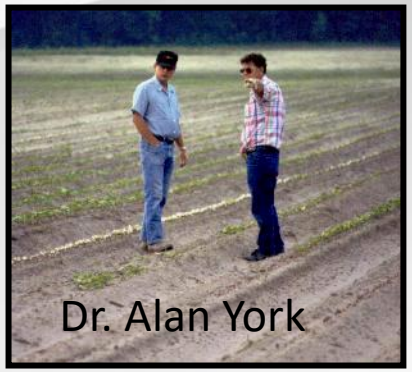
Family Farms, The Endangered Species Act, and The Environment

Woodland, NC

Stanley Culpepper
University of Georgia
Tifton, Georgia


Dr. Alan York

Presentation Objectives

- Herbicide strategy adds <u>flexibility</u>
- Outreach – education extremely <u>complex</u> but achievable
- Species mapping <u>improvements</u>

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EXTENSION

The Endangered Species Act (ESA)

- ESA implemented in 1973
- Provides framework to conserve & protect endangered & threatened species <u>& their habitats</u>!

Grey Wolf

Whorled Sunflower

Black-footed Ferret

Wood Bison

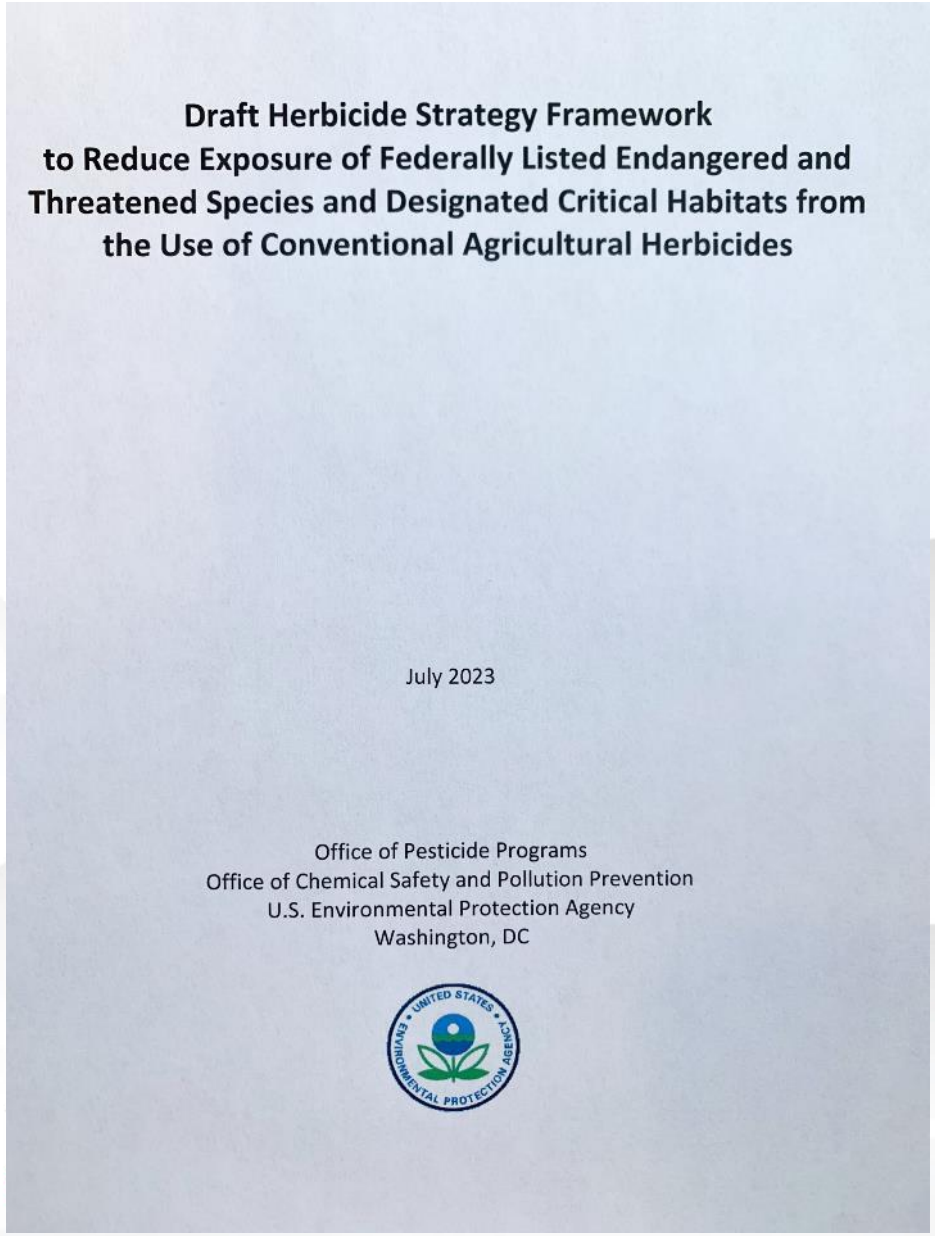
Total of ~1600 species + 900 critical habitats!!!

The Farm's Dilemma with ESA

Court removal of tools

Overwhelming regulations

Herbicide Strategy Evolves



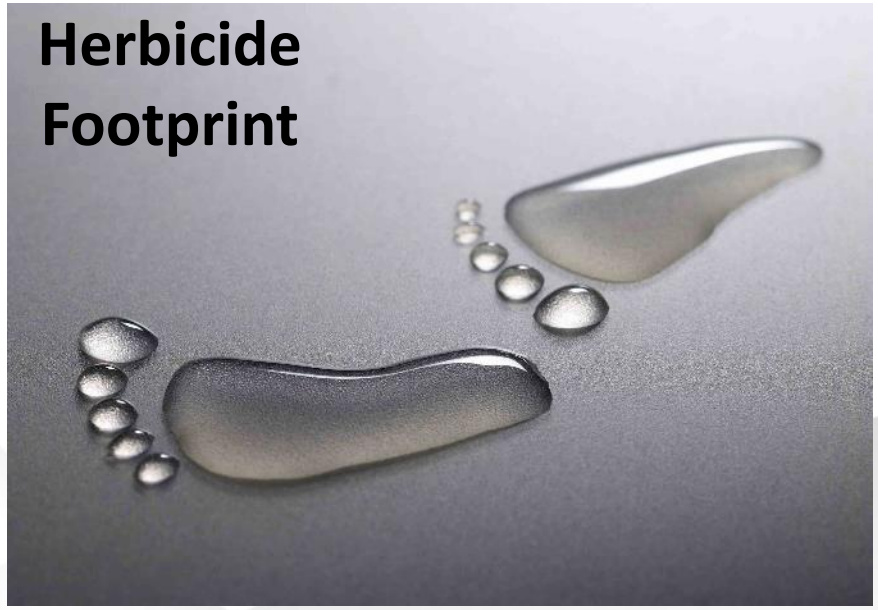
Draft Herbicide Strategy Framework
to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Herbicides

July 2023

Office of Pesticide Programs
Office of Chemical Safety and Pollution Prevention
U.S. Environmental Protection Agency
Washington, DC

Proposed strategy = likely game over for many of us

The Ultimate Goal of EPA Scientists to Reach Compliance is Sound; Unfortunately, the Approach has Been Painful



GOAL: Ensure pesticides are applied on-target and remain there!

Agricultural Stakeholders Became Very Engaged in Support of Our Family Farms

Pesticide Stewardship and the Endangered Species Act

WSSA
WEED SCIENCE SOCIETY OF AMERICA
www.wssa.net

Enormous Effort = Game Changer = Science

U.S. FISH & WILDLIFE SERVICE

DEPARTMENT OF THE INTERIOR

OF GEOL

NSIC

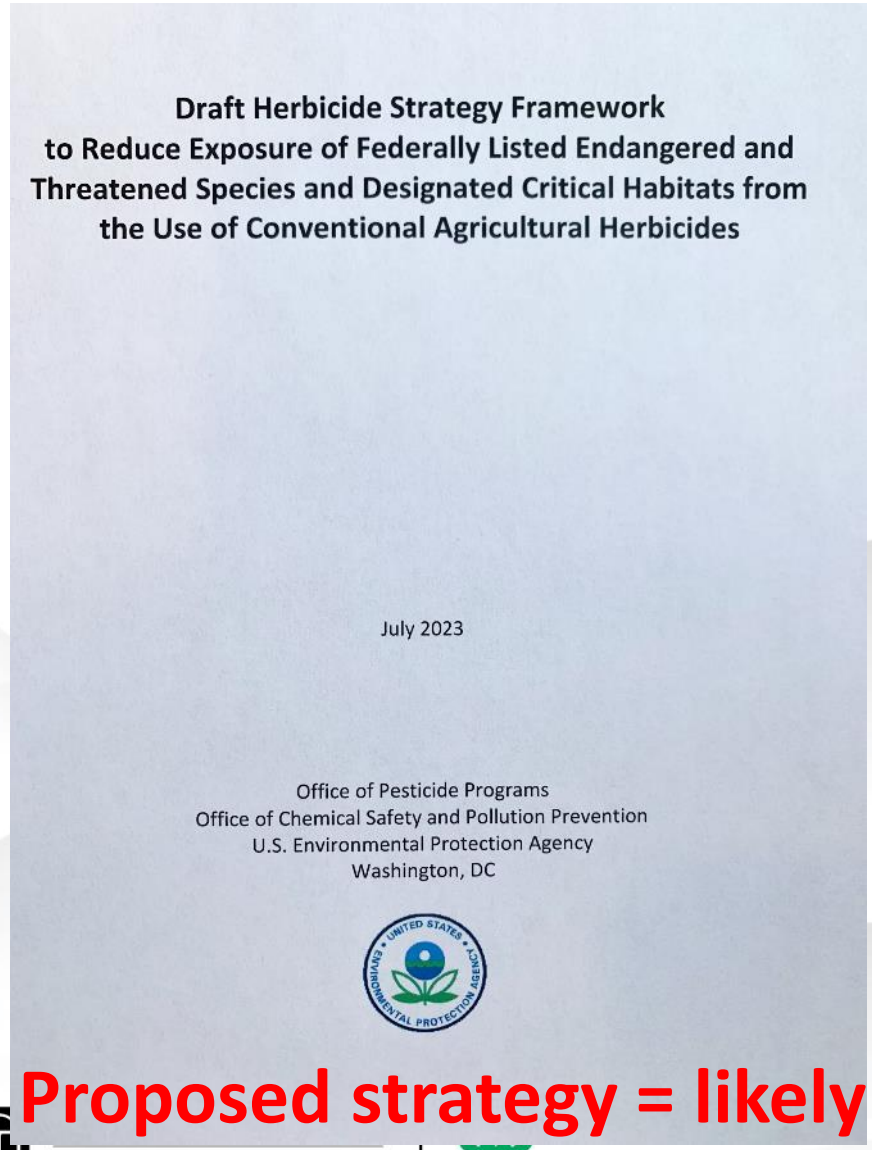
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Farmers

USDA United States Department of Agriculture

GDA GEORGIA DEPARTMENT OF AGRICULTURE PLANT INDUSTRY

Herbicide Strategy Evolves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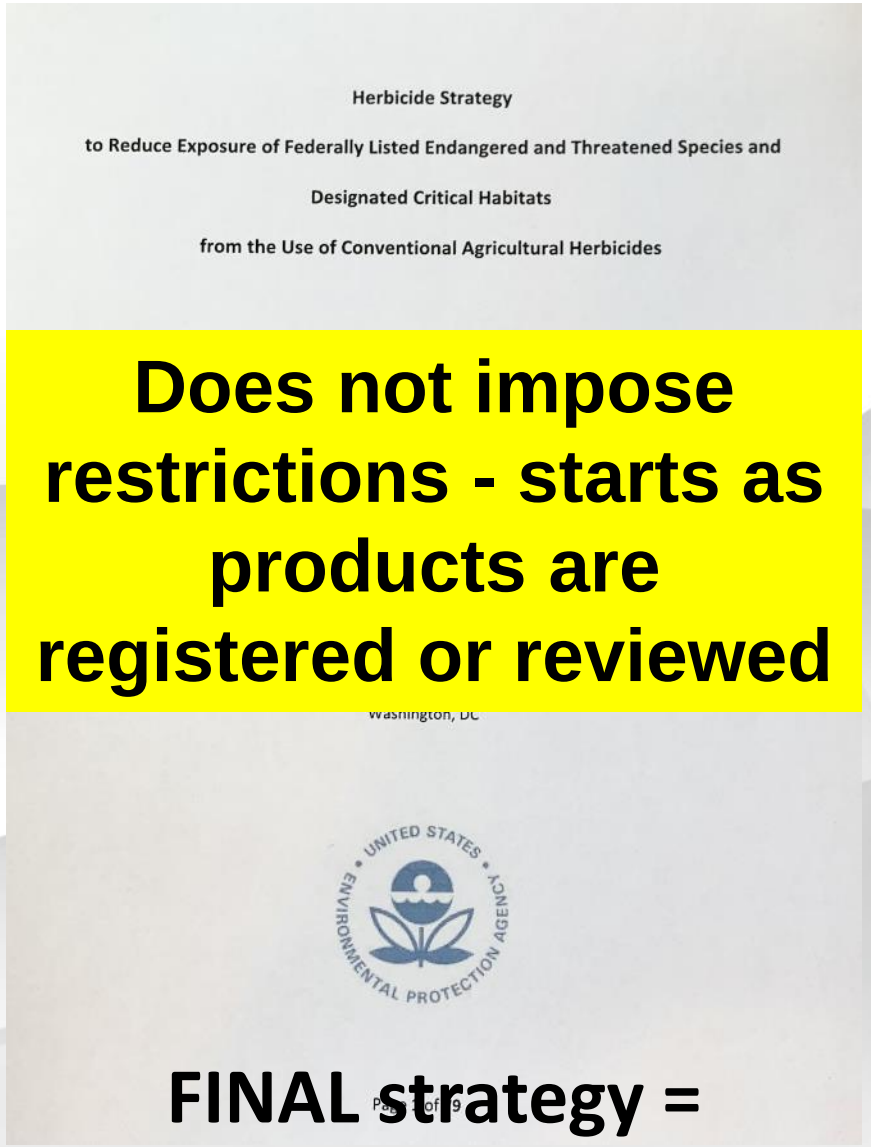

Herbicide Strategy

to Reduce Exposure of Federally Listed Endangered and Threatened Species and

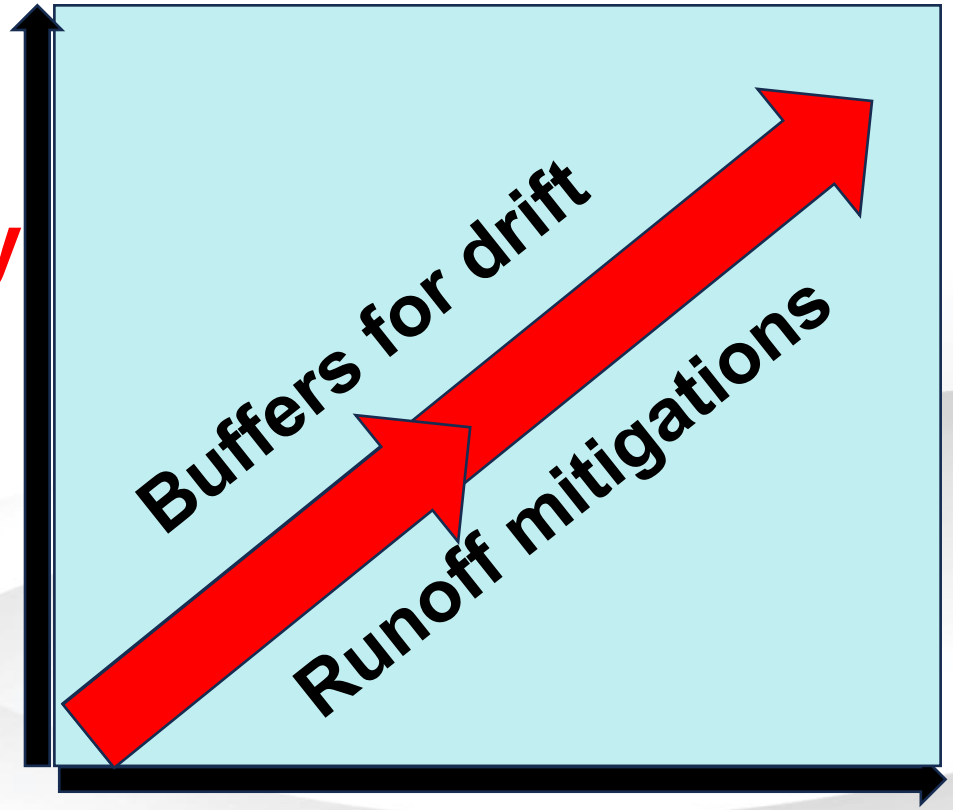
Designated Critical Habitats

from the Use of Conventional Agricultural Herbicides

Does not impose restrictions - starts as products are registered or reviewed

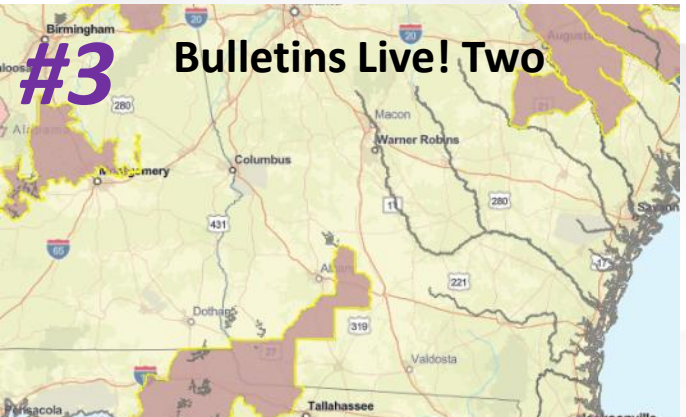
FINAL strategy = still in the game

Herbicide Strategy Evolves



- Decision by field (not farm)
- Decision by product
- Decision by crop
- Challenging but provides an opportunity to do our own risk assessment at the field

Must Understand To Get Started



1. Runoff: **each pesticide will be assigned a value of potential of product to runoff and damage species or habitat (0-9 points).**

2. Particle Drift: **each pesticide will be given a buffer drift requirement as influenced by application method (ground, airblast, airplane, etc.)**

3. BLT: **Website identifies if your field is in a pesticide use limitation area (PULA).**

It is Quite Complicated

#1 Runoff

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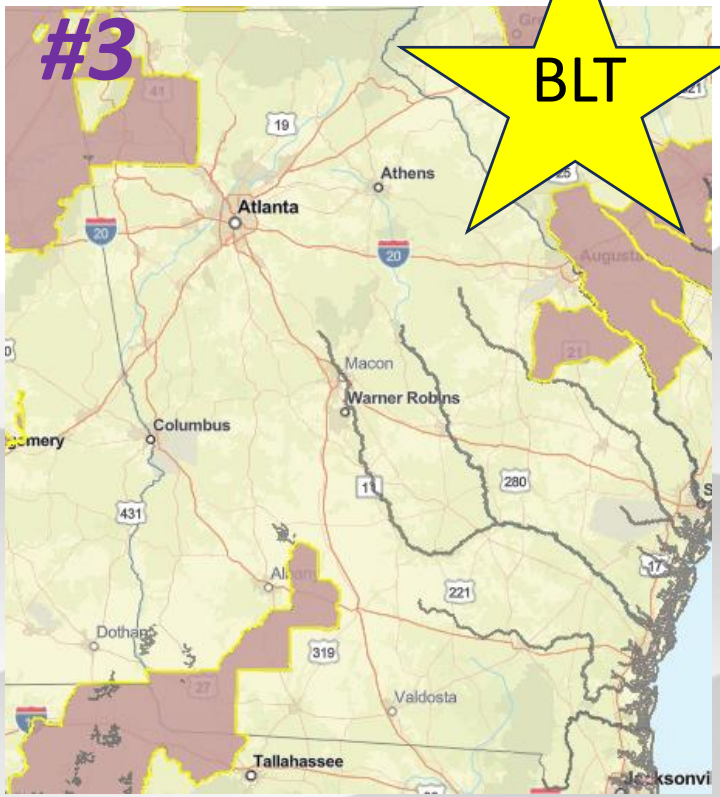
#2 Particle drift

#3

BLT

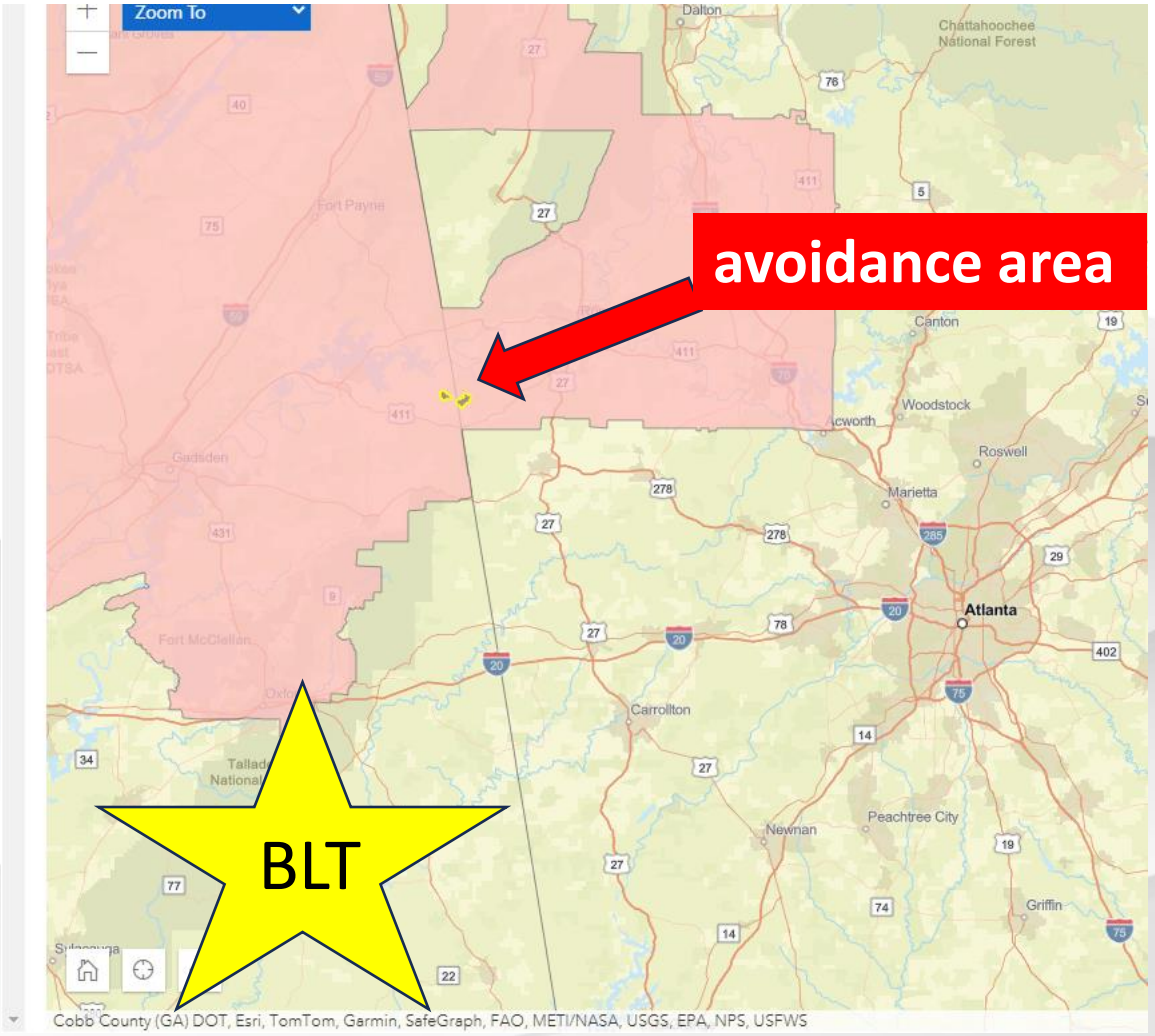


each field

each field

Pesticide Use Limitation Area
***Increase points for runoff**
***Increase drift buffers**
***Remove tool**

New Liberty Ultra Label - ESA Restrictions



Whorled Sunflower

Liberty® ULTRA
Herbicide – Powered by Glu-L™ Technology

Decisions by Field – Product – Crop for Mitigations^

- **Culpepper Farm 2024, NC (small farm)**
  - 5 agronomic crops, 40 fields
  - 30 pesticide active ingredients
  - 372 runoff & 372 drift buffer calculations^
- **SC-LTF 2024, GA (dynamic farm)**
  - 26 unique vegetable & agronomic crops
  - 16 agronomic fields,
  - 372 vegetable “fields” (3 crops/yr)
  - 78 pesticide active ingredients
  - 4344 runoff & 4344 drift buffer calculations^

^Calculations are BEFORE WE GET CREATIVE using the flexibility offered by the final herbicide strategy

^Assumes insecticide/fungicide strategy follow final herbicide strategy approach.

Who the heck can do that on the farm?

Must simplify greatly…..

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We Have Time and Can Simplify for Farmers

Advisors

- Extension
- Consultants
- Retailers
- Manufacturers
- Department of Agriculture

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Extension Approach To Overcome Herbicide Strategy!

#1 Runoff

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#2 Particle drift

Objective 1: **Get growers to 9 points for all fields overcoming runoff mitigations.**

Objective 2: **Help growers take 230-foot drift buffer down to near 0 (ground application).**

Objective 3: **Get input from growers helping us understand any barriers to meet these objectives.**

Runoff Mitigation Approach – By Production Practice

Raised Large Bed Plasticulture

Bareground – Tilled
Center Pivot Veggies

Agronomic Production

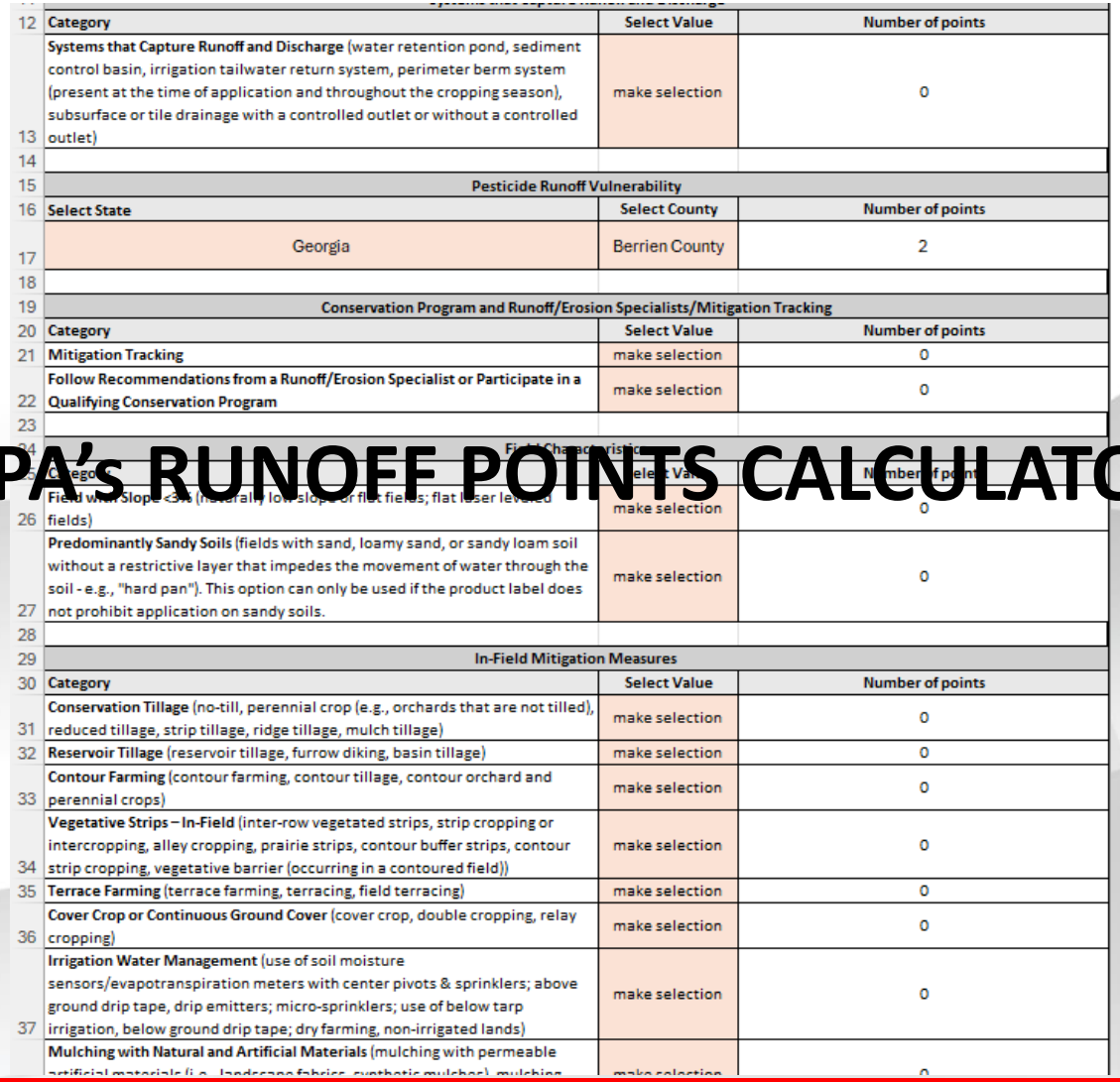
- **For this exercise just think about one field next to the house ….after we get more comfortable, we will start thinking about other fields**

Agronomic Crop in Georgia

Mitigation	Points
Mitigation relief points	
Field with ≤ 3% slope	
Sand, loamy sand or sandy loam	
Cover crops	
Strip-till production	
Non-irrigated lands	
Incorporation (center pivot	
Grass waterway	
Terraces	
Field border of vegetation	
Mitigation tracking	

Information Available To Help = EPA Resource Toolbox?

1. Mitigation Menu
2. Mitigation Calculator Guide
3. <u>Calculator is Key</u>
   - Advisor……KEY
   - Farmer…not so much



	Category	Select Value	Number of points
12			
13	**Systems that Capture Runoff and Discharge** (water retention pond, sediment control basin, irrigation tailwater return system, perimeter berm system (present at the time of application and throughout the cropping season), subsurface or tile drainage with a controlled outlet or without a controlled outlet)	make selection	0
14			
15	**Pesticide Runoff Vulnerability**		
16	**Select State**	**Select County**	**Number of points**
17	Georgia	Berrien County	2
18			
19	**Conservation Program and Runoff/Erosion Specialists/Mitigation Tracking**		
20	**Category**	**Select Value**	**Number of points**
21	**Mitigation Tracking**	make selection	0
22	**Follow Recommendations from a Runoff/Erosion Specialist or Participate in a Qualifying Conservation Program**	make selection	0
23			
24	**Field Characteristics**		
25	**Category**	**Select Value**	**Number of points**
26	**Field with Slope <3%** (naturally low-sloped or flat fields; flat laser leveled fields)	make selection	0
27	**Predominantly Sandy Soils** (fields with sand, loamy sand, or sandy loam soil without a restrictive layer that impedes the movement of water through the soil - e.g., "hard pan"). This option can only be used if the product label does not prohibit application on sandy soils.	make selection	0
28			
29	**In-Field Mitigation Measures**		
30	**Category**	**Select Value**	**Number of points**
31	**Conservation Tillage** (no-till, perennial crop (e.g., orchards that are not tilled), reduced tillage, strip tillage, ridge tillage, mulch tillage)	make selection	0
32	**Reservoir Tillage** (reservoir tillage, furrow diking, basin tillage)	make selection	0
33	**Contour Farming** (contour farming, contour tillage, contour orchard and perennial crops)	make selection	0
34	**Vegetative Strips – In-Field** (inter-row vegetated strips, strip cropping or intercropping, alley cropping, prairie strips, contour buffer strips, contour strip cropping, vegetative barrier (occurring in a contoured field))	make selection	0
35	**Terrace Farming** (terrace farming, terracing, field terracing)	make selection	0
36	**Cover Crop or Continuous Ground Cover** (cover crop, double cropping, relay cropping)	make selection	0
37	**Irrigation Water Management** (use of soil moisture sensors/evapotranspiration meters with center pivots & sprinklers; above ground drip tape, drip emitters; micro-sprinklers; use of below tarp irrigation, below ground drip tape; dry farming, non-irrigated lands)	make selection	0
	Mulching with Natural and Artificial Materials (mulching with permeable artificial materials (i.e., landscape fabrics, synthetic mulches), mulching	make selection	0

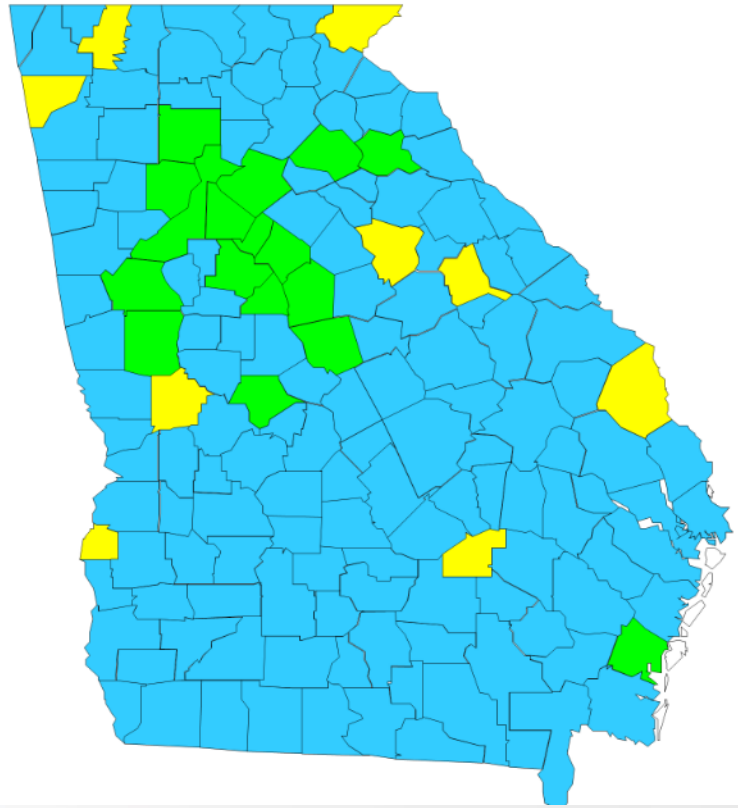
EPA's RUNOFF POINTS CALCULATOR

https://www.epa.gov/pesticides/mitigation-menu
https://www.epa.gov/endangered-species/pesticides-and-endangered-species-educational-resources-toolbox

Agronomic Crop in Georgia

Mitigation	Points
Mitigation relief points	2

Runoff & Erosion: Mitigation Relief Points



0 points = yellow

2 points = blue

3 points = green

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Agronomic Crop in Georgia

Mitigation	Points
Mitigation relief points	2
Field with ≤ 3% slope	2
Sand, loamy sand or sandy loam (no hard pan)	2

Predominately Sandy Soil

50% sand, loamy sand, or sandy loam without restrictive layer that impedes movement of water into the soil

2 points

Are Our "Definitions" of Mitigations Same as the EPA's?

Working hard to be on the same page, resources are available

Agronomic Crop in Georgia

Mitigation	Points
Mitigation relief points	2
Field with ≤ 3% slope	2
Sand, loamy sand or sandy loam (no hard pan)	2
Cover crops (no tillage)	3

Cover Crop Options – Points

Tilled cover: terminated using tillage. **POINTS = 1**

Short duration cover: planted in fall but no active growth in spring or planted in spring. **POINTS = 2**

Long duration cover: planted in fall growing into spring, vegetation on field year around. **POINTS = 3**

Agronomic Crop in Georgia

Mitigation	Points
Mitigation relief points	2
Field with ≤ 3% slope	2
Sand, loamy sand or sandy loam (no hard pan)	2
Cover crops	3
Strip-till production	2
Non-irrigated lands	3
Incorporation (center pivot or tillage)	1
Grass waterway	2
Terraces	2
Field border of vegetation	3
Mitigation tracking	1

Do you have at least 9 points?

Other Options if Needed – Agronomic Crop

1. Exempt – managed areas 1000 foot down gradient
2. Expert (1 point) or conservation program (2 points)
3. Water sensors with center pivot = 2 points
4. Mitigation measures from multiple categories = 1 pt

Trying to avoid

1. Rate of product applied (annual max)
2. Percent of field treated (new technologies)

Trying even harder to avoid

Culpepper Farms: Fields 1- 36

Mitigation	Points
Mitigation relief points – Northampton County	2
Field with less 3% slope	2
Cover crops	3
Strip till	2
Dry Farming	3
Grass waterways	2
Multiple categories of mitigation	1
Mitigation tracking	1
	16

- As you ride around the farm this summer, think about grouping your fields and covering them on one mitigation form. Example for 36 of our fields all on one form.

Culpepper Farms: Fields 37-40

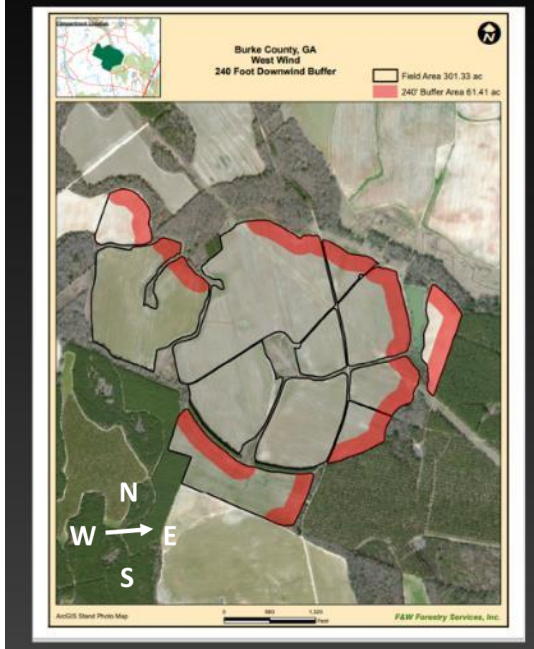
Mitigation	Points
Mitigation relief points – Northampton County	2
Field with less 3% slope	2
Cover crops	3
Strip till	2
Dry farming	3
Mitigation tracking	1

13

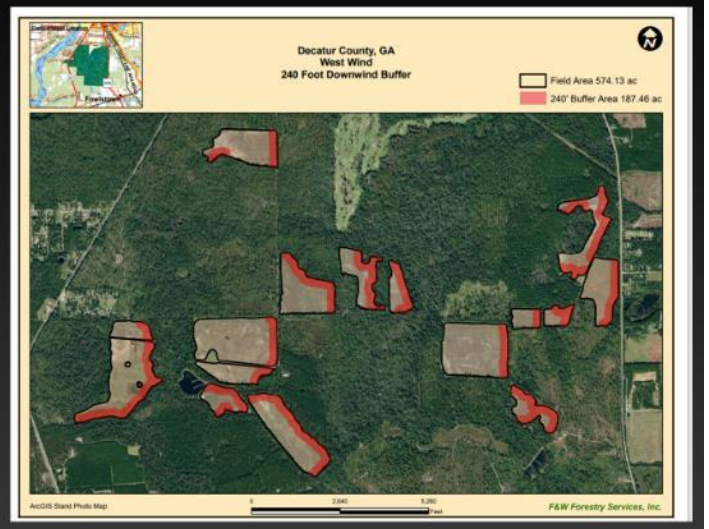
A few fields do not have grass waterways so when I take that away I lose multiple category mitigation as well so I am using a second form to get the last 4 fields on the farm.

Impact From In-Field Drift Buffers*

Impact from 240-ft Downwind Buffer



Best case = lose 20.4%



Worst case = lose 32.6%

*Calculation assumes west wind.

EPA DETERMINED WORST CASE FOR GROUND RIG WILL BE <u>230 FEET DOWNWIND</u>

Calculations are BEFORE WE GET CREATIVE using the flexibility offered by the final herbicide strategy

* As interpreted in the Draft Herbicide Strategy

Spray Drift Ground Application– (0 to 230 feet)

Mitigation Measures	% Reduction
Low boom, coarse drops	75%
High boom, coarse drops	65%
Low boom, fine to medium	40%

OBJECTIVE: Take 230 feet and figure out how to make it workable on your farm

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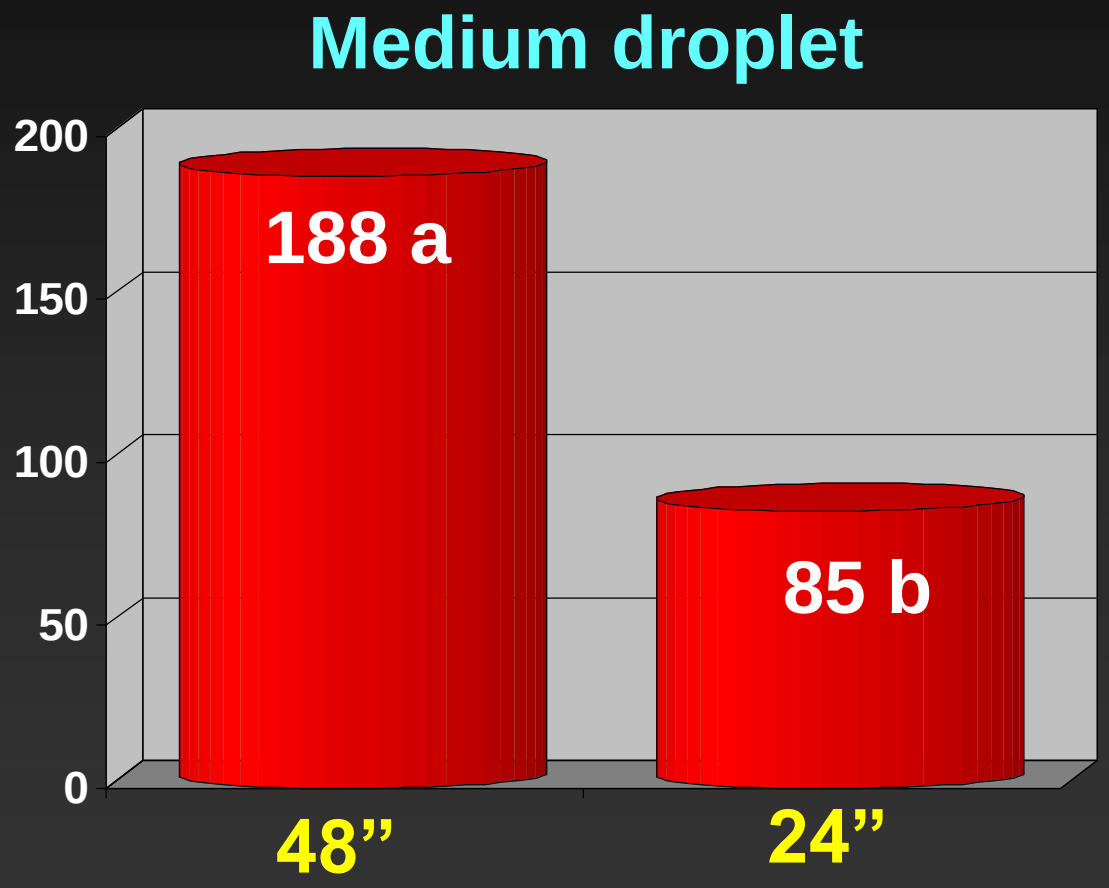
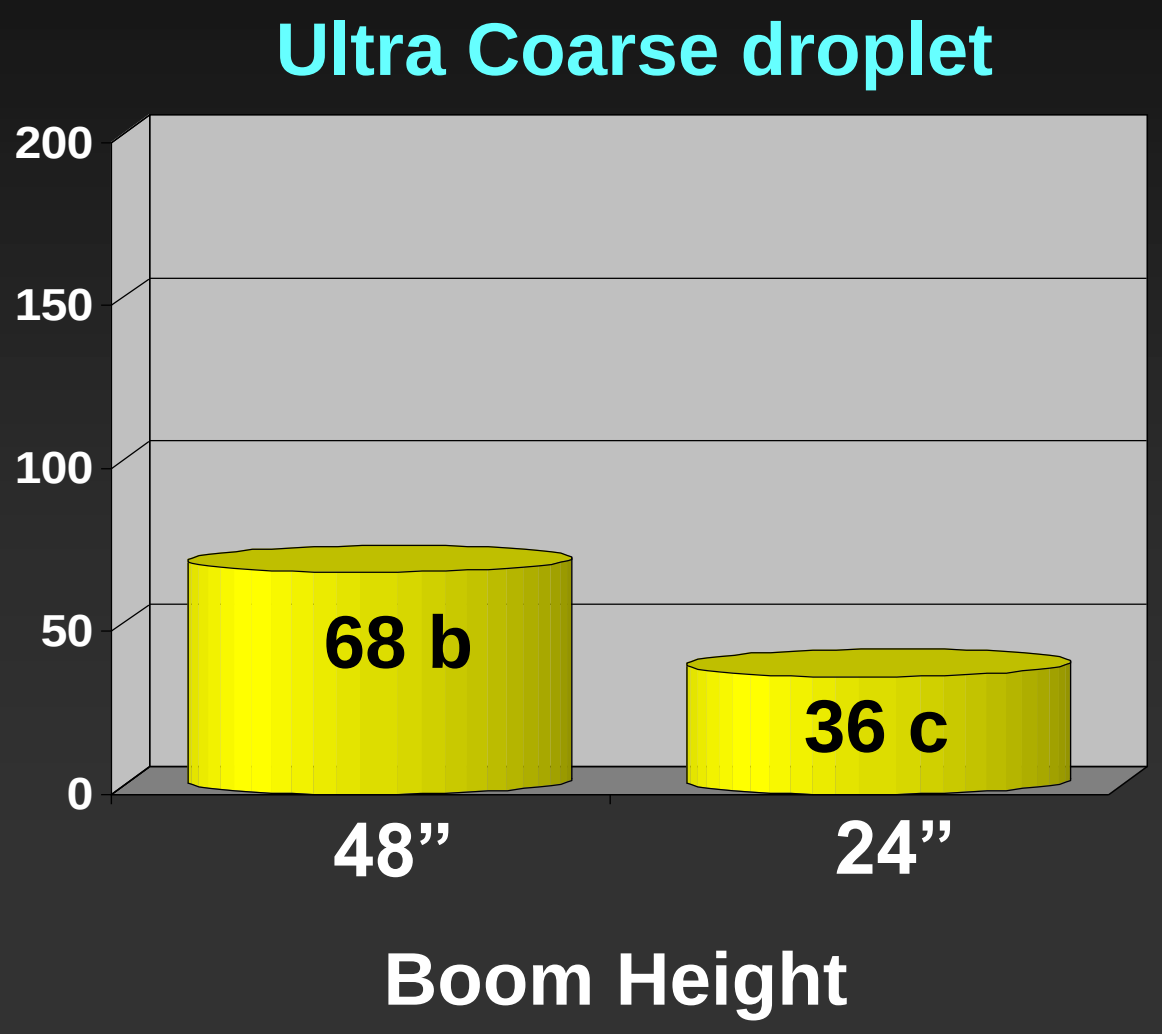
From Herbicide Strategy

Boom Height and Spray Droplet Size Impacts Pesticide Drift Distance (feet) to COTTON





Spray Drift Ground Application– (0 to 230 feet)

Mitigation Measures	% Reduction
Low boom, coarse drops	75%
High boom, coarse drops	65%
Low boom, fine to medium	40%
DRA as influenced by droplet	15-30%
Relative humidity ≥ 60%	10%

Low boom, coarse droplets, DRA (15%), RH = 75 + 15 + 10 = 100%

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From Herbicide Strategy

From Herbicide Strategy

Additional Methods to Reduce Buffer

Broadcast Hooded: 50%

Layby Rig: 50%

Downwind Measures	% Reduction
Rate of product (single ap)	% below max
Windbreak – 4 foot wide, height of boom	50%
Windbreak – 8 foot wide, 2X boom height	75%
Forest/shrubland ≥ 60 ft, 2X boom height	100%

Hooded: 75%

Managed Areas Adjacent To Treated Field Downwind Can Represent Spray Drift Buffers

Approved Out of Field Buffers Downwind - Relevant to Georgia*
Ag fields
Roads, grassy areas, bareground
Field borders, hedgerows, CRP
On-farm contained irrigation water sources (irrigation ponds)

From Herbicide Strategy

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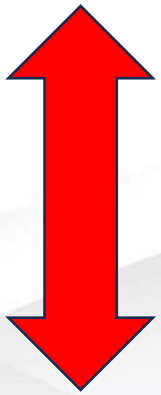
*More options are available through herbicide strategy!

PULA Refinement

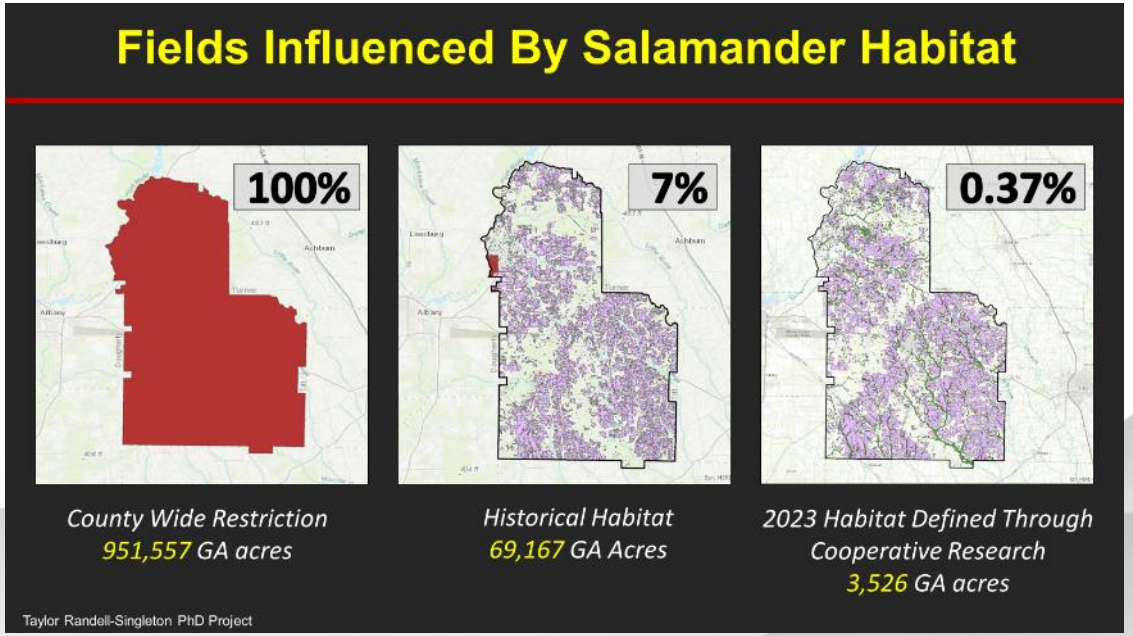
Essential to Protect Species and Farms

Location of species & habitat *



Overlap?

Location of fields treated with pesticides *



Vulnerable Species Action Plan

Focus on highly vulnerable species (27)

Runoff, drift, volatility, bioaccumulation

Maps refined before restrictions

EPA Takes Mapping Approach National – Dec of 2024

Process EPA Uses to Develop Core Maps for Draft Pesticide Use Limitation Areas for Species Listed by the U.S. Fish & Wildlife Service (FWS) and their Designated Critical Habitats

December 2024

Office of Pesticide Programs
Office of Chemical Safety and Pollution Prevention
U.S. Environmental Protection Agency
Washington, DC

ESA Take Home Messages

- Advisors key to ESA; calculator key for advisor… calculator continues to improve
- Drift calculator being developed
- Help us identify issues, challenges, errors
- We have time….herbicides for 2025 Liberty Ultra, Enlist One, Enlist Duo
- EPA webinar in March
- <u>Remember pesticide applicators must do their part, be accountable!</u>

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Science, Cooperation, & Communication

Farmers

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