# Challenges to Producing Peanuts Using the Organic Approach

David Jordan, Crop and Soil Sciences

North Carolina State University

919-515-4068

david_jordan@ncsu.edu

# I bet you could sell every pound of organic peanuts you can grow…


U.S. Peanut Grade Chart
Spanish Jumbo
Spanish #1
Runner Medium
Runner Jumbo
Runner #1
Runner Splits
Virginia #2
Spanish Splits
Virginia Extra Extra Large
Virginia #1
Virginia Extra Large
Virginia Medium
Virginia Super Jumbo
Virginia Jumbo
Virginia Fancy

# Information and Updates

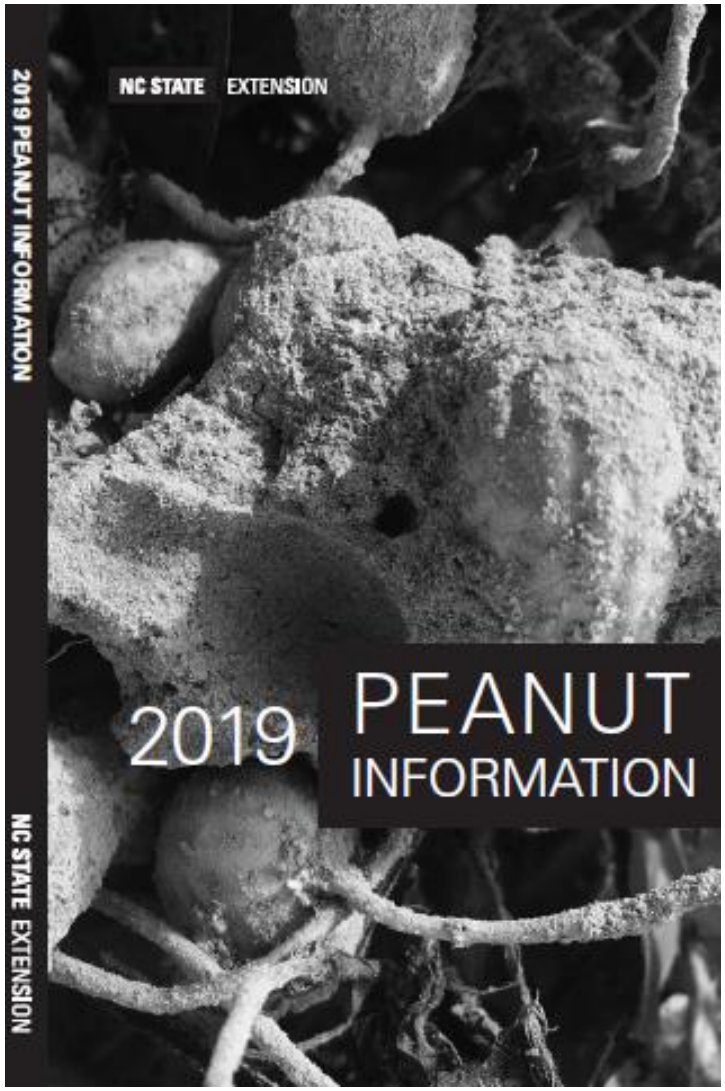
*Peanut Notes*

*Peanut Information* Series

Field days

County production meetings

Risk Management Tool

# Topics

Survey

Peanuts 101

Primary issues and tools

Keys to success

Organic budget

**Organic Grower Survey with Respect to Peanuts 2019**

**This survey is for research only and is voluntary. Your information will remain anonymous and there is not compensation for completing the survey. There will be a raffle of two hand tools for those completing the survey. The recipient of a tool will be randomly selected from the individuals who turn in the survey.**

1. What is the total number of acres that you farm? _____
2. How many different crops do you grow on your farm? _____
3. Have you ever grown peanuts on your farm? _____
4. Would you be interested in growing peanuts? Circle Yes or No
5. What price do you think you would you need to receive relative to conventional peanut production to consider growing peanuts organically? (circle the best estimate)

   A. Same for both
   B. 1.5 times more (50% more) for organic
   C. Twice as much for organic
   D. 2.5 times more for organic
   E. Three times as much for organic

6. What is your estimate of yield in organic peanut compared to conventional peanut? (circle the best estimate)

   A. Greater yield in organic production
   B. Same for both
   C. 25% less for organic
   D. 50% less for organic
   E. 75% less for organic

7. There are some challenges to growing peanuts organically in terms of production and pest management issues. Rank the following in terms of most limiting with a 1.

   ____Insects
   ____Nematodes
   ____Fertility
   ____Weeds
   ____Stand establishment
   ____Disease

8. In addition to concerns about pests, which of the following infrastructure-type issues would limit your decision to grow peanut organically? Rank the following in terms of most limiting with a 1.

   _____The official organic certification process from planting through marketing
   _____Establishing and maintaining markets for organic peanuts
   _____Equipment for planting, digging and harvesting
   _____Equipment for drying, storing and shelling
   _____Sufficient scale of production to justify investment in organic peanut production

9. Which best fits your philosophy about the concept of organic production in general? (place a mark by each one that fits)

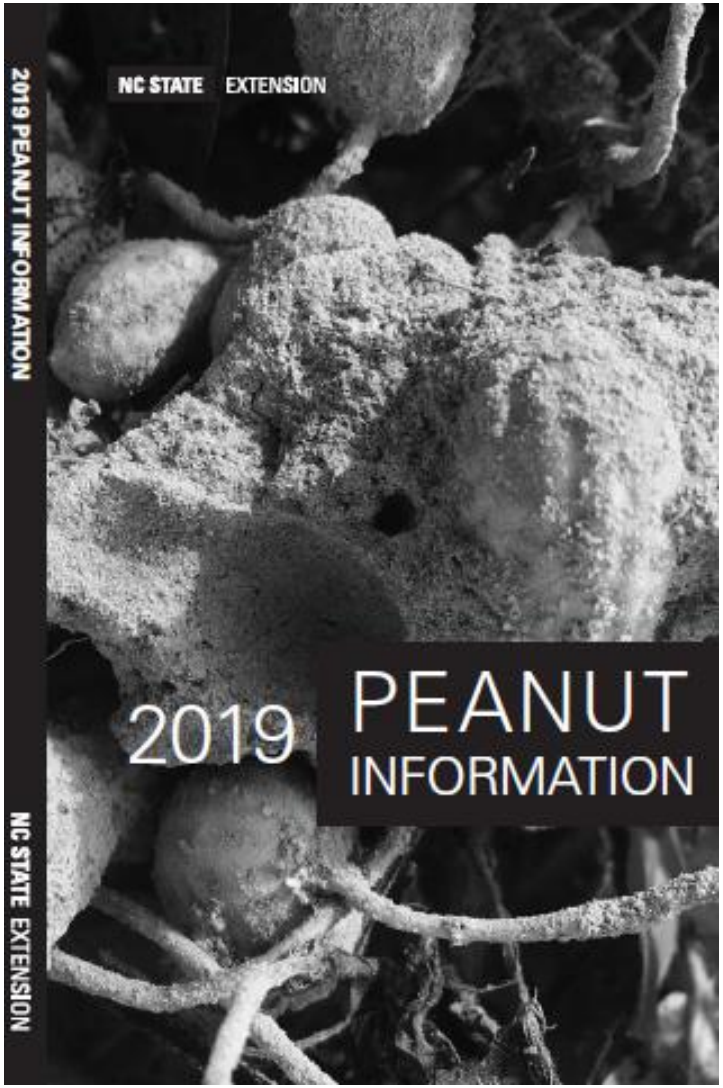
   _____ if farmers can capture markets and make a profit on organic production it is a good idea

   _____ it suggests that there is something wrong with conventional production

   _____ organic production is safer than conventional production with respect to the environment

   _____ organically-produced foods are safer for consumers than conventionally-produced foods

   _____ it is important for proponents of both organic production and proponents of conventional production to honestly discuss the benefits and challenges of both systems




## 12. ORGANIC PEANUT PRODUCTION

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

**Barbara B. Shew**
*Extension Specialist— Department of Plant Pathology and Entomology*

**Rick L. Brandenburg**
*Extension Specialist— Department of Plant Pathology and Entomology*

**Chris Reberg-Horton**
*Extension Specialist— Department of Crop and Soil Sciences*

**S. Gary Bullen**
*Extension Economist—Department of Agricultural and Resource Economics*

**Derek Washburn**
*NC Farm School Associate—Department of Agricultural and Resource Economics*

**Amanda Kaufman**
*Graduate Student—Department of Food, Bioprocessing, and Nutrition Sciences*

**Lisa Dean**
*Research Food Technologist—Market Quality and Handling Research Unit, United States Department of Agriculture, Southeast Area*

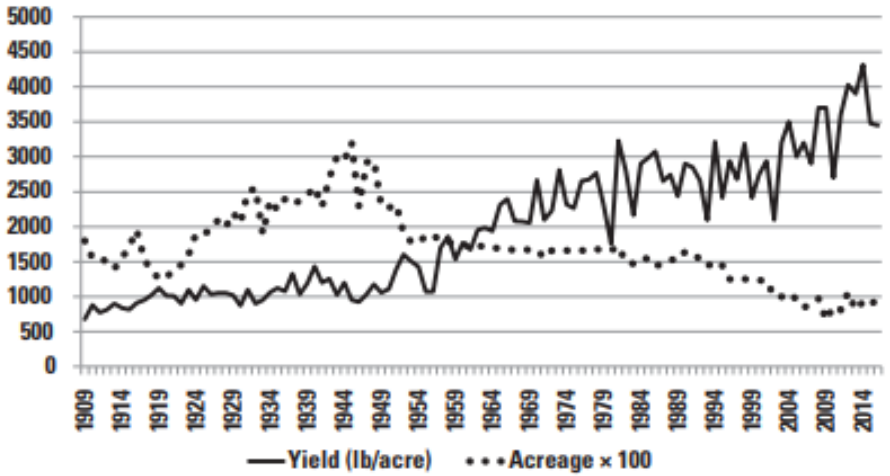
**Bob Sutter**
*Chief Executive Officer —North Carolina Peanut Growers Association Inc.*

# Keys to Success

- Long rotations
- Suitable soils for peanuts
- Improved varieties
- Plant protection products
- Management
- Weather

NC STATE EXTENSION

**Peanut acreage and pod yield in North Carolina: 1909 to 2016**




# 2018 PEANUT INFORMATION

Planted May 19




Planted May 19





AMADAS

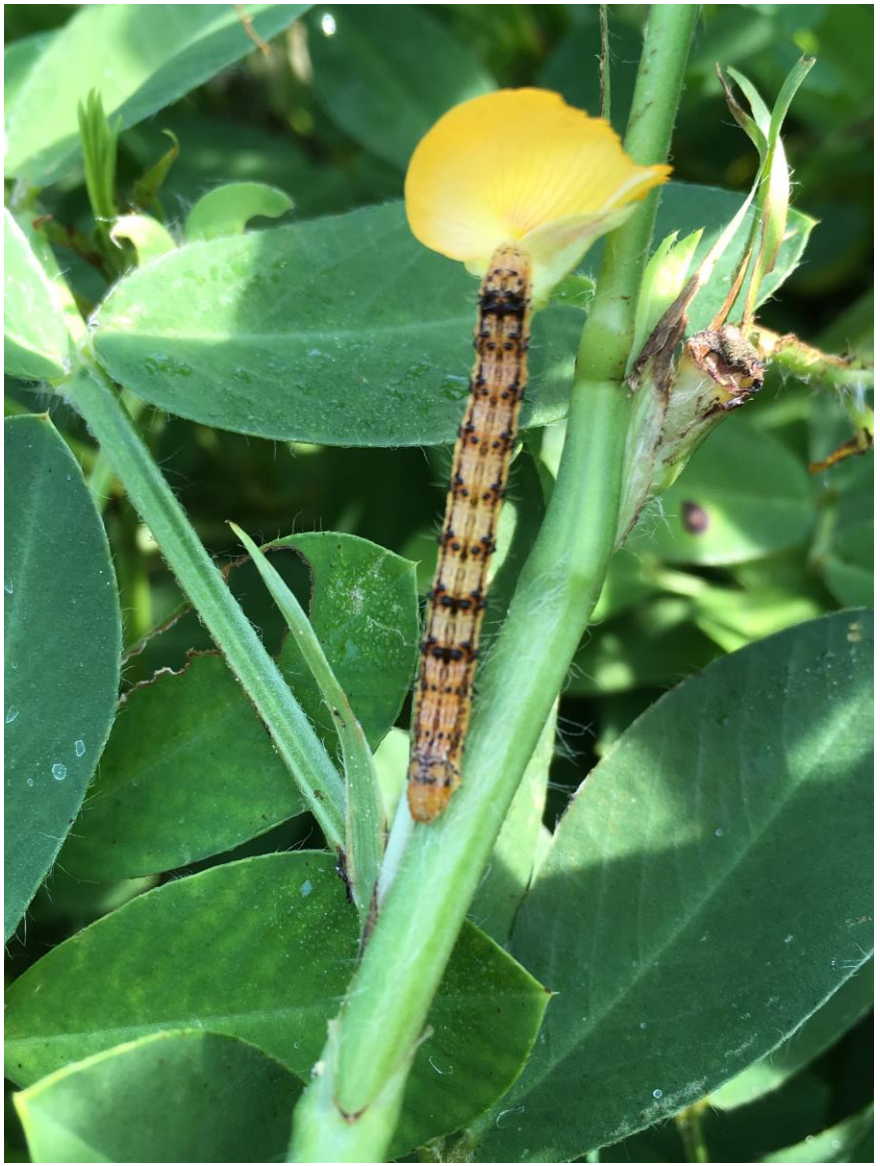
# General Production Practices

- Apply nutrients based on soil test
- Avoid excessive Mg and K
- Avoid fields with zinc
- Establish good rotations
- Plant in May
- 5 plants per foot of row on 36-inch rows
- Conventional tillage
- Inoculate with *Bradyrhizobia* for BNF
- Apply calcium at pegging
- Apply boron and manganese as needed
- Control pests using IPM practices

# Arthropod Management

- Thrips
- Rootworms
- Spider mites
- Corn earworm, budworm and fall armyworm


101



# Components of Insect Management

- Insect identification/Scouting
- Economic thresholds
- Crop rotation *(marginal)*
- Variety resistance *(very little)*
- Treat insects that are active *(OMRI-approved products are available for some arthropods)*
- Cultural practices

# Specifics for Organic Production

- Late-May planting minimizes thrips and TSWV
- Fewer insecticide and fungicide applications minimize spider mites
- Late-May plantings more prone to rootworm injury
- Peanut can withstand significant injury from foliar-feeding insects
- If you miss the window for late-May planting yields will decrease significantly with June plantings

More options for arthropod management than other categories of pests, *BUT* insects and spider mites are not the most yield limiting

# Diseases

- Seedling disease complex
- Leaf spot
- Sclerotinia blight
- Stem rot
- Black root rot
- Tomato spotted wilt
- Nematodes

# Components of Disease Management

- Crop Rotation
- Cultivar Resistance
- Sanitation
- Disease Scouting and Weather-Based Advisories *(protectants)*
- Fungicides *(protectants)* and Fumigants *(not available)*

# Specifics for Organic Production

- Crop rotation
- Resistant varieties
- Certified seed and minimize soil movement
- Copper- and sulfur-based fungicides for leaf spot
- Plant in late-May for seedling disease and use 1.5 to 2X seedling rate

Options are available for disease management in the form of rotation, variety resistance, and protectant fungicides once the stand is established…

A key limitation is seedling disease and stand establishment, but with higher seeding rates seedling disease can be avoided, well, mostly…

Untreated seed
200 pounds/acre


Treated seed
130 pounds/acre


Image credit, Amanda Kaufman

# Challenges of Managing Weeds in Peanut

## Relatively weed-free conditions are needed throughout the season

- Peanuts are low growing and are very susceptible to weed interference
- Peanuts have to be dug and inverted, and pod loss can be high if weeds are present
- Multiple fungicide applications are needed to control diseases and weeds can prevent uniform and adequate fungicide deposition into the peanut canopy

# Components of Weed Management

- Crop Competition
- Crop Rotation
- **Cultivation**
- Weed Scouting
- Herbicides *(no OMRI-approved materials that control weeds)*

# Specifics for Organic Production

- Deplete the soil seedbank with previous crops
- Plant to establish 8 plants per foot of row
- Begin cultivation 3-5 days after planting (plant 3 inches deep) with a tine weeder and continue for the next 6 weeks on a weekly basis
- Remove weeds by hand as needed
- Mow weeds within 3 weeks of digging to improve digging efficiency

The most challenging aspect of organic production is weed management, especially grasses…

There are no rescue options before, during and after planting…

# Keys to Success

- Long rotations (yes)
- Suitable soils for peanuts (yes)
- Improved varieties (yes)
- Plant protection products (yes/NO)
- Management (yes)
- Weather (always an issue)

# Results for Best Treatment in a System

**Amanda Kaufman, PhD student**
**NC Ag Foundation**

| System | Plants/20ft 14 DAP | Thrips (1–5 scale) 30 DAP | Canopy width (in) 30 DAP | Canopy width (in) 60 DAP | Defol (%) 120 DAP |
|---|---|---|---|---|---|
| Simulated organic | 50 | 1.1 | 7.5 | 24.5 | 24 |
| Conventional | 72* | 0.3* | 9.5* | 26.8* | 8* |

Fertility and weed management was conventional across both systems

# Results for Best Treatment in a System

**Amanda Kaufman, PhD student**
**NC Ag Foundation**

| System | Yield (lbs/acre) | Fancy pods (%) | ELK (%) | SMK (%) | Rootworm (Scars/100 pods) |
|---|---|---|---|---|---|
| Simulated organic | 3610 | 84 | 48 | 64 | 5 |
| Conventional | 4310* | 79* | 51 | 64 | 3 |

Fertility and weed management was conventional across both systems

# Post-Harvest Challenges

- Drying
- Certified storage
- Certified shelling and processing
- Certified storage
- Peanuts are a semi-perishable commodity

*Table 12-1. Estimated Enterprise Budget for Certified Organic Peanut Production*

| Item | Quantity or Unit | Price per Unit | Total per Acre ($) | Your Farm |
|---|---|---|---|---|
| **1. GROSS RECEIPTS**[1] | 2,500 lb | 0.46 | 1,150.00 | |
| Total receipts | | | 1,150.00 | |
| **2. VARIABLE COSTS** | | | | |
| Seed | 200 lb | 0.85 | 170.00 | |
| Inoculant | 1.00 acre | 6.00 | 6.00 | |
| Fertilizer (prorated)[2] | 1.00 acre | 40.00 | 40.00 | |
| Lime (prorated) | 0.33 ton | 46.00 | 15.18 | |
| Gypsum (spread) | 0.60 ton | 47.50 | 28.50 | |
| Hand weeding[3] | 1.00 acre | 22.92 | 22.92 | |
| Insecticides | 1.00 acre | 74.71 | 74.71 | |
| Fungicides[4] | 1.00 acre | 180.00 | 180.00 | |
| Scouting | 1.00 acre | 16.00 | 16.00 | |
| Organic certification fee[5] | 1.00 acre | 32.00 | 32.00 | |

| | | | | |
|---|---|---|---|---|
| Hauling | 1.25 ton | 12.00 ton | 14.97 | |
| Drying | 1.25 ton | 45.00 ton | 56.14 | |
| State Check-off Fee | 1.25 ton | 3.00 ton | 3.75 | |
| National Assessment | 1,150.00 acre | 0.095% | 10.93 | |
| Crop insurance | 1.00 acre | 30.00 | 30.00 | |
| Tractor/Machinery[6] | 1.00 acre | 103.44 | 103.44 | |
| Labor[7] | 9.02 | 11.27 | 103.37 | |
| Interest on Operating Capital | 376.60 | 6.0% | 22.60 | |
| Total Net Variable Costs | | | 930.51 | |
| **3. INCOME ABOVE VARIABLE COSTS** | | | **219.49** | |

| | | | | |
|---|---|---|---|---|
| Total Net Variable Costs | | | 930.51 | |
| **3. INCOME ABOVE VARIABLE COSTS** | | | **219.49** | |
| **4. FIXED COSTS** | | | | |
| Machinery | 1.00 acre | 147.59 | 147.59 | |
| Total Fixed Costs | | | **147.59** | |
| **5. TOTAL COSTS** | | | **1,078.10** | |
| **6. NET RETURNS TO LAND, RISK, & MANAGEMENT** | | | **71.90** | |

**Please note:** This budget is for planning purposes only. It does not include land rent.

[1]Peanut price was set at twice the price for conventionally produced peanut.

[2]No nitrogen application is considered, but we assume that P and K levels are maintained with a previous crop for which the cost is estimated to be $40.00 an acre.

[3]Hand weeding is hand labor paid at $11.46 an hour for two hours an acre.

[4]Fungicide cost includes eight passes with a copper-containing, OMRI-approved product.

[5]The organic certification fee includes the cost of maintaining records as well as the annual assessment to stay certified.

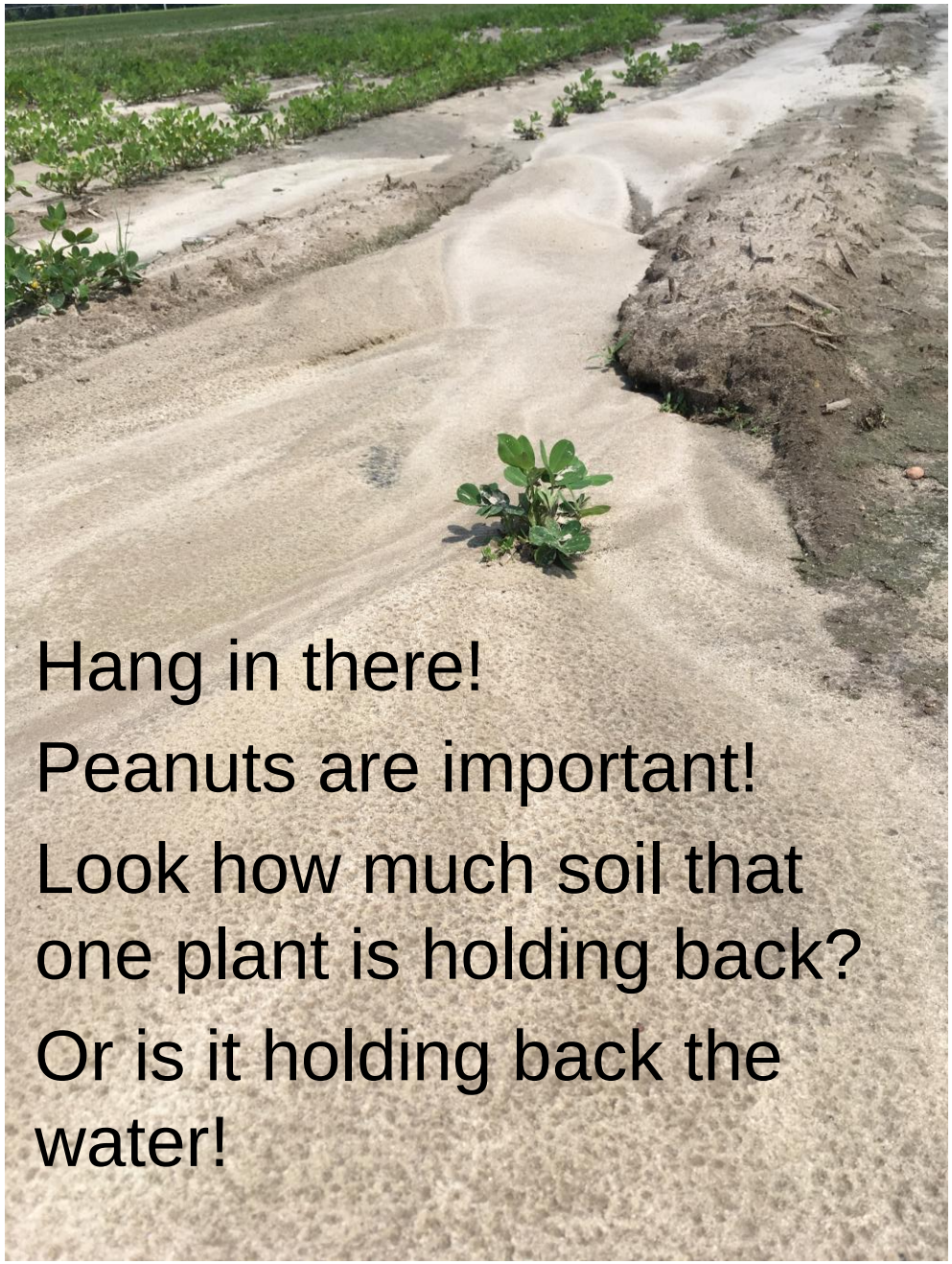
[6]Equipment cost assumes eight passes with a cultivator at a total equipment cost of $66.96 and two hours of equipment operator labor and could also be included in the cost of weed control.

[7]This is labor that is operating equipment in the field.

# Vision for Peanut in North Carolina

**Current project partially funded by NC Ag Foundation**

- Successful production
- Sell in-shell peanuts to the buyer
- Successful production overtime
- Organic peanut grower cooperative
- Purchase a sheller
- In-shell and shelled products
- Market expansion


Hang in there!
Peanuts are important!
Look how much soil that one plant is holding back?
Or is it holding back the water!