Pollinator/Wildlife/Native Habitat

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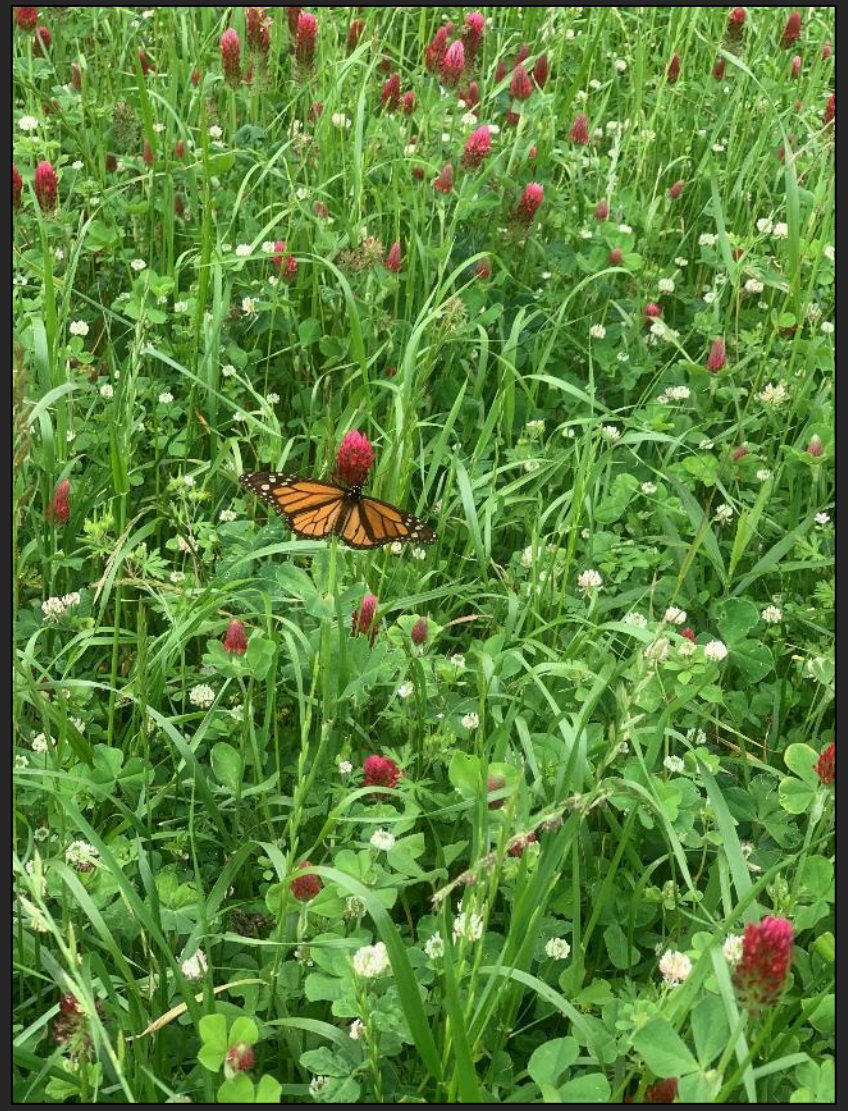
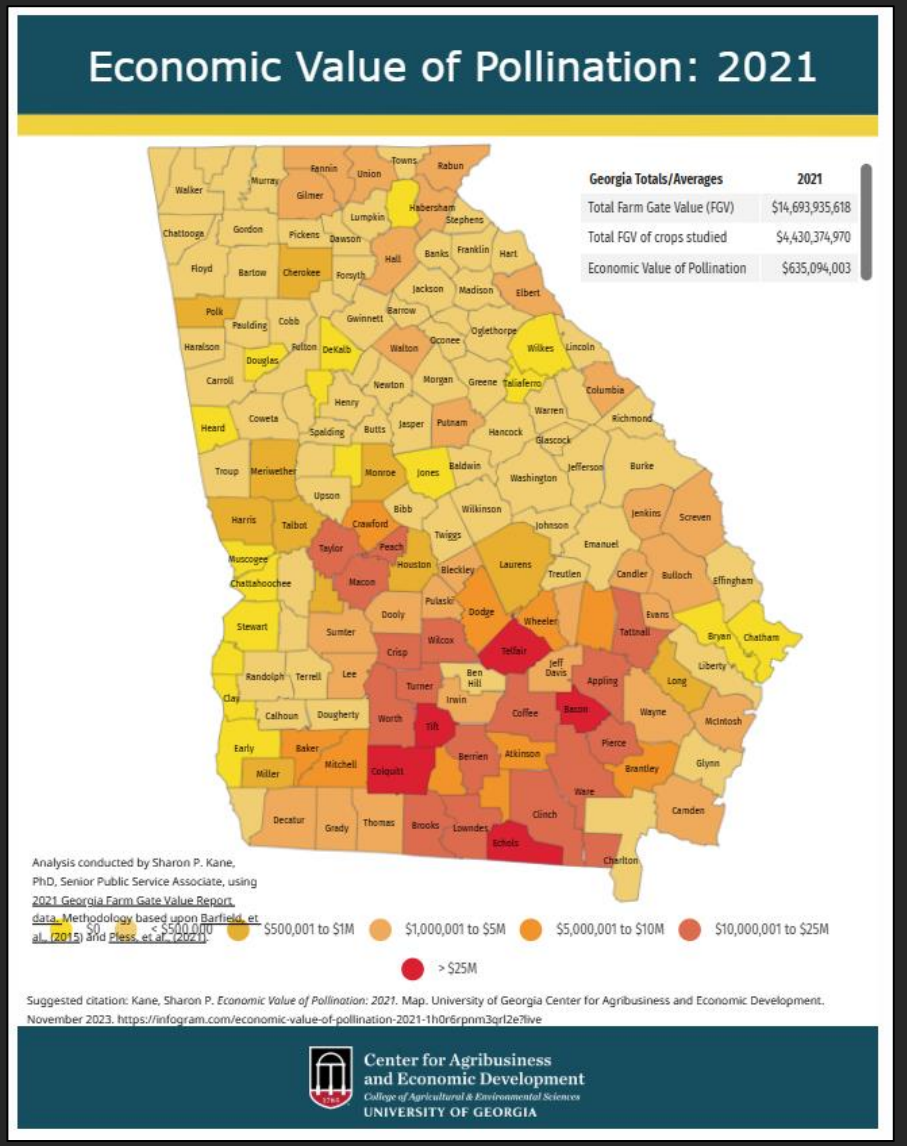
Increased Interest

- Support pollinators
  - Vegetables/agronomic
  - Pecans/citrus
  - Cover crops
- Unused land – dry corner, field borders, unproductive area
- Meadows
- Agrotourism – U-pick/photography
- Dry corners
- Wildlife “habitat”



Pollinator Habitat on the Farm

- Impact on day-to-day life:
  - –30% of world's food is pollinated
  - –130+ fruits and vegetable plants
  - –1 in 3 bites of food
- Why should you care???
  - –*$18-27 billion/yr* in US crop yields
    - GA = $635 million
    - ***Services from pollinators is FREE!***
    - Indirect cash crop???



Beyond “Pollination”

- No Pollination….no seed….no fruit….no profit…..
  - Why else should we consider?

1. *Environmental/ecological stewardship*
2. *Implications for pesticide stewardship*
3. *Public engagement/recreational*

Environmental

- Environmental/ecological stewardship
  - Biodiversity → diverse diet
  - Wildlife habitat
  - Help control pests → predators/parasitoids

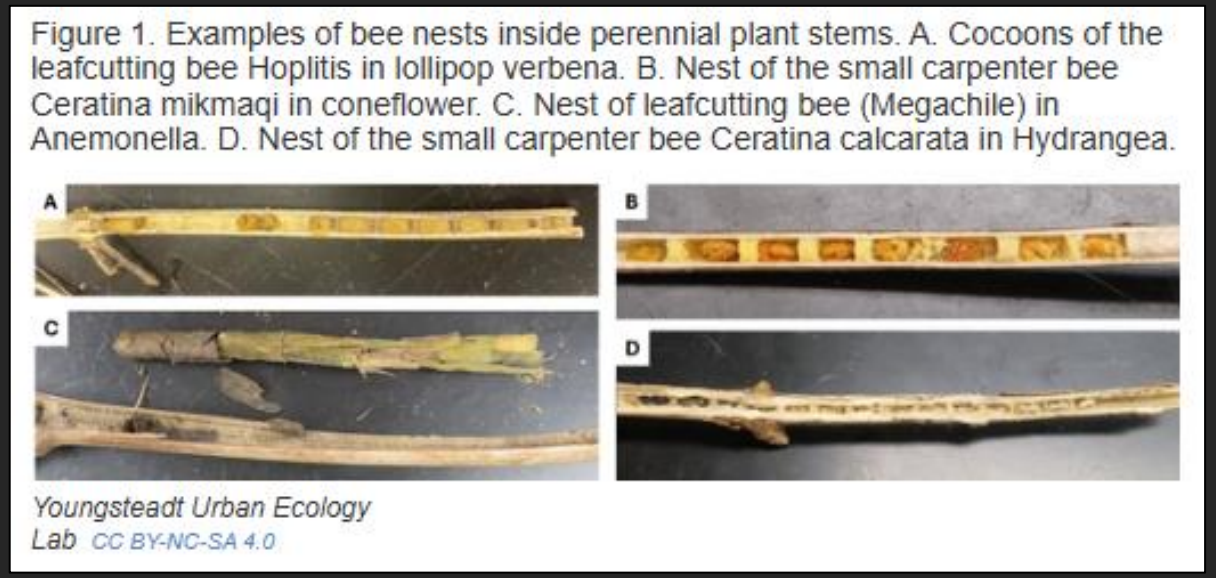
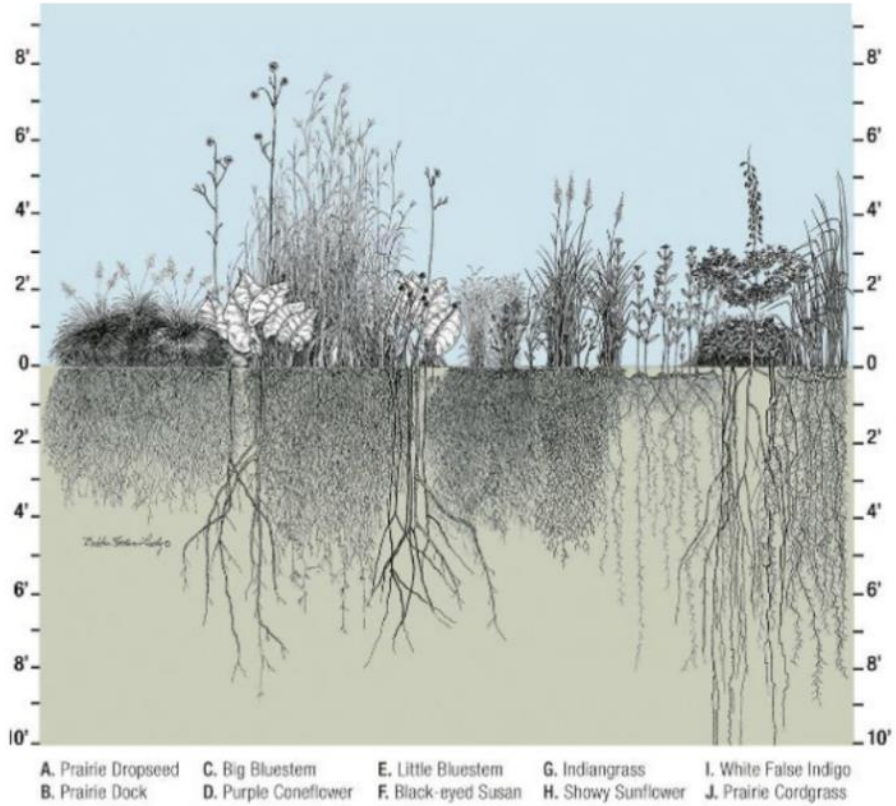


Figure 1. Examples of bee nests inside perennial plant stems. A. Cocoons of the leafcutting bee Hoplitis in lollipop verbena. B. Nest of the small carpenter bee Ceratina mikmaqi in coneflower. C. Nest of leafcutting bee (Megachile) in Anemonella. D. Nest of the small carpenter bee Ceratina calcarata in Hydrangea.

Youngsteadt Urban Ecology Lab

Environmental

- Environmental quality
  - Filter pollutants (runoff/erosion)
  - Improves air quality
  - "Heat island" effect in urban areas
  - Increase soil OM/water infiltration
  - Sequester carbon



Root systems of selected prairie flowers and grasses

Pesticide Stewardship

- Indirect ROI…..hard to quantify
  - Don’t directly increase yield, etc.
  - Extra expense to install/maintain
- Direct Implications
  - Supporting endangered/listed/sensitive species
  - Mitigation for runoff/erosion

Public Engagement/Recreational

- Positive public engagement
  - Eye catching
  - Conversations about what's happening on the farm
  - Get people onto the farm!
- Wildlife/hunting habitat
  - Economic benefits
  - Enjoyment
  - Connection to nature

Define Goal of the Site

- What does the grower want to accomplish?

- This will inform:
  - What to plant
  - When to plant
  - How to manage the site for longevity
  - What financial resources are available
  - And most importantly…..what to **EXPECT**!

Think Through….

Logistics

Equipment

Site conditions (sun/shade/wet/dry)

WEED PRESSURE

Management potential

(Burning? Mowing?)

Site history

Timeline

Land/space commitment

Timeframe to establishment

Ground coverage constraints

Types of Plantings/Sites

1. Wildlife/hunting habitat
   - Quail, others
2. Meadow
   - Grasses, habitat/grazing (?)
3. Pollinator habitat
   - Pollinating insects, flowers
4. Hybrid
   - Cover crops, pollinator, agrotourism, etc.

Wildlife Habitat

- Many resources available in GA for private landowners:
  - Georgia DNR
    - Private Lands Program (PLP)
    - Wildlife biologists
  - Quail Forever
    - Conservation/Farm Bill biologists
  - NRCS
    - Resource concern/planning
  - Georgia Foresty Commission
    - Land planning

Wildlife Incentive Programs

Including technical assistance and/or financial incentives

****START HERE*****

- GA DNR Landowner's Guide to Conservation Resources
  - *https://indd.adobe.com/view/04519a6a-5d2b-44a7-b452-890ef04b8c7d*

- DNR/Quail Forever Bobwhite Quail Incentive (BQI)
  - *https://georgiawildlife.com/bobwhite-quail*
- DNR/GFC Forest Stewardship Program (FSP)
  - *https://gatrees.org/forest-management-conservation/forest-stewardship-program/*
- DNR Open Habitat Incentive (OHI) Program
  - *https://georgiawildlife.com/open-habitat-initiative-rcpp*
- NRCS – Working Lands for Wildlife (Gopher Tortoise)
  - *https://www.nrcs.usda.gov/programs-initiatives/working-lands-for-wildlife/gopher-tortoise*

Meadow

- Predominately native grasses (typical)
  - 65-70% of total space
  - LONG TERM COMMITMENT
- Often naturally around wooded habitat sites
  - MUST keep out “invasives”
  - Can have forbs included
  - Hard to establish but easy to maintain
- Research is growing in this area
  - NRCS GA PMC
- *https://fieldreport.caes.uga.edu/publications/B987-4/native-plants-for-georgia-part-iv-grasses-and-sedges-2/*

Pollinator Habitat

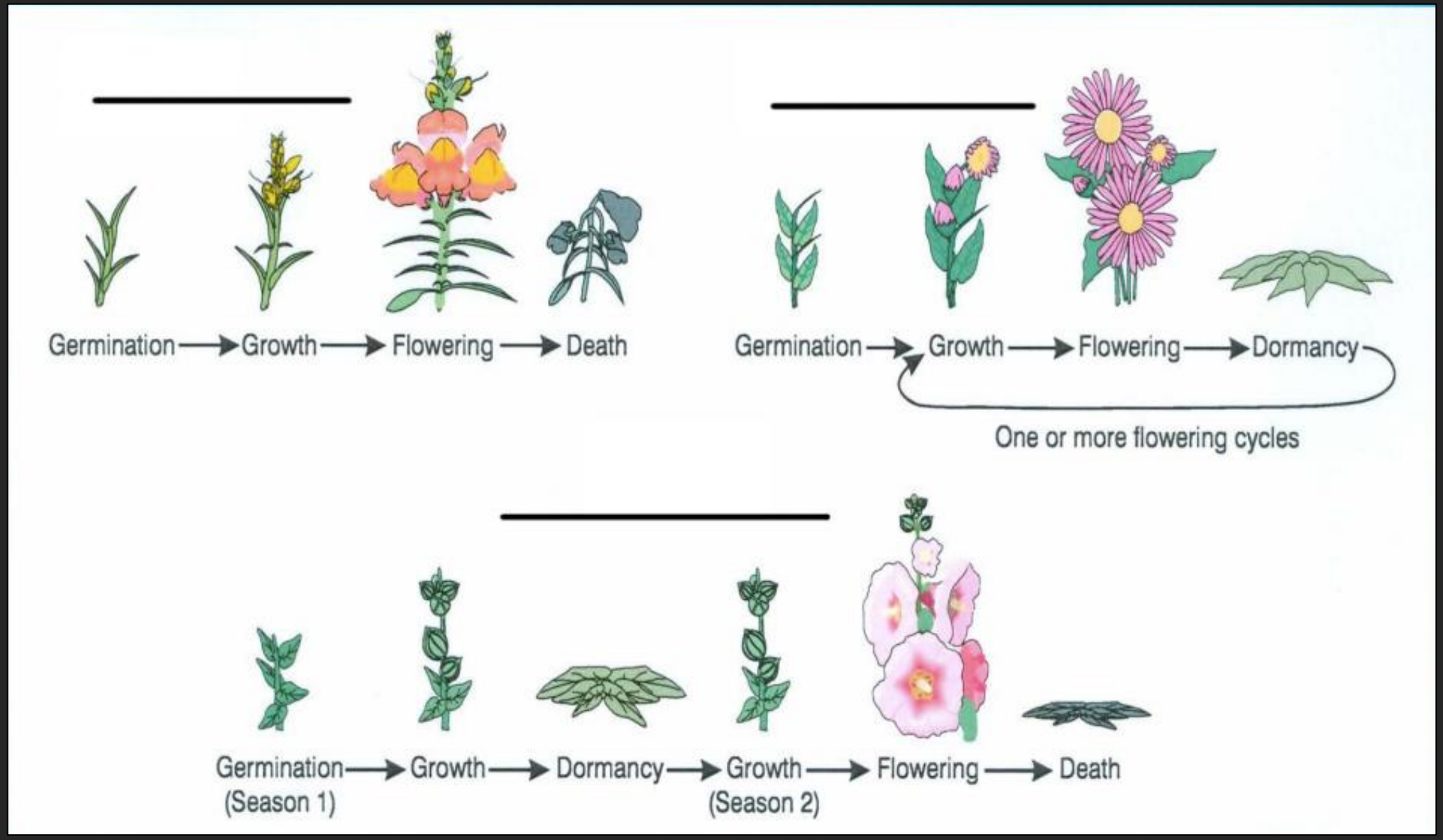
- "Flower-rich" habitat supporting pollinating insects, birds, bats, etc.
  - Flowering plants, grasses, shrubs, trees
  - Nectar/pollen throughout growing season (spring/summer/fall)
  - Water availability
  - Nesting/foraging materials
- Types of species included:
  - Native
  - Non-native (commercialized, ornamental)

A Year of Pollinator Habitat




Winter ----------Spring ----------Summer/Fall----------After 1st Freeze/Frost-----

Life Cycle is Important



Let's Plant Habitat on the Farm!

- Unproductive, bare area of farm
- Can I go throw out some seed?
  - Not recommended!
  - Think back to timeline/logistics
  - $$$$$
- Many challenges and questions:
  - What species?
  - How to plant?
  - Maintenance?
  - WEED CONTROL????

UGA Research Plan

Goal = help you implement pollinators habitat on your farm

1. Mixture of native species
2. Weed control during establishment
   - PRE (residuals)
   - POST (cleanup)
3. Persistence over time

Year 1

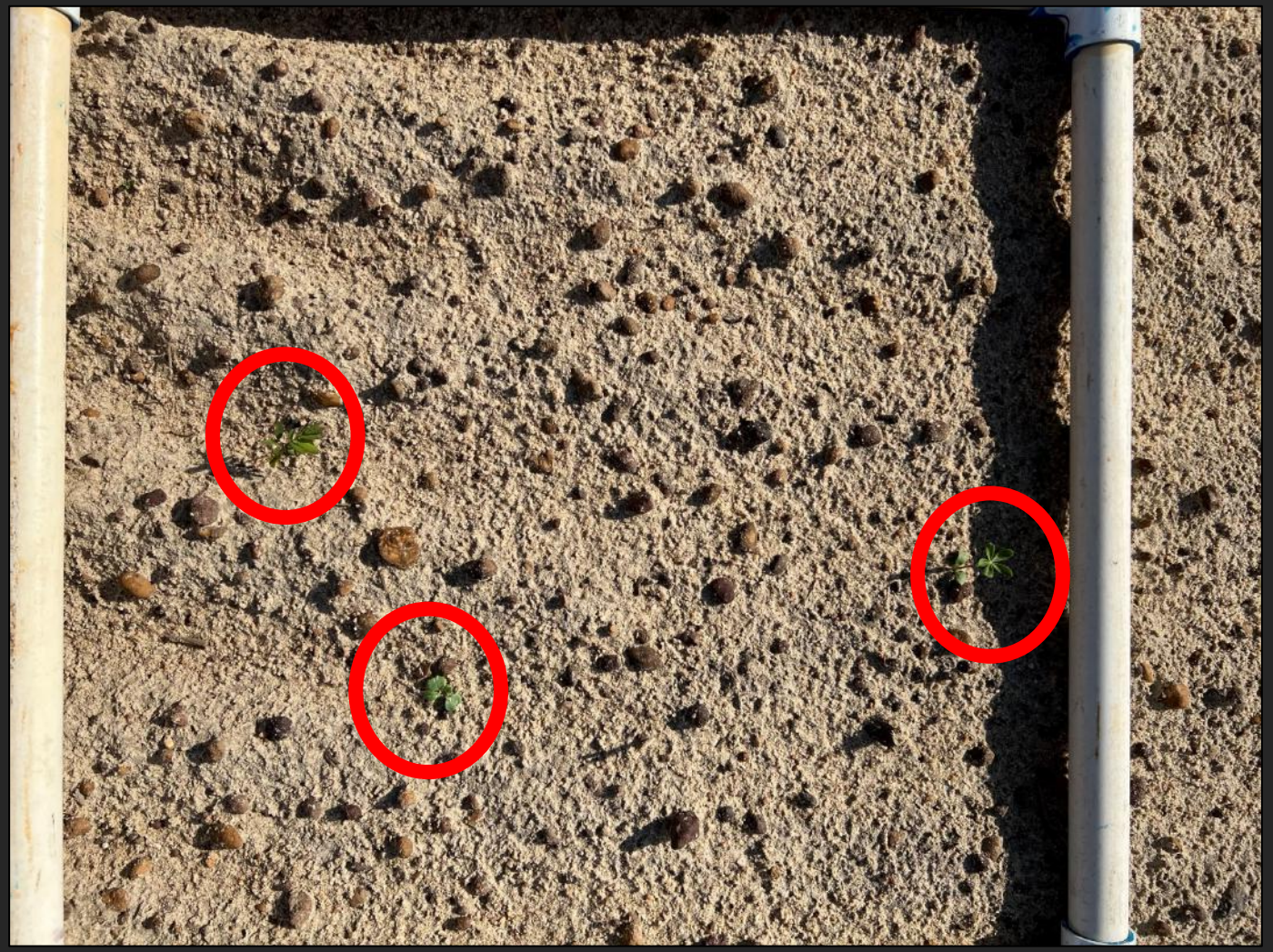
UGA Ponder Farm (TyTy, GA)

- 23 native species
- Overhead irrigation
- Hand weeded = no competition
- PRE/POSTs
- NTC for every species

Perfect planting/growing conditions

Year 1 = disaster

Seeding rate = 0.5-3.7 lb/a



Emergence rate = 0-1%

…across 2 sites!

UGA Research Plan

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1. Mixture of native species
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   - PRE (residuals)
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UGA Research Plan

Goal = help you implement pollinators habitat on your farm

1. ~~Mixture of native species~~
2. ~~Weed control during establishment~~
   - ~~PRE (residuals)~~
   - ~~POST (cleanup)~~
3. ~~Persistence~~

Year 2/3 → Switch Focus

- Start with commercialized annuals, add in natives after establishment
  - Fast growing
  - Hardy
  - *Herbicide tolerance?*
- PRE herbicides → screen for tolerance across wide range of products
  - Zinnia, Cosmo, Marigold, Mexican sunflower

Screening for Everything (PRE)

3 years ….and running!

- Alite (Axant)
- Axiom
- Brake
- Cadre
- Caparol
- Command
- ~~Dacthal~~
- Devrinol
- Dual Magnum
- Enversa
- Eptam
- Goal
- Goltix
- Nortron
- Prowl
- Pursuit
- Reflex
- Spartan
- Staple
- Torero
- Treflan
- Chateau/Valor
- Warrant

Screening for Everything (PRE)

NO	MAYBE (adjust rate?)	YES
Command	Warrant	Devrinol
Eptam	Axiom	Prowl
Valor	Dual	Treflan
Brake	Nortron	
Reflex	Enversa	
Cadre		
Pursuit		
Alite 27		
Goal		
Caparol		
Staple		
Spartan		
Goltix		
Torero		




Data Collected

- Injury/tolerance
- Height
- Stand
- Time to bloom
- Bloom counts

Fundamentals of Weed Science

- Principles of SOUND weed management still apply!!!!
  - –Remembering what Drs. Culpepper/Prostko have taught us for years
  - –Systems approach, diversified, timely, smart!

Clean @ planting
PRE residuals
POST if needed…keep it clean
Manage grass

<u>On Going Work</u>

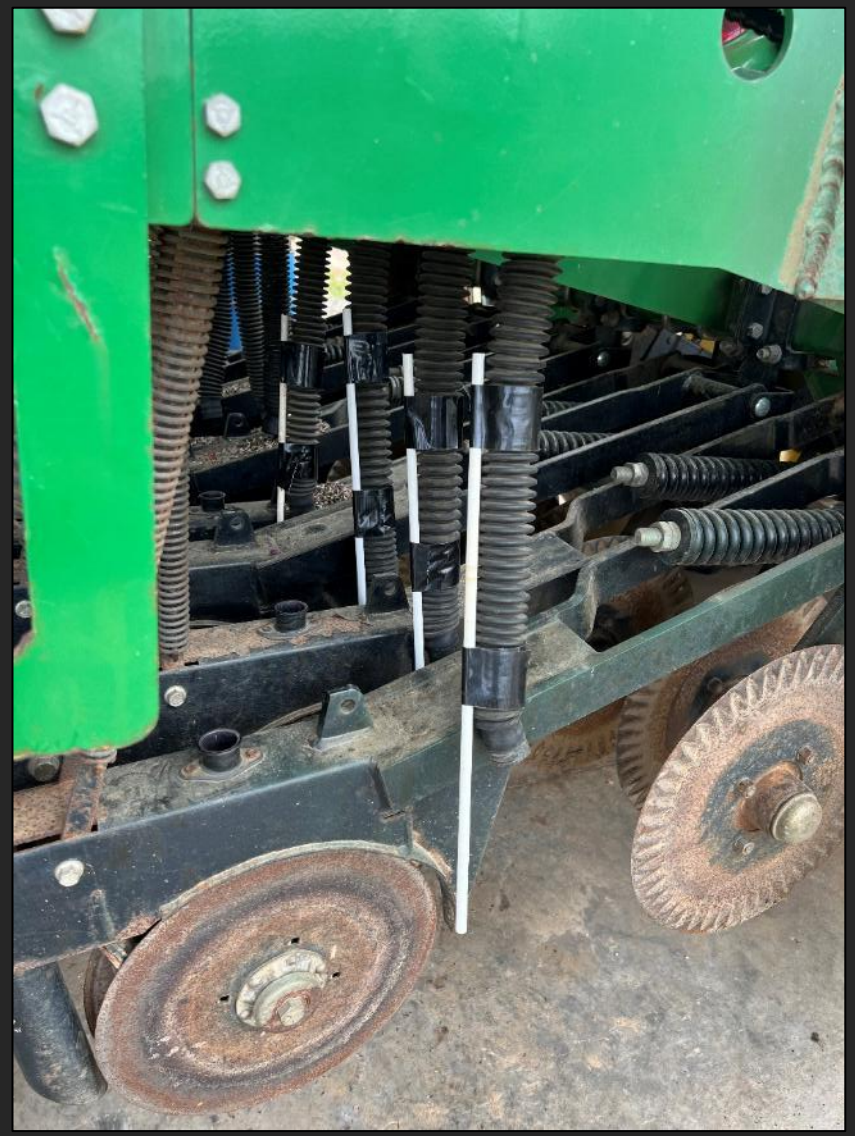
1. **Systems approach**
2. **How to plant for optimum ground coverage?**

Creating a Systems Approach to Weed Control*

2026:
Expand on tank mixtures/study rates….add new products?

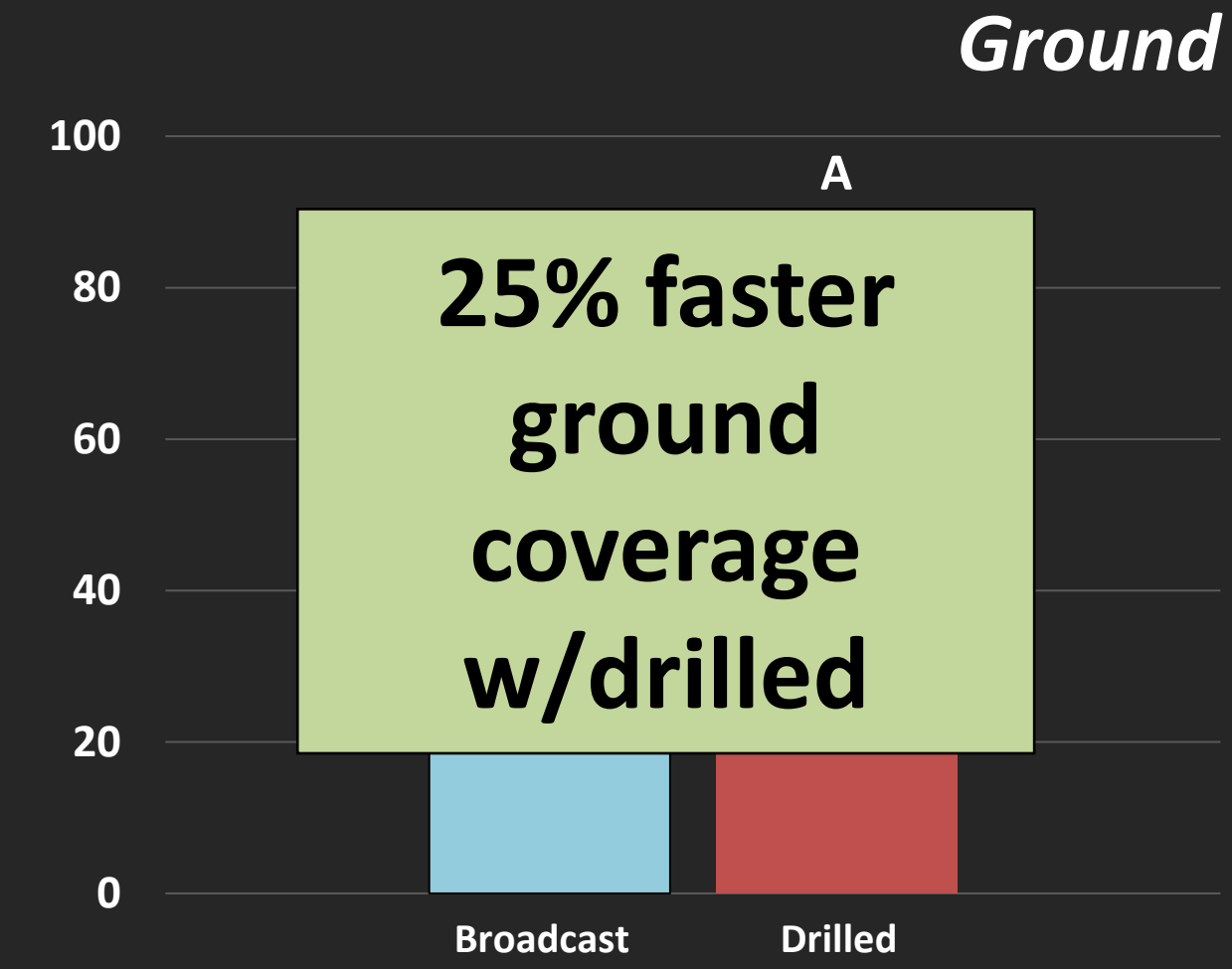
*Fall 2024/Spring 2025 – 1 location; 3 reps

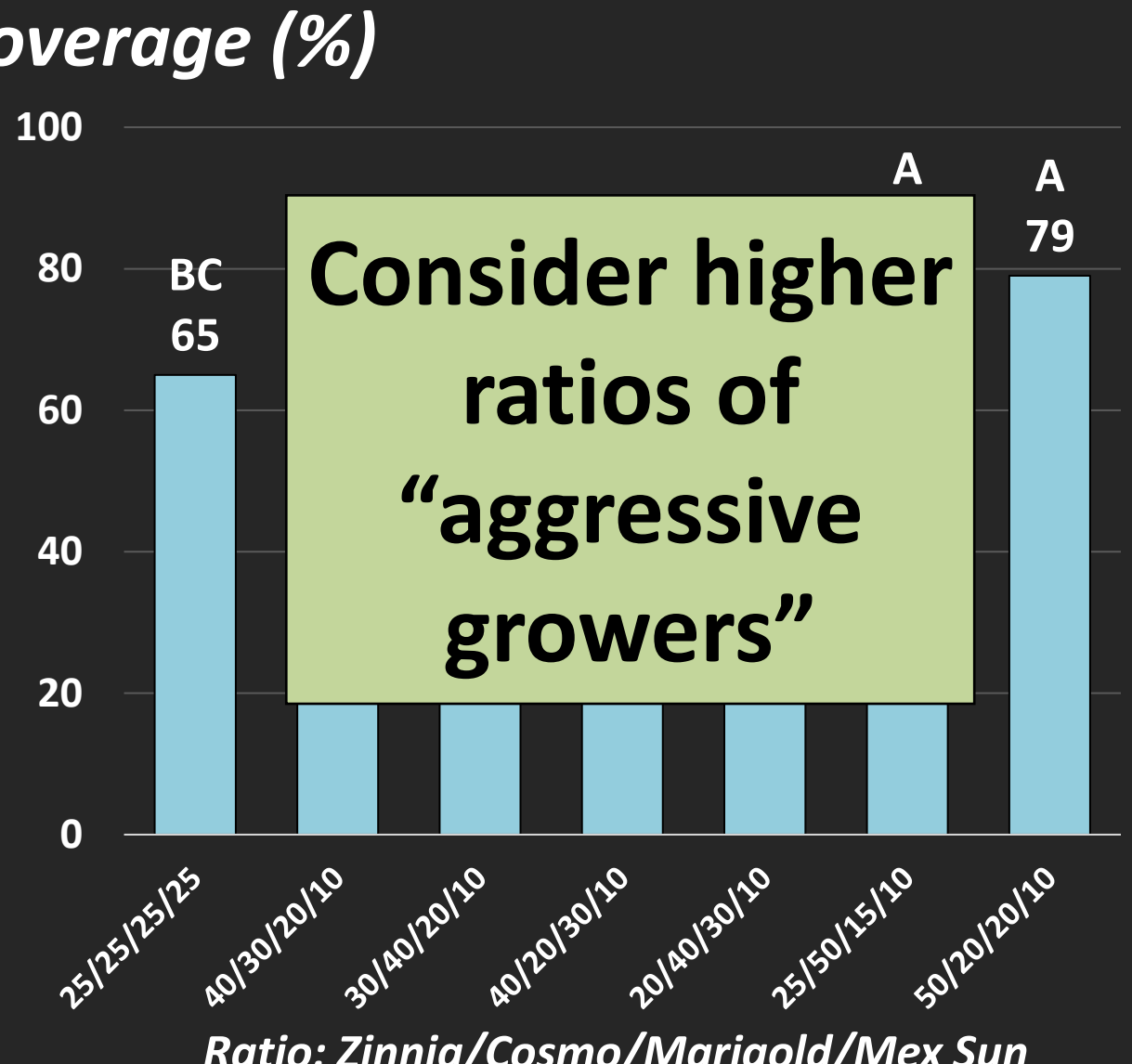
Year 3 – Integrated Approach to Weed Mgmt



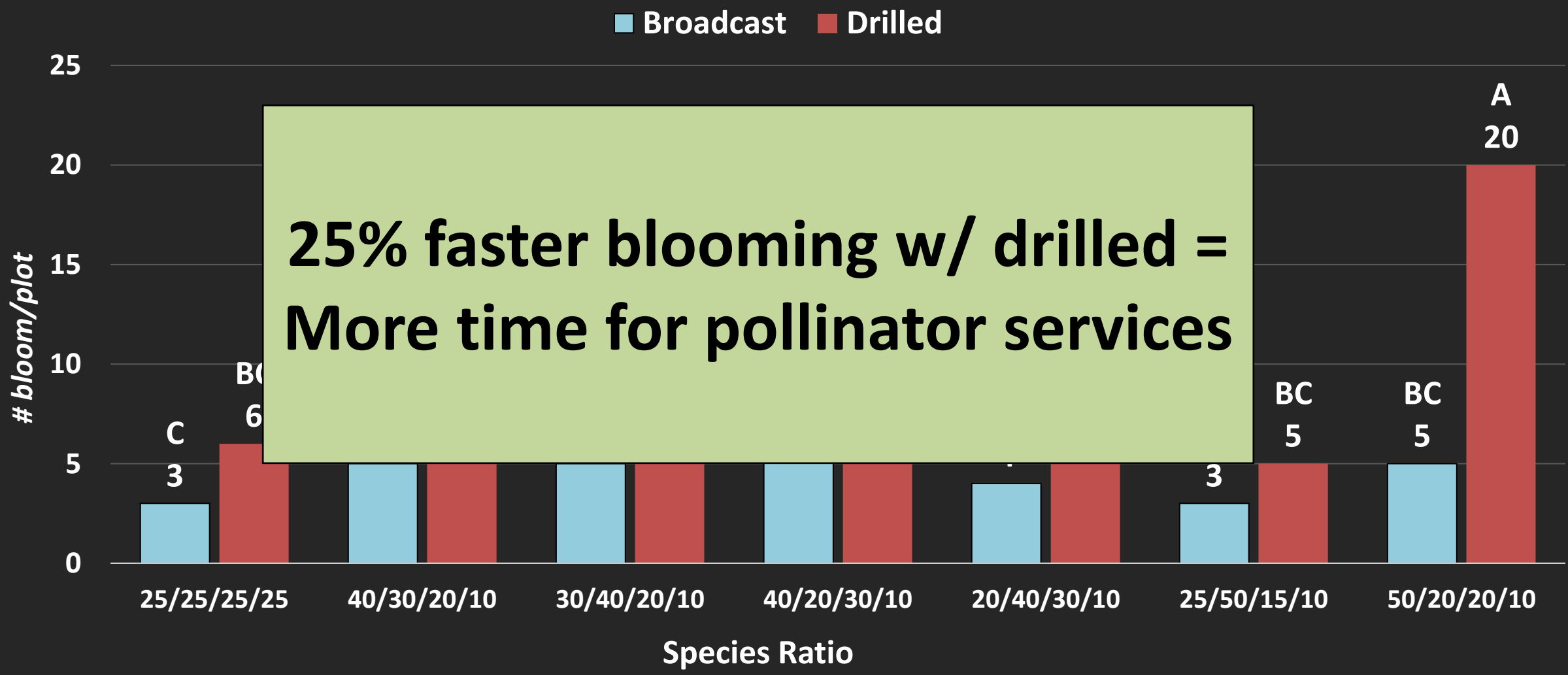
Year 3 – Integrated Approach to Weed Mgmt

Integrated Approach to Weed Mgmt





Planting Method Influences Bloom



Year 3 – Collaborating with NRCS

- UGA + NRCS USDA Jimmy Carter Plant Material Center
  - –Comparing UGA vs NRCS “mixes”
  - –What establishes? Blooms? Weed control?

UGA Mix

NRCS Mix

NRCS Mixture – Site 1

Flwr1-24
51 DAP

No herbicide

PRE: treflan
POST: none

PRE: none
POST: cadre

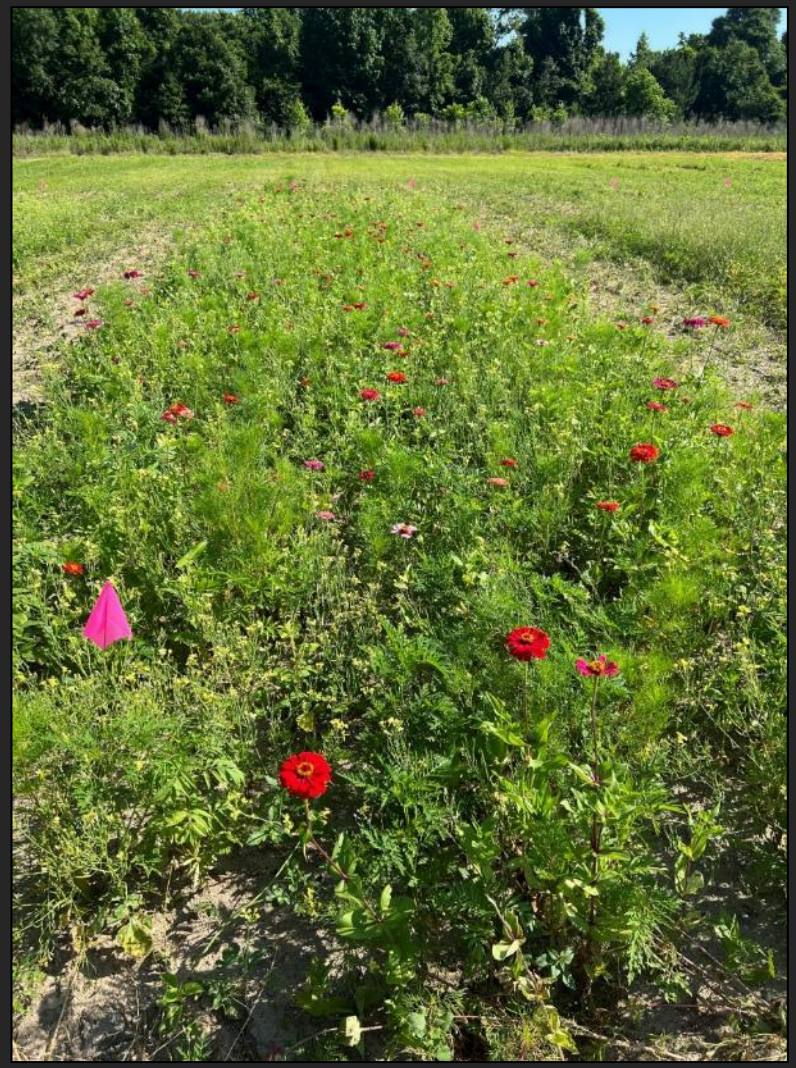
UGA Mixtures – Site 1

Ratios = Zinnia/Cosmo/Marigold/Mexican sunflower

Flwr1-24
51 DAP

25/25/25/25

40/30/20/10
“low” seeding rate



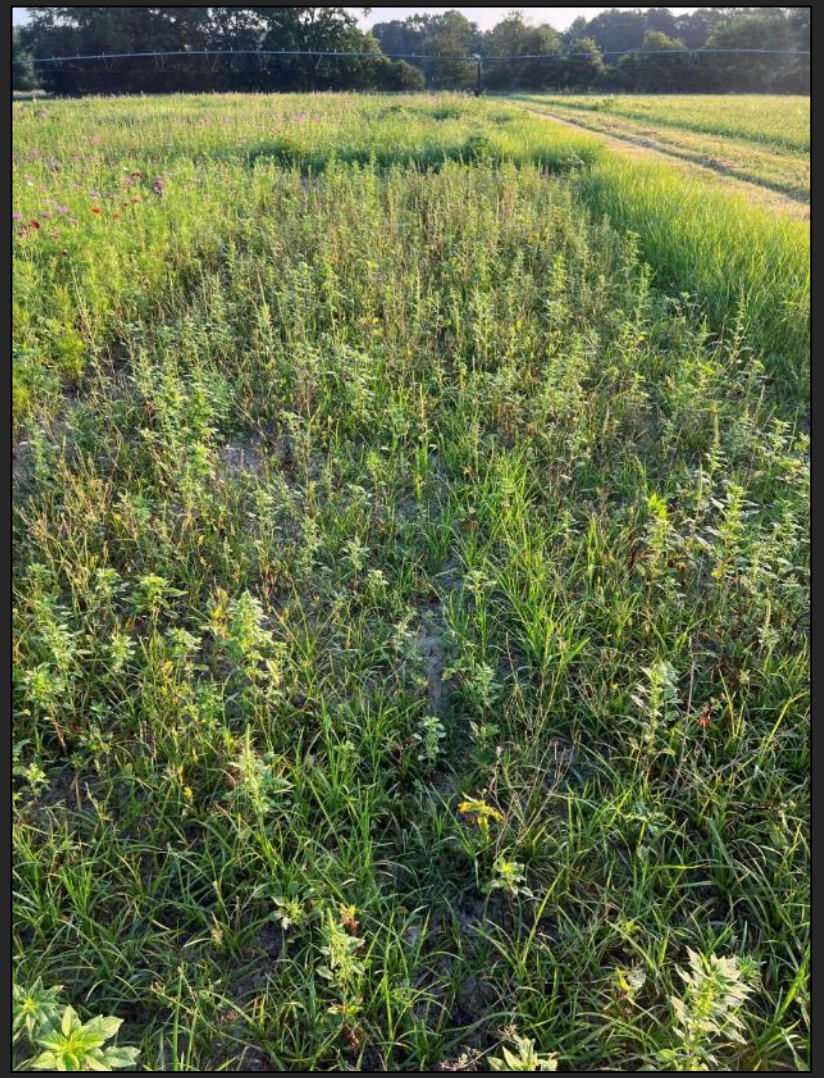
40/30/20/10
“high” seeding rate

NRCS Mixture – Site 2

Flwr2-24
Ponder Farm
51 DAP

No herbicide

PRE: treflan
POST: none

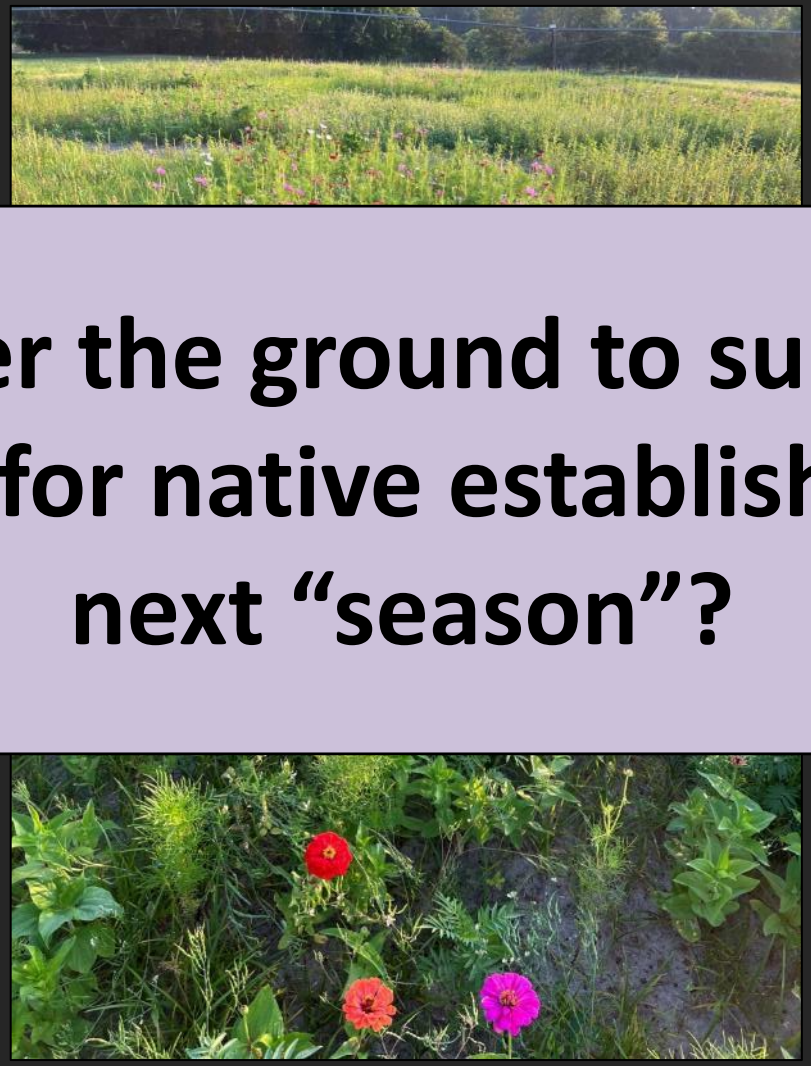


PRE: none
POST: cadre

UGA Mixtures – Site 2

Ratios = Zinnia/Cosmo/Marigold/Mexican sunflower

Flwr2-24
Ponder Farm
51 DAP



….cover the ground to suppress weed for native establishment next “season”?

25/25/25/25

40/30/20/10
“low” seeding rate

40/30/20/10
“high” seeding rate

My Thoughts - Natives vs Non-Natives

- Long-term, these habitats need to be majority natives
  - Regen. mechanisms are adapted for GA
  - Less potential for “invasive/weedy” characteristics
  - But, NOT competitive with weeds and SLOOOOOOW
- Non-native, commercial species can buy us time….
  - Cover the ground, suppress weeds
  - Lots of blooms and color year 1
  - Still providing a service to pollinators

Installation Recommendations

1. Start getting rid of weeds NOW!
   - Burndown herbicides/tillage to clean site
   - Once established, NO KNOWN OPTIONS for broadleaf weeds
2. Select species and mixes:
   - Program requirements?
     - Select suitable mix carefully (SE adapted species, wet/dry site)
     - Supplement with non-native (zinnia, cosmo)
   - Creating their own?
     - I like UGA mix with understanding to supplement year 2 & add natives overtime

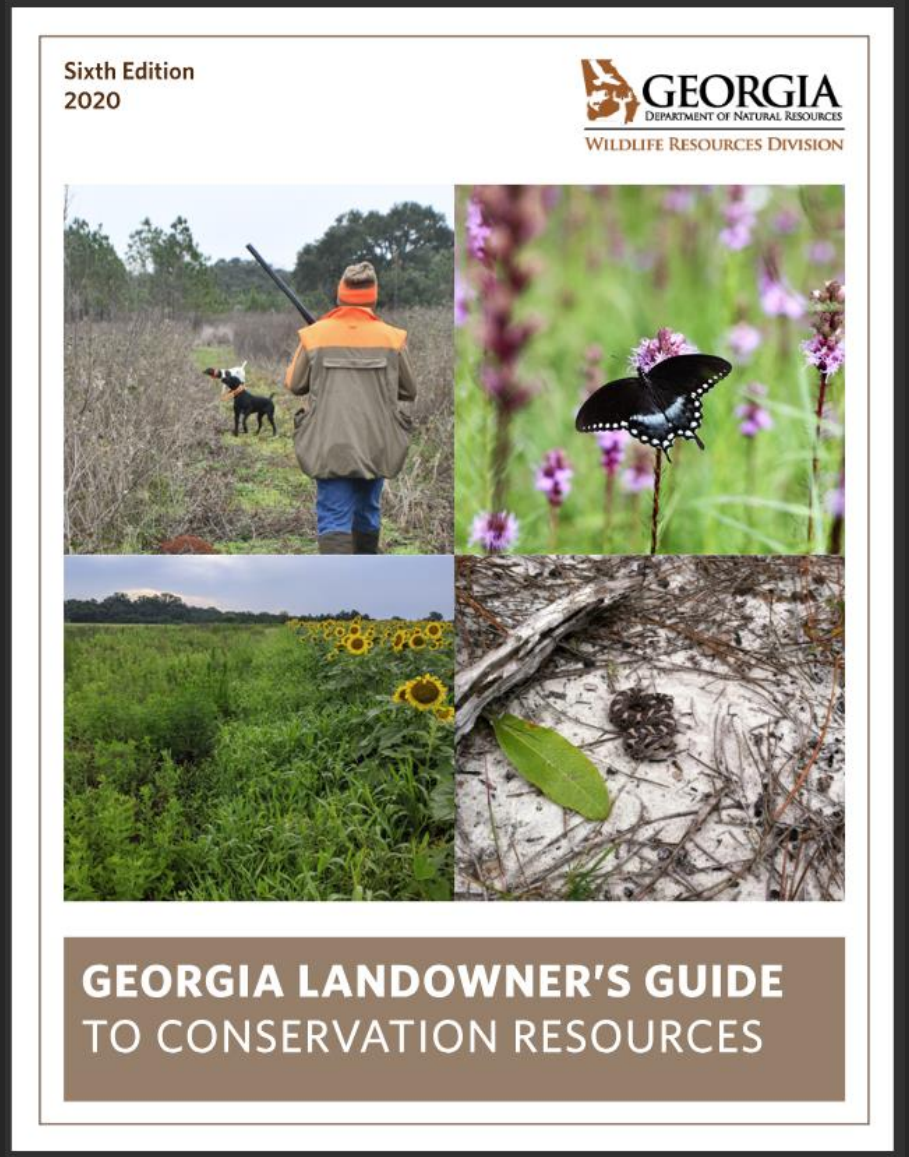
Installation Recommendations

3. Be prepared to spot spray if needed
4. Manage over winter – after first frost/freeze
   - Consider leaving residue (it will look bad but it's really good habitat!)
   - Mow after frost/before green up to spread seed
   - Burning is also good

Seed Sources

1. Roundstone Native Seed Company
   - Mix SS-W1 - Southern Pollinator Conservation Mix - Roundstone Native Seed Company
   - Mix HB-1 - Honey Bee Specialty Mix - Roundstone Native Seed Company
   - Mix 124 - Coastal Mixed Grass Meadow Economy Mix - Roundstone Native Seed Company
   - Mix 122 - Coastal Mixed Grass Meadow Mix - Roundstone Native Seed Company
   - Mix 118 - Coastal Tall Grass Meadow Mix - Roundstone Native Seed Company
   - Mix 178 - Southern Annual and Perennial Native Wildflower Garden Mix - Roundstone Native Seed Company – ***this is my preferred mix based on the components**
2. Ernst Conservation Seeds
   - Ernst Southeastern U.S. Roadside Native Mix Seed (this mix includes a native grass)
   - Southeast Annual and Perennial Wildflower Mix – ***this is my preferred mix based on the components**
3. Eden Brothers
   - Commercialized annuals, non-native, ornamentals

Financial Resources



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