

# What We Thought We Knew about Growing Plasticulture Strawberries

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# Where are We today?

- We are not quite this far ahead, but. . .
- Many growers are an average of 2 to 3 weeks ahead of schedule.



# Goals Today

- To address some of the common practices, thoughts and possible misconceptions about annual plasticulture strawberry production.
- Apply what we know to maximize the spring of 2023 crop.

# High Tunnel / GH Strawberry Production is not E. Feasible

- True
- False
- Generally True, But . . . Some growers have found niches!

# Tunnel / GH vs. Field

**Tunnel / GH - Chandler**

**Field - Chandler**



# Tunnel / GH Production



*Chandler*



# Tunnel / GH Production

- NRCS Funded or Cheap (wood) GH
- Albion appears to be the best variety
- Early planting of conditioned plants – Thanksgiving to Christmas fruit
- Let go “dormant” when cold
- Harvest early spring crop
- Concerns
  - Spider Mites
  - Thrip
  - Botrytis
  - Production/Expenses

# Issues of Late Planting in the Fall of 2022

- There are several growers that were 2 to 4 weeks later planting than the recommended planting date.
- How will these plants perform this spring?



# 5 Factors Influencing Tip / Plant Issues in Fall of 2022

1. Loss of 6 million tips (N. Moss)
2. Pressure of Ruby June demand
3. Balamore - limited Camarosa Production
4. Labor Issues – Canadian Vaccination requirements
5. Hurricane that went up coast to PEI

# Planting Date is Critical

- True
- False
- Generally True, But . . . There are occasional “miracles”.

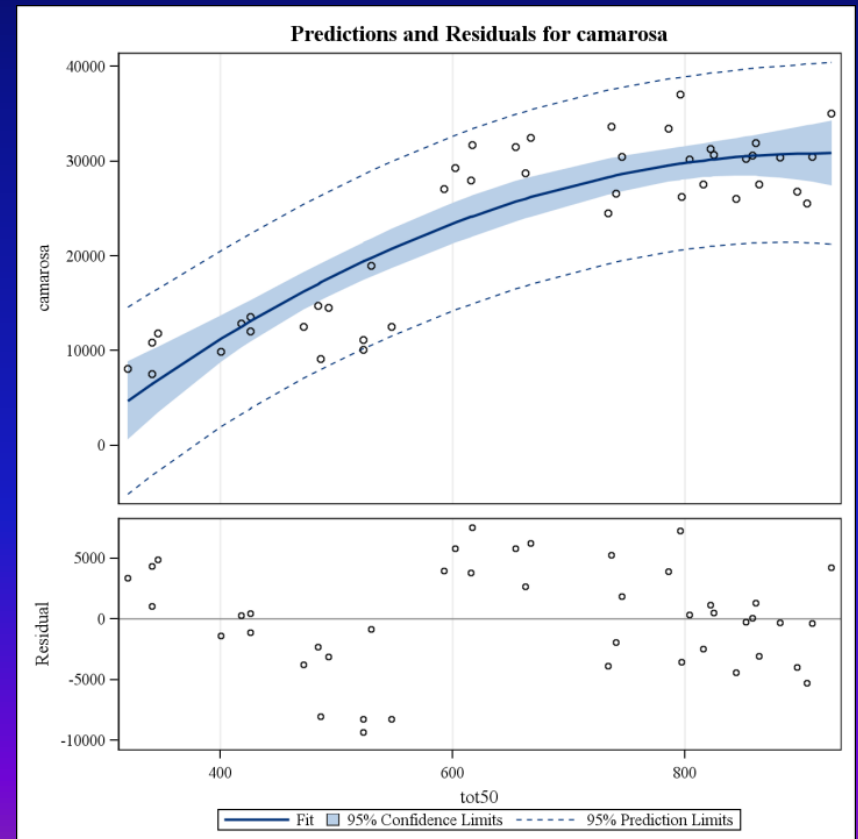
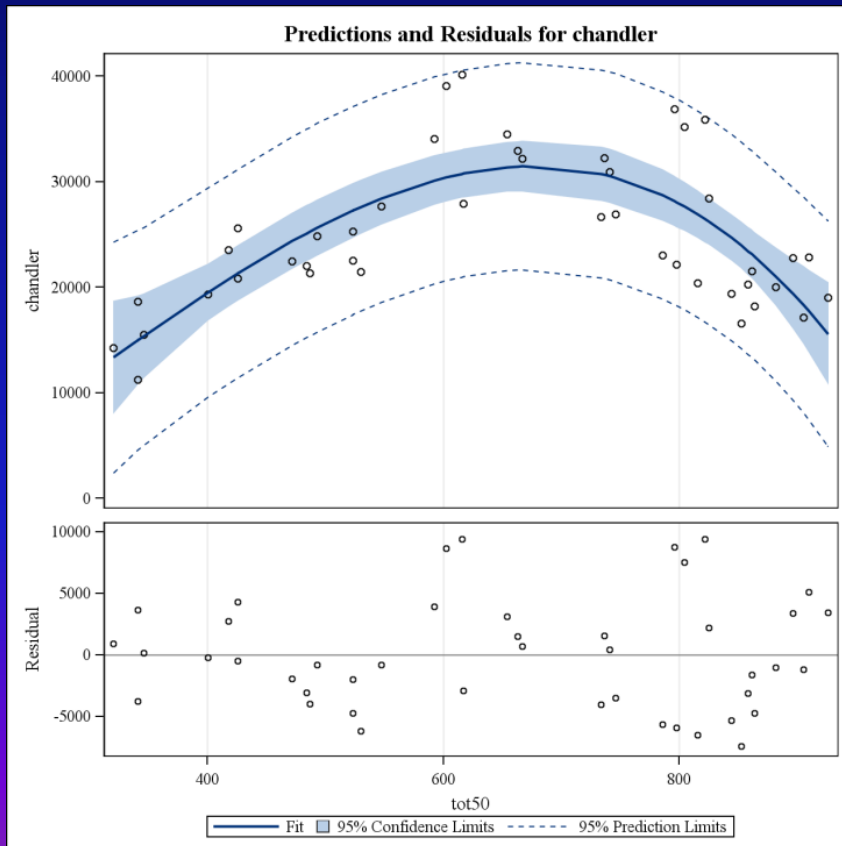
# Mechanism of Yield Increase



- *Planting date impacts # of Branch Crowns ( $p < 0.0001$ )*
- *Appears that **row covers** are NOT increasing # of Branch Crowns ( $p = 0.39$ )*
  - *Increases in # of flowers / Branch Crown*
- *Row covers are increasing floral bud initiation during the fall, NOT in the winter!*



Chandler: yield peaks at 600 units ( $R^2=0.56$ ,  $P<.0001$ )  
Camarosa: yield peaks at 800 units ( $R^2=0.78$ ,  $p<.0001$ )  
**Total GDD (50F) Oct, Nov, Dec (90 days)**



# Other Factors

- Fall Row Covers
- “Normal” Spring
- Cool May is critical for continued development
  - If temperatures do warm (80’s), run drip during the heat of the day
  - Run fertilizer at end of the irrigation events

# Example Fall of 2019



- Scenario
  - Should plant late September – 1<sup>st</sup> week in October
  - Planted October 29 – November 6
  - Just above Chattanooga, TN



# Row Covers applied 11/6/2019



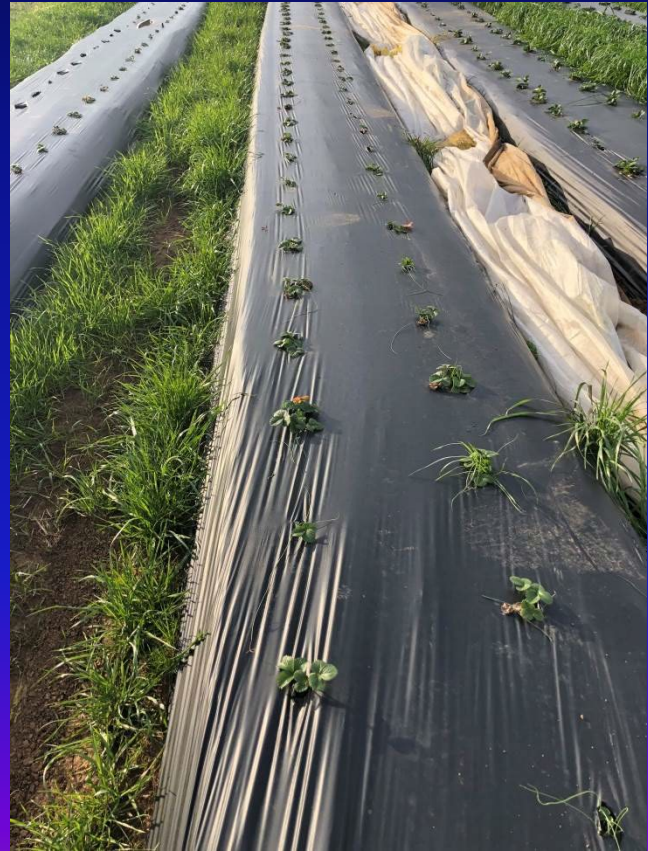
1.2 oz material 'Typar'  
– spun bound

# Chandler March 1, 2020

**Covered**

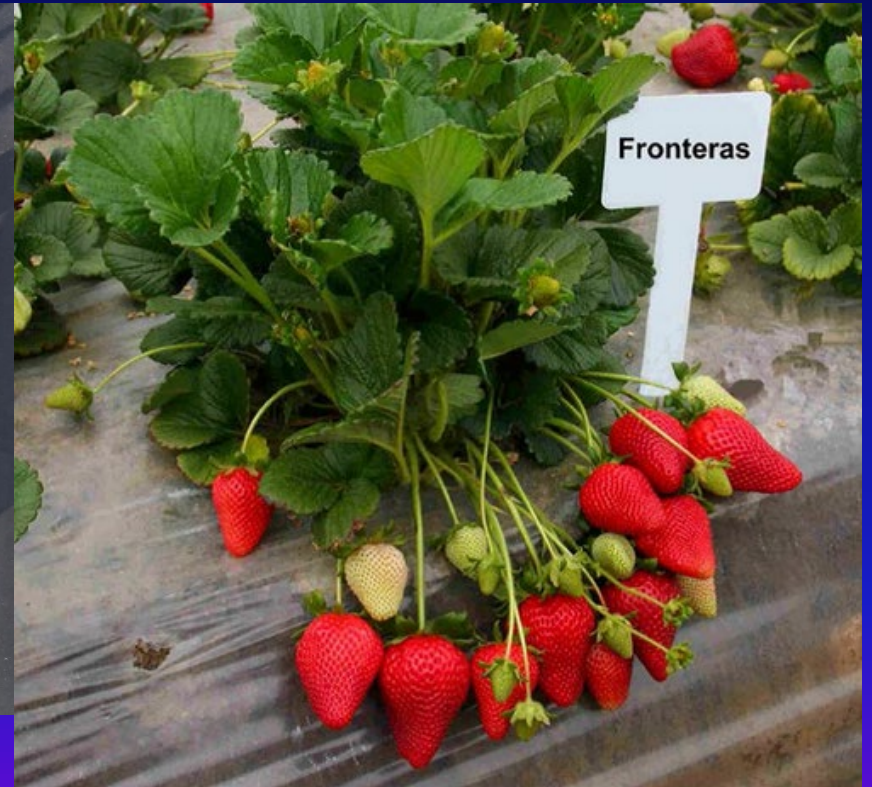


**Uncovered**



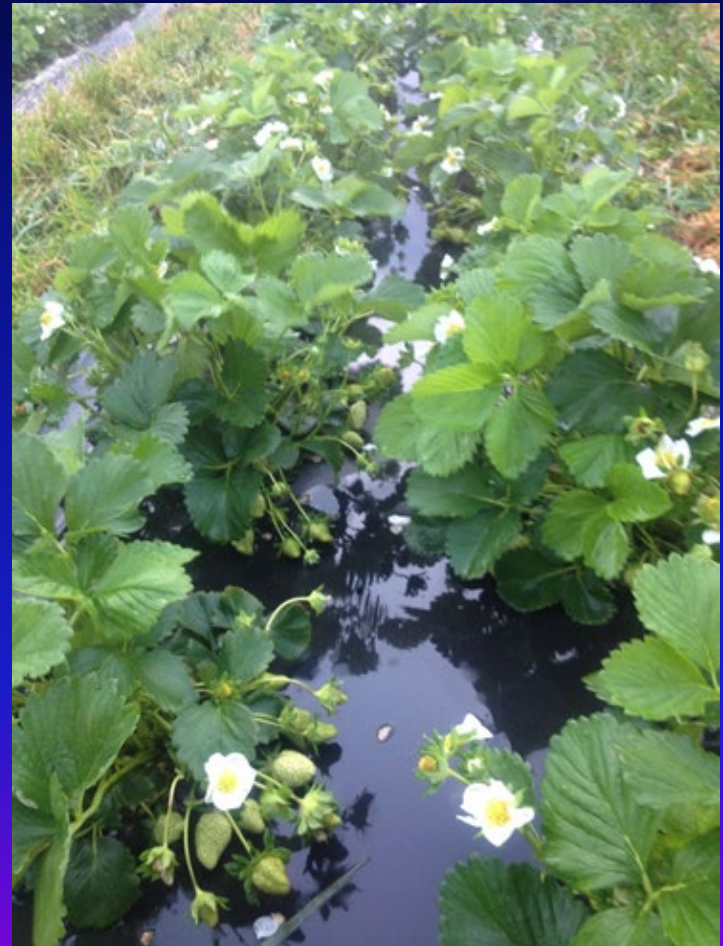


# Fronteras



# Result

- The grower harvest approximately  $\frac{1}{2}$  to  $\frac{2}{3}$  of a “normal” crop.
- 2020 – SW VA and East TN
  - Different result
- Witt’s example
  - Ruby June



# Weed control is more of an issue since losing MB

- True
- False
- This was True: However, Prowl and Spartan changing this issue

# Weed Control

- A weakness of many of the MB alternatives is consistent weed control.
- So we have been evaluating herbicides applied to the bed top under the plastic.
- Dual may also be an option.
- Prowl H<sub>2</sub>O at 2 – 3 pints/A  
plus
- Spartan 4F at 8 fl oz/A
  - (Make sure it is labeled in your state)
- Apply to bed top with minimal soil disturbance.



# Prowl and Spartan

- Prowl
  - Grass
  - Winter Annuals
- Spartan
  - Yellow Nutsedge
  - Broadleaf Weeds



# Issues with Rain-Flo Bedders

- No room between end of soil pan and roller / plastic
- How to get the herbicide to the soil?
- Apply the herbicide to the back side of the plastic.

# Rain-Flo Bedder



# Rain-Flo Tank





# Rain-Flo “Red Neck”



# “Red Neck” Tank





# 5 to 7 lb of N/A/week is all the Fertilizer Strawberries need in the Spring

- True
- False
- It depends (for John Pierce)

# Tissue Analysis Labs

- Public
  - North Carolina  
Department of  
Agriculture, 1040  
Mail Service Center,  
Raleigh, NC 27699-  
1040 or 4300 Reedy  
Creek Rd, Raleigh,  
NC 27607
  - Other State  
Universities
- Private
  - Micro-Macro  
International, Inc., 183  
Paradise Blvd., Suite  
108, Athens, GA  
30607  
Phone: 706-548-4557  
Fax: 706-548-4891
  - Waypoint Analytical
    - Richmond, VA
    - Memphis, TN
  - Waters

# Common Questions

- How often do I fertilize?
  - Every week?
  - Every other week?
- How much fertilizer do I apply?
  - How often are you going to fertilize?
- What N source do I use?

# Irrigation and Fertigation

- Irrigation

- Spring

- Once growth begins in late winter or early spring

- Fertigation

- Once growth begins in late winter or early spring or at least by early bloom
    - Apply 5 lb of N/A/week
    - $\frac{3}{4}$  lb of N/A/day
    - For 8 to 10 weeks
  - Some areas / growers like to “wake” the plants up with higher rates

# Possibilities / Past

- Fertilize every two weeks
  - Too much N at one time
  - Soft berries
  - Poor Flavor
- Fertilize every week
  - Rotation
    - 50 lb of calcium nitrate / A
    - 50 lb of potassium nitrate / A
    - 50 lb of 20-20-20 /A
  - Lower rate once harvest begins (?) (25 lb/A)

# N Source in Spring

- Ammonium Nitrate and Urea
  - Pro's
    - Cheap
    - Water Soluble
    - Quick Growth Response
    - Large Fruit
  - Con's
    - Soft Fruit
    - Bland Fruit
- Nitrates
  - Calcium Nitrate
  - Potassium Nitrate
    - Pro's
      - Firmer Fruit
      - Good Flavor
    - Con's
      - More Expensive
      - $\text{KNO}_3$  Hard to dissolve
    - Liquid K sources
- 20-20-20



# Spring Irrigation / Fertigation

- Irrigation
  - 1" to 1.5" / A / week
    - Monday
      - 1/3" to 1/2"
    - Wednesday
      - 1/3" to 1/2"
    - Friday
      - 1/3" to 1/2"
- Fertigation
  - Monday
    - 15 - 25 lb of calcium nitrate/A
  - Wednesday
    - 15 - 25 lb of potassium nitrate/A
  - Friday
    - 15 - 25 lb of 20-20-20/A

# Spring Irrigation / Fertigation Carry-Over Plants

- Irrigation
  - 1" to 1.5" / A / week
    - Monday
      - 1/3" to 2/3"
    - Wednesday
      - 1/3" to 2/3"
    - Friday
      - 1/3" to 2/3"
- Fertigation
  - Monday
    - 25 - 50 lb of calcium nitrate/A
  - Wednesday
    - 25 - 50 lb of potassium nitrate/A
  - Friday
    - 25 - 50 lb of 20-20-20/A

# Spring Irrigation / Fertigation Day Neutral Varieties

- Irrigation
  - 1" to 1.5" / A / week
    - Monday
      - 1/3" to 2/3"
    - Wednesday
      - 1/3" to 2/3"
    - Friday
      - 1/3" to 2/3"
- Fertigation
  - Monday
    - 20 lb of calcium nitrate/A
  - Wednesday
    - 20 lb of potassium nitrate/A
  - Friday
    - 20 lb of 20-20-20/A
  - At least 1 lb of N/A/day

# Nitrogen and Varieties

- Chandler
  - 1+ lb of N / A / day
- Albion
  - 1 lb of N / A / day
- Camarosa
  - $\frac{3}{4}$  lb of N / A / day
- Ruby June ?
  - $\frac{3}{4}$  lb of N / A / day ?
- Flavorfest
  - $\frac{1}{2}$  lb of N / A / day

# Micronutrients in Spring

- Boron
  - Drip applications
  - **1/8** to **1/4** lb of actual B / A / application
- Mg / S
- Epson Salts
  - Foliar
    - 2 to 4 lb of Epson Salt /A every 1 to 2 weeks
  - Drip
    - 25 lb of Epson Salts / A every 2 weeks
- Foliar Magnesium Products



# Following Recommendations Based on Tissue Tests Provides Sufficient B

- True
- False
- False; Some of the critical ranges are too low. Boron deficiency has been observed when following recommendations.

# Boron Deficiency





# Severe Boron Deficiency



# Boron Deficiency



- 1 lb of actual Boron/A Preplant
- $\frac{1}{4}$  lb of actual Boron/A every 2 – 3 weeks in the spring
  - Foliar
  - Drip

# Evaporative Cooling with Drip?

- When the temperatures start heading toward the mid-80's we worry about plants going vegetative.
- Most of us don't like to overhead irrigate while ripe fruit is on the plant.
- Can we drip irrigate in the middle of the day to cool the plants?
- Two growers that drip irrigate daily in the heat of the day and extended 'Chandler' harvest 2 to possibly 3 weeks.
- Daily Fertilization



# Summary

- At this point use row covers for frost protection.
  - Don't let the plants get too "hot" on warm days
- Maintain moderate fertilizer rates
  - Don't throw it to them
- Pray – a cool April and especially May is our friend
  - Continued branch crown development
- When temperatures reach mid-80's, use evaporative cooling in the middle of the day

# Questions ?

