

Greenhouse Tobacco Seed Performance Research

T. David Reed and R. Spencer Irby

Virginia Tech

Southern Piedmont Center
Blackstone, Virginia

51st Tobacco Workers' Conference
January 15-17, 2024



Goal is to maximize usable transplant yield



Contrasting Seedling Stands

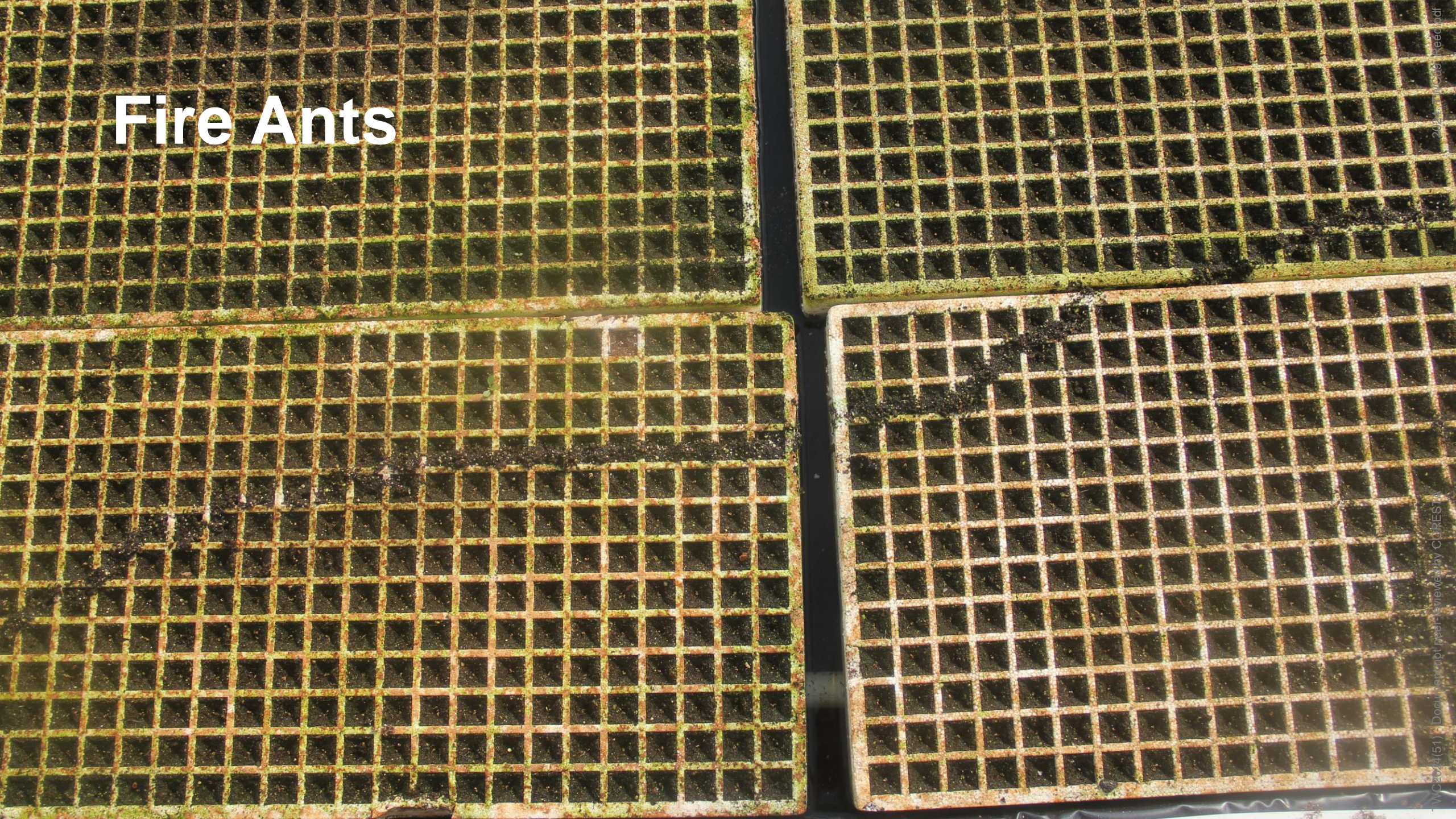
98% stand (1 small seedling)



87% stand (at least 8 small seedlings)

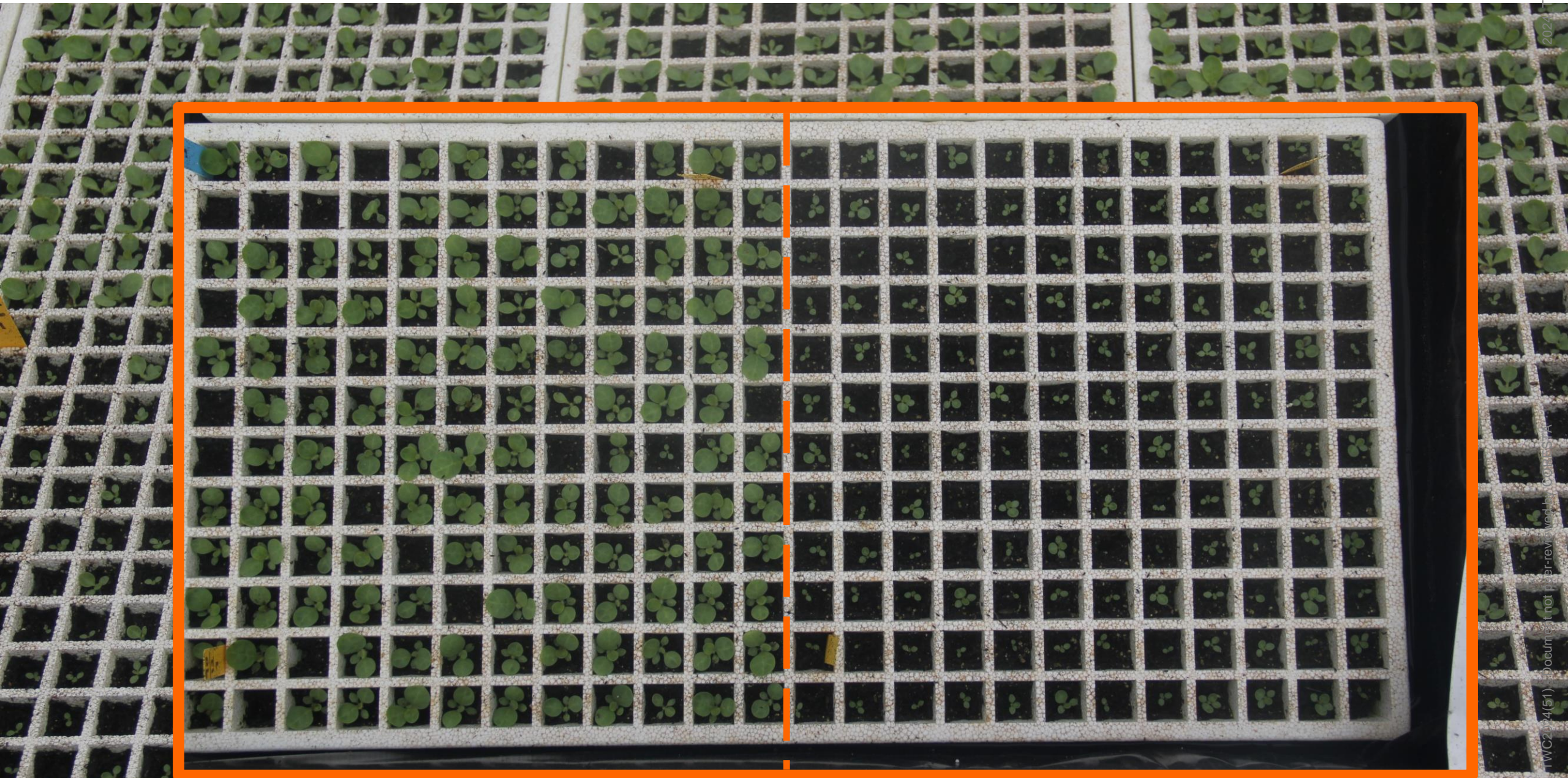


Fire Ants





TN 90 in spring `23





Factors impacting tobacco seedling emergence

✓ **Temperature**

- Fluctuating temperature to break dormancy

✓ **Sunlight**

- A lot of antidotal data on role of light and tobacco seedling emergence

✓ **Seed imbibition of water**

- Must first wet the pellet material
- Wetting properties of soilless mix

✓ **Seed quality**

Evaluation of Greenhouse Tobacco Seed Performance Factors – Spring 2023

Objective

Evaluate the interaction of multiple factors impacting float greenhouse tobacco seed performance

Variables Evaluated

1. Greenhouse seeding date
2. Soilless germination mix
3. Seed coating

Evaluation of Greenhouse Tobacco Seed Performance Factors – Spring 2023

Treatments

- ✓ 4 seeding dates: February 23 and March 3, 13, and 22
- ✓ 3 soilless mixes
 - Carolina's Choice 60:20:20 peat, vermiculite, and perlite
 - Carolina Gold (Beltwide) 90:8:2 peat, vermiculite, and perlite
 - Lambert Aggregate-Free 100% peat
- ✓ Comparison of 2 seed pellets for the same seed lot
 - melt-away vs. spilt-coat

Carolina's Choice

The Gold (Beltwide)

Carolina Gold AFM

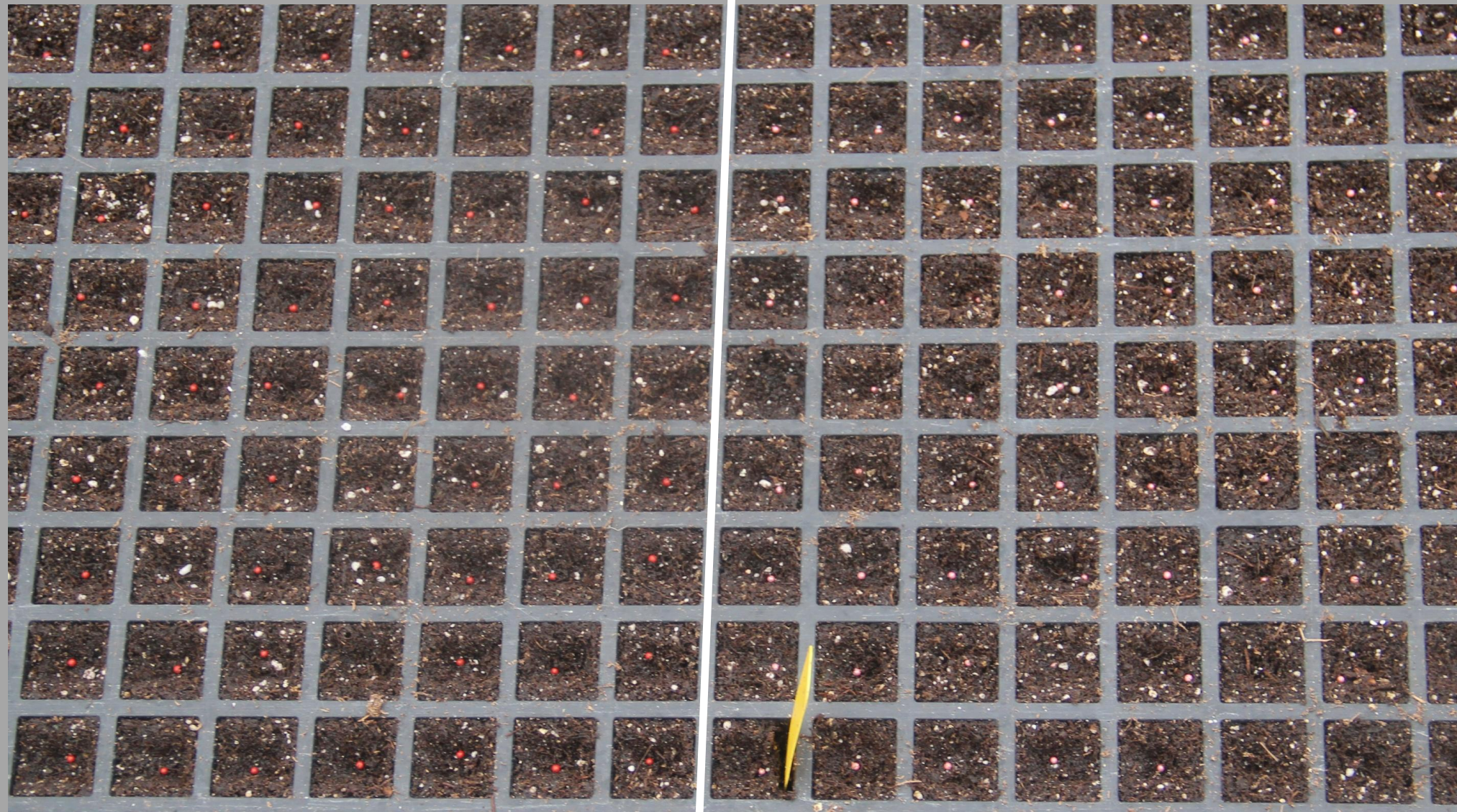


Comparison of Seed Pellet Technology



Melt-away

Spilt coat

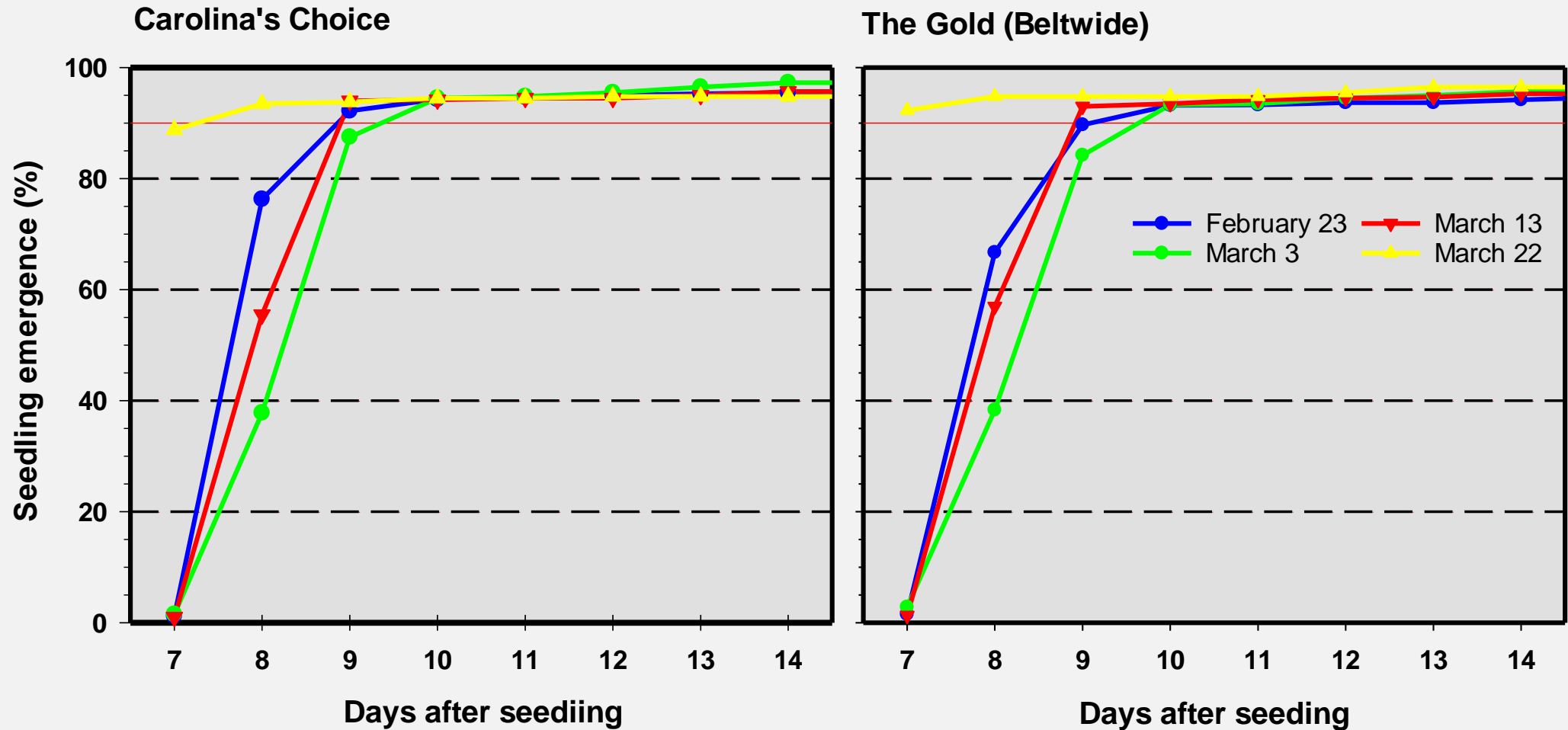


Melt-away

Spilt-coat

Greenhouse Tobacco Seed Performance Trial, Spring 2023

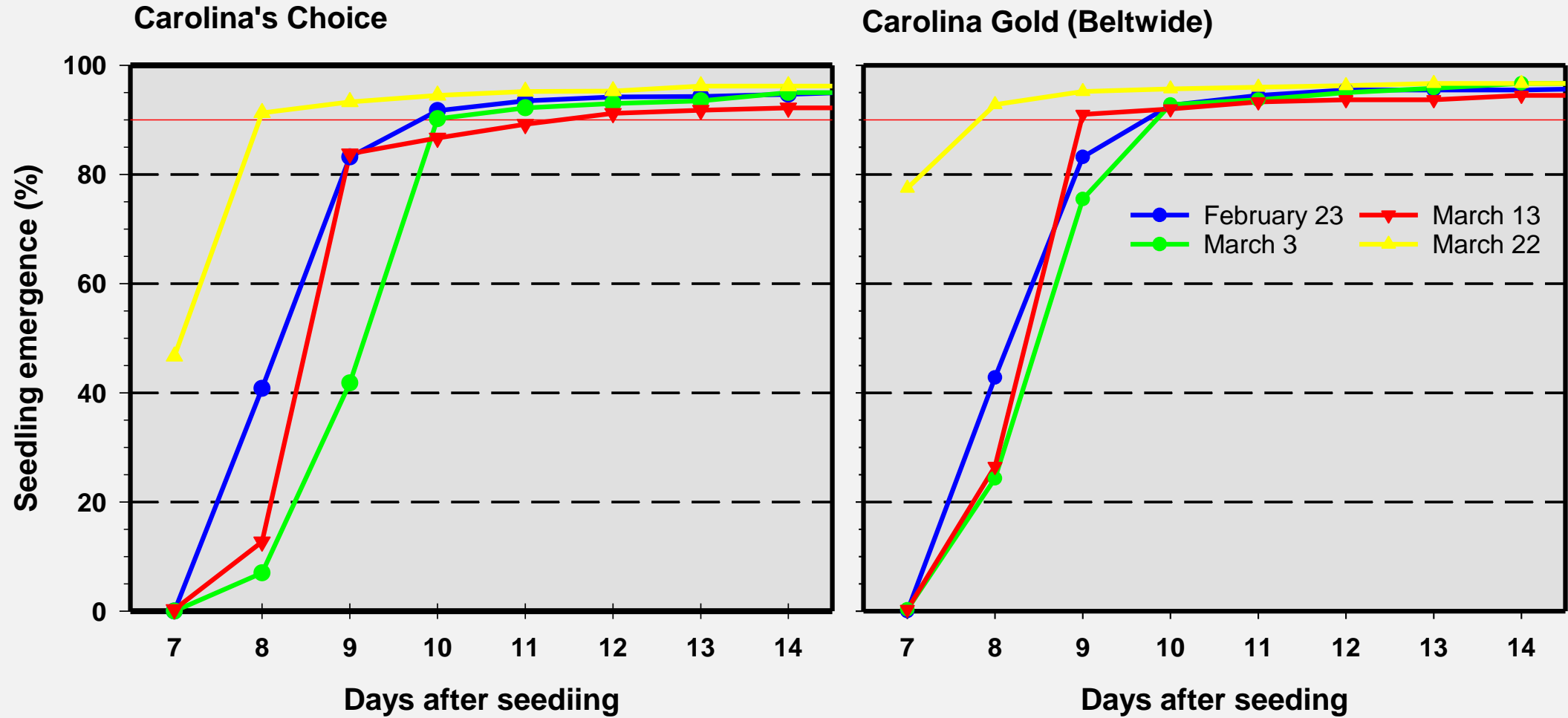
Virginia Tech, Southern Piedmont Center



Standard commercial pellet (melt-away)

Greenhouse Tobacco Seed Performace Trial, Spring 2023

Virginia Tech, Southern Piedmont Center

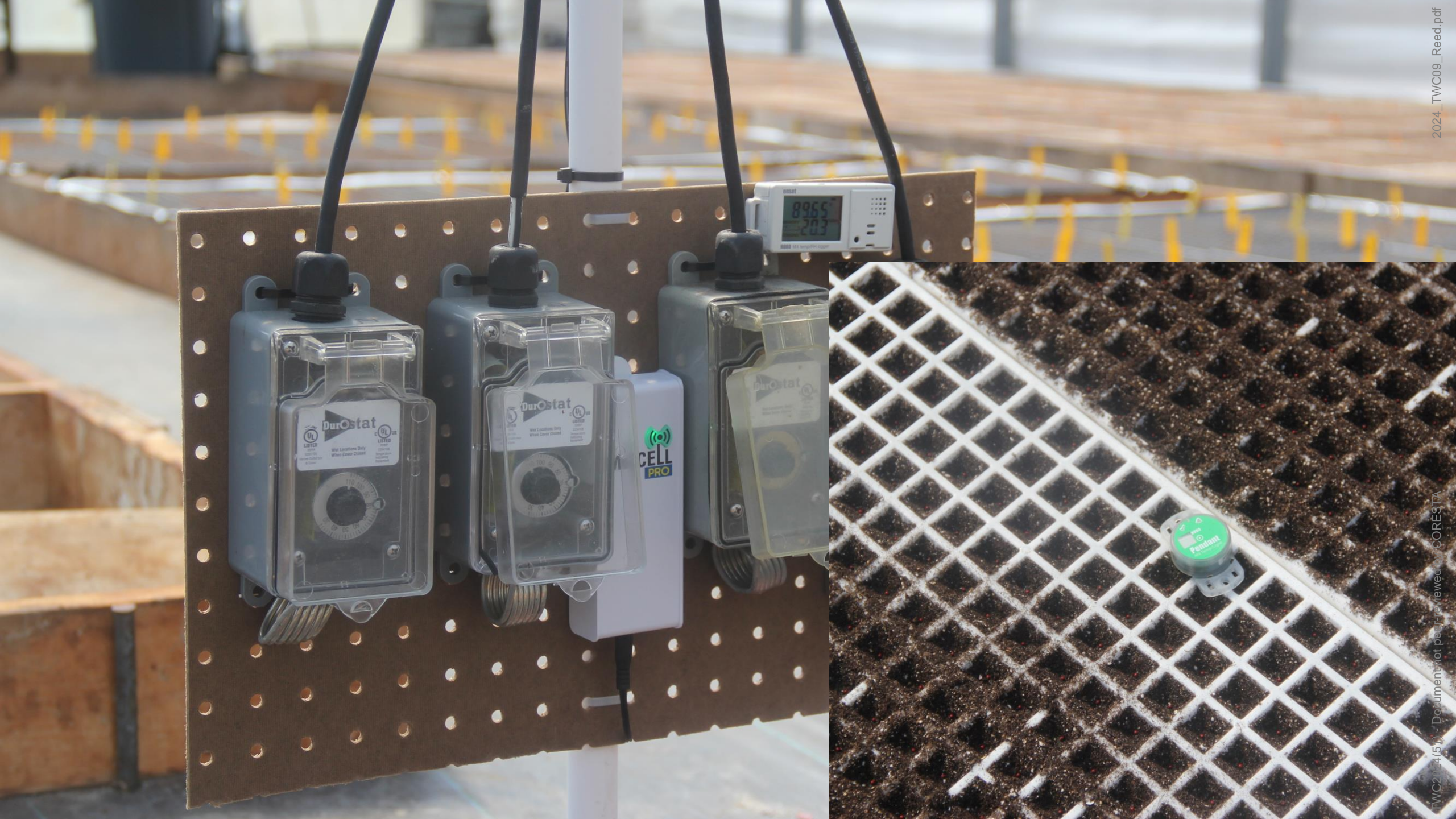


Experimental pellet material (spilt-coat)

Seed Performance Trial, 2023 -- ANOVA

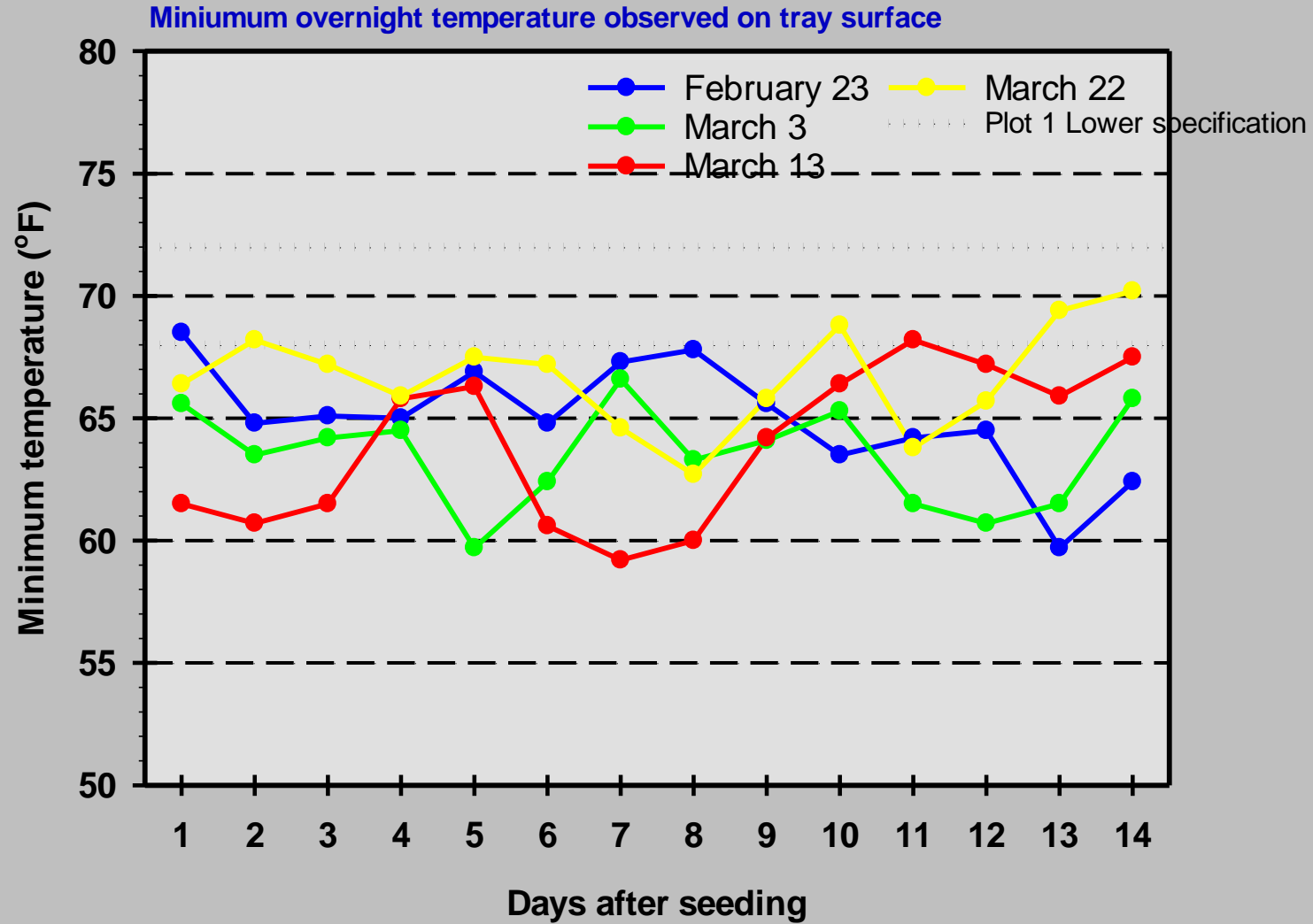
Combined analysis over 4 seeding dates (3 soilless media X 2 seed pellet treatments)

Source	P > F		
	Seedling emergence		Seedling stand
	8 DAS	10 DAS	14 DAS
Pellet	< 0.0001	< 0.0001	0.0134
Soilless Mix	< 0.0001	0.0942	0.3373
Pellet X Mix	0.0268	0.0407	0.0341
Seeding Date	< 0.0001	0.0126	0.2925
Pellet X Date	< 0.0001	0.1620	0.1895
Mix X Date	0.0014	0.4258	0.1219
Pellet X Mix X Date	0.6405	0.3670	0.1003



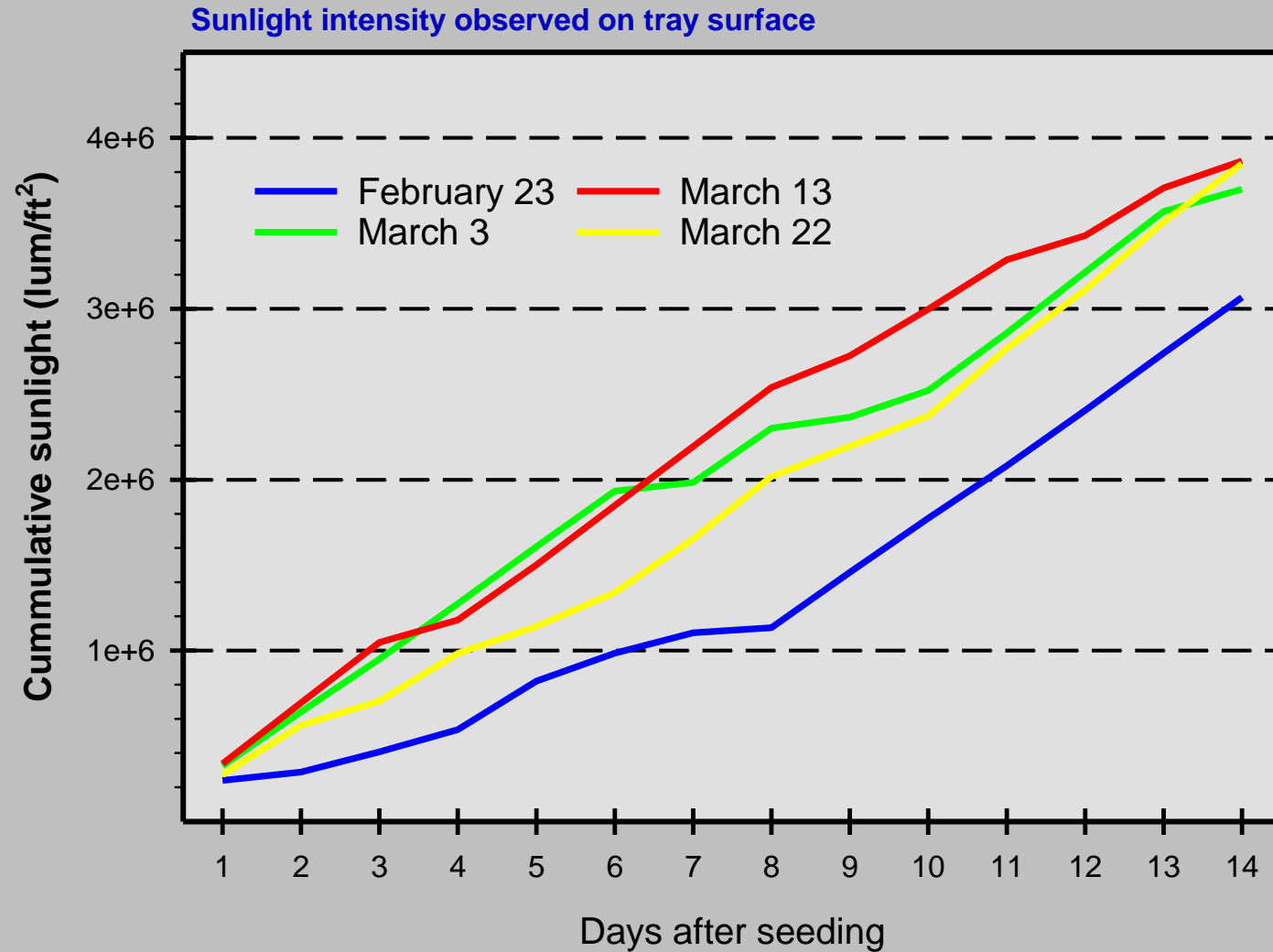
Greenhouse Tobacco Seed Performance Trial, Spring 2023

Virginia Tech, Southern Piedmont Center

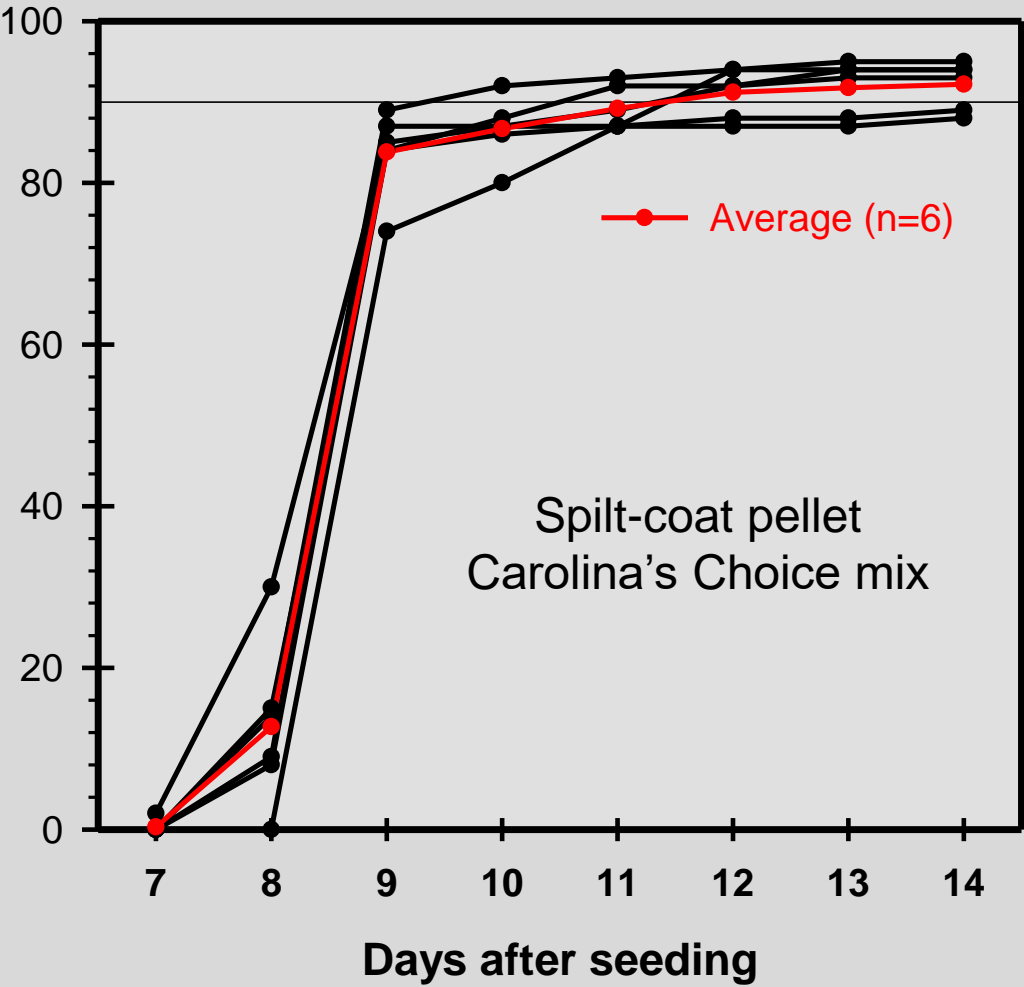
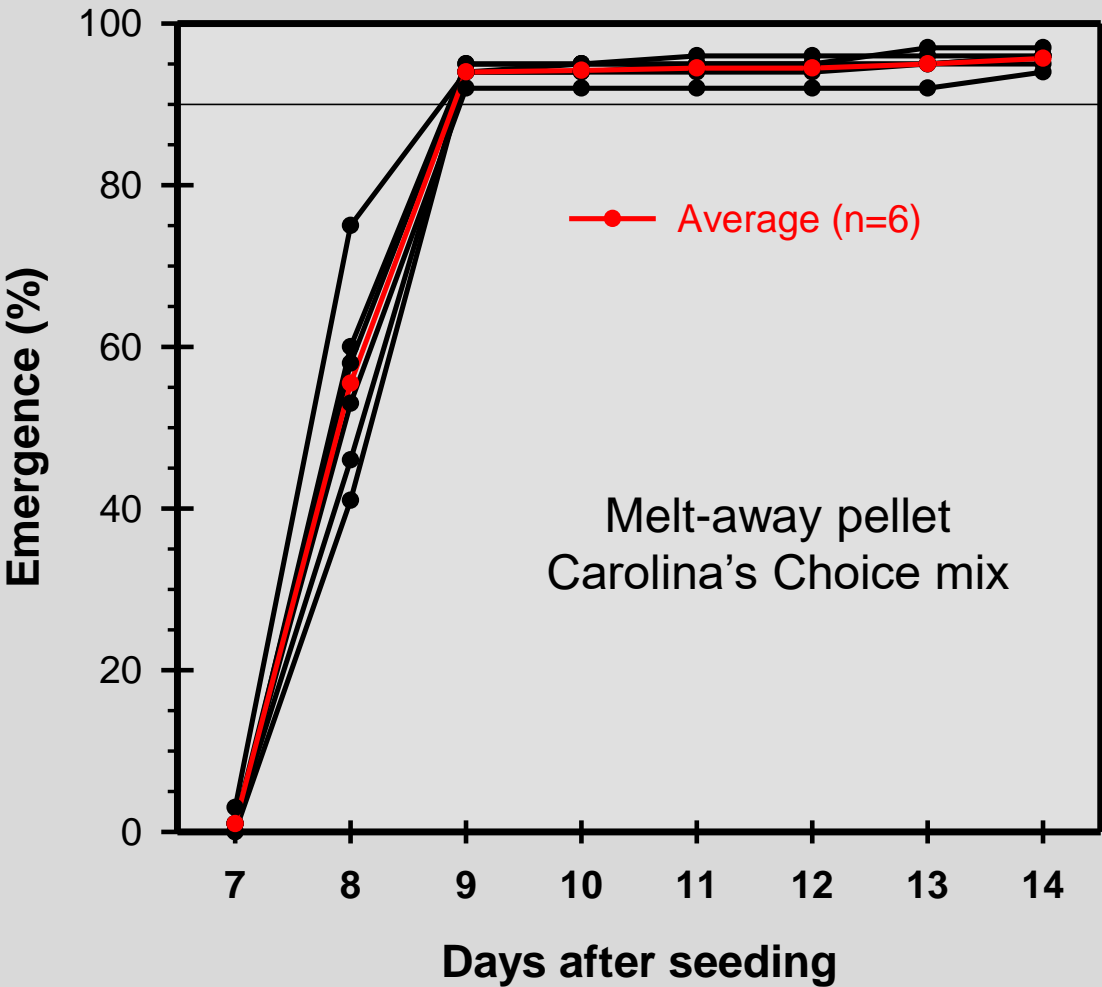


Greenhouse Tobacco Seed Performance Trial, Spring 2023

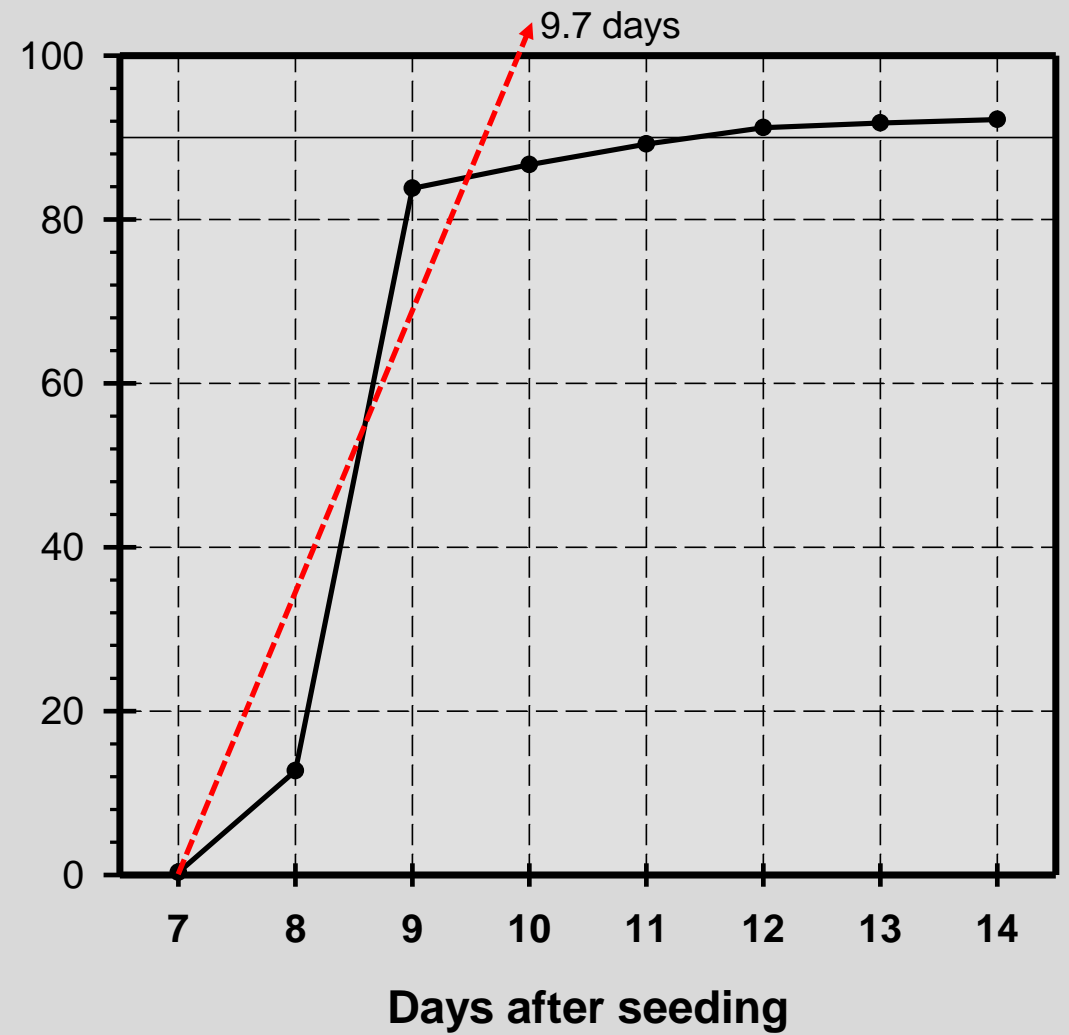
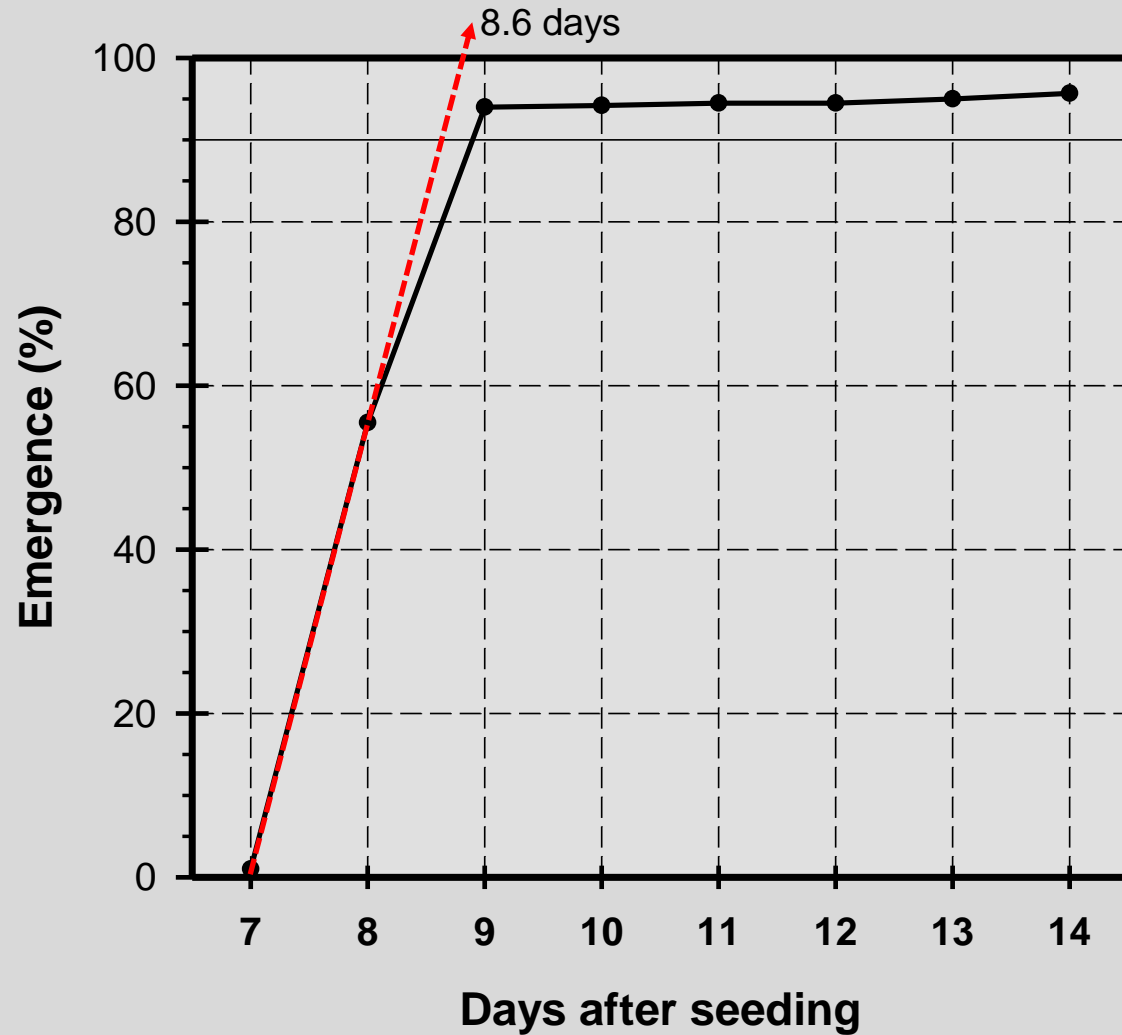
Virginia Tech, Southern Piedmont Center



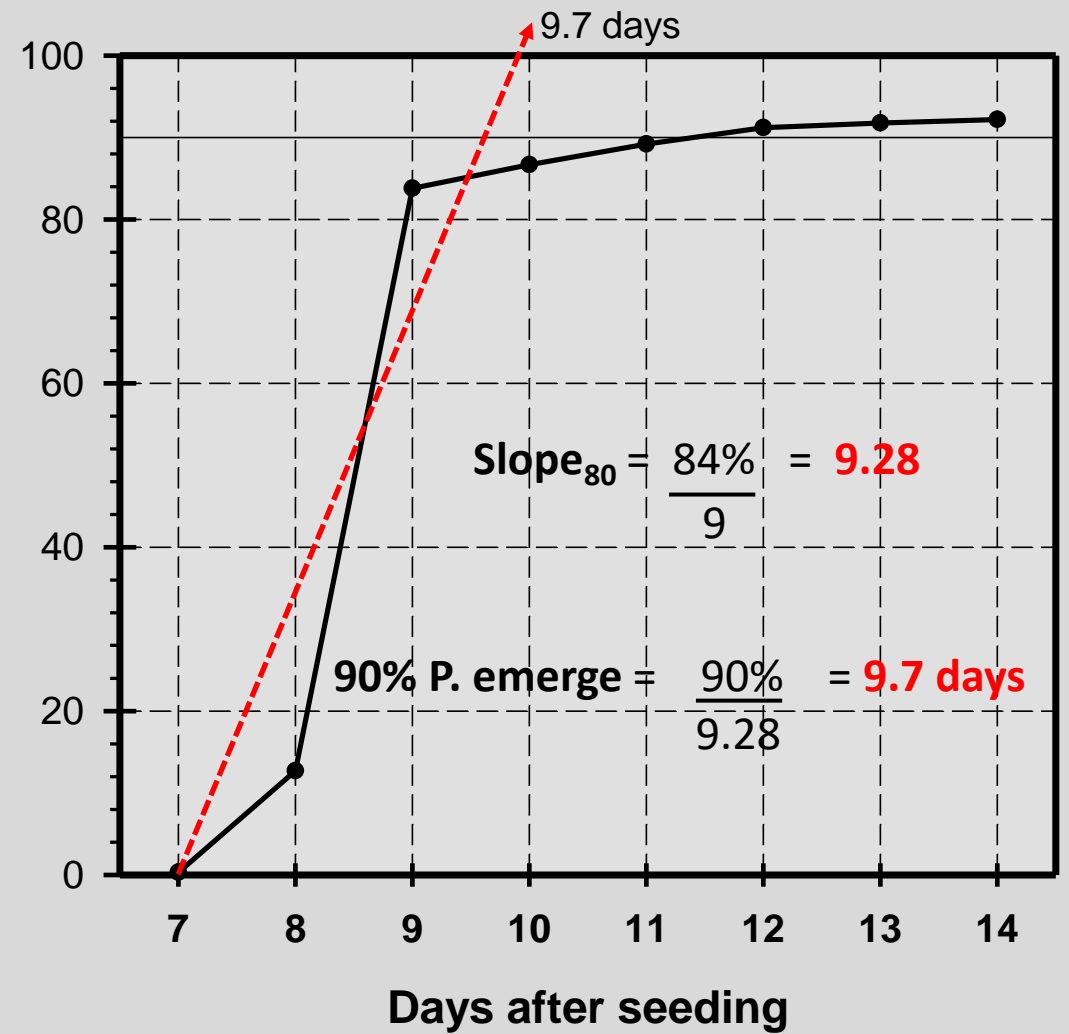
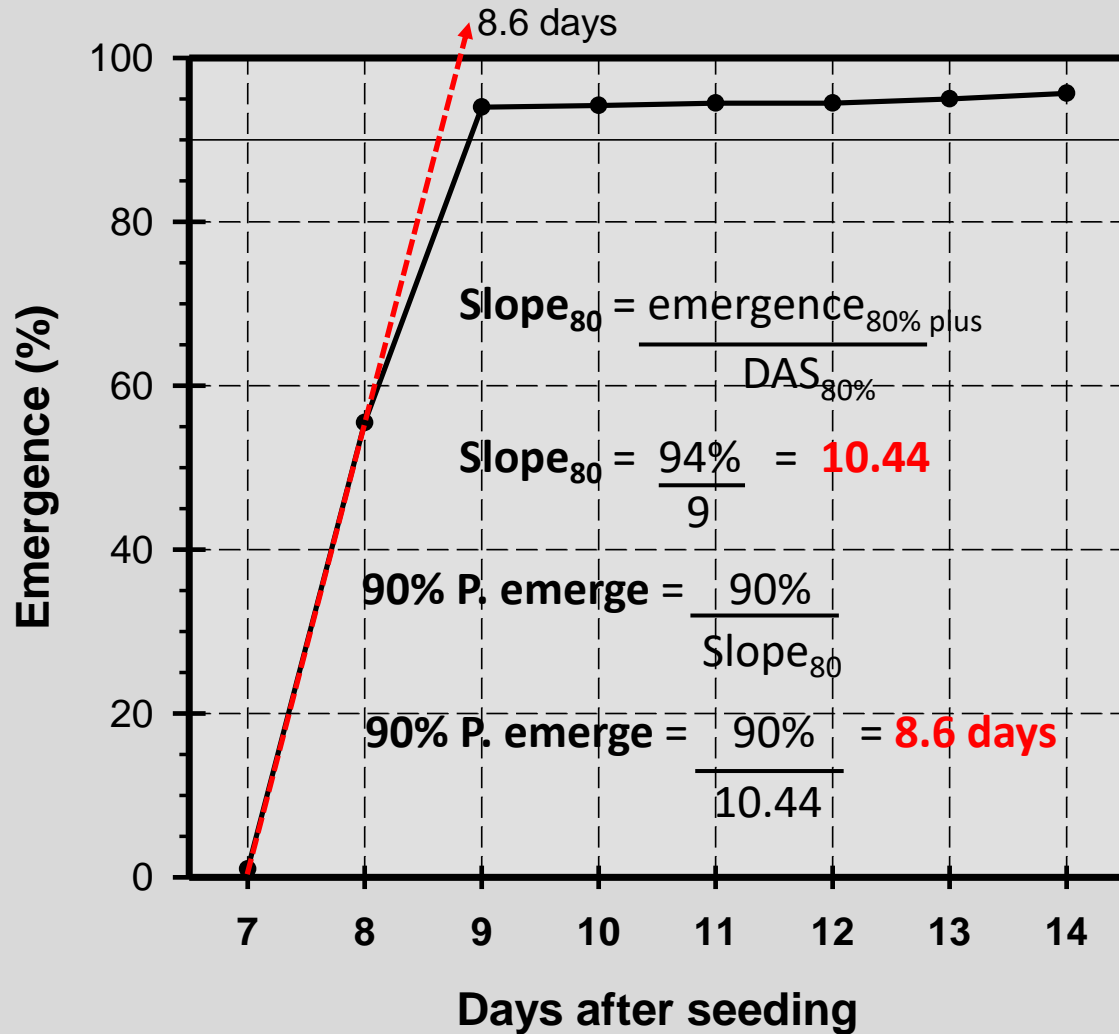
Variability in Seedling Emergence



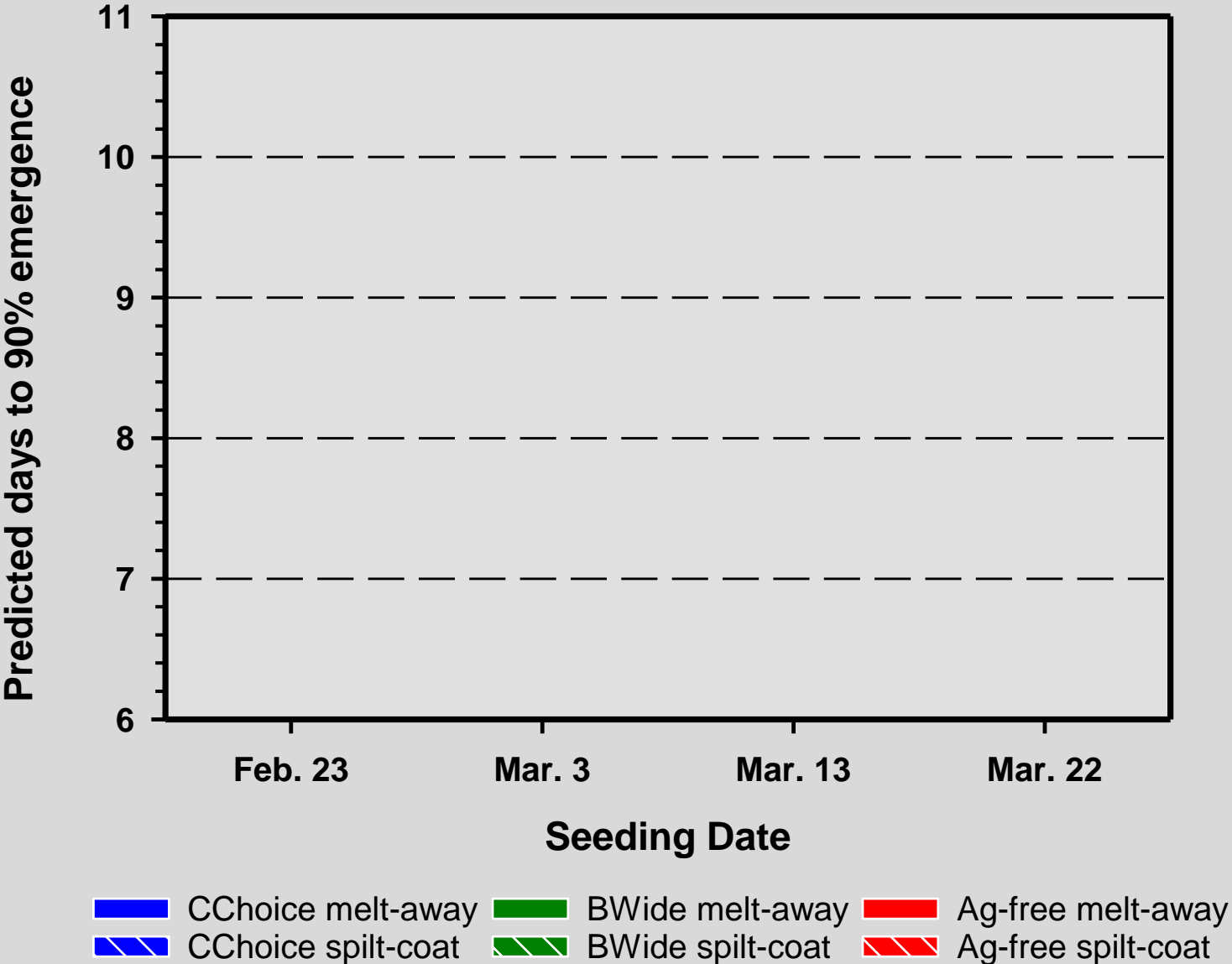
Calculation of a “Predicted Days to 90% Seedling Emergence”



Calculation of a “Predicted Days to 90% Seedling Emergence”



Seed Performance – Seed X Media X Seeding Date Study, 2023



Seed Performance – Seed X Media X Seeding Date Study, 2023

Combined ANOVA over 4 seeding dates (3 soilless media X 2 seed pellet treatments)

Source	P > F
	Predicted 90% emergence based on rate to 80%
Pellet	< 0.0001
Soilless Mix	< 0.0001
Seeding Date	< 0.0001
Pellet X Mix	0.4099
Pellet X Date	0.1592
Mix X Date	0.0155
Pellet X Mix X Date	0.0775

Summary

- ✓ **Significant differences were observed between seed pellets for early emergence at 8 DAS through seedling stand at 14 DAS**
- ✓ **Delayed emergence and more variable emergence were observed with the increased inclusion of perlite in the soilless mix**

Summary

✓ **What factors impacted seed performance ?**

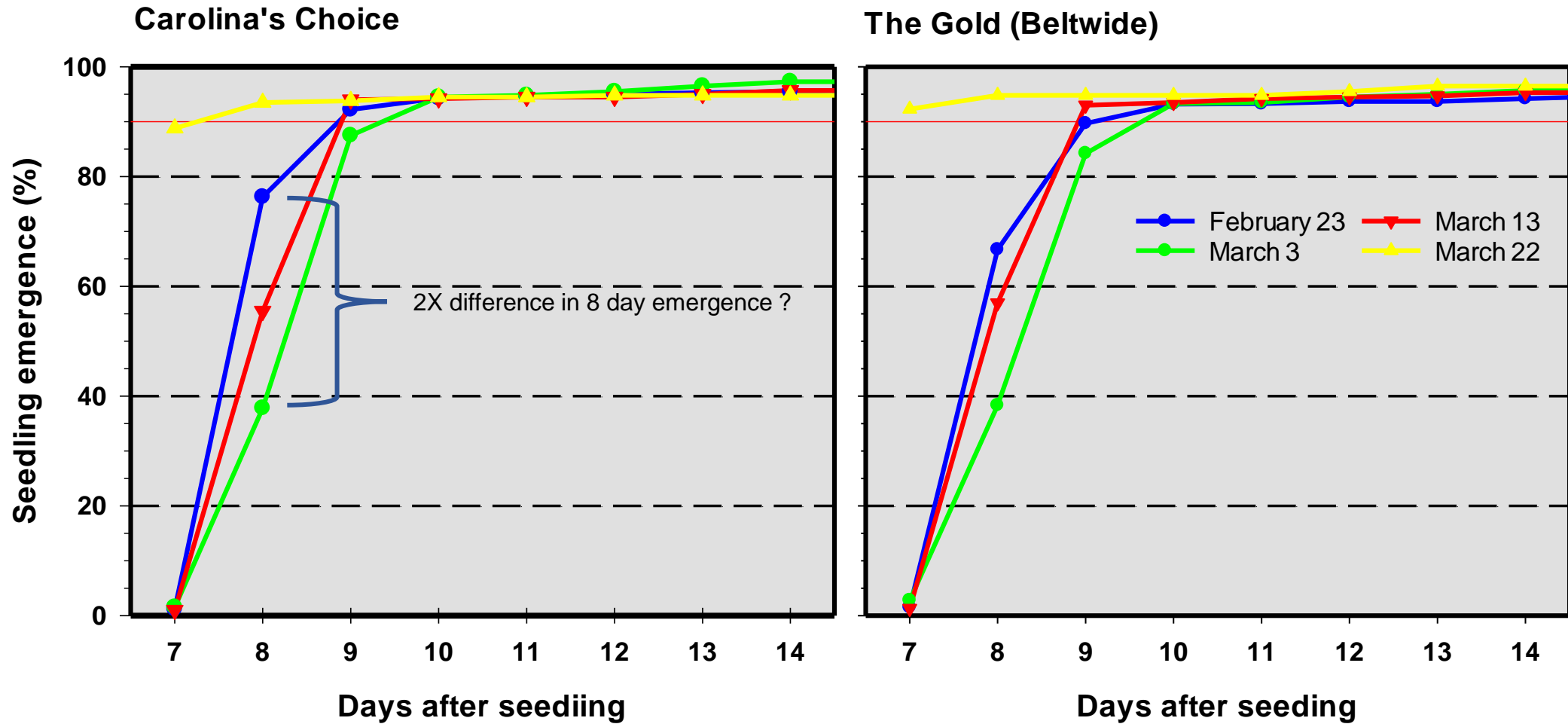
Seed Pellet >> Soilless Mix > Seeding Date

Early Emergence > 14-day Seedling Stand

Thank You

Greenhouse Tobacco Seed Performace Trial, Spring 2023

Virginia Tech, Southern Piedmont Center



Standard commercial pellet (melt-away)