Common Questions Related to Peanut Agronomy and Fertilization Practices in North Carolina

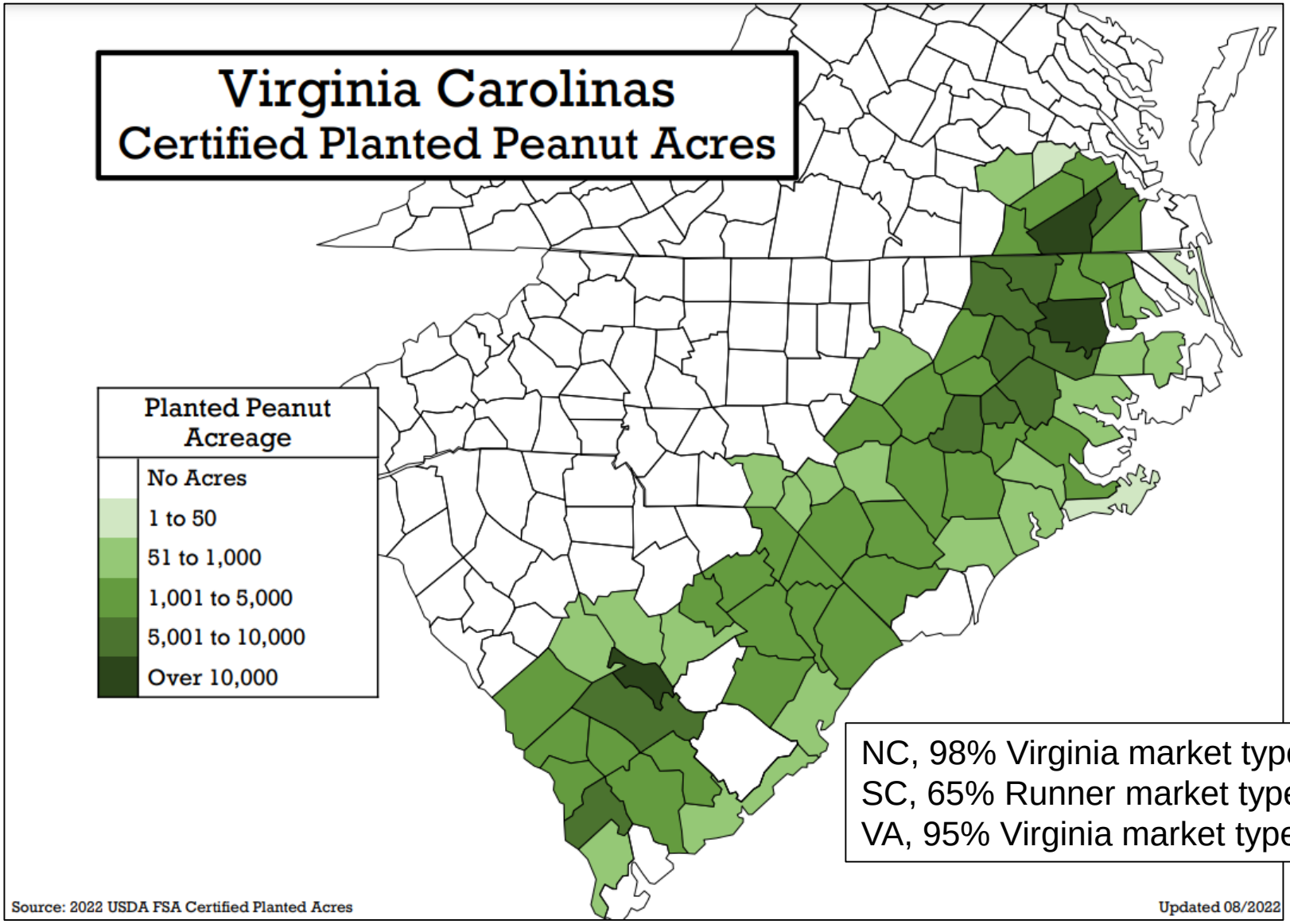
What would members of the Soil Science Society of North Carolina be interested in?

David Jordan
Department of Crop and Soil Sciences
North Carolina State University

919-810-6611
david_jordan@ncsu.edu

Qualifications for a crops person?

Simmons
Kleiss
Miner
Cox
Kamprath
Cassel



Created by Ruth Fitzgerald and Ashley Collins, NCPGA

Walton – Sullivan – Emery – Bailey II

Concerns

Weather patterns
Input costs
Contract prices
Logistics of harvest
Loss of tools
Pests on the horizon

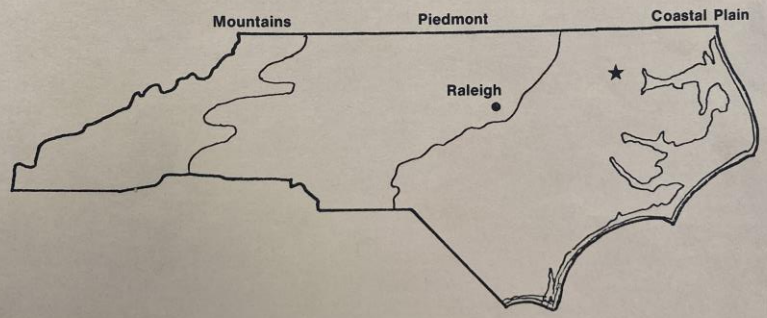
Tillage Practices in Peanut in North Carolina

Percentage of farmers listing a practice on at least a portion of their acreage

Tillage	1998	2004	2009	2014	2019
Disk	90	78	71	75	79
Chisel	25	23	27	12	21
Moldboard plow	58	17	7	5	6
Field cultivate	75	55	42	44	53
Rip and Bed	49	39	40	55	48
Bed	44	35	32	25	35
Reduced till	10	23	41	20	31

~~DR. PAUL H. SISCO, USDA-ARS~~
DEPT. OF CROP SCIENCE
NORTH CAROLINA STATE UNIV.
1250 WILLIAMS HALL
P. O. BOX 7620
RALEIGH, N.C. 27695-7620

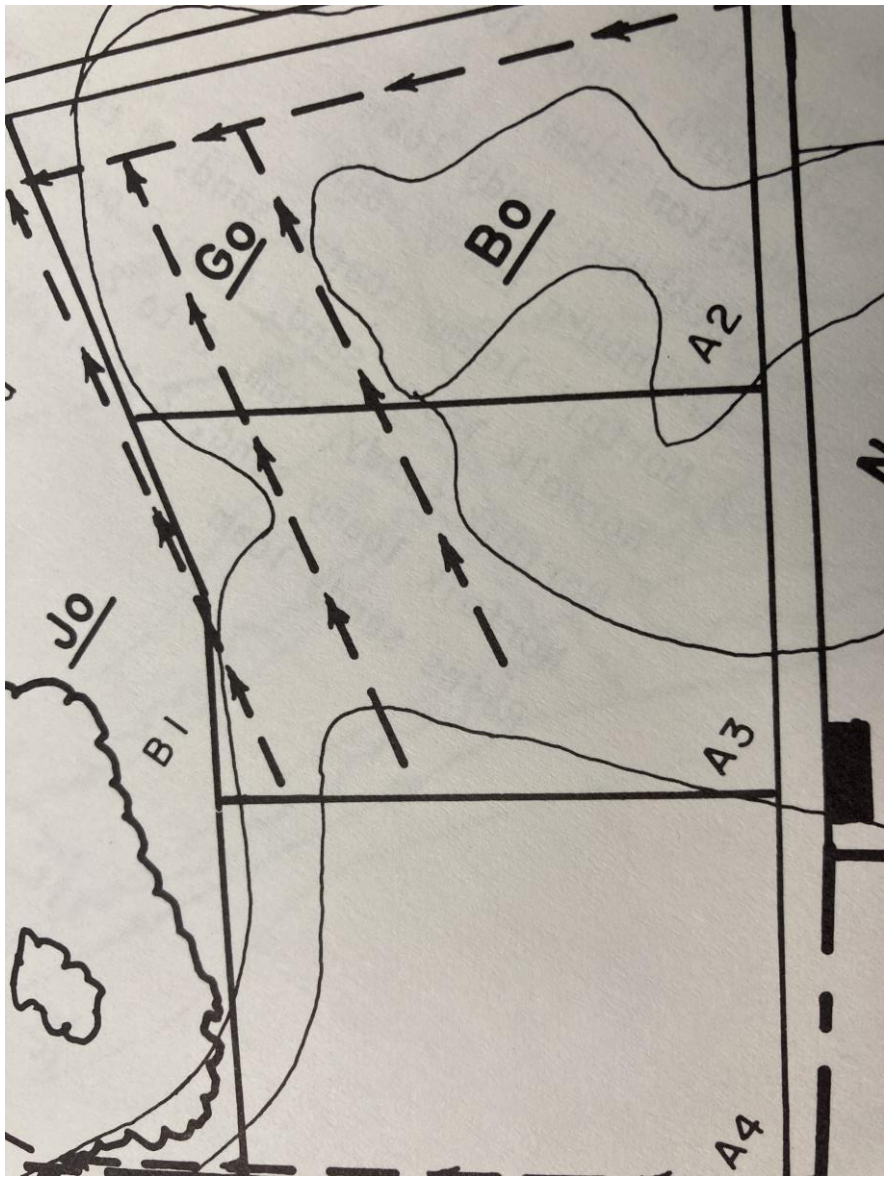
SOILS
of the
PEANUT BELT RESEARCH STATION
Lewiston, North Carolina
THEIR TECHNICAL AND USEABILITY CLASSIFICATION
1982



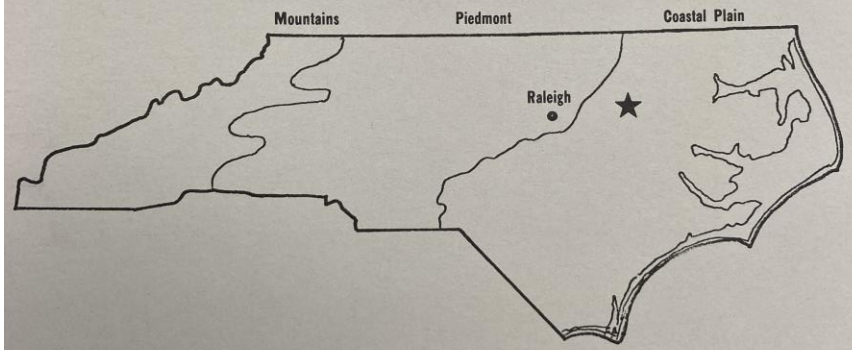
This report was prepared by:

H. J. Kleiss, Coordinator
F. G. Averette
R. E. Horton

Soil Science Department
North Carolina State University



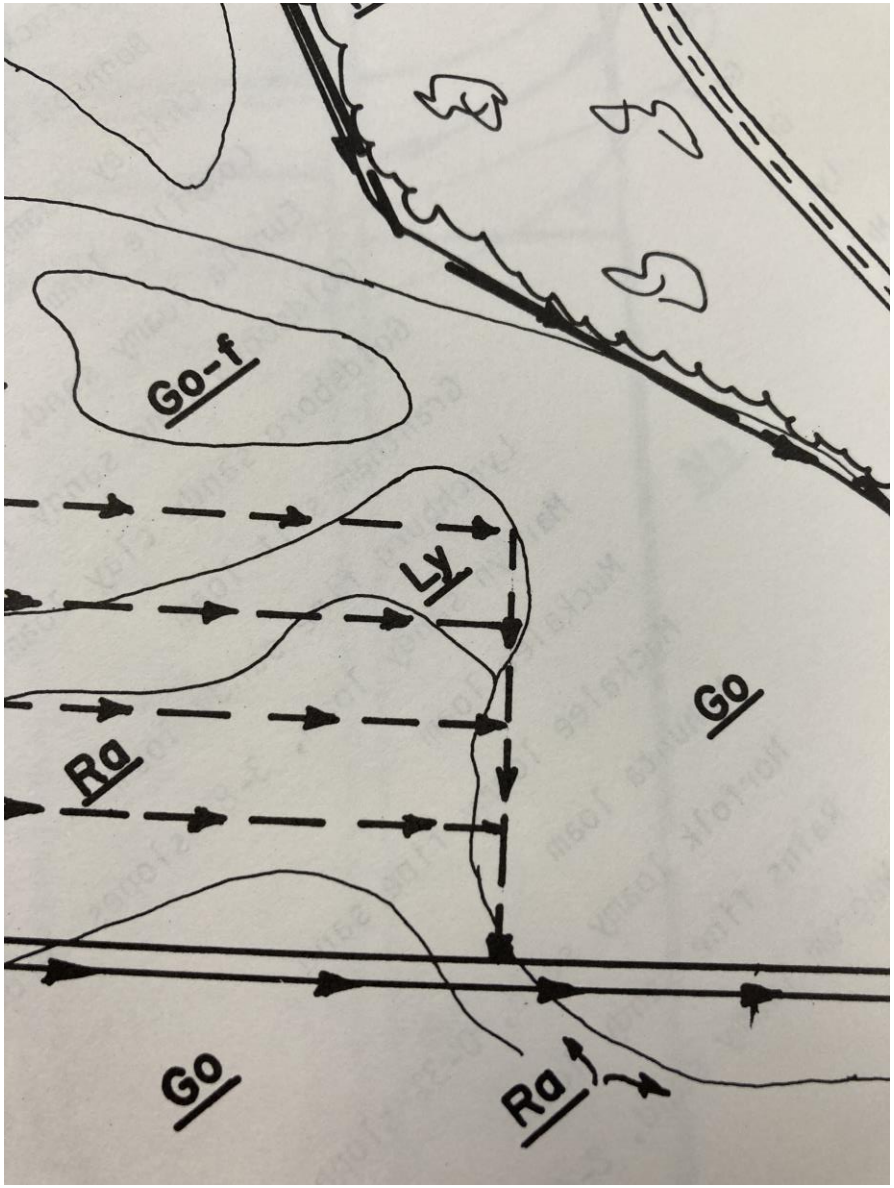
SOILS
of the
UPPER COASTAL PLAIN RESEARCH STATION
Rocky Mount, North Carolina
THEIR TECHNICAL AND USEABILITY CLASSIFICATION
1983



This report was prepared by:

H. J. Kleiss, Coordinator
R. E. Horton
R. B. Daniels
F. G. Averette

Soil Science Department
North Carolina State University



Crop Yield Response to Continuous Conventional and Strip Tillage

The rotation × tillage interaction was often not significant
Peanut yields reflect average of long and short rotations
Data are pooled over rotations and years

	Lewiston-Woodville (1999-2022) Norfolk and Goldsboro series	
Crop	**Conventional till**	**Strip till**
Corn (bu/acre)	119	124 * (n = 12)
Cotton (lbs lint/acre)	823	816 (n = 15)
Peanut (lbs/acre)	3917	3899 (n = 9)

	Rocky Mount (2000-2022) Lynchburg, Raines, and Goldsboro series	
Crop	**Conventional till**	**Strip till**
Corn (bu/acre)	147	150 (n = 6)
Cotton (lbs lint/acre)	904	901 (n = 11)
Peanut (lbs/acre)	3871	3147 * (n = 9)

Table 3-15. Advisory Index for Determining the Risk of Peanut Yield in Reduced-Tillage Systems Being Lower Than Yield in Conventional-Tillage Systems

Category	Scoring Criteria	Your Score
Soil series Pod loss on finer-textured soils, such as those on the Roanoke and Craven series, is often greater than on coarser-textured soils, such as Conetoe and Wanda series, regardless of tillage system. Difficulty in digging can increase when these soils become hard in the fall if rainfall is limited.	Roanoke and Craven —40 points Goldsboro and Lynchburg — 20 points Norfolk — 10 points Conetoe and Wanda — 0 points	**Soil series Your score:**

Tillage intensity Peanut response to reduced-tillage systems is invariably correlated with the degree of tillage. Efficient digging can be difficult when peanuts are planted in flat ground in reduced-tillage systems. Although fields may appear to be flat and uniformly level, often fields are more rugged than they appear, and setting up the digger to match unforeseen contours in the field can be difficult. Strip tillage into flat ground is a better alternative than no tillage into flat ground, although digging peanuts planted on flat ground can be more challenging regardless of the tillage system. Strip tillage into preformed beds often results in yields approaching those of conventional tillage.	No tillage into flat ground — 35 points Strip tillage into flat ground — 10 points Strip tillage into stale seedbeds — 0 points	**Tillage intensity Your score:**

Risk of yield being lower in reduced tillage than in conventional tillage:	35 or less — low risk 40 to 50 — moderate risk 55 or more — high risk	**Total index value Your score:**

Biological Nitrogen Fixation

Table 3-4. Peanut Yield Response and Economic Return at a Price of $535 per Ton in Fields without a History of Peanuts versus Fields with Frequent Plantings of Peanuts (1999 – 2017) (Trials were conducted in North Carolina, South Carolina, and Virginia with Virginia market type varieties.)

	New Peanut Fields		Fields with a Recent History of Peanuts	
Inoculant Use	**Yield (lb per acre)**	**Economic return ($ per acre)**	**Yield (lb per acre)**	**Economic return ($ per acre)**
No inoculant	3,460	5	4,280	227
Inoculant	4,660	323	4,450	268
Difference	1,200	318	170	41
Number of Trials	52	52	43	43
Years	1999 – 2017		1999 – 2017	

Table 3-5. Peanut Response from 14 Trials to Inoculation and Ammonium Sulfate at 571 lb/acre (120 lb actual N/acre) Applied when Nitrogen Deficiency Is First Visible

Inoculant	Ammonium Sulfate	Pod Yield (lb/acre)	Net Return ($/acre)
No	No	3,530 c	20 c
Yes	No	4,850 a	353 a
No	Yes	4,550 b	271 b

Means followed by the same letter are not significantly different at $p < 0.05$.

Table 3-6. Peanut Response to Ammonium Sulfate (AMS) Applied in Mid-June to Early July and Estimates of Financial Return on Broadcast Applications to Correct a Nitrogen (N) Deficiency

Percent of Field that is N Deficient	Rows with N Deficiency (8 Planter Units)	Yield Based on Research	Actual Pounds not Realized due to N Deficiency	Value of Peanuts not Realized at a Price of 25 cents/lb	Financial Return from a Broadcast Application of AMS at 500 lb/acre at a Cost of 29 cents/lb ($145/acre)
12	1	4,420	122	31	-114
23	2	4,306	245	61	-84
38	3	4,148	367	92	-53
50	4	4,062	490	123	-22
63	5	3,940	612	153	8
75	6	3,818	734	184	39
88	7	3,696	856	214	69
100	8	3,574	978	245	100

Table 3-7. Ammonium Sulfate Rate Needed Relative to When a Nitrogen Deficiency is Observed

Days after Planting	Ammonium Sulfate Rate (lb/acre)
70 or less	500
71 to 100	400
101 to 130	300
More than 130	200

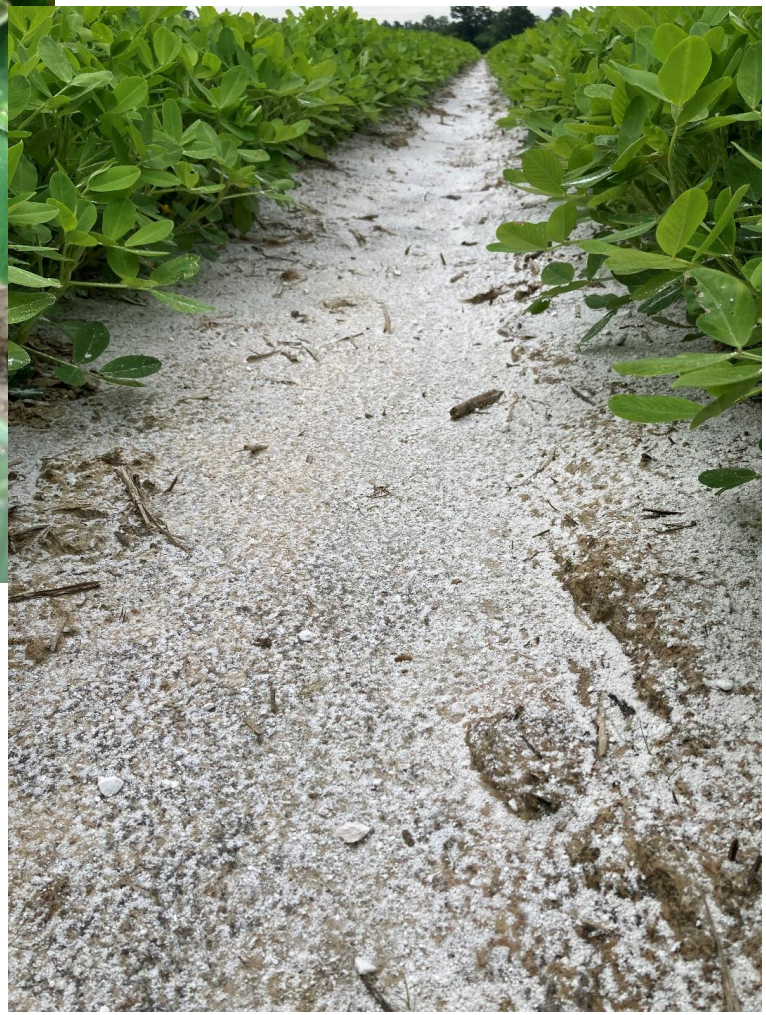


Table 3-3. Peanut Response to Soil pH and Gypsum Rate[a]

Approximate Soil pH	Peanut Yield Relative to Gypsum Rate		
	0	0.5×	1.0×
	Percent of Maximum Yield		
4.5	42 f	55 e	55 e
5.2	55 e	56 e	59 e
5.6	78 c	78 c	69 d
6.0	84 b	97 a	95 a

[a]Means followed by the same letter are not significantly different at p = 0.10. Data are pooled over three years.

pH 6.0 and gypsum had 26% greater yield than pH 5.6 and gypsum

pH 5.6 and gypsum had 17% lower yield than pH 5.6 and no gypsum

pH 6.0 and gypsum had 11% greater yield than pH 6.0 and no gypsum