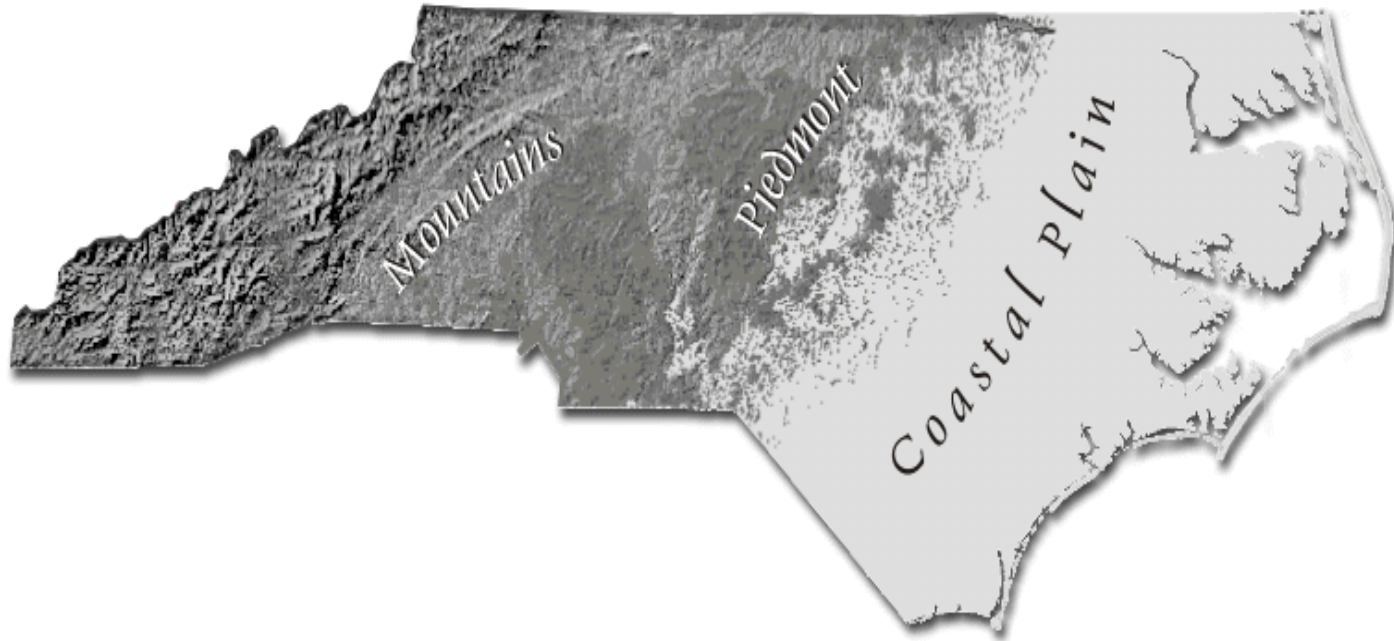


# 2022 Strawberry Pre-Plant Webinar



# Your hosts



**Amanda Lewis**  
Communication Assistant  
NCSU Small Fruits Program



**Dr. Mark Hoffmann**  
Small Fruits Extension Specialist  
NCSU

# Today's Speakers



**Mark Hoffmann**  
Small Fruits  
Extension Specialist  
NC State



**Gina Fernandez**  
Dest. Professor;  
Strawberry Breeder  
NC State



**Bill Cline**  
Strawberry Disease  
Extension Specialist  
NC State

# Today's Agenda

- Strawberry Cultivars (Gina Fernandez)
- Fumigation and Pre-Plant Considerations (Mark Hoffmann)
- Disease Control in Strawberries (Bill Cline)
- Short Weed Control Update (Mark Hoffmann)

# Webinar Basics

- Please ask Questions in the Q+A box or the chat box
- We address Questions at the end of each video
- You are muted and can't speak
- You always also can email: [mark.hoffmann@ncsu.edu](mailto:mark.hoffmann@ncsu.edu)

# Webinar recording will be available



<https://strawberries.ces.ncsu.edu/>

# Please follow us on Social Media



@TheVeryBerryLabNCSU



@NCSUberrylab

# Fumigation and Pre-Plant Considerations

Mark Hoffmann

Small Fruits Extension Specialist  
[mark.hoffmann@ncsu.edu](mailto:mark.hoffmann@ncsu.edu)





# Aims

- Update and Refresh Knowledge
- Common Questions and Answers

# Southeastern Strawberry School

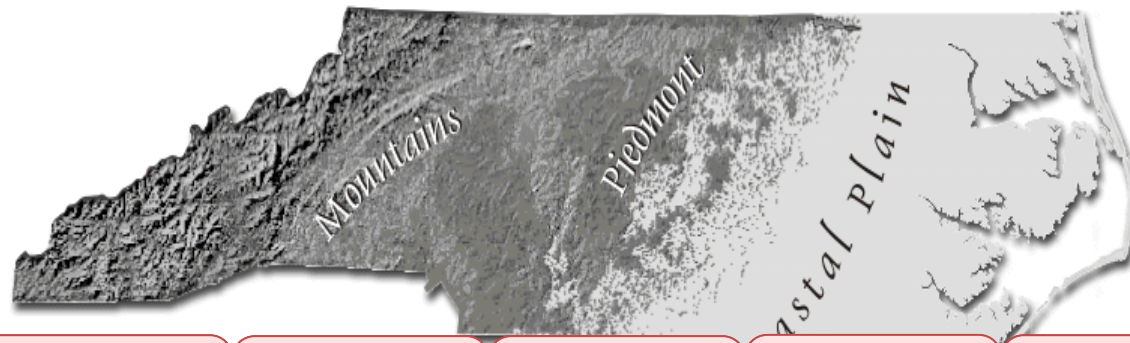
<https://smallfruits.org/2021/02/southeastern-strawberry-school-webinar-series/>

Two sessions on pre-plant!  
Watch!!!

- Step 1: Site Selection and Pre-Plant June – September/October
- Step 2: Transplanting September/October
- Step 3: Post Transplant Oct-Dec
- Step 4: Winter and Dormancy Dec-Jan
- Step 5: Pre-Harvest; Frost and Freeze Protection Feb/Mar/Apr
- Step 6: Harvest April/May/June
- Step 7: Crop Termination

# Planting Dates for NC

- Irrigate after transplanting!
- Bare roots (cut-offs): plant 3-5 days earlier than plug plants



Mountains	Foothills	Upper Piedmont/ Tidewater	Lower Piedmont/ Coast. Plains	Lower Coast. Plains
1 <sup>st</sup> WK	3 <sup>rd</sup> WK	4 <sup>th</sup> WK	1 <sup>st</sup> WK	2 <sup>nd</sup> WK
September			October	

## Site Selection

- Site Location: Windbreaks in north/northwest of field/ good visibility for PYO/close to water source
- Row Orientation: Important: Air Drainage (west), **Water Drainage (water needs a place to go)**. If possible, rows in North-South direction
- Slopes: South-facing: early/ North-facing: late

## Site Selection

- Wildlife can be a large problem: Invest in fences. Deer love to eat small strawberry plants.

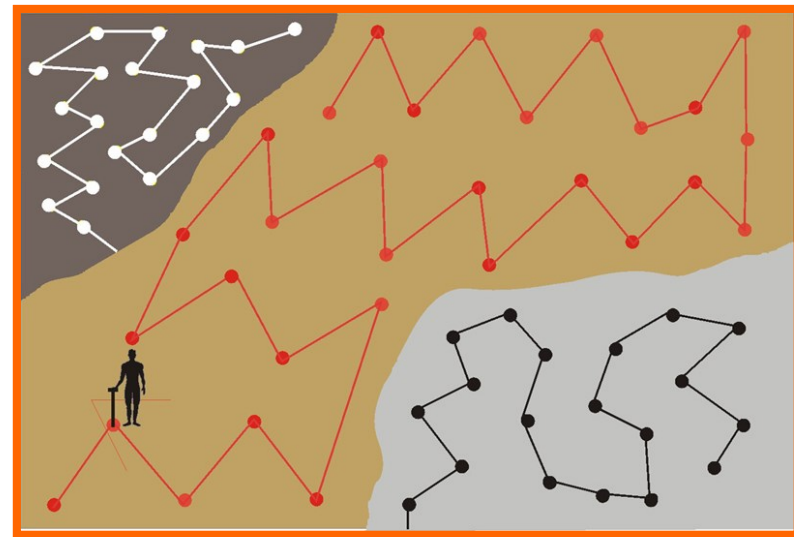


## Soil Preparation and Fertilization

- Soil Type: sandy loam – clay loam are preferable
- Soils with high sand, clay or rock content are no preferred!
- Need to be able to form a **6-8” bed!!!**

## Soil Sampling

- Sample 4-6 months prior to planting
- **Apply lime to target pH (6-6.5)**
- **Depth: 8 Inches**





## Soil Preparation and Fertilization

- Plow 3-6 months prior (decreases residues)
- Remove debris, trash, work soil deep, remove rocks

## Soil Preparation and Fertilization

- Apply fertilizer shortly before bed formation, according to soil test recommendations
- **Rule of thumb: 60 lbs/acre of N; 120 lbs/acre of P and K**
- Maybe Boron (if on sandy soils, see soil test)
- Maybe sulfur (if sulfur index is below 30)
- **Recommendations on strawberry fertility:**

<https://www.ncagr.gov/agronomi/documents/StrawberryFertility-Feb2015.pdf>

## Fumigation and Bedding

Planting Space based on:  
Variety, Experience and Vigor of  
plant

- 12 Inches = 17,500 plants/A  
(small cultivars, colder sites)
- **14 Inches = 15,000 plants/A**
- 15 Inches = 14,000 plants/A



# FUMIGATION SOIL CONDITIONS

- SOIL CONDITIONS are more important than TIMING
- Clod free,
- well airted,
- at 70% field capacity!
- Between 50 and 85F temp

# Fumigation and Bedding



## Fumigation and Plastic

### ❖ **Pic-Clor 60/80 (300-350 lbs/a, 21 days)**

Chloropicrin (60/80%) + 1,3D (40/20%)

### ❖ **Telone (30-40 gal/a, 21 days)**

Chloropicrin (17-35%) + 1,3-D (65%)

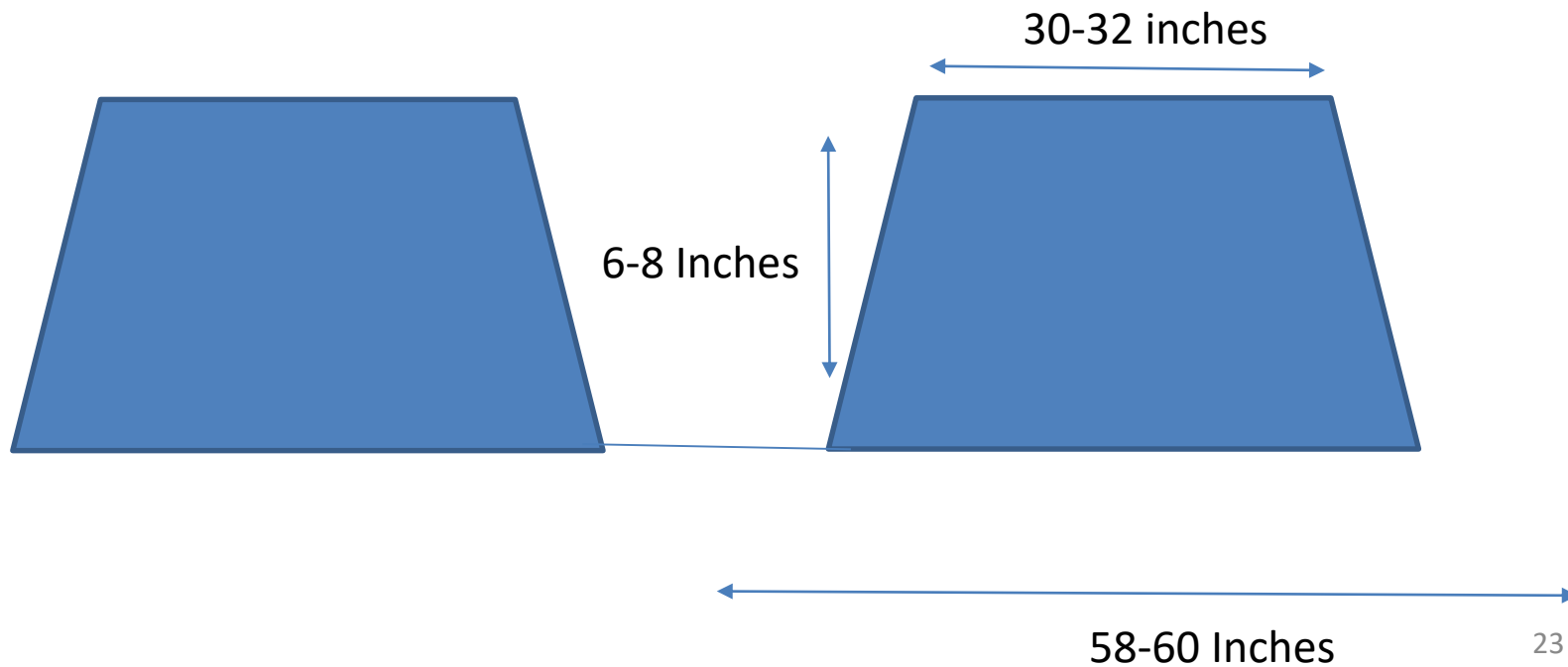
### ❖ **Paladin (14 days)**

Chloropicrin (21%) + Di-Methyl Disulfide (79%)

### ❖ **Vapam/Kpam/Sectagon and others (21 days)**

Metam Sodium/Metam Potassium

## Fumigation and Bedding



## Fumigation and Bedding

- 60 Inch center: 8712 linear feet of plastic / acre
- Use a 64-66 inch plastic roll
- Make sure beds are minimum 6 inches high!! Better 8!



## Fumigation and Plastic

Plastic	Costs	Control Efficacy
PE Films	Cheap	low
VIF	Costly	Low-medium
TIF	Costly	Medium-high

VIF and TIF have much better control efficacy. PE Film lets certain fumigants (1,3-D) escape very quickly, especially in sandy soils.

## Fumigation and Plastic

- *Soil Temperature*: > 50F;
- *Soil Structure*: High OM (-); Too many clods (-); Sandy soils (+);
- *Soil Moisture*: usually ca. 70% of field capacity;
- *Plastic and sealing*: TIF/VIF. Plastic needs to be tight to bed
- *Application rate*: Don't safe on fumigant! E.g. Pic-Clor 60: usually min rates of 350-400 lbs/ac (applied area). (equals around 170 lbs/ac (total area))

**Make Fumigation Plan!!!!**

## Fumigation and Plastic

Fumigant	Nematode	Disease	Nutsedge	Other weeds
Telone C 35 + VIF/TIF	+++++	+++++	+++	+++
Telone C 35	+++++	+++++	+	+
In-Line	+++++	+++++	+	+++
Metam Sodium	++	+++	++	+++++
Dominus	++	+++	++	+++
Pic-Clor 60	+++++	+++++	+	+++
Chloropicrin	+	+++++	-	-



## Safety and PPE

- Fit Test!
- Medical Exam
- Make sure it forms a seal
- Store at dry and cool place (not in garage/shop)
- Clean regularly
- Change cartridge regularly
- Never use a cartridge AFTER expiration date

# Transplanting

- **Well developed root ball!**
- Plug: Crown should be above substrate
- Bare-root: crown should be .5-1 inch thick

Picture by B. Poling

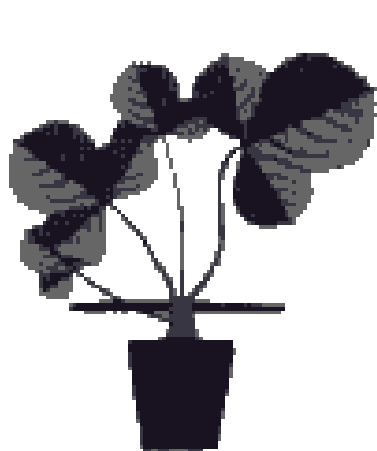


Plug Plant

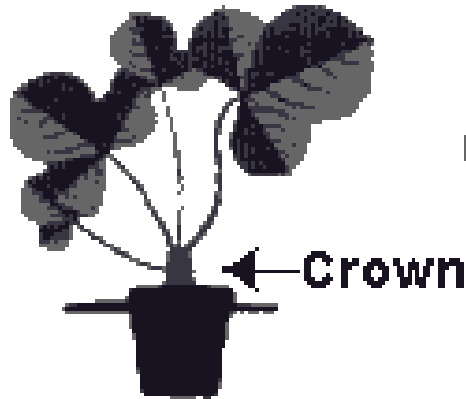
Bare Root/Cut-Off



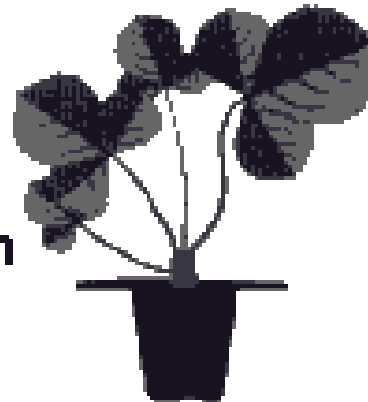
## Transplanting: Plugs



**TOO DEEP**



**TOO SHALLOW**

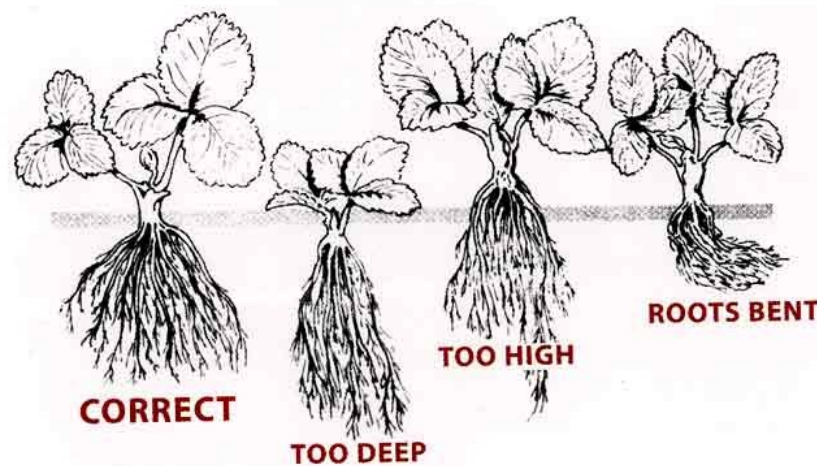


**CORRECT**

Pictures by [www.strawberryplants.com](http://www.strawberryplants.com)



## Transplanting: Bare Roots



Pictures by StarkBros Nursery





## Important Tips

- **Don't walk away after planting!!!**
- Don't plant weak plants. Get 5-10% more plants than you need
- Check on plants and replant! (1-2 weeks after planting)
- Use a drip applied fungicide to control Phytophthora root rot
- Remove crispy leaves
- Control of Neo-P: apply fungicides (Thiram)
- Remove Runners before end of Fall



## Important Tips

Most important reasons plants die shortly after transplanting:

- Phytophthora
- Anthracnose Crown Rot
- Neopestalopsis
- Not enough/no water (drip line is broken, no water was applied, too dry)
- Fumigation Residue
- Incorrect planting (often too shallow)
- Plug plants were weak/not very well developed

[SRSFC Activities](#)[Crops](#)[Regional Experts](#)[IPM/Production Guides](#)[County Agent Training](#)[Weather](#)

## IPM/Production Guides

*Last updated Friday 5 January 2018 8:9 GMT*

### Blueberries

[Southeast Regional Blueberry Integrated Management Guide](#)  
[Southeast Regional Blueberry Horticulture and Growth Regulator Guide](#)  
[Southeast Regional Organic Blueberry Pest Management Guide](#)

### Bunch Grapes

[Southeast Regional Bunch Grape Integrated Management Guide](#)

### Caneberries

[Southeast Regional Caneberries Integrated Management Guide](#)  
[Southeast Regional Caneberry Production Guide \(PDF\)](#)  
[Southeast Regional Caneberry Production Guide \(Online Version\)](#)

### Muscadines

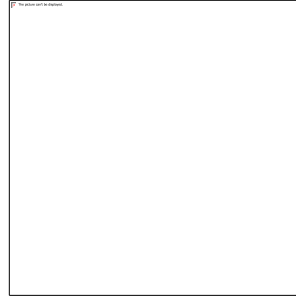
[Southeast Regional Muscadine Grape Integrated Management Guide](#)

### Strawberries

[Southeast Regional Strawberry Integrated Pest Management Guide](#)  
[Southeast Regional Strawberry Plasticulture Production Guide](#)  
[Fungicide Selection for Botrytis and Anthracnose Fruit Rot Management 2017](#)

[www.smallfruits.org](http://www.smallfruits.org)

- NCSU Strawberry Portal: <https://strawberries.ces.ncsu.edu/>
- NCSU Diagnostic Key: <https://diagnosis.ces.ncsu.edu/strawberry/>
  - NC Strawberry Association: <https://ncstrawberry.com/>
- Strawberry School: <https://smallfruits.org/2021/02/southeastern-strawberry-school-webinar-series/>



# Thank You

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