



# Oilseeds and Roots

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**Washington State University**  
**12/7/2019**





- Soil Fertility
- Stand Establishment
- Winter Survival
- *Rhizoctonia s.* Root Imagery





**Pie in the sky  
vs.  
Down to earth**



# Soil Fertility

- N-Rate Calculator for Spring Canola
- The 4Rs for Nutrient Management
- Micronutrients in Canola



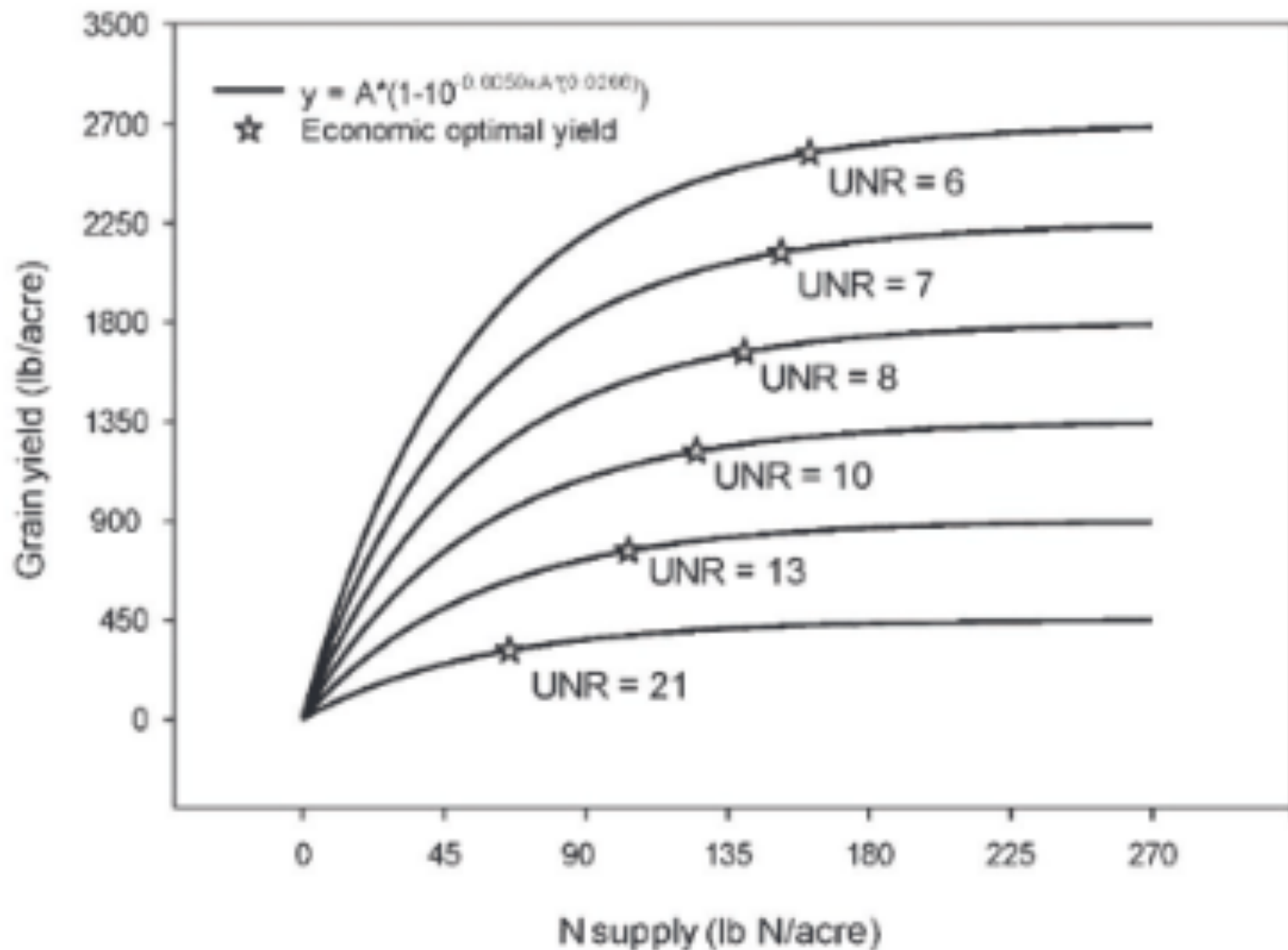
# N Rate Calculator

Data used to create an N calculator

- Multiple small plot experiments
- Multiple locations
- Multiple N rates including 0 fertilizer application



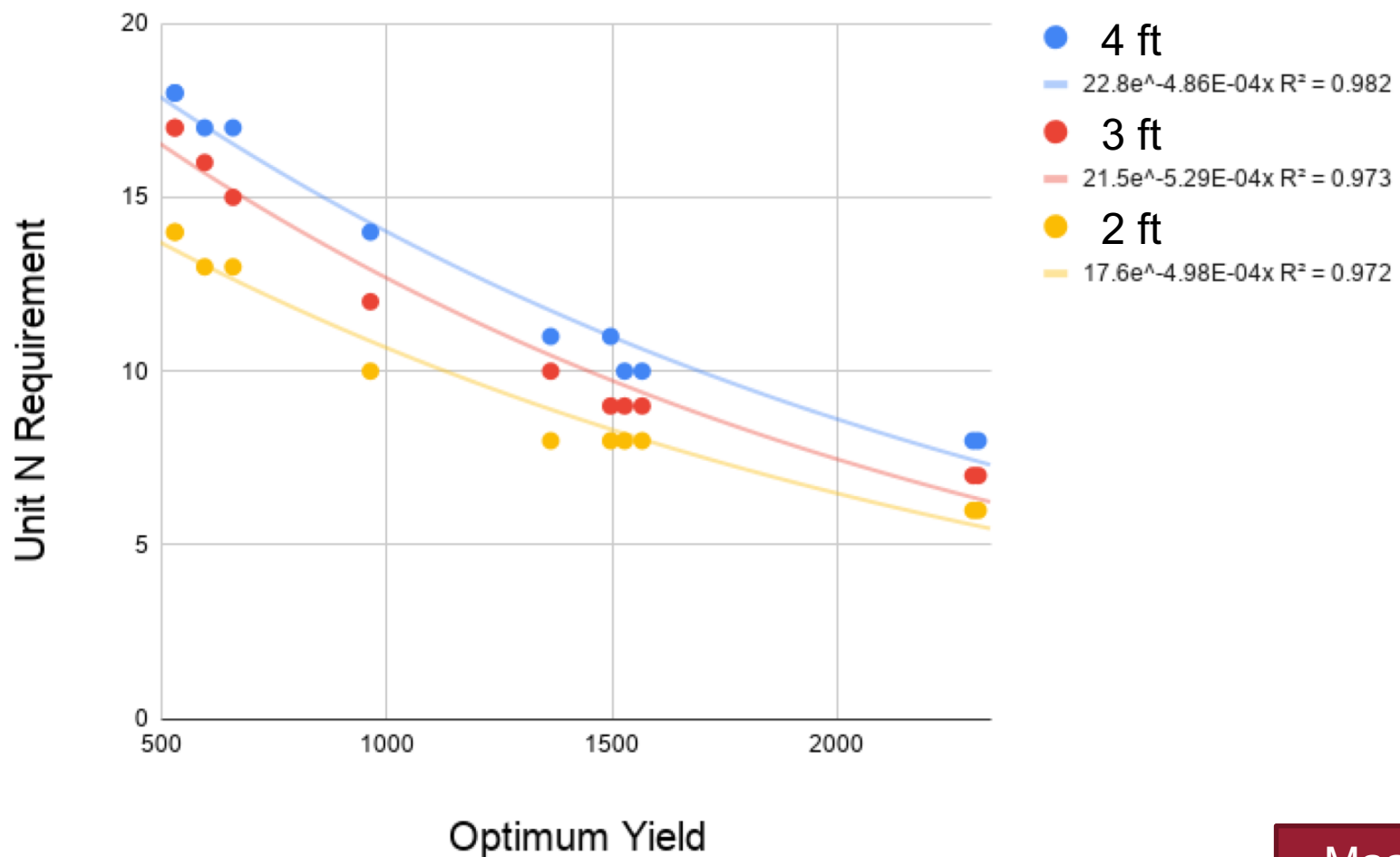
# Unit Nitrogen Requirements





# Unit Nitrogen Requirement as Effected by Depth of Sampling

Optimum Yield vs. UNR for different sampling





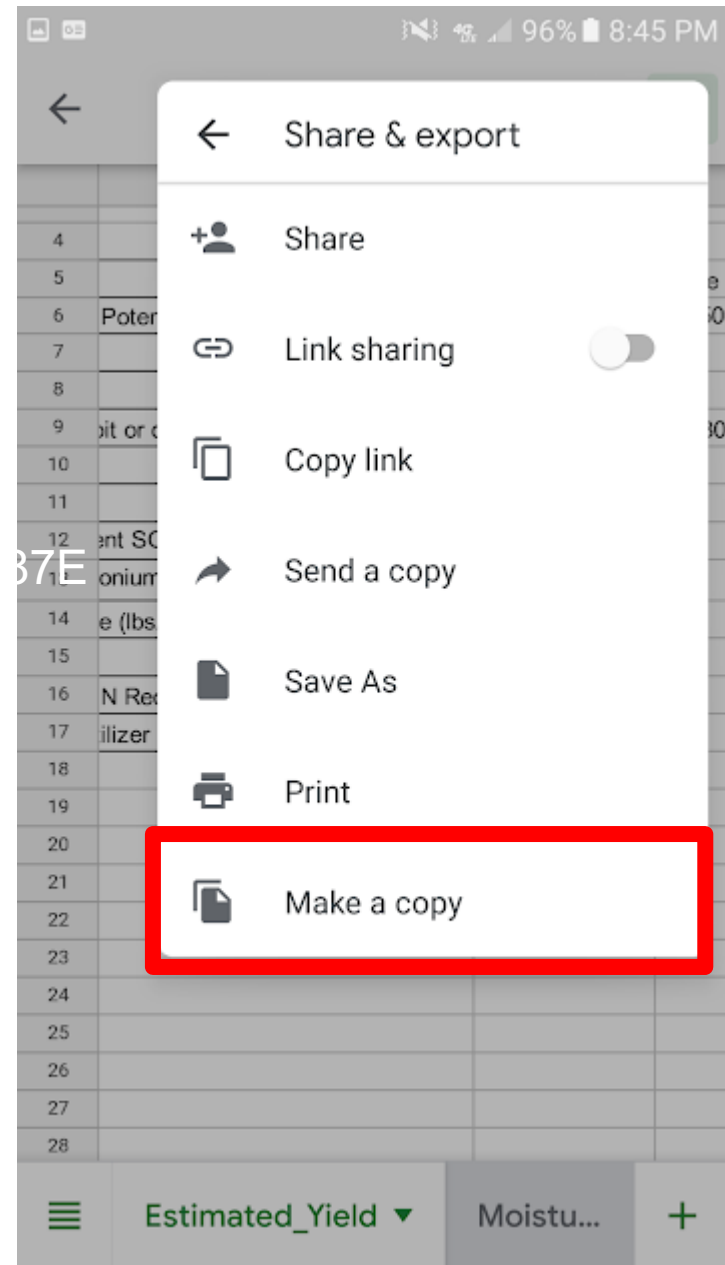
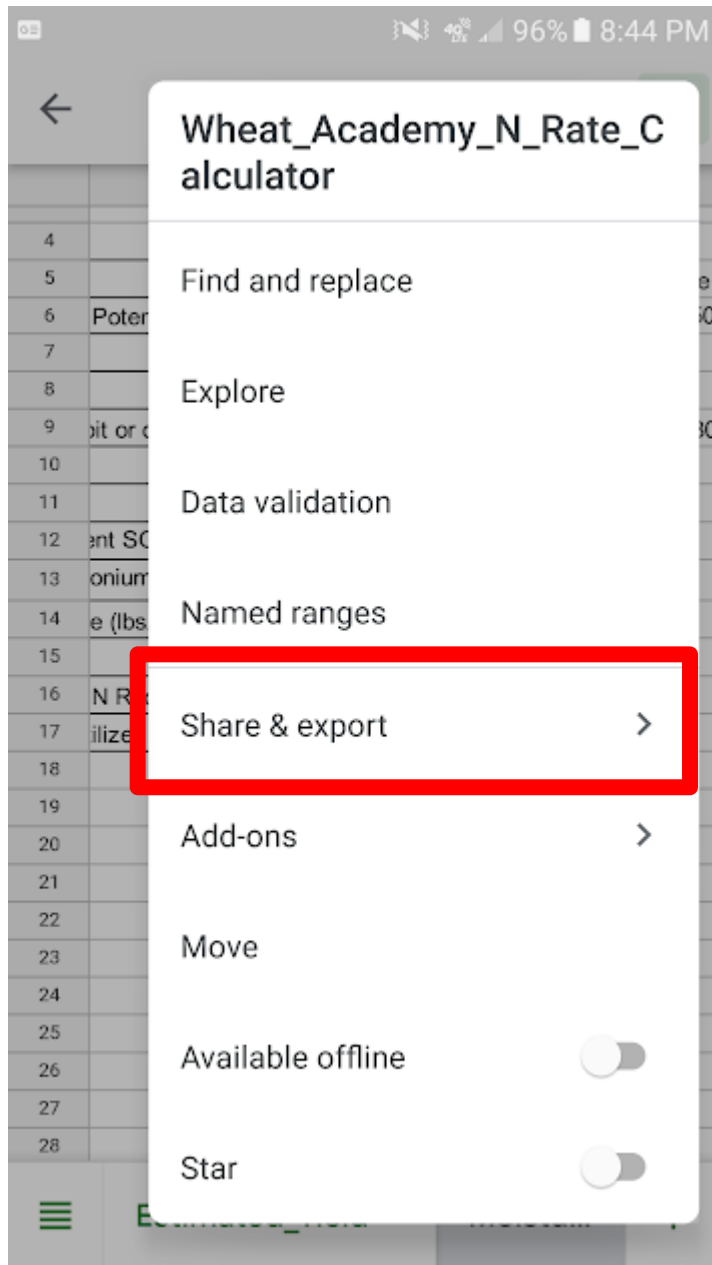


# N Rate Calculator Exercise





# Screen shots Share and Make a Copy





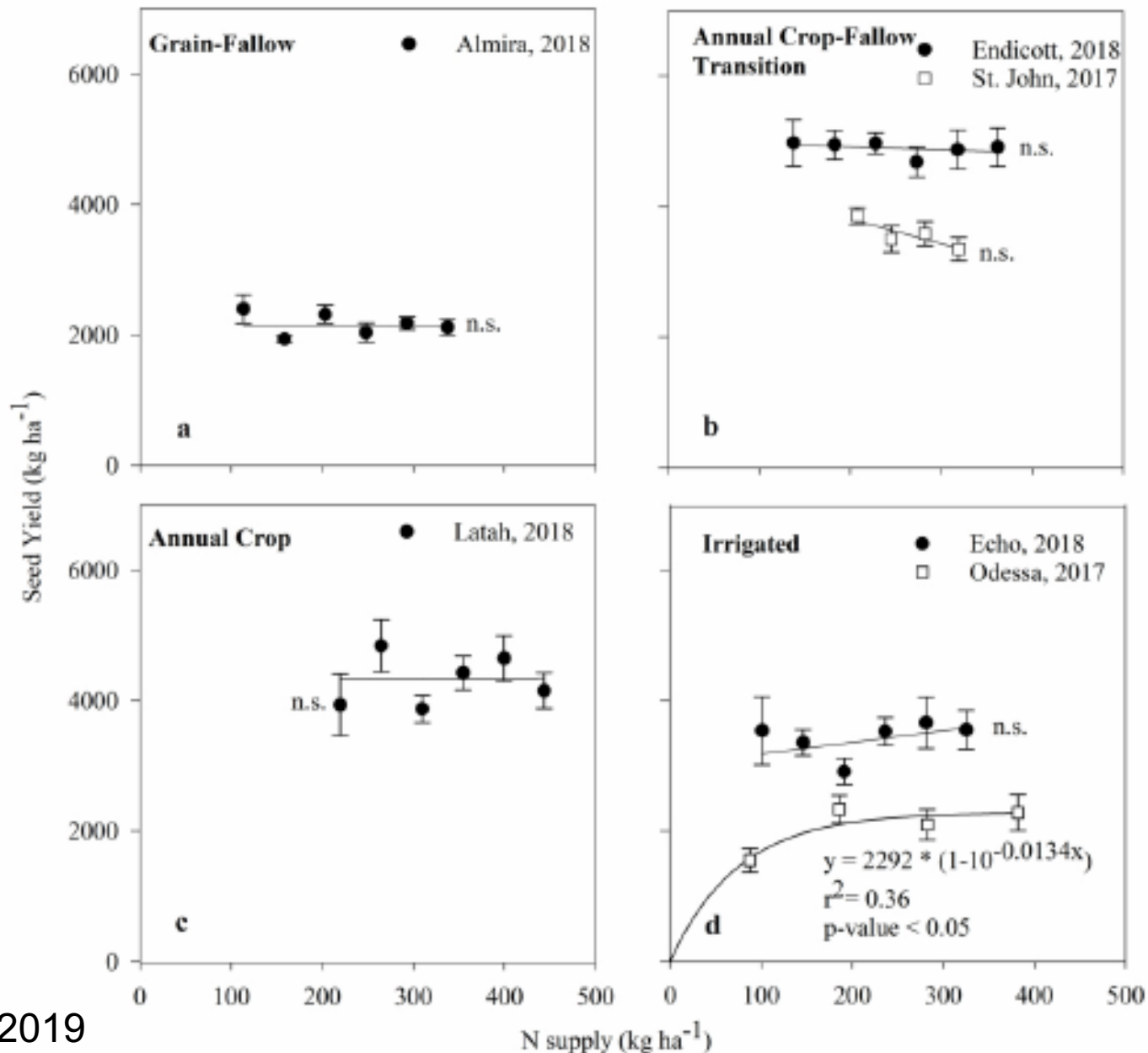
## **Box B**

### **Credit From Previous Grain and Forage Legume Crops**

<b>Preceding crop and yield</b>	<b>Credit (lb N/acre)</b>
Peas > 2500 lb/acre	20
Peas 1500 to 2500 lb/acre	15
Peas < 1500 lb/acre	10
Lentils >1000 lb/acre	10
Alfalfa	50



# Yield Response to N in Winter Canola





# Calculator Sources of Error

- % Organic Matter Mineralization
- Yields greater than 2500 lbs/A can push UNR very low
- Legume credits and wheat debits are based on older data

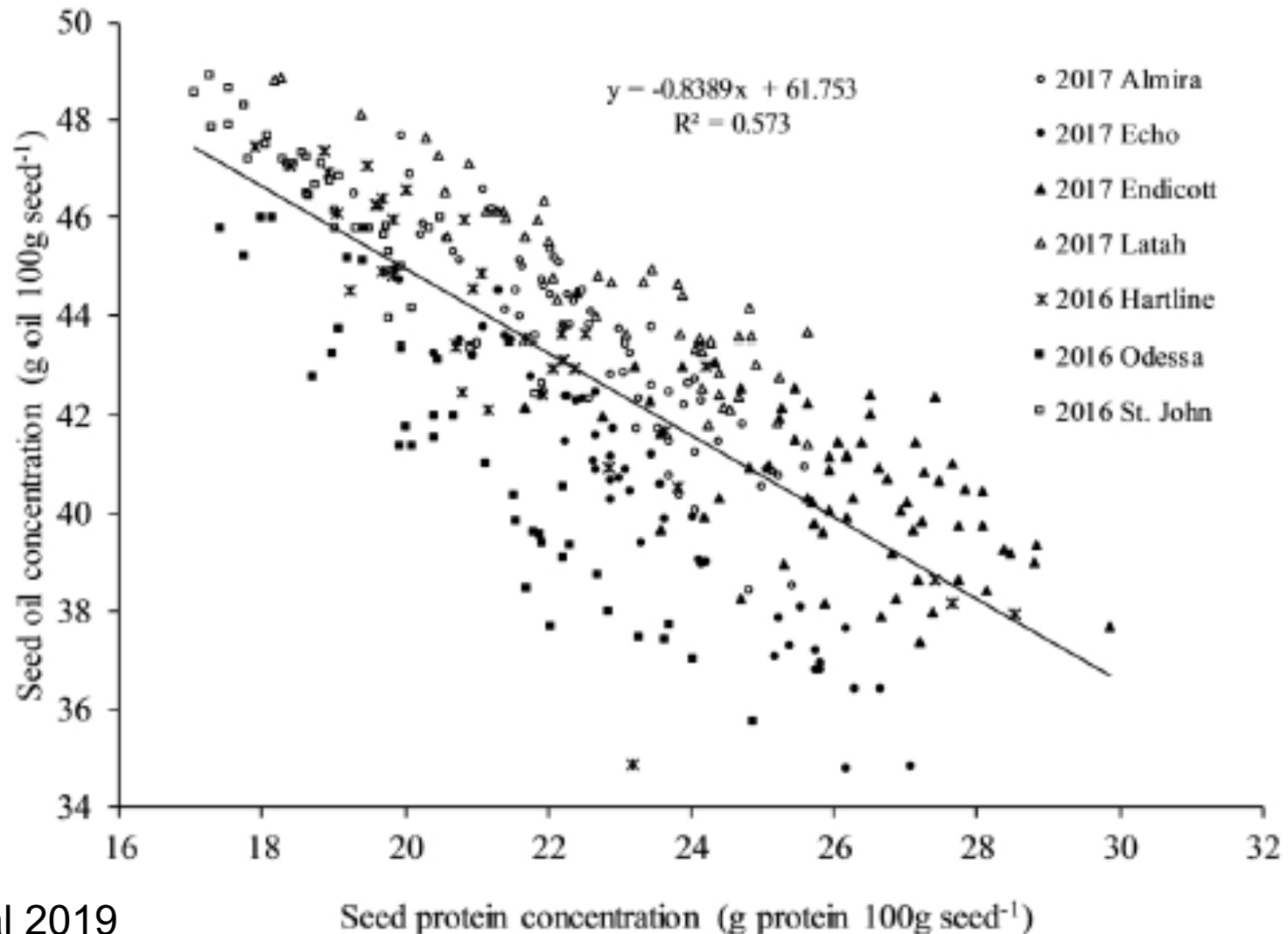




What additional features  
would you like to see?



# Effects of additional N on seed quality





**Considering the correct  
placement, source, and  
timing of N for canola**



# Ammonia toxicity from the fertilizer band





# Increasing Urea







**Urea**



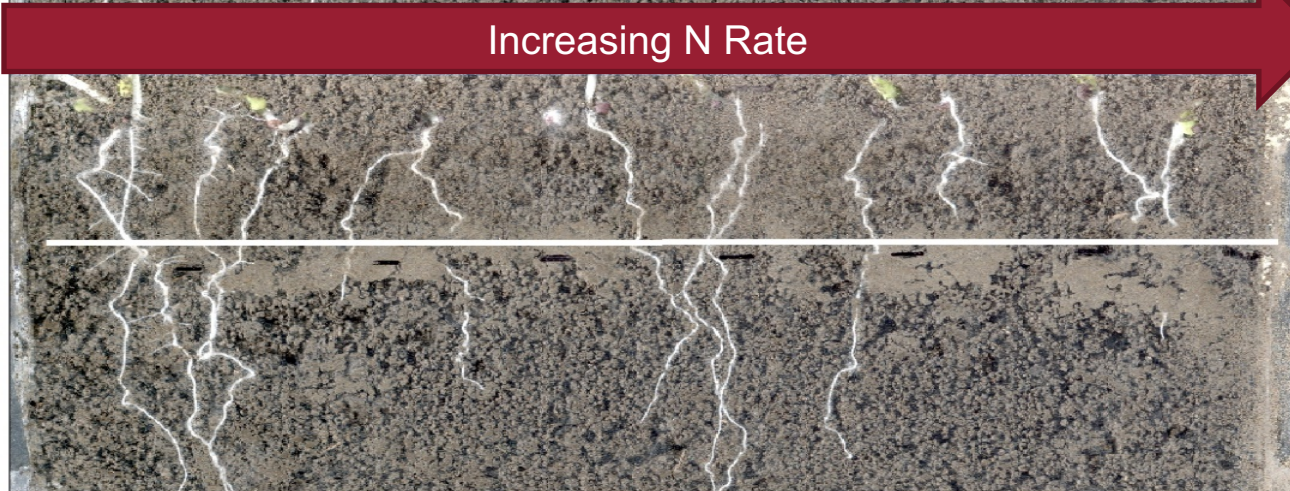
Increasing N Rate

**AS**



Increasing N Rate

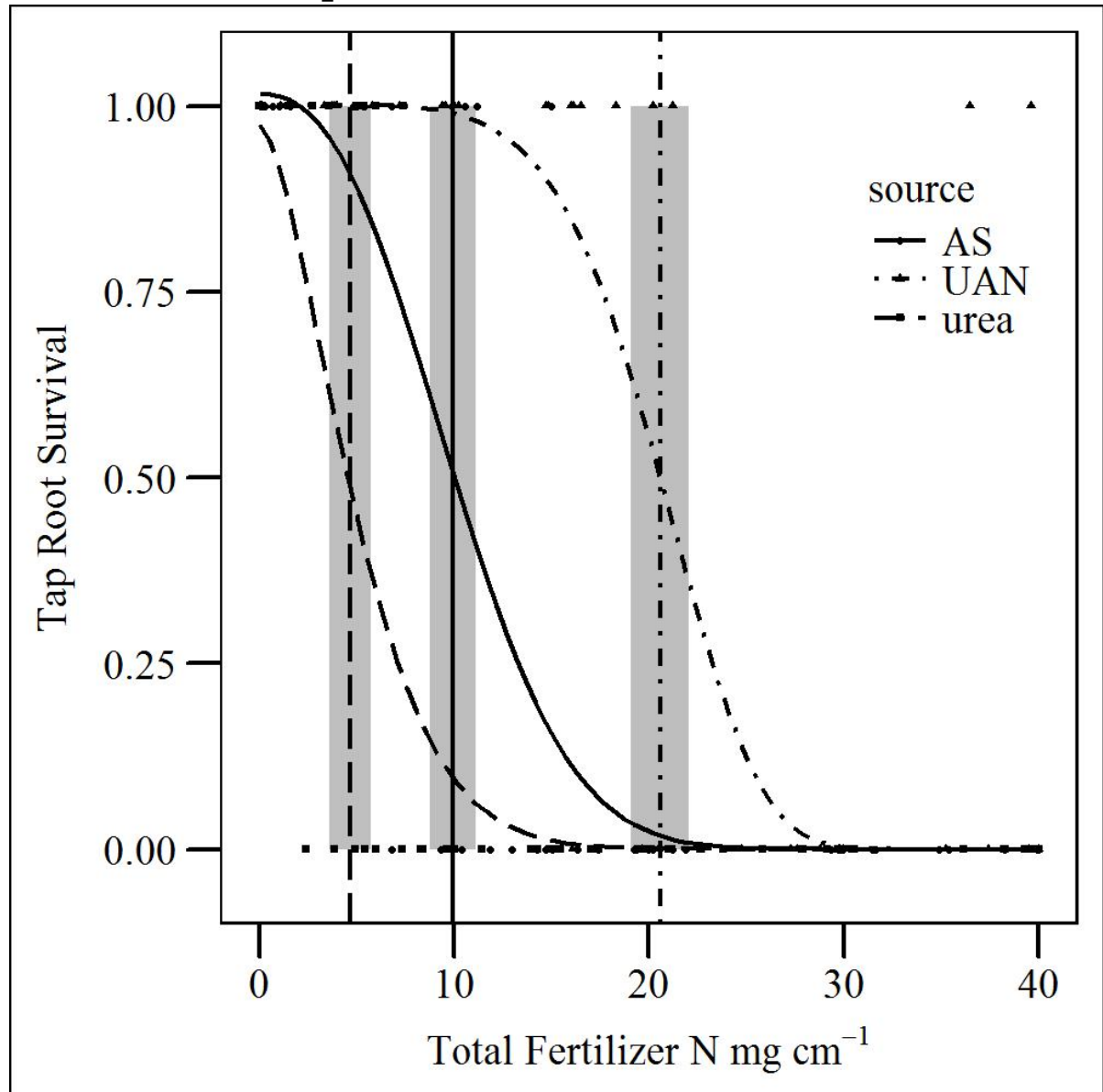
**UAN**





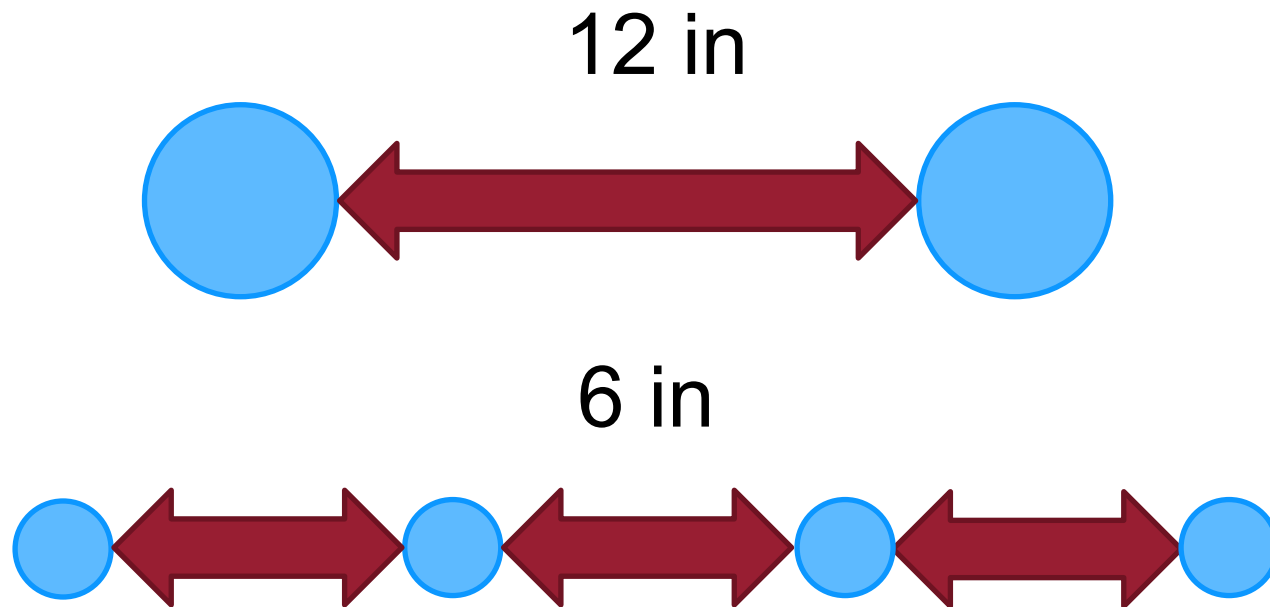
# Tap Root Survival

**Urea = 4.7**  
**AS = 9.7**  
**UAN = 20.6**





# Relationship between in-furrow concentration and row spacing







# In Furrow Concentration Calculator



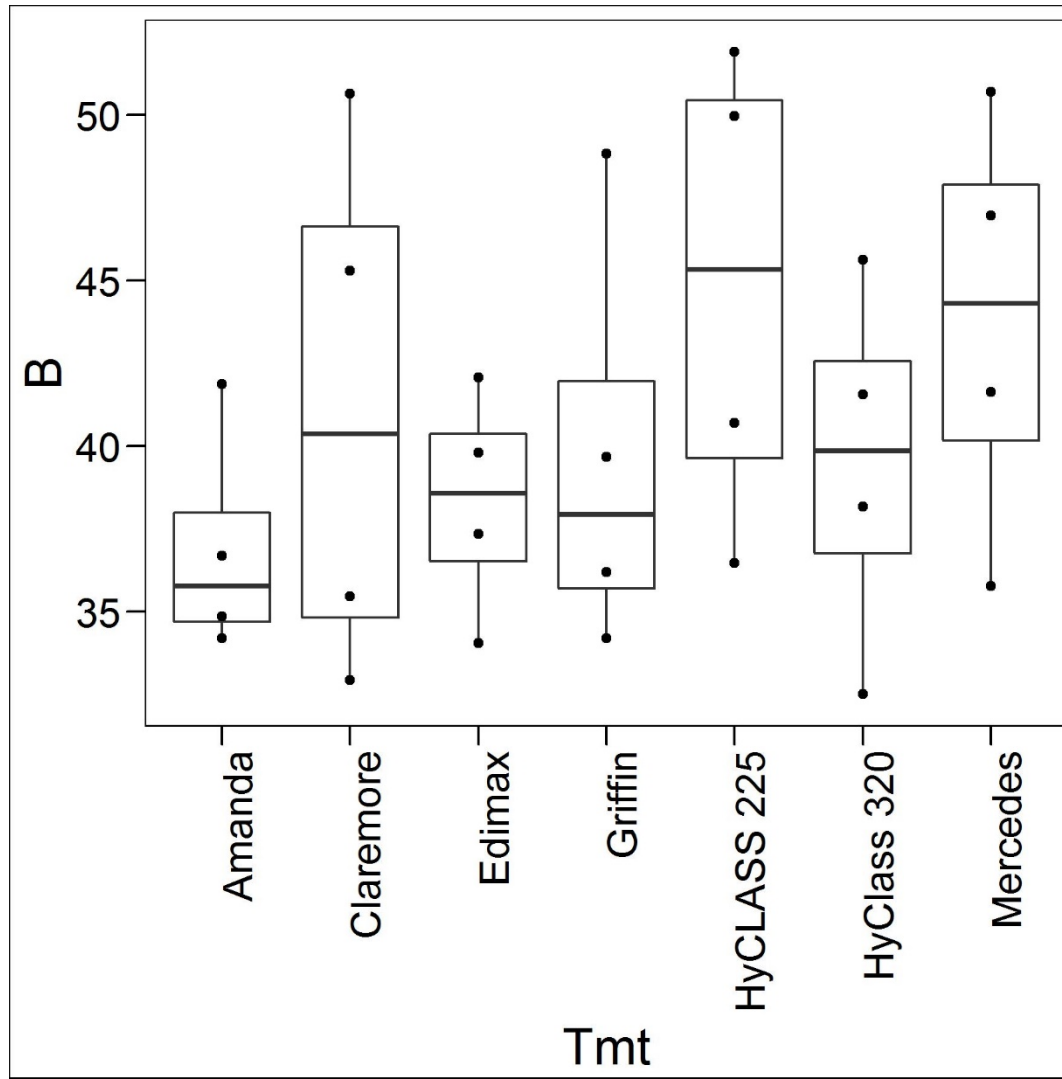


# **Micronutrients in Canola Tissue Levels and Application Methods**



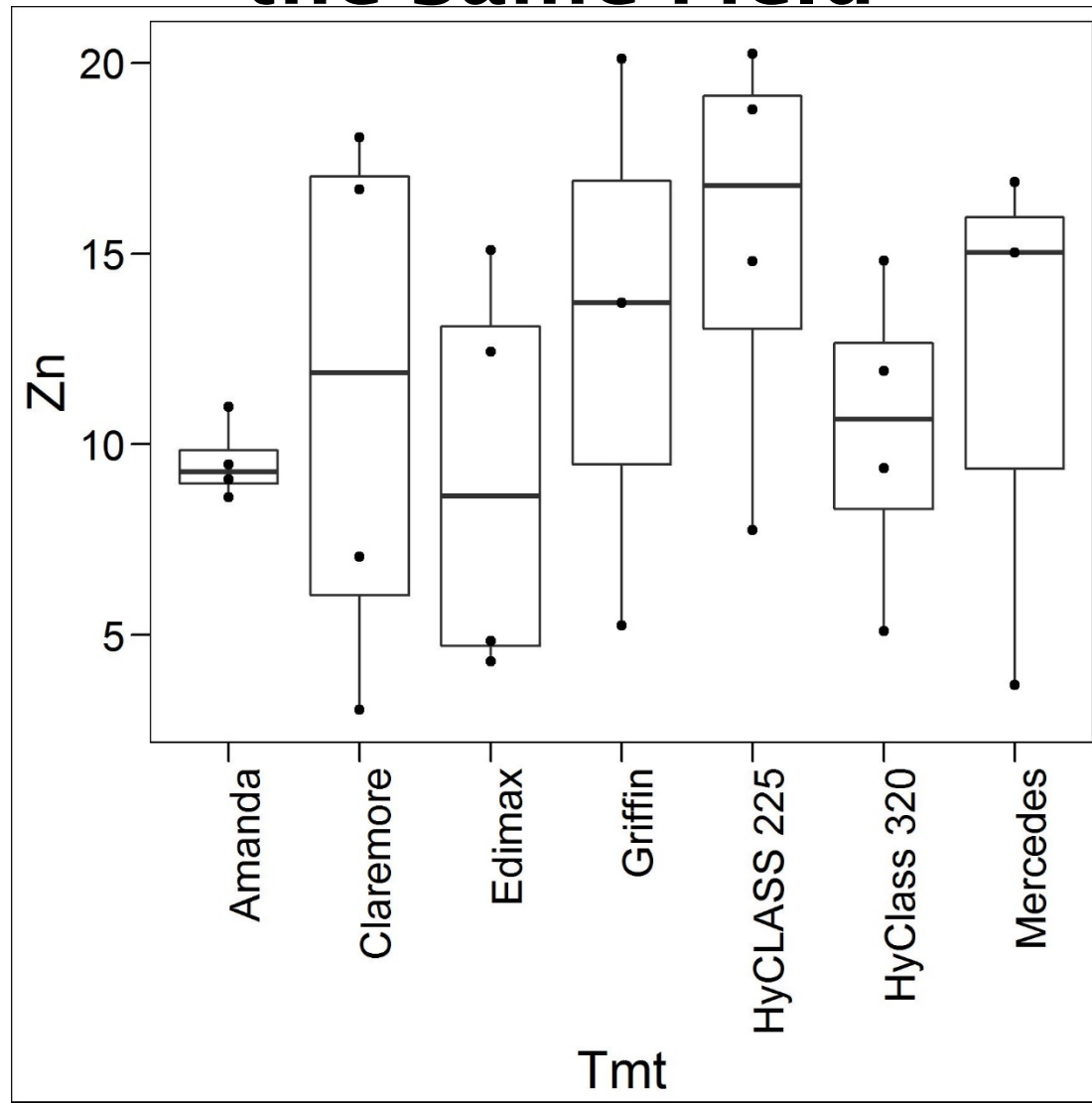


# Tissue Tests For Different Varieties in the Same Field



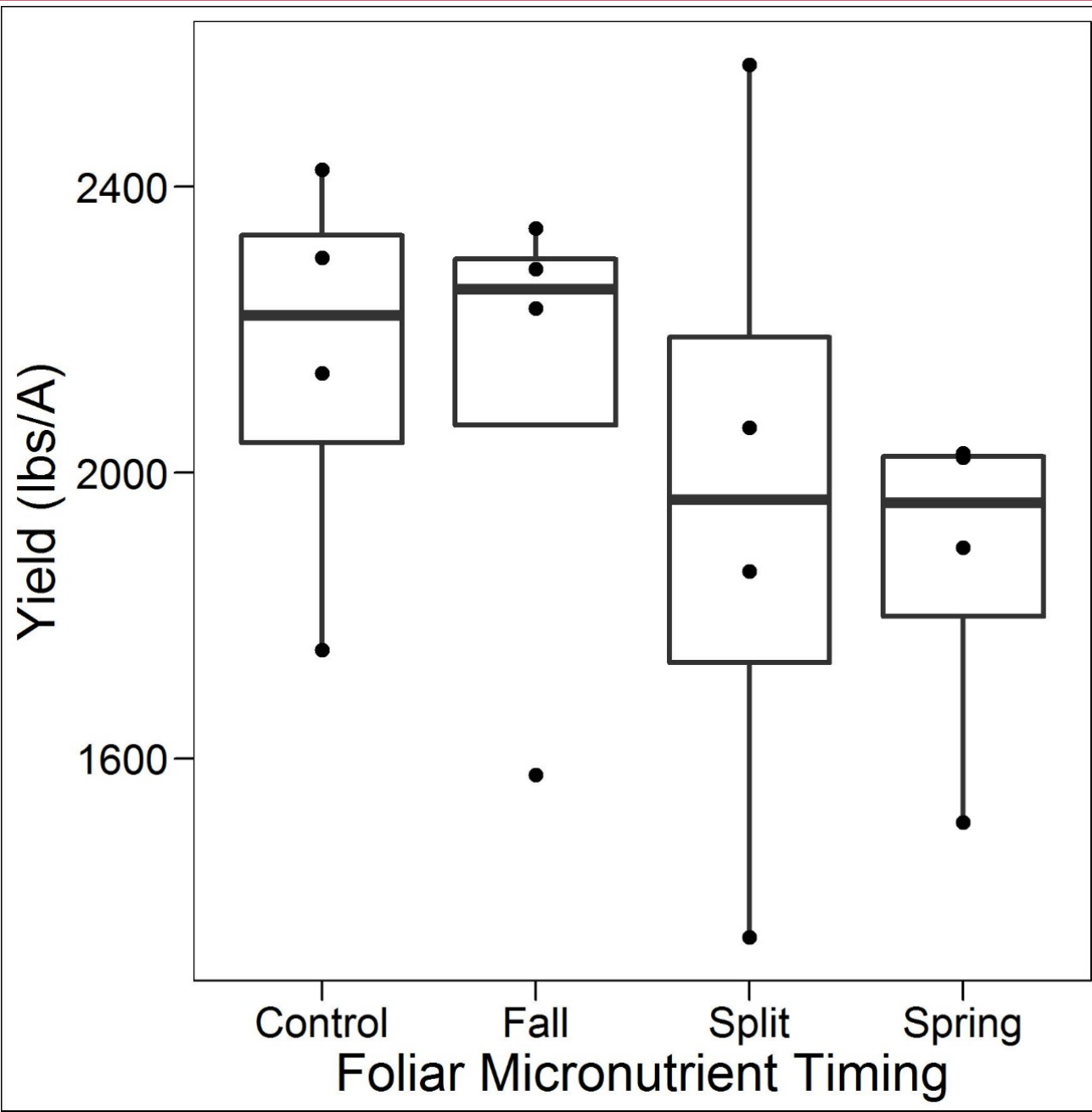


# Tissue Tests For Different Varieties in the Same Field



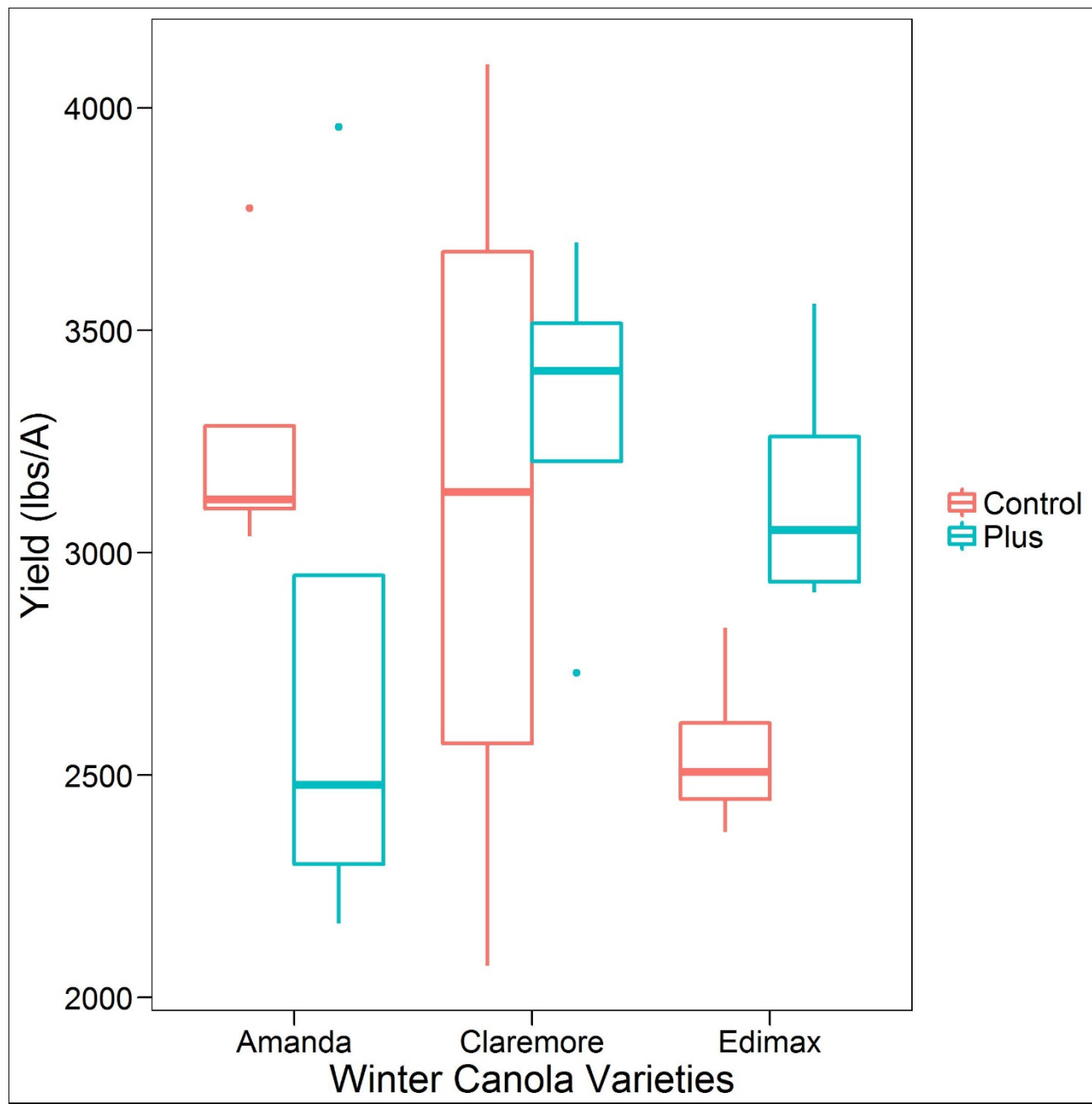


# **Zn and B Application Trials**





# **Does Canola Variety Effect Responses to Micronutrient Applications?**





# Future of Micronutrient Research

- Establish 'norms' for high yielding canola fields.
- Examine intra- and inter- field variation
- Examine intra- and inter- region variation



**And that's all on fertility  
for now**





# Stand Establishment

- Standard Practice
  - Planting dates, depths, moisture
- Pie in the sky
  - In-furrow moisture
  - Seed Priming
  - Companion Cropping

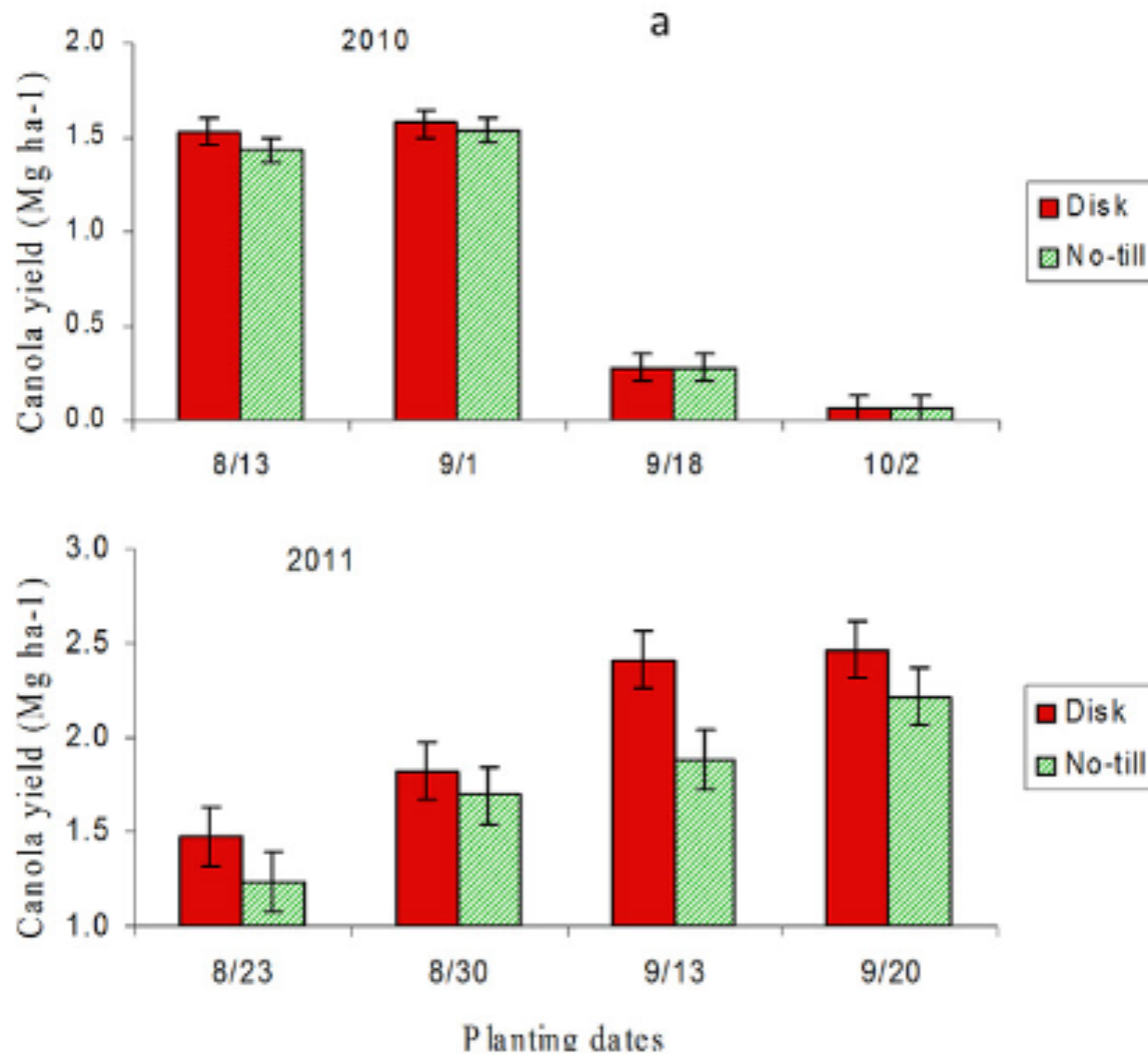


# **Planting Dates, Depths, and Moisture**

Water and Temperature



# Planting Dates and Tillage in The Great Plains





# Seed Priming and In-Furrow Moisture

- On farm strip trial and small plot tests to date have not shown and improvement
- Lab experiments being conducted to develop conditions which these practices are 'likely' to work in.



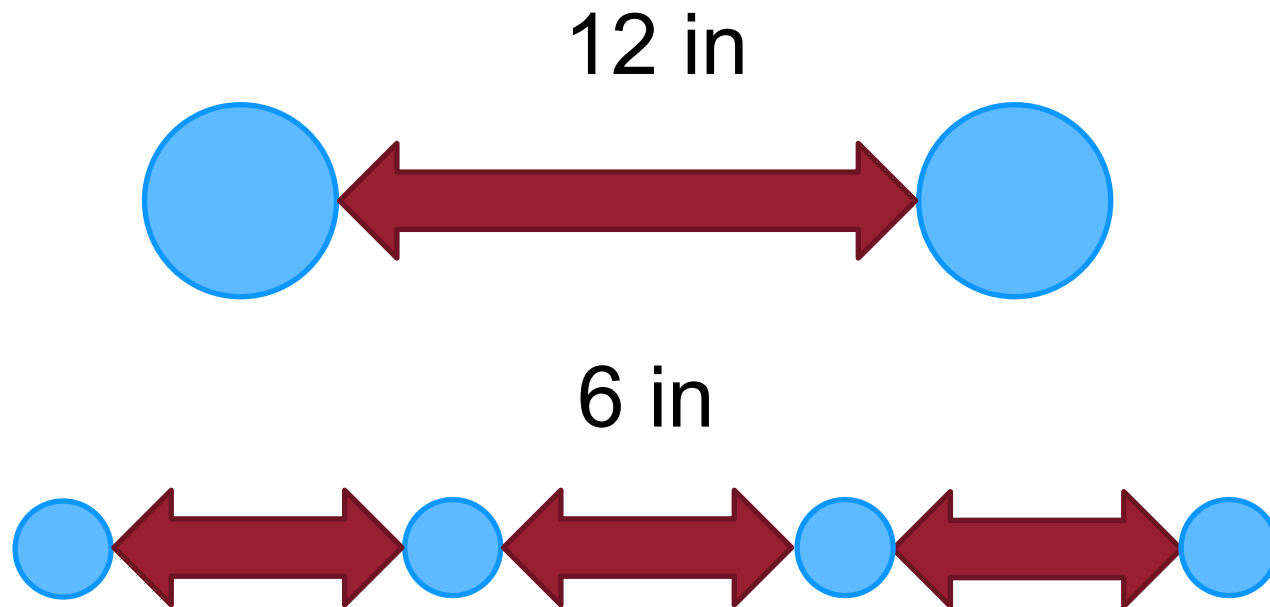
# In-Furrow Water Application



Increasing Levels of In-Furrow Moisture

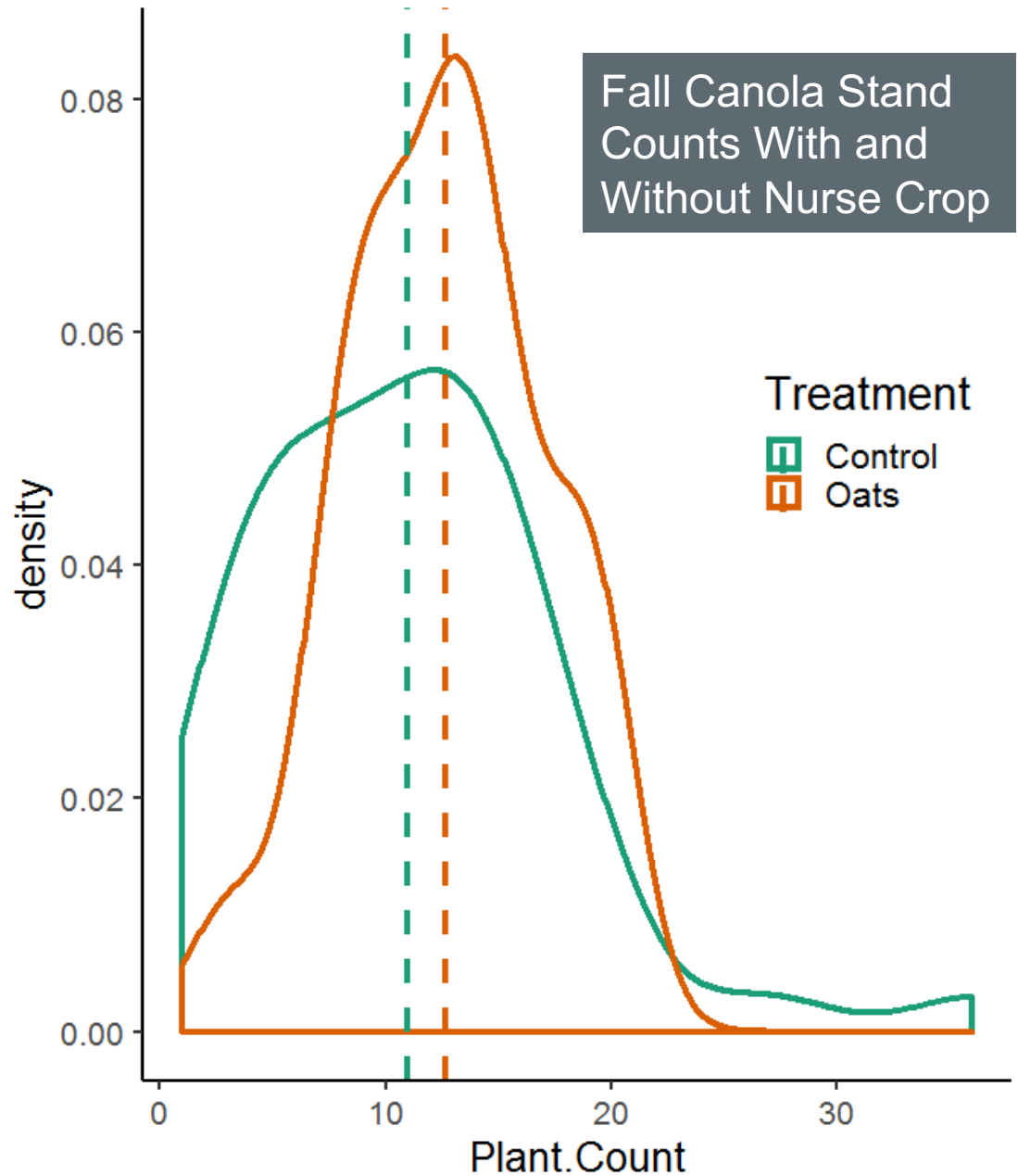


# Relationship between in-furrow concentration and row spacing





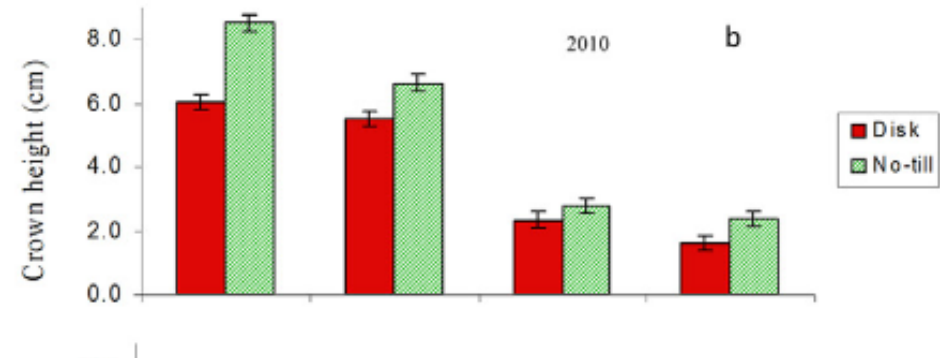
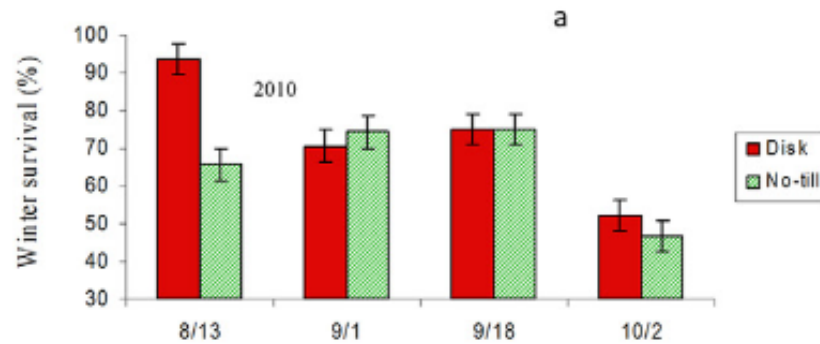
# Nurse Crops For Winter Canola Establishment







# Winter Survival







# Winter Survival

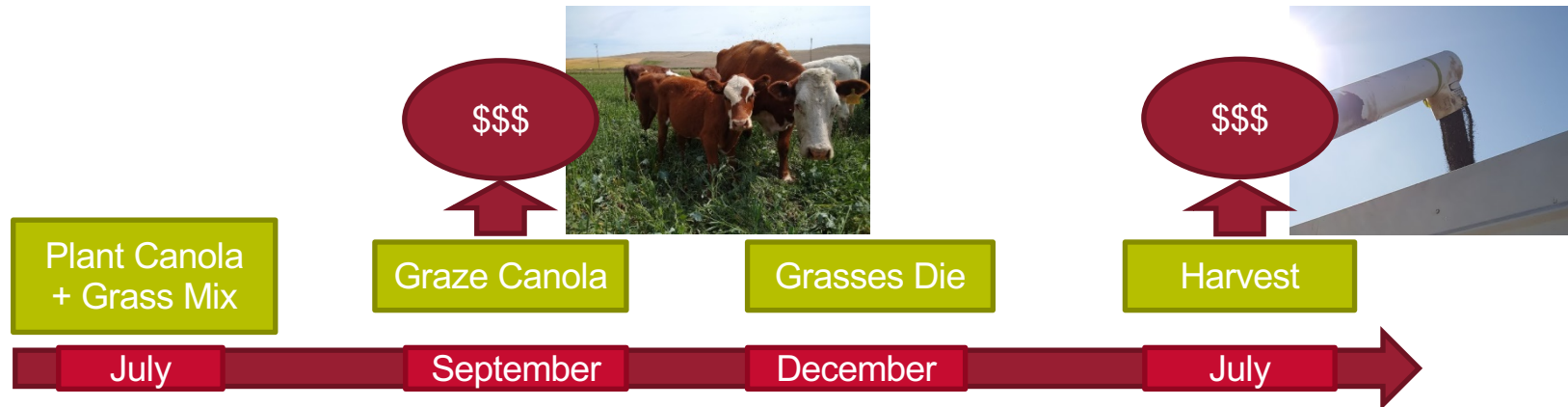
- Weather severity is the most crucial component
- Tillage and crown height appear to have some effect



# Dual Purpose Crops

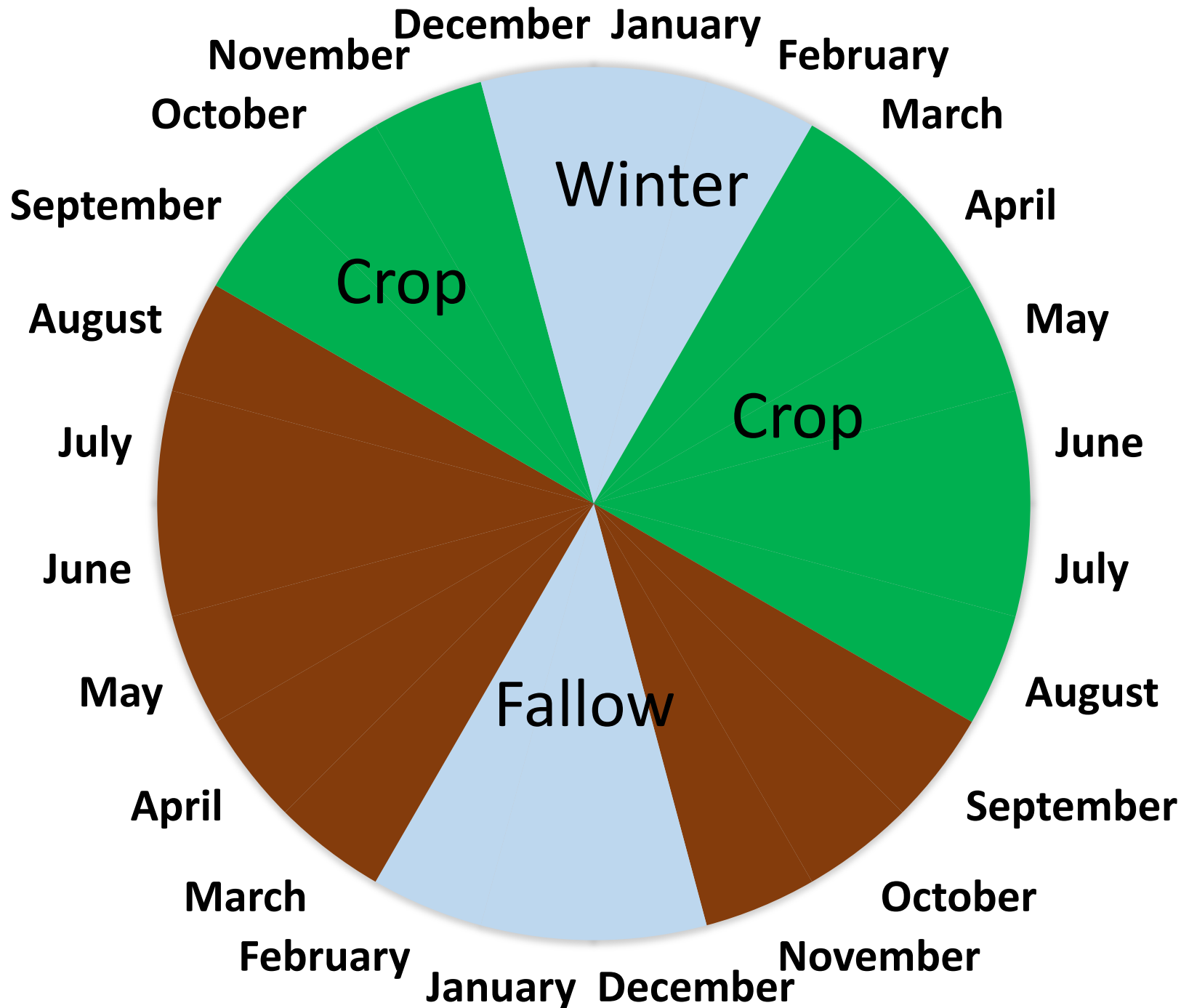


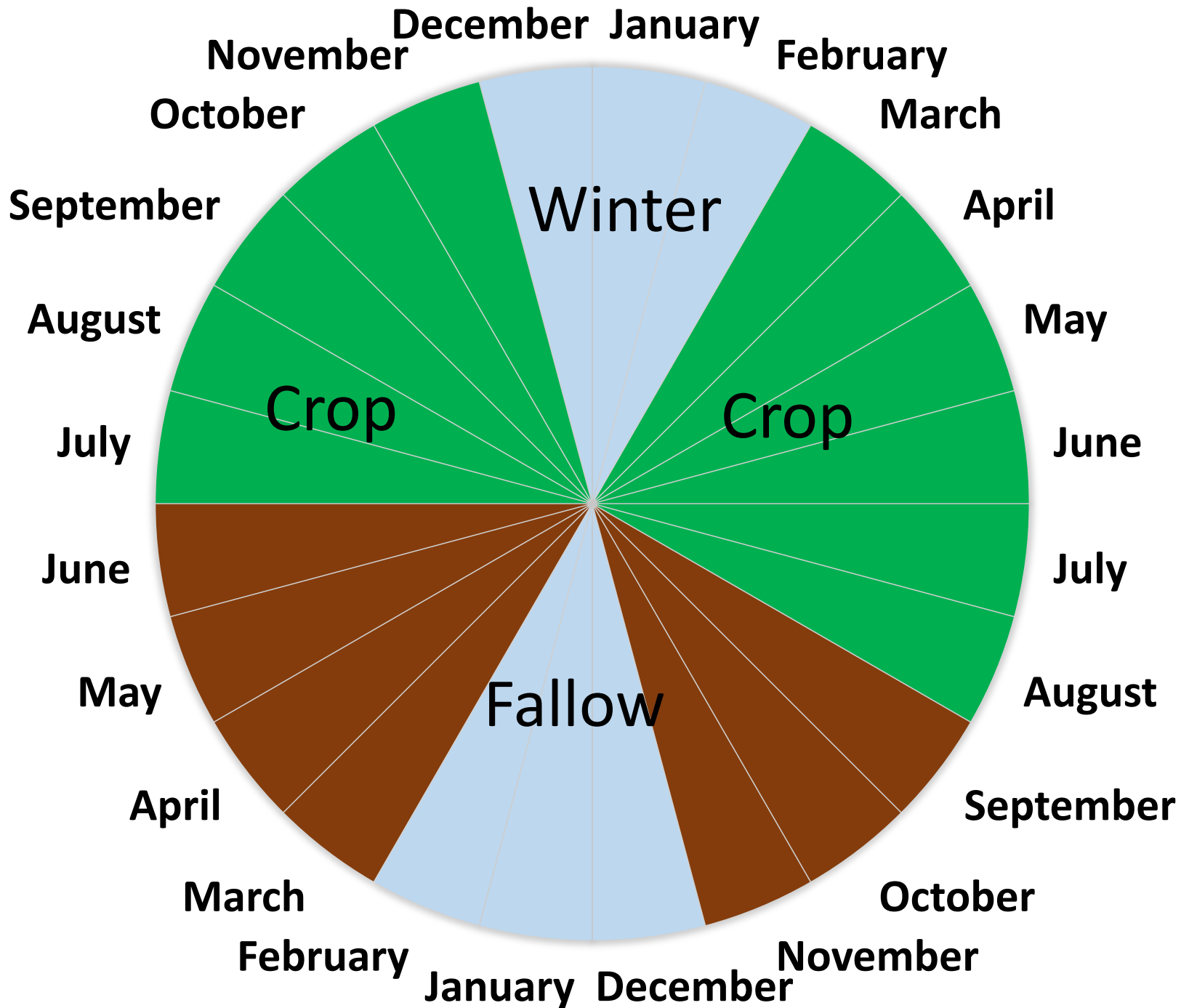
## Timeline for Dual Purpose Companion Planted Canola



**Applicable to WW-F and Preventative Plant Scenarios**









# 2017-2018 Grazing Trial





Treatments	Yield (lbs/a)	Grazing pressure (46 head)
Pasture 1	2464	Heavy
Pasture 2	2143	Severe
Pasture 3	3322	Light
Ungrazed	3384	None

**Table 1: Seed yield and cattle gain from canola grazing.**





# 2019-2020 Crop Year

## Oat-Canola



















# Improved Forage From Intercropping Oats

Table 2	Canola	Oat & Canola
Dry Matter	11.6	19
Crude Protein	21.3	14.2
Acid Detergent Fiber (ADF)	16.9	20.2
Neutral Detergent Fiber (NDF)	17.3	29.5
Relative Feed Value (Estimated)	407	231

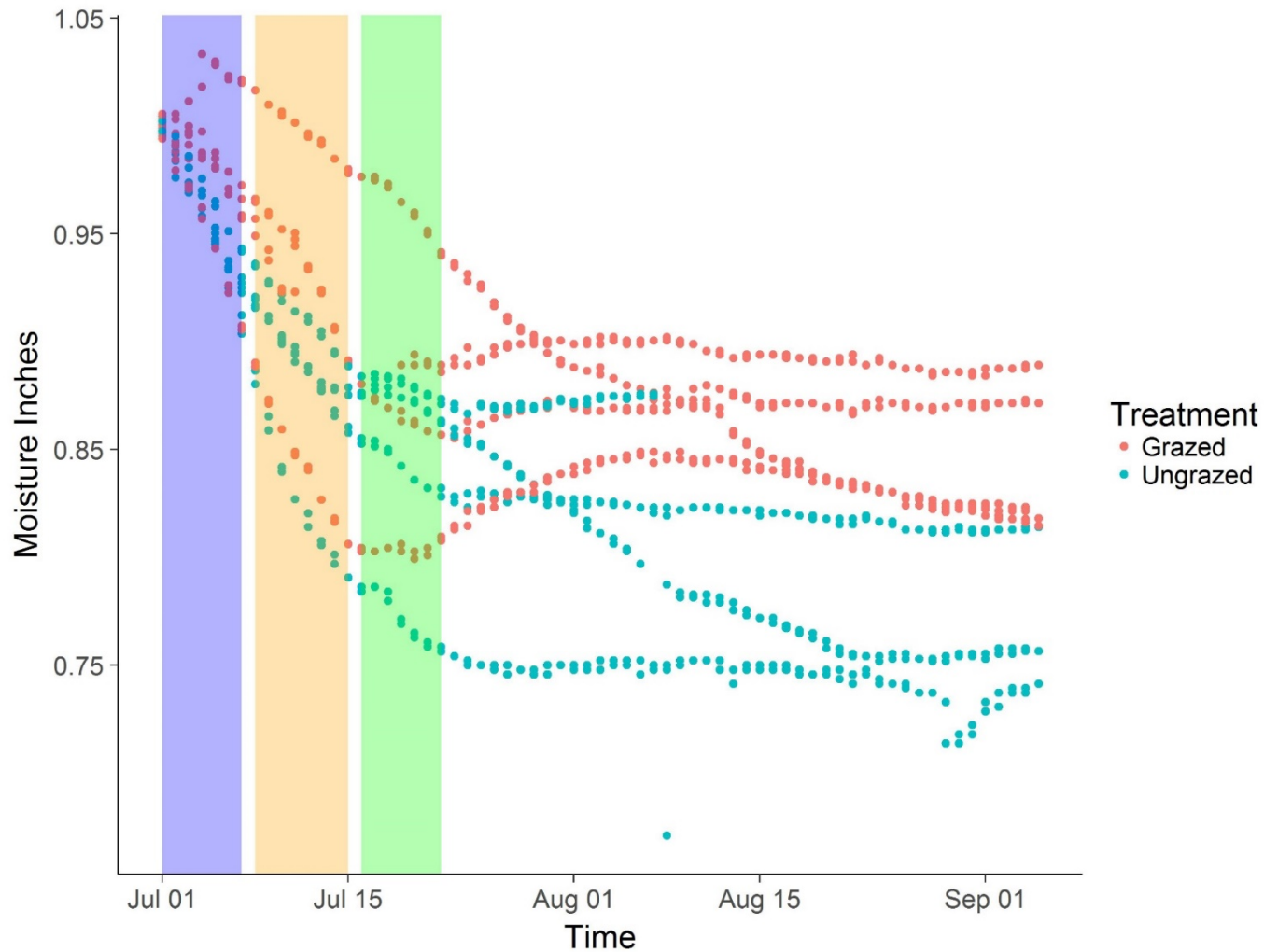


# Monitoring Fall Water Usage





# Reduced Water Usage in Grazed vs Ungrazed Plots







# Additional Insect Challenges

Second Grazing By Aphids

First Grazing By Cattle

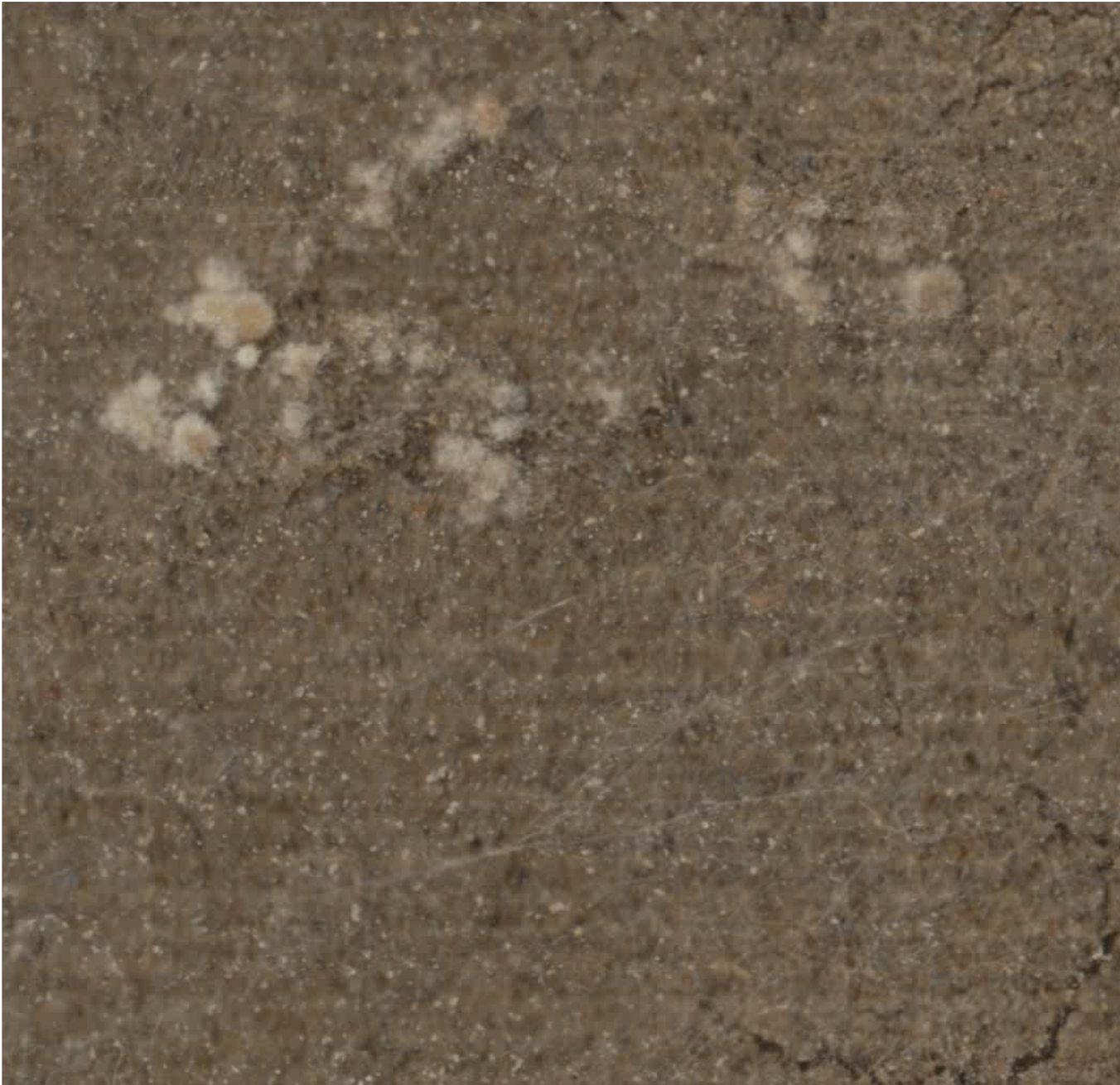




# Rhizoch



# Lesion Formation









# WOCS annual winter workshops

Jan. 28<sup>th</sup> Almira, WA

Jan. 30<sup>th</sup> Clarkston, WA



**WASHINGTON OILSEED  
CROPPING SYSTEMS**

*Part of the Washington State  
Biofuels Initiative*



# Thank you!



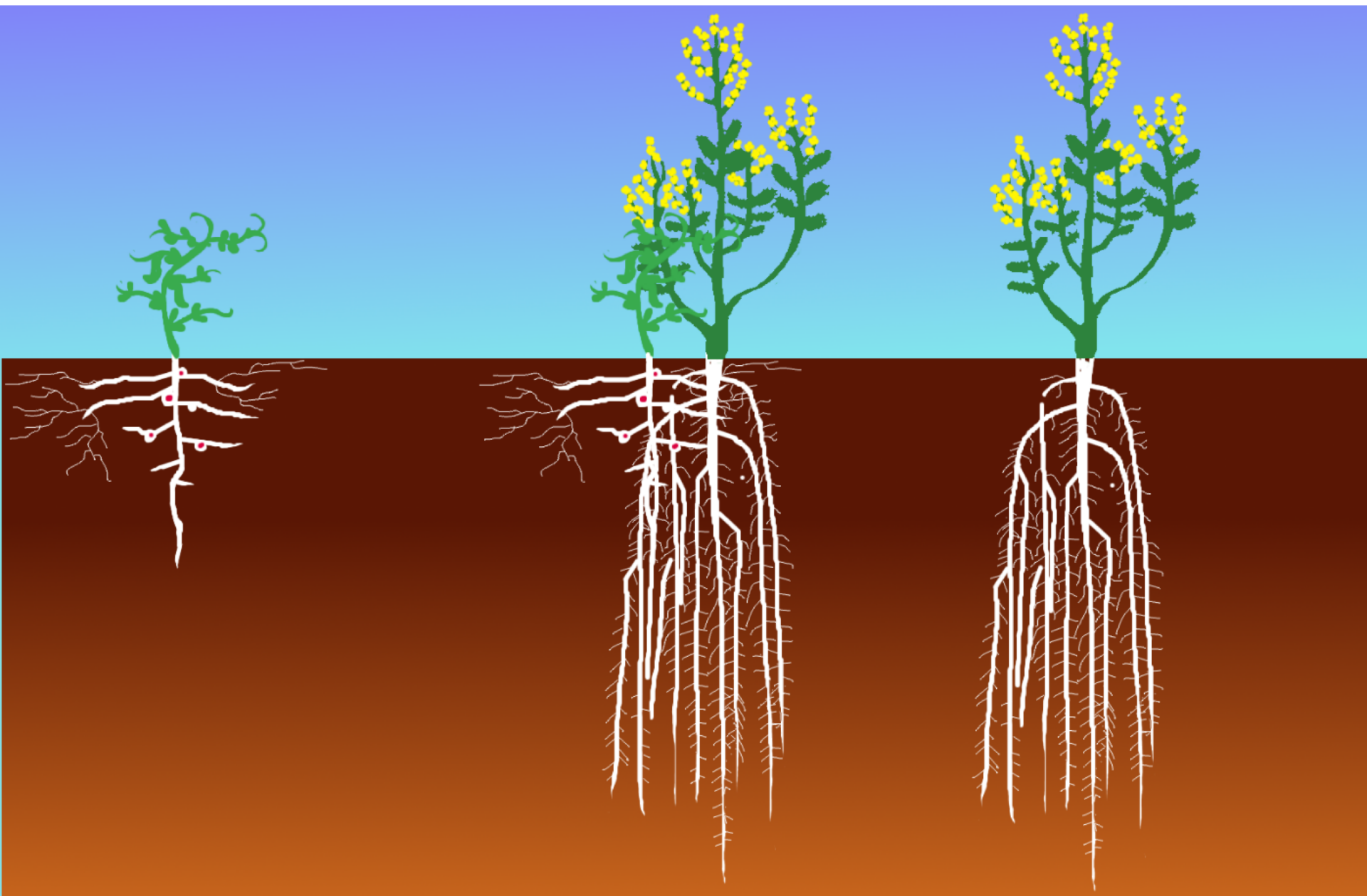


# **Intercrops as and opportunity to stack diversity in the absence of cover crops**





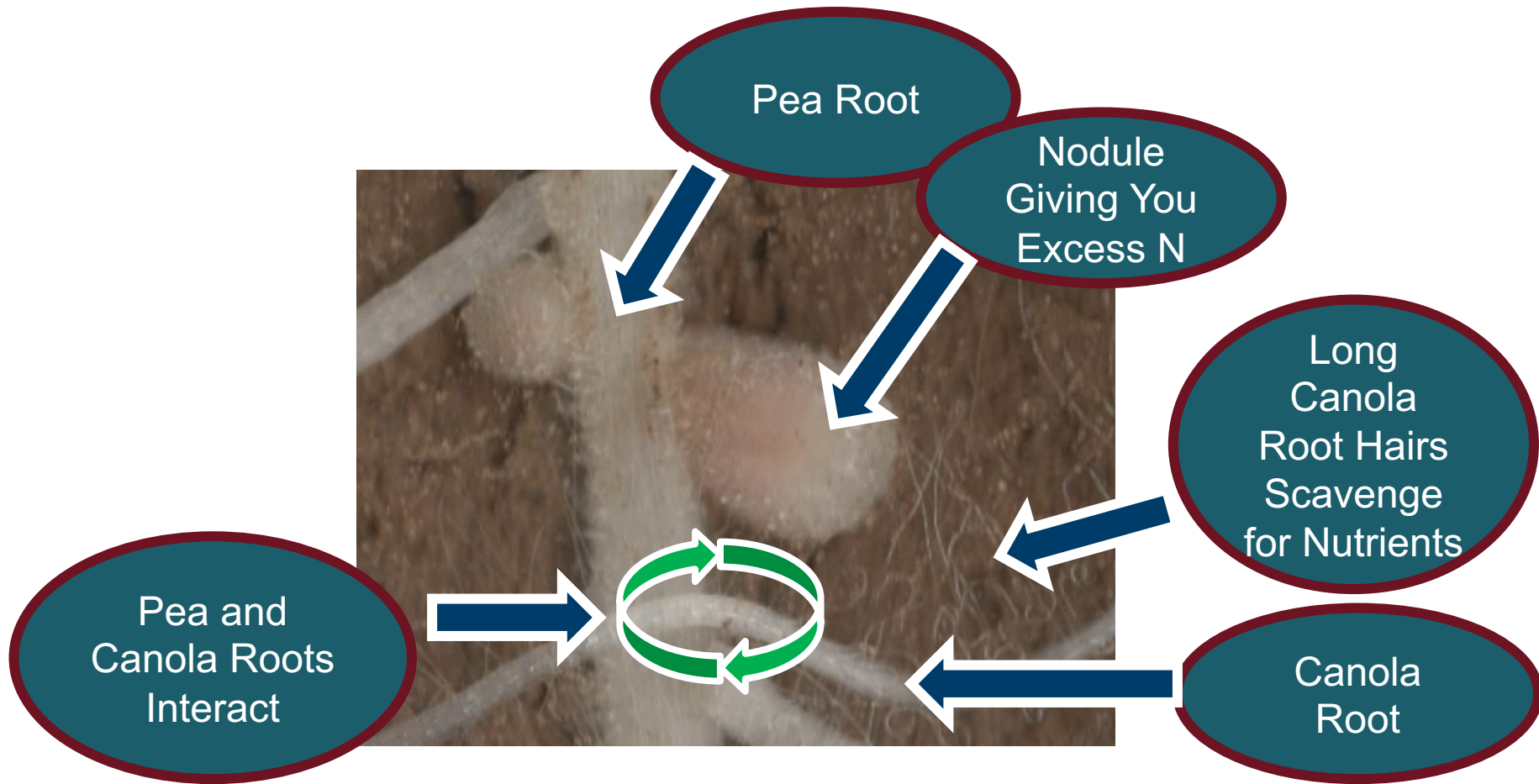
# Complementary Architectures







# Theoretical Advantages of peaola











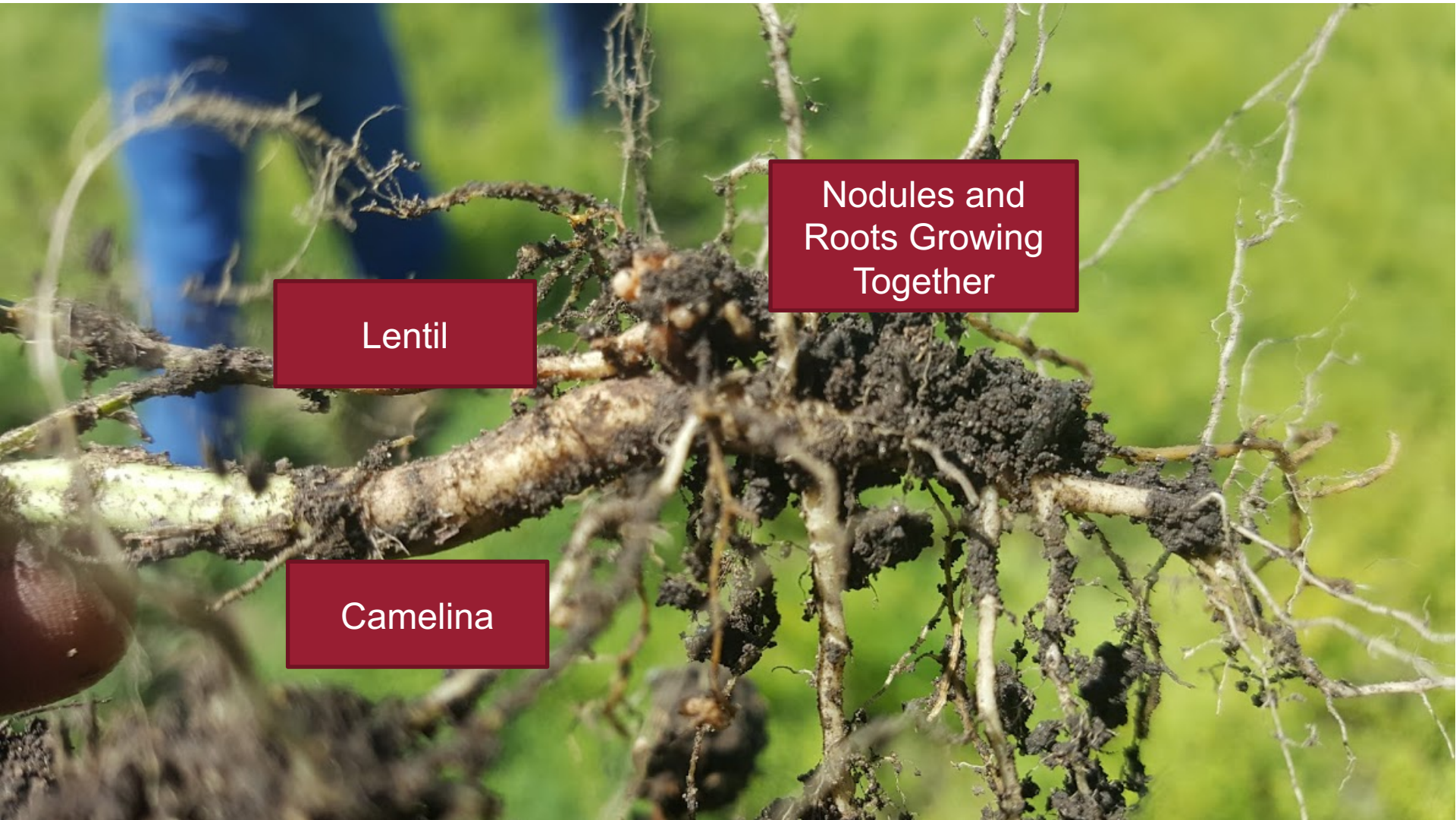
## Camelina hirsuta







# Complimentary Architectures



Lentil

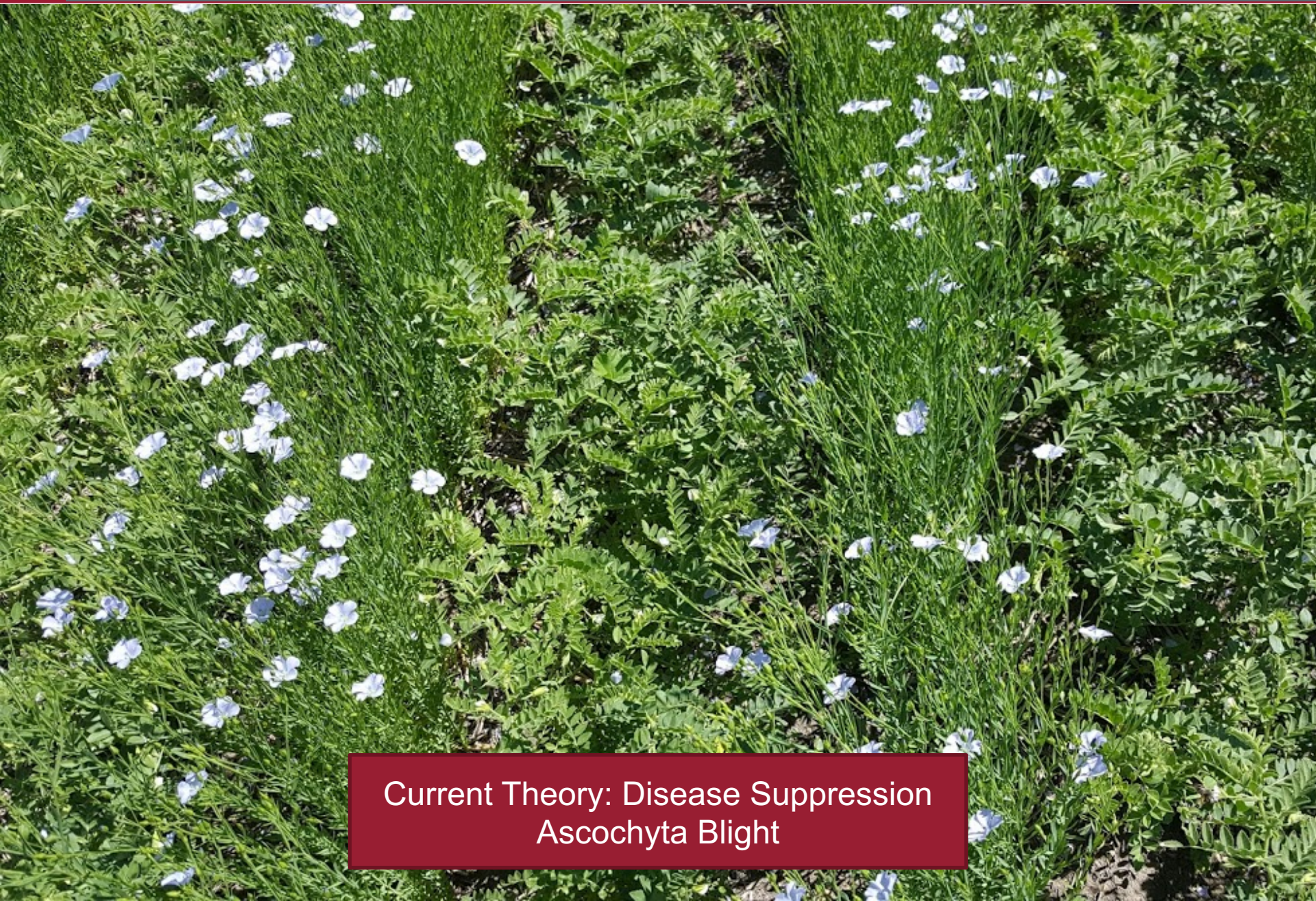
Nodules and  
Roots Growing  
Together

Camelina









Current Theory: Disease Suppression  
Ascochyta Blight

















# Logistical Concerns

