel Overcash, Josh Mays, Don Nicholson, Tim Hall, Mike Wilder (2 sites), Chris Jernigan (2 sites), Jacob Searcy, Carla Pugh (2 sites)*
- 3) Validation of Soil Test Potassium Recommendations and Plant Tissue Analysis to Optimize Corn Yield in North Carolina Cropping Systems Project leaders – David Hardy, Carl Crozier, Ronnie Heiniger, Kristin Hicks, Jot Smyth, Jim Dunphy. Field assistance from *Chris Leek, Dwayne Tate, Don Nicholson, Tim Hall, Mike Wilder, Chris Jernigan (2 sites), Jacob Searcy (2 sites), Carla*
 - 4) Effect of soilless media type on Fraser fir seedling production – *Dwayne Tate, Jerry Moody*
 - 5) Race determination of soybean cyst nematodes present in North Carolina – *Chris Jernigan, Tyler Whaley, Carla Pugh, Georgia Love, Mike Wilder, Josh Mays, Daniel Overcash, Steve Dillon, and County Extension Agents.*
 - 6) Bicarbonate adjustments for organic tobacco seedling production – Matthew Vann, Loren Fisher, *Michelle McGinnis*
 - 7) Nitrogen management for attaining high malt quality in two-row winter barley in the southeastern U.S. – Kristin Hicks, *Michelle McGinnis, Mike Wilder, Daniel Overcash, Chris Leek, Josh Mays, Steve Dillon, Dwayne Tate, Hunter Landis, Kyle Crump Scott Tilly, other NCDA people, too.*

Personnel Changes for Calendar Year 2017 (permanent staff)

Research Technician (60011793)

March 2017 – Dwight D McClure resigned

May 2017 – Alonzo B Yancey hired (Temporary hired through Temp Solutions)

Administrative Assistant I (60011775)

June 2017 – Dawn Brooke resigned

September 2017 – Rebecca C Boone hired

Regional Agronomist, Region 8 – (60011816)

September 2017 – Robin J Watson retired

October 2017 – Michael Brandon Poole hired

Regional Agronomist, Region 4 – (60011825)

September 2017 – Tim Hall retired

October 2017 – William Tyler Whaley hired

Chemistry Technician III – (60011800)

December 2017 – Smita Desai retired

January 2018 - Joshua Peavey resigned 60011790/promoted to 60011800

Chemistry Technician I – (60011785)

September 2017 – Sarah Jacobs resigned

November 2017 – Taylor Hardy resigned 60011804/promoted to 60011785

Chemistry Technician III – (60011799)

September 2017 – Rodney McKoy resigned

October 2017 – Madelaine Roberts hired

Chemistry Technician I – (60011791)

September 2017 – Jensen McLamb resigned

November 2017 – Ashley Jones-Keough (Temporary hired through Temp Solutions)

Research Tech (Shipping & Receiving Coordinator) – (65005715)

October 2017 – Matthew Mason resigned

December 2017 – Position remains vacant

Research Technician – (60011813)

November 2017 – Ma Kpa Deceased

December 2017 – Position remains vacant

Research Technician – (60011804)

November 2017 – Taylor H Hardy hired/promoted to 60011785

December 2017 – Position remains vacant

Nematology Technician – (60011809)

November 2017 – Kendal Capps resigned

December 2017 – Position remains vacant

Processing Assistant III (Receptionist) – (60011772)

December 2017 – Jennifer H Johnson resigned

December 2017 – Position remains vacant

APPENDICES

Appendix A. Laboratory Tours for Calendar Year 2017

	Tour Group	Tour Date
1.	Tobacco Short Course Attendees (35)	February 1, 2017
2.	NCSU CS 214 (21)	February 2, 2017
3.	NCSU CCS 111 (12)	February 14, 2017
4.	NCSU CCS 111 (8)	February 14, 2017
5.	NCSU SSC 201 (18)	April 4, 2017
6.	NCSU SSC 201 (21)	April 5, 2017
7.	Wayne Community College Soil Science Class (20)	April 5, 2017 (am)
8.	Wayne Community College Soil Science Class (15)	April 5, 2017 (pm)
9.	NCSU SSC 201 (20)	April 6, 2017 (am)
10.	NCSU SSC 201 (14)	April 6, 2017 (pm)
11.	Hoke, Robeson, and Scotland Master Gardeners (20)	April 11, 2017
12.	Home schooled 10-year old kids (5)	April 19, 2017
13.	NCDA Soil & Water New Employee Training (10)	May 9, 2017
14.	Onslow Master Gardeners (22)	May 15, 2017
15.	New Hanover Master Gardeners (16)	May 23, 2017
16.	State Master Gardeners (25)	June 8, 2017
17.	NCDA Human Resources (2)	June 12, 2017
18.	Alamance Soil & Water staff (4)	August 18, 2017
19.	NC Composting Council Short Course (35)	September 13, 2017
20.	Dr. Bill Collins with Chinese Delegation (25-30)	September 25, 2017
21.	Halifax and Northampton County Master Gardeners (15)	October 9, 2017
22.	Harnett County Master Gardeners (22)	October 10, 2017
23.	Catawba Valley Community College Hort. and Turf Class (15)	October 12, 2017
24.	Pitt County Master Gardeners (15)	October 13, 2017
25.	Bosnia Delegation (9)	October 16, 2017
26.	Lenoir Community College – Horticulture Course (12)	October 20, 2017
27.	NCSU CS111 (24)	October 25, 2017
28.	NCSU SSC 201 (22)	October 21, 2017
29.	NCSU SSC 201 (22)	November 1, 2017
30.	NCSU SSC 201 (22)	November 2, 2017
31.	NCSU Department of Crop and Soil Sciences Advisory Committee (12)	November 2, 2017
32.	Brunswick County Master Gardeners (18)	November 3, 2017
33.	NCSU PP502 (12)	November 6, 2017
34.	Wilson County Extension Staff (12)	November 16, 2017
35.	Center for Environmental Farming Systems (CEFS) Apprentices (4)	November 8, 2017

Appendix B. Educational Exhibits for Calendar Year 2017

2017 Educational Exhibits		Date
1.	SE Regional Fruit and Vegetable Conference	Jan 5-8, 2017
2.	NC Apple Growers Meeting (Asheville)	Jan 10-11, 2017
3.	NC Blueberry Council Open House and Trade Show (Fayetteville)	Jan 11-13, 2017
4.	NC Commodities Conference (Durham)	Jan 11-13, 2017
5.	Green & Growin' Show (Greensboro)	Jan 14-15, 2017
6.	NC Peach Society Annual Meeting (Carthage)	Jan 24, 2017
7.	Southern Farm Show (Raleigh)	Feb 1-3, 2017
8.	Winter Apple School (Hendersonville)	Feb 1, 2017
9.	Winter Vegetable/Tomato Conference (Asheville)	Feb 8-9, 2017
10.	NC Commercial Blackberry & Raspberry Growers (Shelby)	Feb 15, 2017
11.	NC Christmas Tree Association Winter Meeting (Boone)	Feb 23-24, 2017
12.	NC Successful Small Farm Opportunities Conference (Louisburg)	Feb 25, 2017
13.	Chatham County Spring Ag Fest	Mar 25, 2017
14.	Organic Commodities & Livestock Conference (Rocky Mount)	Mar 6, 2017
15.	NE Ag Expo Field Day	July 27, 2017
16.	Blacklands Farm Managers Tour	Aug 2, 2017
17.	Caldwell County Nurseryman's Association (Collettsville)	Sept 8, 2017
18.	NC Christmas Tree Association Summer Meeting (Jefferson)	Aug 25-26, 2017
19.	NC Greenhouse Vegetable Growers Association (Raleigh)	Oct 24-25, 2017
20.	SE Strawberry Expo (Wilmington)	Nov 1-3, 2017
21.	Tri City Farm Banquet (Elizabeth City)	Nov 10, 2017
22.	SE Vegetable & Fruit Expo (Myrtle Beach)	Nov 27-29, 2017

Appendix C. News Releases and Interviews for Calendar Year 2017

1. Consider applying lime for home vegetable gardens, Dr. David Hardy Jan. 31, 2017
2. Now is the time for tobacco transplant producers to test float bed water, Dr. Kristin Hicks Feb. 1, 2017
3. Agronomic Services lab making equipment upgrades with peak-season soil testing fees, Dr. Colleen Hudak-Wise Feb 21, 2017
4. New regional agronomist assigned to Chatham County, Dr. Michelle McGinnis Feb 27, 2017
5. Take soil samples to know plants' spring fertilization needs, Jagathi Kamalakanthan Mar 20, 2017
6. A soil test can help manage fertility in warm-season grasses, Jagathi Kamalakanthan April 7, 2017
7. Agronomic services help keep Wilkes family greenhouse business blooming, Dr. Michelle McGinnis May 8, 2017
8. NCDA&CS warns of emerging nematode that could impact the state's sweet potato crop, Dr. Weimin Ye May 10, 2017
9. NCDA&CS survey finds soybean cyst nematode distribution wider than previously thought, Dr. Weimin Ye Aug. 18, 2017
10. Consider soil testing now for fertilizer recommendations for fescue, Jagathi Kamalakanthan Aug. 25, 2017
11. Users reminded peak-season soil testing fees go into effect Dec.1, Dr. David Hardy Oct. 27, 2017
12. Offsetting losses due to late planting caused by Hurricane Matthew (article, Mike Wilder in NC Strawberry Grower Association newsletter) Jan 11, 2017
13. Warm weather effects on crops (radio interview, Don Nicholson on WUNC) Feb 24, 2017
14. Warm weather effects on crops (newspaper interview, Don Nicholson with N&O) Feb 27, 2017
15. Effects of frost on strawberry crop (TV interview, Don Nicholson on WRAL) Mar 2, 2017
16. Effects of frost on strawberry crop (TV interview, Don Nicholson on WTVD) Mar 3, 2017
17. Strawberry crop (radio interview, Don Nicholson on SFN) Mar 9, 2017
18. Agronomic and production advice helps greenhouse grower (Ag Review) June, 2017
19. Crop Update (radio interview, Don Nicholson on SFN) Nov 8, 2017
20. NCDA&CS agronomist Love honored (Ag Review) Dec 2017

Appendix D. Presentations for Calendar Year 2017

- Scotland County Master Gardener Training (Laurinburg; Jan 10, 2017)
 - Presentation: *Soils and Soil Fertility*, G. Love
- Bladen County VAD Agriculture and Landowners Meeting (Elizabethtown; Jan 17, 2017)
 - Presentation: *Nutrient Management Considerations for 2017*, G. Love
- Bladen County Animal Waste Training (Elizabethtown; Jan 20, 2017)
 - Presentation: *Tools for the Plan - Waste, Soil, and Plant Analysis*, G. Love
- Peach Growers' Society Annual Meeting (Carthage; Jan 24, 2017)
 - Presentation: *On-Farm Benefits of NCDA & CS Field Services*, J. Mays
- Raleigh Waste Water Treatment Plant Farmer Appreciation Day (Clayton; Jan 25, 2017)
 - Presentation: *Raleigh Plus in Row Crops*, D. Nicholson
- Pamlico County Master Gardener Training (Bayboro; Feb 15, 2017)
 - Presentation: *Soil Fertility*, J. Searcy
- Madison County Extension Pasture Renovation Workshop (Marshall; Feb 16, 2017)
 - Presentation: *Soil Sampling Pastures and Hayfields*, C. Leek
- Fruit Tree Pruning Workshop (Wentworth; Feb 21, 2017)
 - Moderate Grower Panel: *Early Blooming and Mild Winter*, J. Mays
- NC Christmas Tree Growers Association Winter Meeting (Blowing rock; Feb 22, 2017)
 - Presentation: *Does pH affect the growth of Seedling Fraser Fir*, D. Tate and J. Moody
- Enterlobii Nematode Meeting at Hilltop Farm Service (Smithfield; Mar 4, 2017)
 - Presentation: *Enterlobii Nematode in Sweet Potato*, D. Nicholson
- Plant Industry Plant Pest Specialist Annual Staff Meeting (Burlington; March 7, 2017)
 - Presentation: *Agronomic Services for Nursery Growers*, D. Overcash
- Surface Irrigation System Operators Training School Field Day (Raleigh; Mar 15, 2017)
 - Field demonstration: *NCDA Agronomic Lab Services*, D. Nicholson
- Currituck & Dare Counties Master Gardener Training (Currituck; March 21, 2017)
 - Presentation: *Soil Fertility*, J. Searcy and C. Pugh
- Graham County Extension Training (Robbinsville; Mar 23, 2017)
 - Presentation: *How to Collect a Soil Sample and Interpret the Soil Test Report*, C. Leek
- Land Application Training School (Raleigh; Apr 4, 2017)
 - Presentation: *Agronomic Services for Land Application*, M. McGinnis
- Land Application Training School (Raleigh; Apr 5, 2017)
 - Presentation: *Agronomic Considerations*, D. Nicholson
- Horticultural Extension Agent Training (Clinton; Apr 7, 2017)
 - Presentation: *Soils & Managing Fertility in Warm-Season Turfgrass*, G. Love
- Strawberry Field Day, Biological Applied Research (Raleigh; Apr 20, 2017)
 - Presentation: *Agronomic Services for Strawberry Growers*, M. Wilder
- Madison County Master Gardener Training (Marshall; May 10, 2017)
 - Presentation: *Soils, Fertility, and Diagnostics*, C. Leek
- State Soil & Water Commission Meeting (Raleigh; May 16, 2017)
 - Presentation: *Grain Sorghum Agronomic Considerations*, D. Nicholson
- Haywood County Master Gardener Training (Waynesville; May 17, 2017)
 - Presentation: *Soil and Soil Fertility*, C. Leek
- NC Tobacco Tour (Kinston, Rocky Mount, Oxford; Jul 25-26, 2017)
 - Presentation: *Boron Sufficiency Ranges in Flue-Cured Tobacco*, C. Jernigan
- Pasture Fertilization: Organic vs. Conventional Seminar (Louisburg, Jul 13, 2017)
 - Presentation: *Pasture Soil Sampling*, M. Wilder
- Bladen County Animal Waste Training (Elizabethtown; Aug 1, 2017)
 - Presentation: *Tools for the Plan – Waste, Soil, and Plant Analysis*, G. Love
- Regional Strawberry Preplant Meeting (Nashville; Aug 15, 2017)
 - Presentation: *Agronomic Services for Strawberry Production*, M. Wilder
- Johnston Area Strawberry Preplant Meeting (Smithfield; Aug 29, 2017)
 - Presentation: *Nutrient Management in Strawberries*, D. Nicholson

- Alliance One International Tour of Cunningham Research Station (Lenior; Sep 5, 2017)
 - Presentation: *NC Tobacco Research Projects*, C. Jernigan
- Therapy Dog International Convention (Pittsboro; Sep 1, 2016)
 - Presentation: *Clover Receives the Sweetest Dog in the World Award*, M. McGinnis
- Pasture and Livestock Management Field Day, (Rougemont; Sep 15, 2017)
 - Presentation: *Nutrient Management in Pastures*, D. Nicholson
- Madison County Farm Agencies Harvest Dinner (Marshall; Oct 5, 2017)
 - Presentation: *Overview of Agronomic Field Services*, C. Leek
- Southeast Strawberry Expo (Wilmington; Nov 2, 2016)
 - Presentation: *Dual Season Strawberry Production in North Carolina*, J. Mays
- Caldwell County Cattleman's Association Meeting (Lenoir, Nov 14, 2017)
 - Presentation: *Agronomic Division Services*, D. Tate
- North Carolina Agricultural Consultants Association Annual Meeting (Raleigh; Nov 30, 2017)
 - Presentation: *Race Determination of Soybean Cyst Nematodes Present in North Carolina*, T. Whaley
- Orange County Ag Preservation Board Grower Appreciation Breakfast (Hillsborough; Nov 30, 2017)
 - Presentation: *Agronomic Division Field and Laboratory Services*, B. Poole
- Waste Continuing Education Class, (Bolivia; Nov 30, 2017)
 - Presentation: *Nutrient Management Considerations for 2018*, G. Love
- NCDA/NCSU Research Stations Training for Horticultural Crop Unit Managers (Raleigh; Dec 7, 2017)
 - Presentation: *Soil and Tissue Sampling*, D. Nicholson
- Regional Sweetpotato Meeting. (Nash County Agricultural Center, Nashville, NC; Feb. 5, 2017)
 - Presentation: *Meloidogyne enterolobii, a new and emerging root-knot nematode in NC*, W. Ye
- 56th Annual Meeting of the Society of Nematologists. (Williamsburg, VA; Aug. 13 – 16, 2017)
 - Presentation: *Characterisation of Oscheius onirici? (Nematoda: Rhabditidae), a hermaphroditic nematode from the marshlands of Wisconsin*, W. Ye
- S-1066 Annual Meeting. (NCDA&CS, Raleigh, NC; Nov. 13 & 14, 2017)
 - Presentation: *Using NCDA&CS Nematode Assay Services in Crop Production*, W. Ye
- NC Ag Consultants Meeting (Raleigh, NC; Nov. 30, 2017)
 - Presentation: *Agronomic Services Update*, C. Hudak-Wise and J. Vitalis
- 2017 Crop Protection School. (McKimmon Center, NC State University, Raleigh, NC; Dec 7, 2017)
 - Presentation: *Nematode Situation in North Carolina — Update*, W. Ye
- Mid-Atlantic Soil Testing and Plant Analysis Working Group (MASTPAWG) (Richmond, VA; Feb 8, 2017)
 - Presentation: *NCDA&CS Agronomic Division: Virtual Tour*, K. Hicks
- NCSU Malting Barley Field Day (MASTPAWG) (Oxford, NC; April 21, 2017)
 - Presentation: *Nitrogen Management in Malting Barley Pilot Study*, K. Hicks
- Animal Operations Inspectors Meeting (Kenansville, NC; June 13, 2017)
 - Presentation: *Method Change for Analyzing Nitrogen in Liquid Waste Samples*, K. Hicks
- Eastern N.C Certified Crop Advisor Training (Smithfield, NC; Dec 12, 2017)
 - Presentation: *NCDA&CS Plant Tissue Analysis: Trends and Troubleshooting*, K. Hicks
- International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture (Portland, OR; Aug 20, 2017)
 - Poster: *Incorporating Slow Release Coated Polymer Aluminum Sulfate into the Substrate to Produce Blue Hydrangeas*, H. Landis
- 2017 MASTPAWG Meeting (Richmond, VA; February 7, 2017)
 - Presentation: *Evaluation of Boron Needs in NC Flue-Cured Tobacco Production*, D. Hardy
- SSC 462 Classroom lecture (Raleigh, NC; March 30, 2017)
 - Presentation: *Getting Ready to Solve Problems Using Agronomic Services- NCDA&CS*, D. Hardy
- NCSU CES Extension Livestock Training (Raleigh, NC; September 14, 2017)
 - Presentation: *Nitrogen Tests and Nitrogen Fertilizers*, D. Hardy
- Eastern CCA Training (Smithfield, NC; December 12, 2017)
 - Presentation: *Soybean & Corn K Studies to Validate Soil Test Recommendations*

- *Harvey Fertilizer & Gas Dealers (Kinston, NC; September 15, 2017)*
 - *Presentation: NCDA Soil Testing Update*
- *Soil Science Departmental Seminar (Raleigh, NC; April 26, 2017)*
 - *Presentation: Evaluation of Boron Needs in NC Flue-Cured Tobacco Production, D. Hardy*

Appendix E. Professional Publications (external) for Calendar Year 2017

1. Davies, K.A., Ye, Weimin, Taylor, G.S, Scheffer, S. Bartholomaeus, F. & Giblin-Davis, R. 2018. Nematodes from galls on Myrtaceae. XI. Descriptions of five new species of *Fergusonobia* from Australia. Zootaxa 4399:1. <http://dx.doi.org/10.11646/zootaxa.4399.1.1>
2. Davies, K.A., Taylor, G.S., Ye, Weimin, Makinson, J.R. & Adair, R.J. 2018. First record of *Fergusonina* (Diptera: Fergusoninidae) and associated *Fergusonobia* (Tylenchida: Neotylenchidae) forming galls on *Leptospermum* (Myrtaceae) in Australia, with descriptions of new species. Insect Systematics & Evolution 49 183–206. DOI 10.1163/1876312X-00002166 brill.com/ise
3. Jordan, D.L., Corbett, T., Bogle, C., Shew, B., Brandenburg, R. & Ye, Weimin. 2017. Effect of previous rotation on plant parasitic nematode population in peanut and crop yield. Crop, Forage & Turfgrass Management 3: (1). doi:10.2134/cftm2016.12.0086
4. Landis, H., Whipker, B. February 2017. Nutrient Management Strategies for Ensuring Blue Coloration of Greenhouse Hydrangeas. E-gro Alert (6) 4. https://e-gro.org/pdf/2017_604.pdf
5. Landis, H., Whipker, B. March 2017. Hydrangea Nutrition: Upper Leaf Interveinal Chlorosis (Iron Deficiency). E-gro Alert (6) 14. https://e-gro.org/pdf/2017_614.pdf
6. Landis, H., Henry, J., Whipker, B. March 2017. Hydrangea Nutrition: Lower Leaf Purpling (Phosphorus Deficiency). E-gro Alert (6) 15. https://e-gro.org/pdf/2017_615.pdf
7. Landis, H., Henry, J., Whipker, B. March 2017. Hydrangea Nutrition: Upper Leaf Tip Necrosis - Water Stress or Calcium? E-gro Alert (6) 13. https://e-gro.org/pdf/2017_613.pdf
8. Xu, Y., Guo, K., Ye, Weimin, Wang, J., Zheng, J. & Zhao, Z. 2017. Morphological and molecular characterisation of *Longidorus juglans* sp. nov. and a sister species *L. fangi* Xu & Cheng, 1991 (Nematoda: Longidoridae) from China. Nematology 19 (8): 951 –970. [10.1163/15685411-00003099](https://doi.org/10.1163/15685411-00003099)
9. Ye, Weimin. 2017. Soybean cyst nematode (*Heterodera glycines*) distribution in North Carolina, U.S.A.. Plant Health Progress 18: 230 - 232.doi:10.1094/PHP-08-17-0050-BR
10. Zhao, L., Ye, Weimin, Munawar, M., Pedram, M. & Gu, J. 2017. *Xiphinema japonicum* n. sp. (Nematoda: Longidorinae) from the rhizosphere of Japanese *Podocarpus macrophyllus* (Thunb.), a cryptic species related to *Xiphinema bakeri* Williams, 1961. Journal of Nematology 49 (4): 404 - 417.
11. Esmaeili, M., Heydari, R., Adeldoost, Y. & Ye, Weimin. 2017. Description of *Ektaphelenchus oleae* n. sp. (Rhabditida: Ektaphelenchinae) from Iran Nematology 19, (10): 1123-1134.
12. Esmaeili, M., Heydari, R. & Ye, Weimin. 2017. Description of a new Anguinid nematode, *Nothotylenchus phoenixae* n. sp. (Nematoda: Anguinidae) associated with palm date trees and its phylogenetic relations within the family Anguinidae. Journal of Nematology 49 (3): 268 – 275.
13. Esmaeili, M., Heydari, R. & Ye, Weimin. 2017. Morphological and molecular characterisation of *Ditylenchus stenurus* n. sp. (Nematoda: Anguinidae) from western Iran. European Journal of Plant Pathology 149:533–542. DOI 10.1007/s10658-017-1201-1
14. Esmaeili, M., Heydari, R., Tahmoures, M. & Ye, Weimin. 2017. *Aphelenchoides salixae* n. sp. (Nematoda: Aphelenchoididae) isolated from *Salix alba* in western Iran. Nematology 19: 697-707.
15. Yu, Q., Gu, J., Ye, Weimin, Li, R. & He, J. 2017. *Deladenus posteroporus* n. sp. (Nematoda: Neotylenchidae) isolated from packaging wood from Canada and white pine (*Pinus monticola*) lumber from the United States and intercepted in Ningbo, China. Journal of Nematology 49(2):168–176.

