Peanut Agent Training Session

January 15, 2020

8:30 am to noon

Agenda

Insect Management Update (Rick Brandenburg)

Disease Management Update (Barbara Shew)

Introduction of Nematologist (Adrienne Gorney)

2020 Schedule (David Jordan)

-Production Contest
-Meeting Schedule
-Peanut Team ($14K)
-New Peanut Maturity Charts
-APRES Participation (July 14-17 in Dallas)
-On-Farm Trials
-Agent Needs
-Addressing Talking Points

Talking Points (Group)

Irrigation feasibility
Relationship between heat, drought and POPS
Feasibility of drying (we have many that sell directly from field)
Anything regarding fungicide choices and combinations (from where I stand, the question would be stated as, "What does a grower do when he buys something that someone is selling rather than using what is recommended?")

Introduction of New Risk Tool (David Jordan and Greg Buol)

8. GUIDELINES FOR THE NORTH CAROLINA PEANUT PRODUCTION CONTEST AND 5,000 POUND CLUB

David L. Jordan
Extension Specialist—Department of Crop and Soil Sciences

Bob Sutter
Chief Executive Officer—North Carolina Peanut Growers Association Inc.

BACKGROUND AND CRITERIA

For many years the North Carolina Peanut Growers Association, in cooperation with NC State Extension, has supported a peanut production contest at county and state levels and a luncheon to recognize farmers producing an average of at least 5,000 pounds per acre on all of their production. Information in Table 8-1 shows the average yield of the 5,000-pound club members from 2014 to 2018 in contrast with state averages and growers attending county production meetings. Entries should be sent to Bob Sutter (sutter@aboutpeanuts.com) and David Jordan (david_jordan@ncsu.edu) by January 20 to be eligible. Growers with a point total of 60 or more will also be recognized as a member of *The Group of Sixty*. Achieving 60 points, as outlined in the next section, is truly remarkable.

Table 8-1. Peanut yield (pounds/acre) from 2014 to 2018

Year	State Average	Grower Meetings Participants	5,000 Pound Club
2014	4,320	4,860 (3,600 to 6,400)	5,660
2015	3,400	4,080 (0 to 5,700)	5,700
2016	3,450	3,840 (0 to 5,740)	5,540
2017	4,030	4,650 (2,300 to 6,530)	5,500
2018	3,780	4,340 (600 to 6,010)	5,470

The peanut production contest involves a combination of yield per acre and additional points based on total acreage. The following criteria are currently being used and include an example calculation.

1. *Eligibility*: Must produce at least 25 acres of peanuts.
2. *Requirements*:
   A. Variety—Any variety can be grown.
   B. Acreage—The entire peanut acreage under production by an individual will be used to determine official yields. The applicant enters the county in which he/

she is a resident, regardless of the percentage of peanuts they produce in that county. The county of residence for the entrant must have at least 1,000 acres.

C. Entry requirement—Official yields will be determined by the county Cooperative Extension agent. The contest will require trust that the applicant is accurately providing yield and acreage information.

3. *Point System*: An example of point calculations is provided below. The official entry will be from the contestant's county of residence (Figure 1).

Step 1. Yield—Average yield per acre (net weight) divided by 100.
Step 2. Acreage—-Points will be accumulated for acreage as follows:

A.	0 – 100 acres	0 points
B.	101 – 200 acres	1 additional point or fraction thereof
C.	201 – 300 acres	1 additional point or fraction thereof
D.	301 – 400 acres	1 additional point or fraction thereof
E.	401 – 500 acres	1 additional point or fraction thereof
F.	501 – 600 acres	1 additional point or fraction thereof
G.	601 or higher	No additional points

Sample calculation:

Farmer produces 2,397,407 pounds on 420.2 acres
Average yield = 2,397,407 divided by 420.2 = 5,705.4 pounds per acre

Step 1. 5,705.4/100 = 57.054

Step 2. Acreage

0 – 100 acres	=	0 point
101 – 200 acres	=	1 point
201 – 300 acres	=	1 point
301 – 400 acres	=	1 point
401 – 500 acres	=	0.202 point
Total Points	**=**	**60.256**

GROWER SURVEY

Applicants also must complete a survey of production and pest management practices (Figure 8-2). Results from surveys often are incorporated into recommendations for North Carolina peanut producers.

Figure 8-1. Sample Certification Form

CERTIFICATION OF POINTS IN PEANUT PRODUCTION CONTEST

Date ______________________

Applicant ______________________ County ______________________

Address ______________________ Total Points ______________________

____

Official Yield __________ ON ALL ACRES PRODUCED BY THE APPLICANT

THE APPLICANT CERTIFIES THAT __________ POUNDS OF PEANUTS WERE HARVESTED FROM __________ ACRES. THE UNDERSIGNED PARTICIPANT GUARANTEES, IN GOOD FAITH, THAT THE PRODUCTION FOR THE GIVEN CROP YIELD AND THE ACRES ON WHICH PRODUCTION OCCURRED ARE ACCURATE.

Average Yield/Acre = ______________________ points

Acreage

A. 0 – 100 acres __________

B. 101 – 200 acres __________

C. 201 – 300 acres __________

D. 301 – 400 acres __________

E. 401 – 500 acres __________

F. 501 – 600 acres __________

G. 601 or higher __________

Total __________

Grand Total __________

Signatures ______________________

County Agent ______________________

Applicant ______________________

Figure 8-2. Sample Production Practices Survey

MANAGEMENT PRACTICES FOR PRODUCTION CHAMPION AND 5000 POUND CLUB—2019 SEASON

Applicants must complete this form to be eligible for the contest.

Name ________________________________ County ____________________

Address ____

Date __________________________

1. Planting date: ________________

2. Seeding rate: ________________

3. Row spacing: Twin or single rows: ________________
   Please provide approximate percentage of acres for each.

4. Varieties (please indicate approximate percentage of acres for each variety):

____

5. Rotation Crops:

2019 ________________ (if more than one, please include percentage of acres)

2018 ________________ (if more than one, please include percentage of acres)

2017 ________________ (if more than one, please include percentage of acres)

2016 ________________ (if more than one, please include percentage of acres)

2015 ________________ (if more than one, please include percentage of acres)

2014 ________________ (if more than one, please include percentage of acres)

6. Lime applied and rate:
   2019 ______________________ 2018 ______________________

7. Fertilizer used: ________________ (provide percentage of acres)

8. Gypsum (please list trade name): __________________________

9. Broadcast or Banded ____________________

10. Bagged, Bulk, or Granular ________________

11. Rate and application date ______________________

Figure 8-2. Sample Production Practices Survey (continued)

12. Herbicides:

Burndown	________	________	________
Preplant	________	________	________
Preemergence	________	________	________
At cracking	________	________	________
Postemergence	________	________	________

13. Leaf spot program: (list fungicide for each timing)

A. ________	E. ________
B. ________	F. ________
C. ________	G. ________
D. ________	H. ________

14. What percentage of your acreage was treated for Sclerotinia blight? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

15. What percentage of your acreage was fumigated for CBR? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

16. What percentage of your acreage was treated with an in-furrow insecticide? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

17. What percentage of your acreage was treated for foliar insects? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

18. What percentage of your acreage was treated for southern corn rootworm? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

19. What percentage of your acreage was treated for spider mites? (circle the percentage)

0 20 40 60 80 100 Chemical used ________________

20. What percentage of your acreage was irrigated? (circle the percentage)

0 20 40 60 80 100

21. Did you apply boron? ______ How much and what brand?________________

22. Did you apply manganese? ______ How much and what brand? ________________

Figure 8-2. Sample Production Practices Survey (continued)

23. Did you inoculate? ________ What product and what percentage of acres?

____

24. What percent of your acreage received the following tillage practices?

Disk	0	20	40	60	80	100
Chisel	0	20	40	60	80	100
Moldboard plow	0	20	40	60	80	100
Field cultivate	0	20	40	60	80	100
Bed	0	20	40	60	80	100
Rip and bed	0	20	40	60	80	100
Strip till	0	20	40	60	80	100
No till	0	20	40	60	80	100

25. Did you apply Apogee or Kudos on your peanuts? If so, what percentage and to what varieties?

26. Place a number for each piece of equipment in a size category.

________ 2-row digger
________ 4-row digger
________ 6-row digger
________ 2-row pull type combine
________ 4-row pull type combine
________ 6-row pull type combine
________ 6-row self-propelled combine
________ 8-row self-propelled combine

27. How many days did it take to dig and harvest your entire peanut crop?

________dig
________ harvest

28. What caused your greatest delay in harvesting?

29. What decisions and/or practices contributed most to your success?

Thursday	30-Jan	AM and PM	South Carolina State Meeting
Monday	3-Feb	9:00 AM	Hertford (Winton)
Monday	3-Feb	Noon	Chowan, Gates, Perquimans (Smalls Crossroads)
Wednesday	5-Feb	Noon	VC Peanut Advisory Committee (Fayetteville)
Friday	7-Feb	9:00 AM	Northampton (Jackson)
Friday	7-Feb	12:30	Halifax (Halifax)
Monday	10-Feb	Noon	Bertie (Windsor)
Monday	10-Feb	5:00 PM	Martin/Washington (Williamston)
Wednesday	12-Feb	10:00 AM	Pitt (Greenville)
Friday	14-Feb	10:00 AM	Southeastern counties (Elizabethtown)
Monday	17-Feb	Noon	Wayne and surrounding counties (Fremont)
Wednesday	19-Feb	10:00 AM	Duplin/Sampson (Kenansville)
Friday	21-Feb	10:00 AM	Edgecombe/Nash (Livestock Arena, Kingsboro Road exit)
Monday	24-Feb	Noon	5 K Luncheon (Williamston)
Wednesday	26-Feb	AM	Virginia State Meeting

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Survey of Practices by Growers in the Virginia–Carolina Region Regarding Digging and Harvesting Peanut

David L. Jordan,* Andrew T. Hare, Gary T. Roberson, Jason Ward, Barbara B. Shew, Rick L. Brandenburg, Dan Anco, James Thomas, Maria Balota, Hillary Mehl, and Sally Taylor

Determining when to dig peanut (*Arachis hypogaea* L.) and invert vines is one of the most important management decisions made by growers to optimize pod yield, market grade characteristics, and economic return (Jordan et al., 2016; Williams and Drexler, 1981). Williams and Drexler (1981) developed the hull scrape method to assist growers and their advisors by using the relationship of pod mesocarp color and kernel development as indicators of yield and quality. A darker mesocarp color is indicative of greater pod and kernel maturation and greater kernel weight. In addition to pod and kernel maturity, the ability of growers to dig peanut and invert vines in a timely manner can be influenced by weather conditions, including tropical systems and freezing potential, disease in the peanut canopy and plant health, and the combination of acreage and digging and harvesting capacities. Additionally, row visibility and the ability of growers to track peanut rows precisely during digging can influence yield. The anti-gibberellin plant growth regulator prohexadione calcium and the use of guidance systems applying global positioning are commercially available and can improve precision and efficiency of digging (Mitchem et al., 1996; Roberson and Jordan, 2014). Reports in the literature are limited relative to growers' understanding of pod mesocarp color in determining when to dig, their use of prohexadione calcium and guidance systems, and the digging and harvesting capacity growers have relative to acreage and yield. In this brief, we discuss a survey conducted during peanut grower meetings in North Carolina, South Carolina, and Virginia in 2018 to gain insights into these practices of growers.

In the survey for all three states, growers were asked to provide the following information for the 2017 growing season: (i) acreage, (ii) estimated peanut yield, (iii) the number of diggers and number of rows (width) for each digger, (iv) number of combines and rows (width) covered by each combine, (v) whether or not prohexadione calcium was applied, and (vi) whether or not a guidance system was used to dig peanut. In North Carolina and Virginia, growers were asked to provide the number of days required to dig and harvest their total acreage; this question was not included in the initial

Crop Management—Briefs

ACCEPTED

Core Ideas

- Harvesting peanut requires approximately twice as much time to complete as the time required for digging peanut.
- Fifty-six percent of growers predicted when optimum yield would occur based on the sample provided within the recommended timeframe.
- Reported yield was positively correlated with the use of prohexadione calcium.

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Conversions: For unit conversions relevant to this article, see Table A.

Crop Forage Turfgrass Manage.
5. doi:10.2134/cftm2019.07.0057

Table A. Useful conversions.

To convert Column 1 to Column 2, multiply by	Column 1 Suggested Unit	Column 2 SI Unit
0.454	pound, lb	kilogram, kg
1.12	pound per acre, lb/acre	kilogram per hectare, kg/ha
2.54	inch	centimeter, cm (10^{-2} m)

survey instrument in South Carolina. During the presentation at these meetings by the senior author, an image of a sample of peanut after the exocarp was removed to reveal mesocarp color was provided. Participants in the audience were asked to provide the number of days required for the pods to reach optimum maturity (Fig. 1). In total, 333 surveys were collected across all three states (232 in North Carolina, 49 in South Carolina, and 52 in Virginia). The number of days required for peanut to reach optimum maturity in these respective states was written on the survey by 148, 35, and 27 respondents. Approximately 31% of acreage in the Virginia–Carolina region (230,000 acres in 2017) was represented in the survey. Data for the pod maturity estimate were pooled across states. Data for prohexadione calcium and guidance use, and digging and harvesting capacities are presented by state. Data for the number of actual days required to dig and harvest peanut were collected only in North Carolina and Virginia and are presented for each state separately. Digging and harvesting capacities were determined by assuming a ground speed of 3 mi h^{-1} and 10-h working days. Pearson correlation coefficients were constructed to determine the relationships among estimated yield and acreage and the use of prohexadione calcium or a guidance system, digging and harvesting capacities, and actual days required for digging and harvesting ($p \leq 0.05$).

Optimum yield was noted 10 days after the image was recorded (Fig. 2). The change in pod mesocarp color over

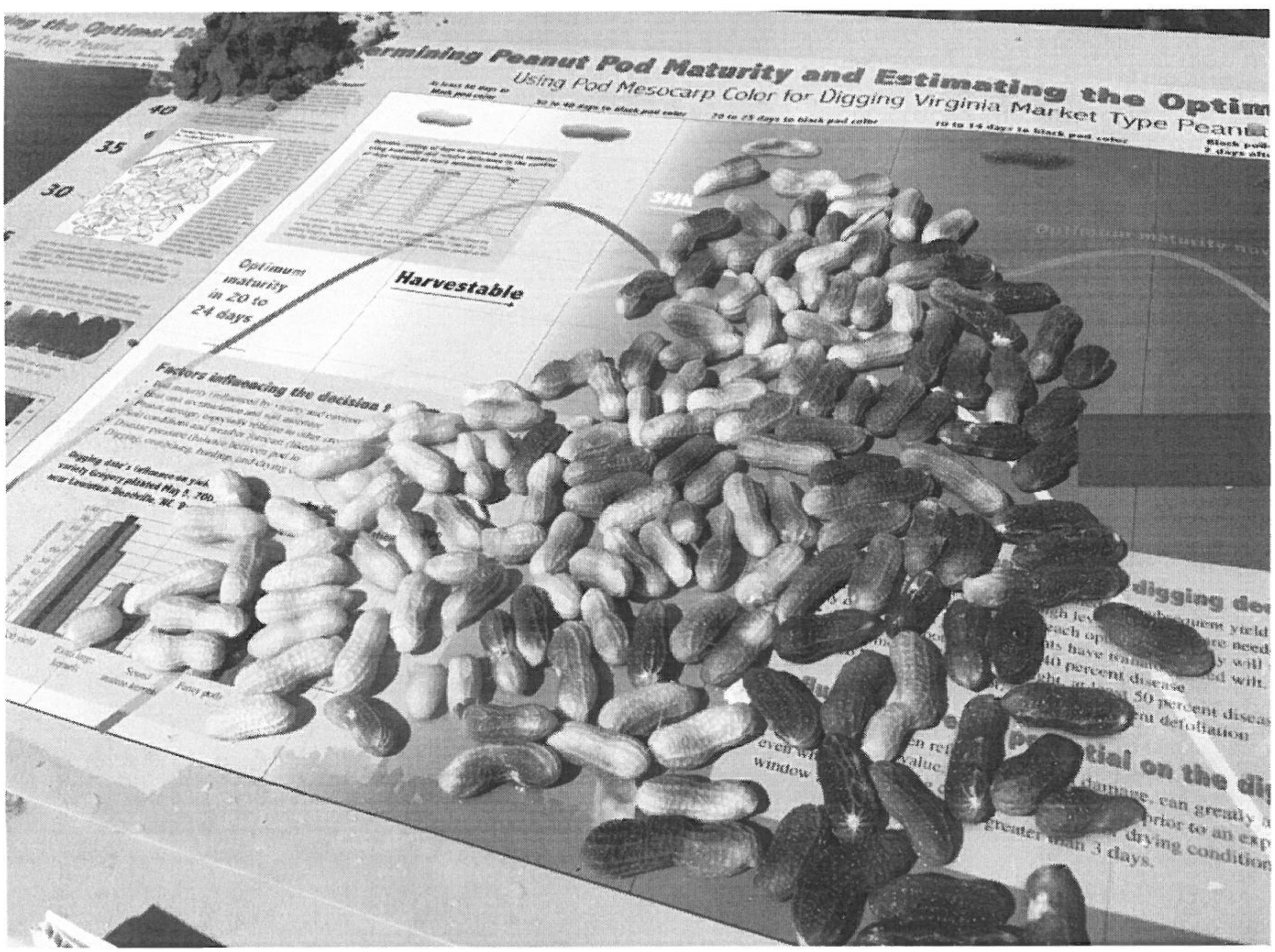


Fig. 1. Peanut sample from North Carolina revealing pod mesocarp color that was used to determine growers' knowledge of the relationship between pod mesocarp color and optimum digging date.

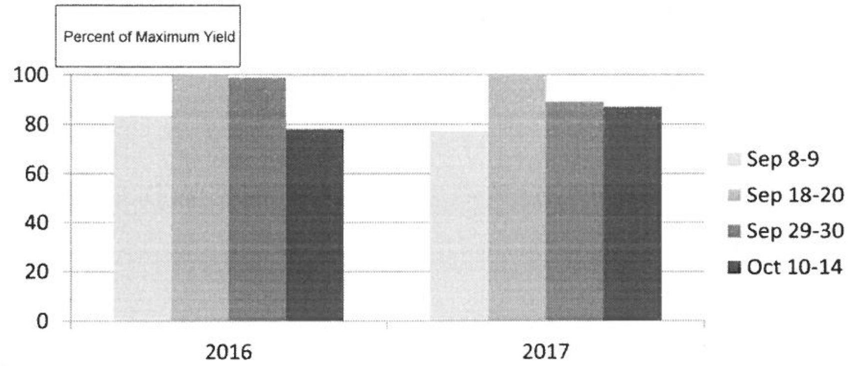
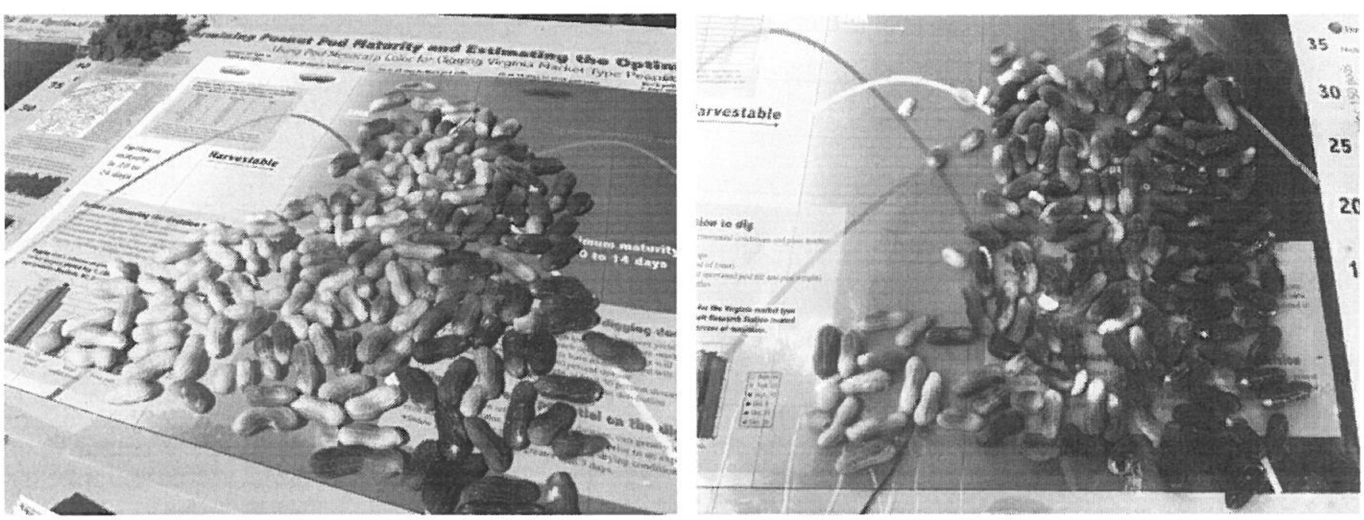


Fig. 2. Peanut pod yield during 2016 and 2017 in North Carolina, demonstrating the importance of digging peanut at optimum pod maturity based on pod mesocarp color.

the 10-day period of time is presented in Fig. 3. Twenty-eight percent of farmers indicated that optimum maturity would occur in 10 days, whereas approximately 28% of growers indicated that optimum maturity would be reached in 8 to 9 or 11 to 12 days (Fig. 4). Approximately twice as many days were needed to harvest peanut compared with the time required to dig, and the amount of time actually required to dig and harvest was approximately twice as long as the capacity growers had in place (Table 1). Prohexadione calcium was applied more often in North Carolina and Virginia, whereas a guidance system was used more frequently in South Carolina (Table 1). Estimates of pod yield were not correlated with acreage, digging or harvest capacities, or use of a guidance system during digging but were positively correlated with the use of prohexadione calcium (Table 2).

These results indicate that educational opportunities continue to exist regarding growers' understanding of the relationship of pod mesocarp color and yield. Fifty-six percent of growers predicted when optimum yield would occur based on the sample provided within the timeframe that would be recommended by the Cooperative Extension Service in North Carolina. However, 25% of growers were digging prior to optimum pod maturity, which could have a negative impact on pod yield and economic value (Jordan et al., 2016). For the remaining growers, digging after the optimum date relative to pod mesocarp color often does not result in reductions in yield or market grade characteristics during a period of 1 to 2 weeks after optimum maturity is reached. However, digging after optimum maturity has been reached increases the risk of exposure to inclement weather and delays in digging, which can result in greater pod shed and yield loss.

The results from the survey also provide information on how growers use prohexadione calcium and guidance systems to improve precision in digging. Information on digging and harvesting capacity and the actual time required to



Sep 7, 2016

Sep 18, 2016

Fig. 3. The change in pod mesocarp color, reflecting increasing peanut maturation over a 10-day period of time during 2016 in North Carolina.

Table 1. Days required to complete digging and harvesting operations compared with equipment capacities and the use of a guidance system or prohexadione calcium to dig peanut more precisely.

Category	North Carolina	South Carolina	Virginia
Capacity and actual requirement to dig and harvest			
	days		
Digging capacity	7.0	–†	6.2
Digging requirement	15	–	12
Harvesting capacity	11.9	–	9.5
Harvest requirement	25	–	18
Tools used to improve the precision of digging and vine inversion			
	Percent growers, %		
Prohexadione calcium	56	13	51
Guidance system	38	79	32
Both prohexadione calcium and guidance system	19	10	8

† Data from South Carolina were not collected.

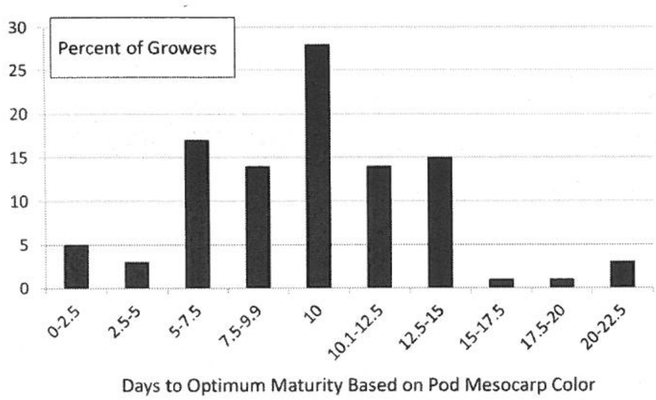


Fig. 4. Percentage of growers in North Carolina, South Carolina, and Virginia (n = 210) expressing the number of days required for peanut to reach optimum maturity based on pod mesocarp color.

Table 2. Pearson correlation coefficients for peanut acreage and yield versus days required to dig and harvest, pod maturity estimates, and use of a guidance system or prohexadione calcium from surveys collected in North Carolina and Virginia.

Factor	Acreage	Yield
Days required to dig	0.40*	0.07
Days required to harvest	0.48*	0.0
Prohexadione calcium	0.03	0.41*
Guidance system	0.25*	0.08
Maturity estimate	0.01	0.11
Total digging capacity	0.59*	0.07
Days to dig based on total capacity	0.72*	0.05
Total harvesting capacity	0.58*	0.09
Days to harvest based on total capacity	0.69*	0.01

* Significance at the 0.05 probability level.

complete these operations provides an insight into the challenges growers experience when growing peanut. Weather conditions during the 2017 digging and harvest season in the Virginia–Carolina region were considered good for field operations. Even so, growers reported that the time required to dig and harvest was twice the capacity of the equipment in place. In seasons where a greater amount of inclement weather is experienced, growers would experience even greater challenges in digging at optimum maturity. These data can encourage growers to improve digging and harvesting capacities relative to acreage.

Acknowledgments

This research was supported financially by the North Carolina Peanut Growers Association, the South Carolina Peanut Board, the Virginia Peanut Growers' Association, and the NIFA USDA under project number SC-1700532. Appreciation is expressed to the peanut growers for completing the survey and the Cooperative Extension Service agents for assisting with collecting the surveys.

References

Jordan, D.L., B.B. Shew, and P.D. Johnson. 2016. Response of the peanut (*Arachis hypogaea* L.) cultivar Gregory to interactions of digging date and disease management. Adv. Agric. 2016:5839090.

Mitchem, W.E., A.C. York, and R.B. Batts. 1996. Peanut response to prohexadione calcium, a new plant growth regulator. Peanut Sci. 23:1–9. doi:10.3146/i0095-3679-23-1-1

Roberson, G.T., and D.L. Jordan. 2014. RTK GPS and automatic steering for peanut digging. Appl. Eng. Agric. 30(3):405–409.

Williams, E.J., and J.S. Drexler. 1981. A non-destructive method for determining peanut pod maturity, pericarp, mesocarp, color, morphology, and classiðcation. Peanut Sci. 8:134–141. doi:10.3146/i0095-3679-8-2-15

On-Farm Nematode Trials

The nematode-resistant cultivar, TifNV High O/L, is compared to the nematicide Velum Total.

Root-knot nematodes are one of the most prevalent and damaging pests in peanut production in the Southeast. Crop rotation, use of resistant cultivars and nematicide applications are the primary strategies for managing root-knot nematodes.

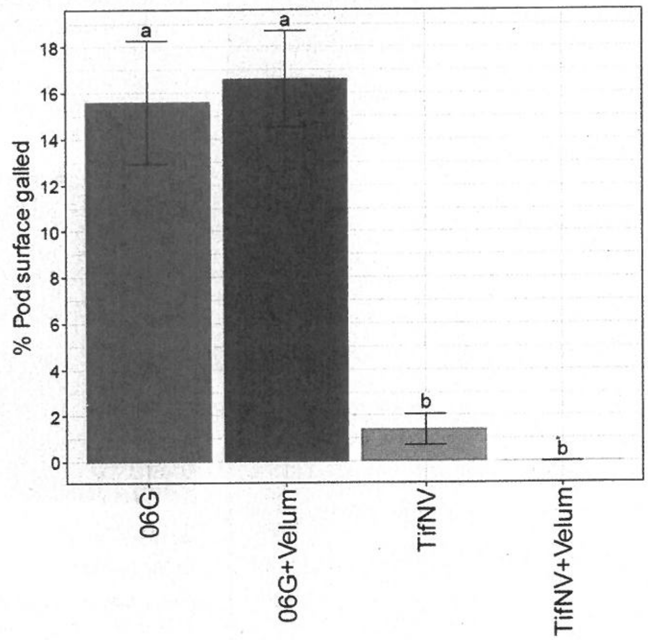
Recently, a new root-knot nematode resistant peanut cultivar, TifNV High O/L, was released by the University of Georgia. Research trials indicate this high-oleic cultivar has greater yield potential than previous resistant cultivars such as Tifguard and Georgia 14N. More testing is needed in commercial fields under root-knot nematode pressure in comparison to commonly used nematicides such as Velum Total.

Options Tested

In 2019, two on-farm peanut nematode trials were conducted in Florida. One trial was conducted in Jackson County on irrigated land and another was conducted in the Suwannee Valley on non-irrigated land. Treatments were as follows: 1) Georgia 06G, 2) Georgia 06G with Velum Total in-furrow at 18 ounces per acre, 3) TifNV and 4) TifNV with Velum Total. Georgia 06G is a root-knot nematode susceptible variety. Treatments were applied in four- or six-row strips across the length of each field. Each treatment was repeated four or five times in each field.

Trial Results

In the Jackson County trial, root-knot nematode pressure was low. The amount of root-knot nematodes was not affected by cultivars or nematicide application. Peanut yield was



In the Suwannee Valley trial, galling by root-knot nematode was greater for Georgia 06G than TifNV. There was no statistical difference in galling with or without Velum Total.

771 pounds per acre greater for 06G than TifNV. Statistically, Velum Total did not increase yield, but 06G yielded 528 pounds per acre more with Velum Total than without Velum Total. Velum Total did not influence TifNV yield.

In this trial, 06G performed better than TifNV under

low root-knot nematode pressure. However, this is a single trial, and caution should be shown in interpreting it. TifNV has been more competitive with 06G in variety testing by UF peanut breeder Barry Tillman on irrigated land than is shown in this trial. Over four years of Florida peanut variety trials, TifNV averaged 350 pounds per acre less than 06G but approximately 700 pounds per acre more than Tifguard.

Under Severe Pressure

In the Suwannee Valley trial, root-knot nematode pressure was severe. There were clear above-ground visual differences between cultivars. Georgia 06G exhibited yellowing, browning and wilting with symptoms increasing in severity later in the season. In contrast, TifNV was greener and healthier than 06G. There were no obvious visual differences between strips treated with or without Velum Total.

Galling on roots and pods at harvest was much greater for 06G than TifNV, which was nearly free of galling. Velum Total did not affect root or pod galling. TifNV yielded 750 pounds per acre more than 06G, whereas Velum Total did not improve yield. Velum Total and other nematicides have shown value in other trials, but not consistently. Growers should not abandon use of nematicides based on these results. The results suggest that resistant cultivars are a more effective option when root-knot nematode pressure is severe.

Always soil test for root-knot nematodes. Based on the results of these trials and other research, producers with a severe root-knot nematode infestation should plant a nematode-resistant cultivar or rotate to a non-host crop. PG

Article by Zane Grabau, UF/IFAS crop nematologist, based on research he conducted with Ethan Carter, regional crop agent; Jay Capasso, Columbia County Extension; and Mark Mauldin, Washington County Extension.

◂ *Strips of Georgia 06G exhibit chlorosis, necrosis and wilting. The rows of TifNV, a root-knot nematode resistant variety, were green and vigorous.*

Southern Cover Crops Council

Group works to double cover crop acreage.

Need help deciding which cover crop to plant? What crops match the goals you are trying to achieve in your fields between production seasons? A new resource is available to help producers with these decisions.

The Southern Cover Crops Council was formed in July 2017. The group includes farmers, university researchers, Extension specialists, industry personnel and interested non-governmental organizations, plus representatives from U.S. Department of Agriculture's Agricultural Research Service and Natural Resource Conservation Service.

The goal of SCCC is to increase cover crop use through collaborative education and research across the South. In fact, its aim is to double the total acreage in cover crops for each state of the Southern region by the next U.S. Ag Census in December 2022.

A Go-To Resource

The Southern Cover Crops Conference was held July 17-18, 2019, in Auburn, Alabama, with nearly 350 participants. Presentations given at the conference can be found on its website: **https://southerncovercrops.org**. In fact, the website is a wealth of information from the cover crop selection tool to crop-specific information sheets. Topics include planting and managing cover crops, planting dates, cover crop fertilization and cover crop mixtures. There are resources for planning when and how to terminate the cover crop.

Audrey Gamble, Auburn University professor and Alabama Cooperative Extension Service soil scientist, is a member of the SCCC executive committee and conducts research in conservation cropping systems/cover crops to improve soil health and sustainability.

Cover Crop Benefits:
- Weed Suppression
- Reduced Erosion
- Increased Water Infiltration
- Increased Soil Moisture Retention
- Reduce Compaction
- Provide Nitrogen
- Retain Excess Nitrogen
- Promote Soil Health

"The Southern Cover Crops website is a good resource with a lot of information on management of cover crops from planting to termination."

The SCCC hopes producers will put more planning and management into their cover crop systems, and the council will provide the resources and information to do just that. Farm profitability and environmental stewardship are always top of mind for the council. PG

Nematode suppression and peanut yield with Velum Total versus Admire Pro in Bertie County at farm scale. Four replications were present at each farm.

	Ring Sep 13	Root knot Sep 13	Pod yield	Fancy	ELK	SMK	SS	TSMK
Smith Farm								
Velum Total	1 a	257 a	5328 a	86 a	44 a	65 a	3 a	68 a
Admire Pro	8 a	1827 a	5120 a	90 a	48 a	65 a	1 a	67 a
Wilkins Farm								
Velum Total	18 a	2525 a	5348 a	95 a	59 a	68 a	2 a	70 a
Admire Pro	25 a	1345 a	5537 a	93 a	60 a	69 a	1 a	70 a
Hedgpeth Farm								
Velum Total	495 a	1343 a	4901 a	91 a	54 a	67 a	6 a	71 a
Admire Pro	315 a	2283 a	4658 a	90 a	54 a	65 a	5 a	71 a
Brown Farm								
Velum Total	1 a	505 a	5824 a	-	-	-	-	-
Admire Pro	6 a	425 a	5780 a	-	-	-	-	-
Pooled over Farms								
Velum Total	127 a	1158 a	5350 a	91 a	54 a	69 a	3 a	70 a
Admire Pro	89 a	1470 a	5271 a	92 a	55 a	70 a	3 a	70 a

Peanut and soybean yield following rotations containing grain sorghum, corn, and cotton in conventional tillage systems at Lewiston-Woodville.†‡

Rotation sequence	Peanut		Soybean	
	Year 3	Year 6	Year 3	Year 6
years 1-6	——lbs/acre——		——bu/acre——	
GS-GS-PN-GS-GS-PN	4360	3740	31	44
GS-CT-PN-GS-CT-PN	4310	3870	26	42
CR-CR-PN-CR-CR-PN	4230	3940	27	47
CR-CT-PN-CR-CT-PN	4310	4060	33	45
CT-CT-PN-CT-CT-PN	3990	3950	32	45
P > F	0.7828	0.4251	0.9693	0.7394

†Abbreviations: GS, grain sorghum; CR, corn; CT, cotton; PN, peanut.
‡Data are pooled over two runs of the experiment.

These data suggest that grain sorghum does not negatively impact peanut or soybean yield in conventional tillage.

Table 1. Cultivars and hybrids used for corn, cotton, grain sorghum, peanut, and soybean 2013-2017 at Lewiston-Woodville, NC.

	Cultivar or hybrid[†]				
Crop	2013	2014	2015	2016	2017
Corn	DK68-03 (L)	P1615 (L)	P1637 (L)	P1637 (L)	DK68-05 (L)
Cotton	DP0912 (E)	DP0912 (E)	DP1321 (EM)	DP1321 (EM)	PHY333 (EM)
Grain sorghum	83P17 (L)	83P17 (L)	83P17 (L)	83P17 (L)	83P17 (L)
Peanut	Bailey (EM)	Bailey (EM)	Bailey (EM)	Bailey (EM)	Bailey (EM)
Soybean	P95M82 (M)	AG5632 (M)	AG6536 (M)	AG6536 (M)	S56-G6 (M)
Wheat	Pioneer 26R20 (L)	Pioneer 26R20 (L)	Pioneer 26R20 (L)	Pioneer 26R20 (L)	Pioneer 26R20 (L)

[†]Abbreviations: E, early maturing cultivar or hybrid; M, mid-maturity cultivar or hybrid; EM, early to mid-maturity cultivar or hybrid; L, late maturing cultivar or hybrid

Table 2. Planting dates for corn, cotton, grain sorghum, peanut, and soybean 2013-2017 at Lewiston-Woodville, NC.

		Planting dates				
Crop	Planting date designation	2013	2014	2015	2016	2017
Corn	Mid-April	18 April	17 April	17 April	15 April	17 April
Corn	Mid-May	15 May	19 May	21 May	16 May	15 May
Corn	Mid-June	17 June	20 June	15 June	20 June	13 June
Cotton	Early May	2 May	6 May	12 May	5 May	3 May
Cotton	Late May	22 May	23 May	20 May	25 May	25 May
Cotton	Mid-June	17 June	20 June	15 June	20 June	13 June
Grain sorghum	Early May	14 May	5 May	12 May	5 May	3 May
Grain sorghum	Late May	6 June	23 May	21 May	25 May	25 May
Grain sorghum	Mid-June	17 June	20 June	15 June	20 June	13 June
Peanut	Early May	6 May	6 May	12 May	5 May	3 May
Peanut	Late May	22 May	23 May	21 May	25 May	25 May
Peanut	Mid-June	17 June	20 June	15 June	20 June	13 June
Soybean	Early May	8 May	5 May	12 May	5 May	3 May
Soybean	Late May	22 May	23 May	21 May	25 May	25 May
Soybean	Mid-June	17 June	20 June	15 June	20 June	13 June

Table 3. Summary of growing-season precipitation as recorded by the State Climate Office of North Carolina weather station at the Peanut Belt Research Station near Lewiston-Woodville, NC, 2013-2017.

	Precipitation				
Month	2013	2014	2015	2016	2017
	mm				
April	81	158	106	220	144
May	45	93	23	93	146
June	190	112	74	105	143
July	163	260	112	205	189
August	88	209	114	57	128
September	63	188	188	434	82
October	62	38	119	275	69
November	70	85	133	37	40
Total	762	1142	868	1426	940

Table 4. Yield of corn, cotton, grain sorghum, peanut, and soybean at Lewiston-Woodville, NC 2013-2017[†].

		Yield					
Crop	Planting date	2013	2014	2015	2016	2017	Pooled
		$kg\ ha^{-1}$					
Corn	Mid-April	10,050 a	7,120 b	4,940 b	8,540 a	6,690 b	7,470 a
Corn	Mid-May	8,410 b	8,260 a	6,980 a	7,890 b	7,880 a	7,880 a
Corn	Mid-June	5,870 c	4,180 c	4,100 c	5,980 c	5,980 c	5,220 b
Cotton	Early May	1,500 b	1,340 a	620 c	1,030 a	1,670 a	1,230 a
Cotton	Late May	1,770 a	1,290 a	970 a	1,100 a	1,610 a	1,350 a
Cotton	Mid-June	1,310 b	580 b	740 b	760 b	1,220 b	920 b
Grain sorghum	Early May	6,410 a	5,230 a	4,990 a	4,000 a	3,220 b	4,770 a
Grain sorghum	Late May	5,120 b	5,230 a	5,550 a	4,720 a	5,830 a	5,290 a
Grain sorghum	Mid-June	6,670 a	1,850 b	5,510 a	3,650 a	3,570 b	4,250 a
Peanut	Early May	3,740 a	4,100 a	6,260 a	4,080 b	4,670 b	4,570 a
Peanut	Late May	3,810 a	4,140 a	4,300 b	5,620 a	7,070 a	4,990 a
Peanut	Mid-June	3,440 a	3,280 b	2,300 c	3,410 c	3,670 b	3,220 b
Soybean	Early May	3,320 b	2,950 ab	2,850 a	2,900 a	3,080 b	3,020 b
Soybean	Late May	4,190 a	3,030 a	2,930 a	2,870 a	3,580 a	3,320 a
Soybean	Mid-June	2,700 c	2,450 b	2,120 b	2,500 b	2,920 b	2,540 c
Wheat	Nov-Dec	3,650	4,630	4,270	1,970	6,270	4,150

[†]Means within a year and crop or within a crop when pooled over years followed by the same letter are not significantly different according to Fisher's Protected LSD test at $p \leq 0.05$.

Table 5. Estimated economic returns for the ten-year average price for corn, cotton, grain sorghum, peanut, soybean, and wheat from 2013 to 2017†,‡.

Crop			Estimated economic returns§					
Winter	Summer	Planting date	2013	2014	2015	2016	2017	Pooled
			$ ha^{-1}$					
None	Corn	Mid-April	855 bc	309 bcd	-97 de	574 b	230 ef	374 c-f
None	Corn	Mid-May	553 d	522 ab	284 bc	455 bc	453 de	453 cde
Wheat	Corn	Mid-June	270 ef*	196 cde*	-2 d*	-15 efg	786 c*	247 efg
None	Cotton	Early May	946 b	684 a	-496 f	169 de	1,214 b	503 bcd
None	Cotton	Late May	1,375 a	600 ab	78 cd	289 cd	1,120 b	692 ab
Wheat	Cotton	Mid-June	828 bc*	-154 f*	108 cd*	-420 i*	1,125 b	297 def
None	Grain sorghum	Early May	202 fg	34 def	-1 d	-142 gh	-253 g	-32 h
None	Grain sorghum	Late May	18 g	34 def	79 cd	-38 efg	120 f	43 gh
Wheat	Grain sorghum	Mid-June	443 de	-67 ef*	429 b	-305 hi*	605 cd*	221 fg*
None	Peanut	Early May	144 fg	321 bcd	1,395 a	310 cd	606 cd	555 bc
None	Peanut	Late May	211 efg	340 bcd	419 b	1,076 a	1,798 a	769 a
Wheat	Peanut	Mid-June	292 def	351 bc	-250 e*	-115 fgh*	837 c*	223 fg*
None	Soybean	Early May	576 cd	427 abc	388 b	407 bc	481 de	459 cde
None	Soybean	Late May	925 b	458 abc	419 b	396 bc	691 cd	578 bc
Wheat	Soybean	Mid-June	527 d	608 ab	415 b	101 def	1,141 b	559 bc

†Means within a year or for data pooled over years followed by the same letter are not significantly different according to Fisher's Protected LSD at $p \leq 0.05$.

‡ * indicates significance at $p \leq 0.05$ when compared with estimated economic return of double cropped wheat and soybean using Dunnett's Procedure.

§Estimated economic returns associated with mid-June planted summer crops included revenue generated by summer crop plus wheat.

Potential Economic Value for Peanut by Increasing Soil pH in North Carolina

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The establishment and maintenance of soil pH at levels that promote root growth and positively affect availability of elements in forms that are readily absorbed by roots are paramount for optimum peanut (*Arachis hypogaea* L.) production (Cox et al., 1982; Jordan, 2019). Appropriate soil pH also minimizes toxicity from aluminum or zinc, promotes biological nitrogen fixation, and increases the possibility of positive response to calcium sulfate applied at flowering for optimum production (Cox et al., 1982; Cox, 1990; Jordan, 2019). The optimum pH for peanut is between 5.8 and 6.2 (Hardy et al., 2014). Using data collected from a field study with various soil pH regimes, we provide information on the potential economic return on investment from lime when soil pH is adjusted to the optimum level for various yield potentials. The potential economic value of liming for peanut growers in North Carolina using soil test reports cataloged by the North Carolina Department of Agriculture and Consumer Services is also presented.

Experiments were conducted during 2001, 2003, and 2004 at the Peanut Belt Research Station near Lewiston-Woodville, NC (36.2 N, -77.2 W) in conventional tillage systems on a Norfolk loamy sand soil (fine-loamy, siliceous, thermic Typic Paleudult) with 0.56 to 1.1% humic matter content. The Virginia market type peanut cultivar NC 7 was planted in early to mid-May of each year. Soil pH regimes of 4.5, 5.0, 5.5, and 6.0 were established prior to 2000 with other research objectives. A soil test was taken in 2003 to determine actual pH levels to develop a standard curve describing the relationship among pod yield and soil pH. The experimental design was a randomized complete block with 4 replications of each soil pH regime. Peanut yield was determined each year and converted to percentage of maximum yield with the highest yielding plot from each replication set at 100% of maximum yield. Data for percent of maximum yield was pooled over years due to a lack of a year × soil pH interaction ($p = 0.3460$). Based on the relationship of yield and soil pH, the potential economic return on investment of lime for yield categories from 3000 lbs/acre to 5500 lbs/acre of farmer stock was determined at increments of 500 lbs/acre. Dolomitic lime cost was set at $46/ton and peanut price was set at $0.23/lb farmer stock (Bullen et al., 2019). Lime cost for this example was not prorated over subsequent crops.

Percentage of maximum yield and soil pH were correlated ($p < 0.0001$, $R^2 = 0.77$). A quadratic relationship ($Y = -257.5x + 27.3x^2 + 660.4$, $p = 0.0013$, $r^2 = 0.60$) was significant for pod yield versus soil pH when yield data were pooled over the 3 years of the study (Figure 1). Percentage of maximum yield was 54%, 59%, 74%, and 97% when soil pH was 4.6, 4.9, 5.3, and 5.8, respectively (Figure 1 and Table 1). The rate of dolomitic lime needed to adjust pH to 6.0 for these respective soil pH values was 1.5, 1.3, 0.9, and 0.5 tons/acre (Hardy, D., personal communication). These data were used to calculate the potential return on investment of lime (Table 1). For example, when estimated maximum peanut yield was 4,000 lbs/acre economic return over lime cost was $350/acre, $313/acre, and $194/acre when soil pH was increased from

4.6 to 5.8, 4.9 to 5.8, and 5.3 to 5.8, respectively (Table 2). This example represents the current average yield and is used in enterprise budgets for peanut production in North Carolina (Bullen et al., 2019). These economic estimates include a charge of the complete cost of lime to peanut. In most cases, lime cost would be prorated across peanut and the following two crops grown in the cropping sequence.

The North Carolina Department of Agriculture and Consumer Resources received approximately 15,362 soil samples requesting lime and fertilizer recommendations for peanut from 2015 through 2018 (Table 3). Approximately 25% of samples had soil pH values of 5.7 or less. Assuming these samples represent soil pH values associated with all peanut production in North Carolina during 2018 (approximately 100,000 acres), 19.4% of these acres represent a soil pH range of 5.4 to 5.7. For this year's acreage, the potential economic return on lime investment at a yield potential of 4,000 pounds/acre is approximately \$3.76 million (yield × 100,000 acres × 0.194 × \$194/acre). The potential increase in economic value relative to lime cost for this investment was approximately 11:1 (\$3.76 million:\$0.34 million). This estimate does not include the economic value of adjusting soil pH below 5.3 or the lower economic contribution for soil pH values above 5.3 up to soil pH 5.8. This estimate also includes the total cost of lime to peanut. None-the-less, these data provide a reasonable estimate for the potential value of lime to peanut in North Carolina.

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Citations

Bullen, S. G., D. L. Jordan, and D. Washburn. 2019. Peanut production budgets. Pages 2-15 *in* 2019 Peanut Information. North Carolina Cooperative Ext. Ser. AG-331. 193 pages.

Cox, F. R. 1990. A note on the effect of soil reaction and zinc concentration on peanut tissue zinc. Peanut Science: January 1990, Vol. 17, No. 1, pp. 15-17.

Cox, F. R., F. Adams, and B. B. Tucker. 1982. Lining, fertilization, and mineral nutrition. Pages 139-163 in H. E. Pattee and C. T. Young, eds. Peanut Science and Technology. Am. Peanut Re. ad ed. Soc., Yoakum, TX. 825 pages.

Jordan, D. L. 2019. Peanut production practices. Pages 21-43 *in* 2019 Peanut Information. North Carolina Cooperative Ext. Ser. AG-331. 193 pages.

Hardy, D. H., M. R. Tucker, J. K. Messick, and C. C. Carter. 2014. Crop fertilization based on North Carolina soil tests. North Carolina Department of Agriculture Circular No. 1. Raleigh, NC 27607.

Table 1. Estimates of peanut yield response to pH using results from regression.

		Yield estimate based on regression estimates					
		Yield category (lbs/acre)					
Soil pH	Percent of maximum yield†	3000	3500	4000	4500	5000	5500
		lbs/acre					
4.6	0.54	1620	1890	2160	2430	2700	2970
4.9	0.59	1770	2065	2360	2655	2950	3245
5.3	0.74	2220	2590	2960	3330	3700	4070
5.8	0.97	2910	3395	3880	4365	4850	5335

†$Y = -257.5x + 27.3x^2 + 660.4$, $p = 0.0013$, $r^2 = 0.60$

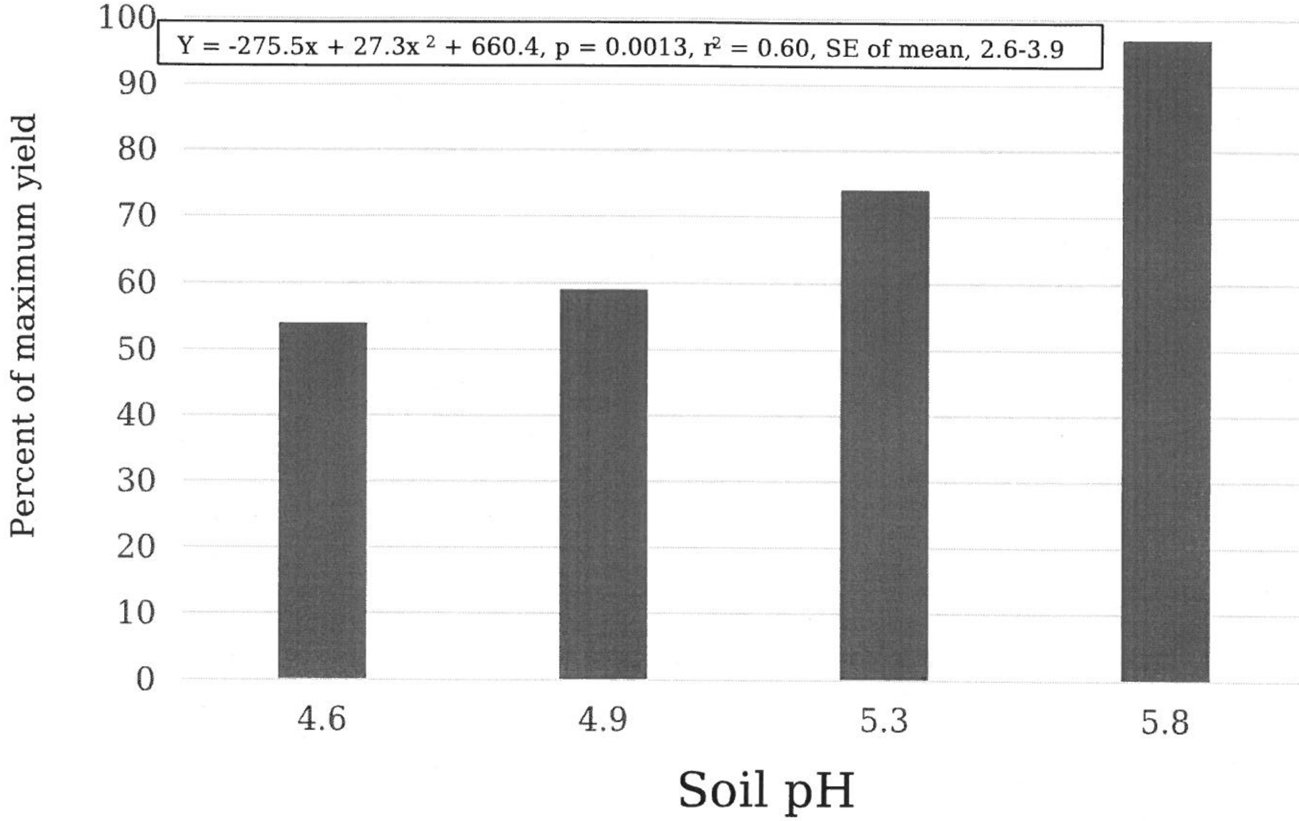
Table 2. Estimated economic return on investment in lime for peanut in a single season.

Adjustment with lime	Dolomitic lime		Economic return on lime investment					
			Peanut yield category (lbs/acre)					
	Rate	Cost	3000	3500	4000	4500	5000	5500
pH	tons/acre	\$/acre						
4.5 to 5.8	1.0	46	251	300	350	399	449	498
4.9 to 5.8	0.8	37	225	269	313	357	400	444
5.3 to 5.8	0.4	18	140	167	194	220	247	273

Table 3. Number of samples received from 2015-2018 to determine lime and fertilizer recommendations for peanut grown primarily in North Carolina.

pH category	Samples from 2015-2018	Acreage estimate for pH categories
	No.	% of samples
<5.4	859	5.6
5.4-5.7	2,969	19.3
5.8-6.2	8,255	53.7
>6.2	3,279	21.4
Total	15,362	-

Figure 1. Influence of soil pH on peanut yield presented as percent of maximum yield. Data are pooled over 3 years.



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Response of Two Virginia Market Type Peanut Cultivars to Planting and Digging Dates in North Carolina

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Crop Management—Briefs

Core Ideas

- Planting peanut in May results in greater economic value than planting peanut in June in North Carolina.
- Delaying digging into October was needed for the cultivar Perry while digging in early October was adequate to optimize economic return for the cultivar CHAMPS.
- When planting is delayed, economic value is optimized with later digging dates.

Virginia market type peanut (*Arachis hypogaea* L.) cultivars often vary in the length of time required to reach optimum pod maturity. The cultivars CHAMPS (Mozingo et al., 2006) and Perry (Isleib et al., 2003) can vary by as many as 9 days from emergence to when the first visible pod on a plant shows natural coloration of the testa (Balota et al., 2015; Boote, 1982). Both planting date and the timing of digging pods and inverting peanut vines can affect economic value of peanut (Jordan, 2019). In this brief, we discuss differences in economic value of two cultivars grown in North Carolina across a range of planting and digging dates.

The experiment was conducted from 2009–2012 near Lewiston-Woodville, NC (36.07N, –77.11W) at the Peanut Belt Research Station in conventional tillage systems on a Norfolk loamy sand soil. The cultivars CHAMPS and Perry were planted approximately 5 May, 20 May, and 8 June during each year, and peanut for each planting date was dug approximately 8 and 20 September and 7 and 20 October. Peanut was harvested within 7 days after digging and dried to 8% moisture. Economic value was determined as the product of yield and the monetary contribution of market grade components for Virginia market type peanut.

Peanut was not irrigated during May and June but was irrigated with overhead sprinklers during July, August, and September. The experimental design was a split plot with planting date serving as whole plot units and combinations of cultivars and digging dates serving as sub-plot units. Treatments were replicated four times. Combinations of digging date and cultivar were randomized within each planting date block. Data for economic value were subjected to analysis of variance using the PROC GLM procedure (SAS Inst. Inc., Cary, NC) for a 4 (year) × 2 (cultivar) × 3 (planting date) × 4 (digging date) factorial treatment arrangement. Means of significant main effects and interactions were separated using Fisher's Protected LSD ($p \leq 0.05$). Liner and quadratic functions for economic return versus days after emergence and heat unit accumulation (base temperature of 56°F) were tested using means for the significant interactions involving digging dates.

Interactions of planting date × cultivar, year × planting date, planting date × digging date, and cultivar × digging date were significant for

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Conversions: For unit conversions relevant to this article, see Table A.

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Table A. Useful conversions.

To convert Column 1 to Column 2, multiply by	Column 1 Suggested Unit	Column 2 SI Unit
0.405	acre	hectare, ha
2.54	inch	centimeter, cm (10^{-2} m)

Table 1. Influence of planting date and cultivar on economic value of peanut. †

Planting date	Heat unit accumulation	Economic value Cultivar CHAMPS	Perry
	growing degree days	—— $ per acre ——	
5 May	2813	939 ab *	1021 a
20 May	2599	988 a	1017 a
8 June	2332	857 b	820 b

*** Indicates significance between cultivars within a planting date. Data are pooled over years and digging dates.**

† Means for economic value within a cultivar followed by the same letter are not significantly different according to Fisher's Protected LSD test at $p \le 0.05$.

Table 2. Influence of year and planting date on economic value of peanut. †

Year	Rainfall in June	Economic value Planting date 5 May	20 May	8 June
	inches	——	$ per acre	——
2009	5.2	1349 a	1378 a	1035 b
2010	2.3	926 a	971 a	748 b
2011	4.3	798 a	723 a	453 b
2012	0.1	846 b	1039 ab	1119 a

† Means for economic value within a year followed by the same letter are not significantly different according to Fisher's Protected LSD test at $p \le 0.05$. Data are pooled over cultivars and digging dates.

economic value ($p \le 0.05$). The interaction of year × planting date × cultivar × digging date was not significant. Economic value was greater for the cultivar CHAMPS when planted 20 May compared with planting on 8 June; economic value from planting 5 May and 8 June was similar (Table 1). Economic value was similar for the cultivar Perry when planted in May and exceeded that of planting in June. When pooled over cultivars and digging dates, economic value was similar when peanut was planted 5 May or 20 May in all years (Table 2). Planting in June resulted in lower economic value compared with May plantings in 3 of 4 yr. In 2012, greater economic value was noted when peanut was planted in June compared with the early May planting. Greater economic value for June-planted peanut in 2012 may have been a result of limited rainfall during June (Table 2). Peak flowering often occurs in June when peanut is planted in early to mid-May. Peanut planted in June was growing vegetatively during the period of drought while reproductive growth of peanut planted in May most likely was affected adversely by this period of drought. Lower economic value was noted when peanut was dug September 8 regardless of planting date when compared to at least one of the later digging dates (Table 3). The greatest economic value was observed when peanut was dug 20 September, 7 October, and 20 October at planting dates of 5 May, 20 May, and 8 June, respectively. Quadratic ($Y = 139.9x - 0.54x^2 - 7889$, $r^2 = 0.98$, $p = 0.0187$), linear ($Y = 12.6x - 576$, $r^2 = 0.87$, $p = 0.0661$), and linear ($Y = 9.6x - 1983$, $r^2 = 0.72$, $p = 0.1563$) functions for economic value versus days after emergence were noted for these respective planting dates (data not shown). Linear and quadratic functions were not significant for economic value versus heat unit accumulation for early and late planting dates ($p = 0.2647$ to 0.3499) while a linear function was significant when peanut was planted 20 May ($Y = 1.41x - 2663$, $r^2 = 0.98$, $p = 0.0048$) (data not shown). Economic value of the later-maturing cultivar Perry was greatest when dug 20 October while the greatest economic value for the early maturing cultivar

Table 3. Influence of planting date and digging date on economic value of peanut. †

Digging date	Heat unit accumulation Planting date 5 May	20 May	8 June	Economic value Planting date 5 May	20 May	8 June
	— growing degree days —			—— $ per acre ——		
8 Sept.	2557	2358	2123	764 c	646 c	391 c
20 Sept.	2778	2583	2321	1071 a	974 b	740 c
7 Oct.	2924	2710	2429	1118 a	1194 a	1063 b
20 Oct.	2993	2756	2460	967 b	1202 a	1161 a

†Means for economic value within a planting date followed by the same letter are not significantly different according to Fisher's Protected LSD test at $p \le 0.05$. Data are pooled over years and cultivars.

Table 4. Influence of cultivar and digging date on economic value of peanut. †

Digging date	Heat unit accumulation	Economic value Cultivar CHAMPS	Perry
	growing degree days	—— $ per acre ——	
8 Sept.	2342	608 d	593 d
20 Sept.	2561	930 c	926 c
7 Oct.	2688	1132 a	1116 b
20 Oct.	2736	1039 b	1180 a

†Means for economic value within a cultivar followed by the same letter are not significantly different according to Fisher's Protected LSD test at $p \le 0.05$. Data are pooled over years and planting dates.

CHAMPS was noted on 7 October (Table 4). When pooled over years and planting dates, fewer heat units were needed for CHAMPS to reach optimum economic value compared with Perry. Quadratic functions of $Y = 88.1x - 0.30x^2 - 5302$ ($r^2 = 0.98$, $p = 0.0180$) and $Y = 125.8x - 0.46x^2 - 7456$ ($r^2 = 0.97$, $p = 0.1187$) for economic value versus days after emergence for these respective cultivars (data not shown). Linear functions were significant for economic value versus heat unit accumulation for CHAMPS ($Y = 1.25x - 2286$, $r^2 = 0.88$, $p = 0.0416$) and Perry ($Y = 1.49x - 2917$, $r^2 = 0.98$, $p < 0.0001$) (data not shown).

These results indicate that planting date and digging date can interact with year and cultivar to affect economic value of peanut. As expected, when planting was delayed digging at optimum maturity required a delay. However, the earlier-maturing cultivar CHAMPS required a shorter delay than Perry. These data can be used as examples of how cultivars with a wide range of pod maturity may respond to planting and digging dates in North Carolina. Estimated economic value for peanut planted 20 May were equal to or greater than economic value when peanut was planted in early May or early June. These results are consistent with previous findings in North Carolina demonstrating that planting peanut in mid- to late-May often results in the greatest yield (Jordan, 2019).

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References

Balota, M., D.E. Partridge-Telenko, P.M. Phipps, and E.A. Grabau. 2015. Comparison of three transgenic peanut lines with their parents for agronomic and physiological characteristics. Peanut Sci. 42:74–82. doi:10.3146/0095-3679-42.2.74

Boote, K.J. 1982. Growth stages of peanut (*Arachis hypogaea* L.). Peanut Sci. 9:35–40. doi:10.3146/i0095-3679-9-1-11

Isleib, T.G., P.W. Rice, R.W. Mozingo, II, J.E. Bailey, R.W. Mozingo, and H.E. Pattee. 2003. Registration of 'Perry' peanut. Crop Sci. 43:739–740. doi:10.2135/cropsci2003.0739

Jordan. D.L. 2019. Peanut production practices. In: Peanut Information. North Carolina Cooperative Ext. Ser. AG-331. p. 21-42

Mozingo, R.W., T.A. Coffelt, P.M. Phipps, and D.L. Coker. 2006. Registration of 'CHAMPS' peanut. Crop Sci. 46:2711–2712. doi:10.2135/cropsci2005.12.0513

Summary from One Trial in 2019 Comparing Dual Magnum (16 oz/acre) or Zidua (2.4 oz/acre) Applied with Gramoxone (8 oz/acre of 3 lb ai/gal) plus Basagran (8 oz/acre) plus Nonionic Surfactant (1 pint/100 gal) on May 31

David Jordan, NCSU

	Peanut injury				
Treatment	June 4	June 10	June 14	June 21	June 27
Gramoxone	35 b	15 b	1 b	9 c	13 a
Gramoxone plus Dual Magnum	46 a	31 a	15 a	23 a	24 a
Gramoxone plus Zidua	35 b	23 ab	13 a	18 b	5 a

	Morningglory control				
Treatment	June 4	June 10	June 14	June 21	June 27
Gramoxone	74 a	68 b	49 b	39 c	30 a
Gramoxone plus Dual Magnum	74 a	88 a	81 a	79 b	59 a
Gramoxone plus Zidua	89 a	89 a	93 a	94 a	59 a

	Palmer amaranth control				
Treatment	June 4	June 10	June 14	June 21	June 27
Gramoxone	-	60 b	88 b	46 b	71 b
Gramoxone plus Dual Magnum	-	93 a	93 a	95 a	96 a
Gramoxone plus Zidua	-	95 a	95 a	95 a	98 a

	Control June 27			
Treatment	Morningglory	Palmer amaranth	Common ragweed	Yellow nutsedge
Gramoxone	30 a	71 b	43 b	15 b
Gramoxone plus Dual Magnum	59 a	96 a	64 b	64 a
Gramoxone plus Zidua	59 a	98 a	96 a	40 ab