

# Herbicide Programs for Florida Strawberry Growers

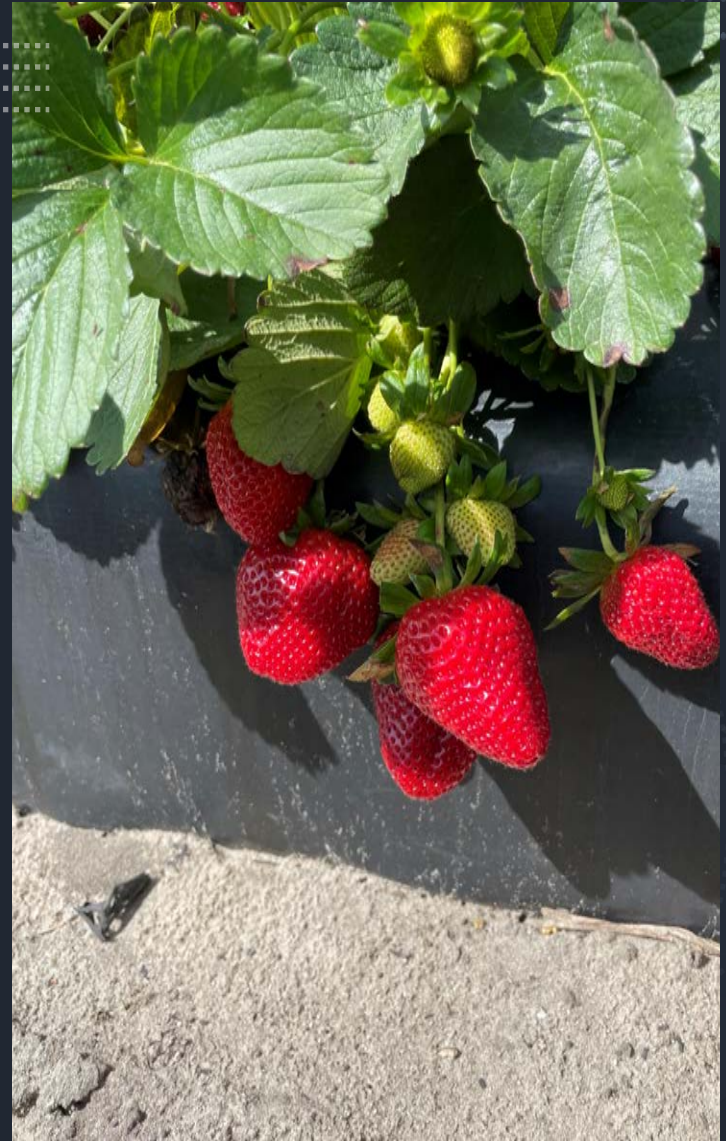
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Alex Rodriguez

Moriah Williams



# Weed Management Program

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- IWM for Key Problem Weeds (Ragweed Parthenium)
- Management of weeds with limited or no solution (Nutsedge)
- Targeted Weed Management





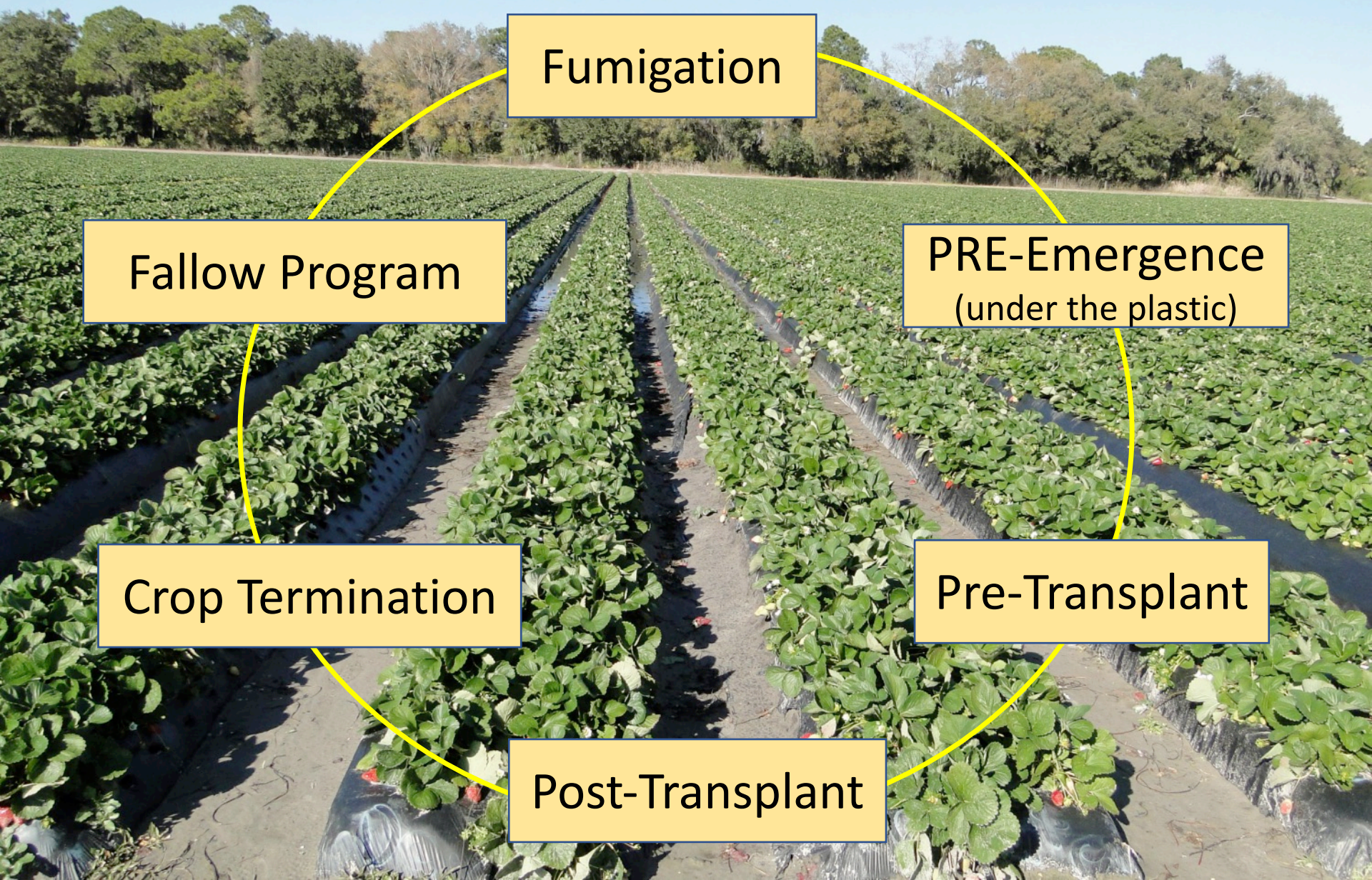
# Ragweed Parthenium Management



Glyphosate and Paraquat Resistance



# INTEGRATED WEED MANAGEMENT PROGRAMS



Fumigation

Fallow Program

PRE-Emergence  
(under the plastic)

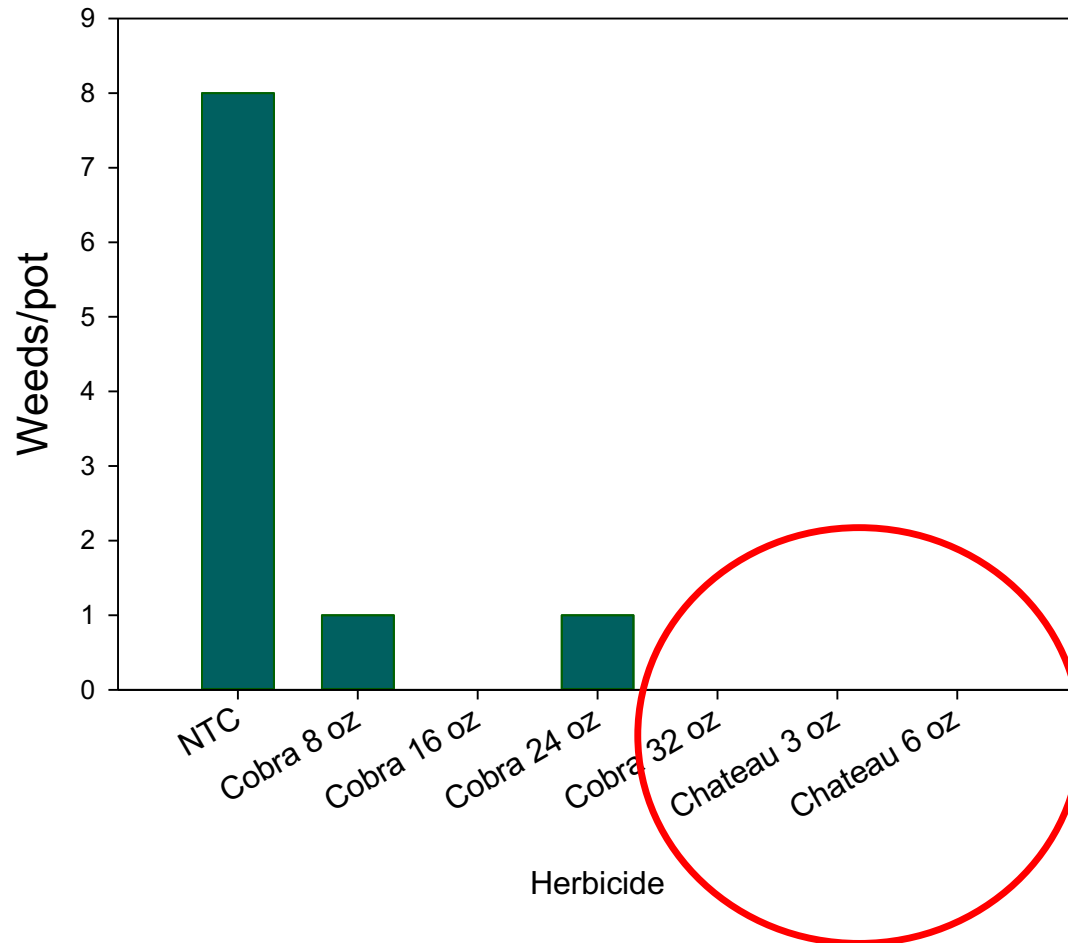
Crop Termination

Pre-Transplant

Post-Transplant

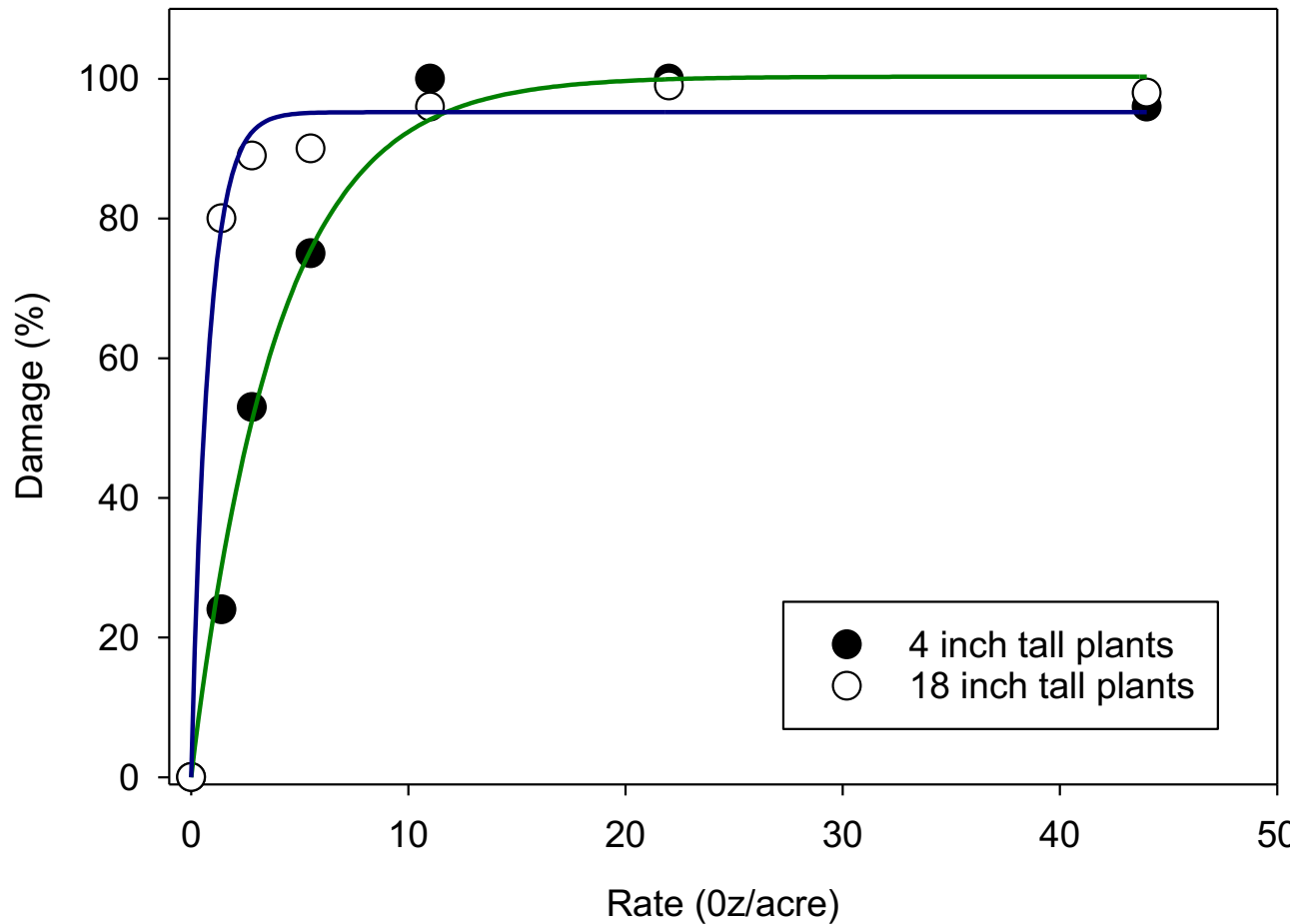


# Preemergence Herbicides for Pathenium Control



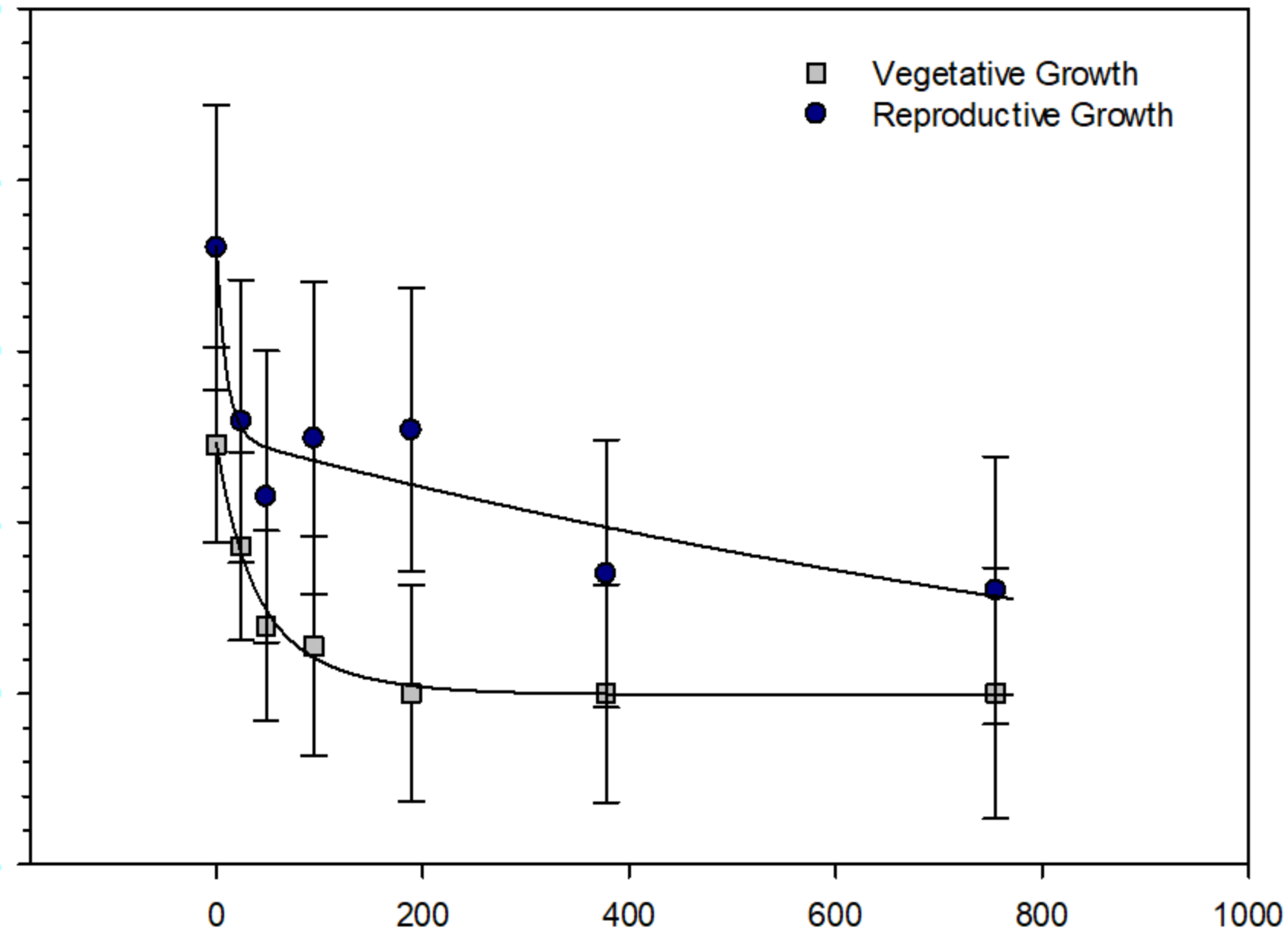


# Glufosinate for Post-Emergence Parthenium Control





# Ragweed Parthenium Response to Glufosinate at the Vegetative and Reproductive Stage





## Cover Crops

Cover crops inhibit  
parthenium growth  
and suppress weed  
seed production





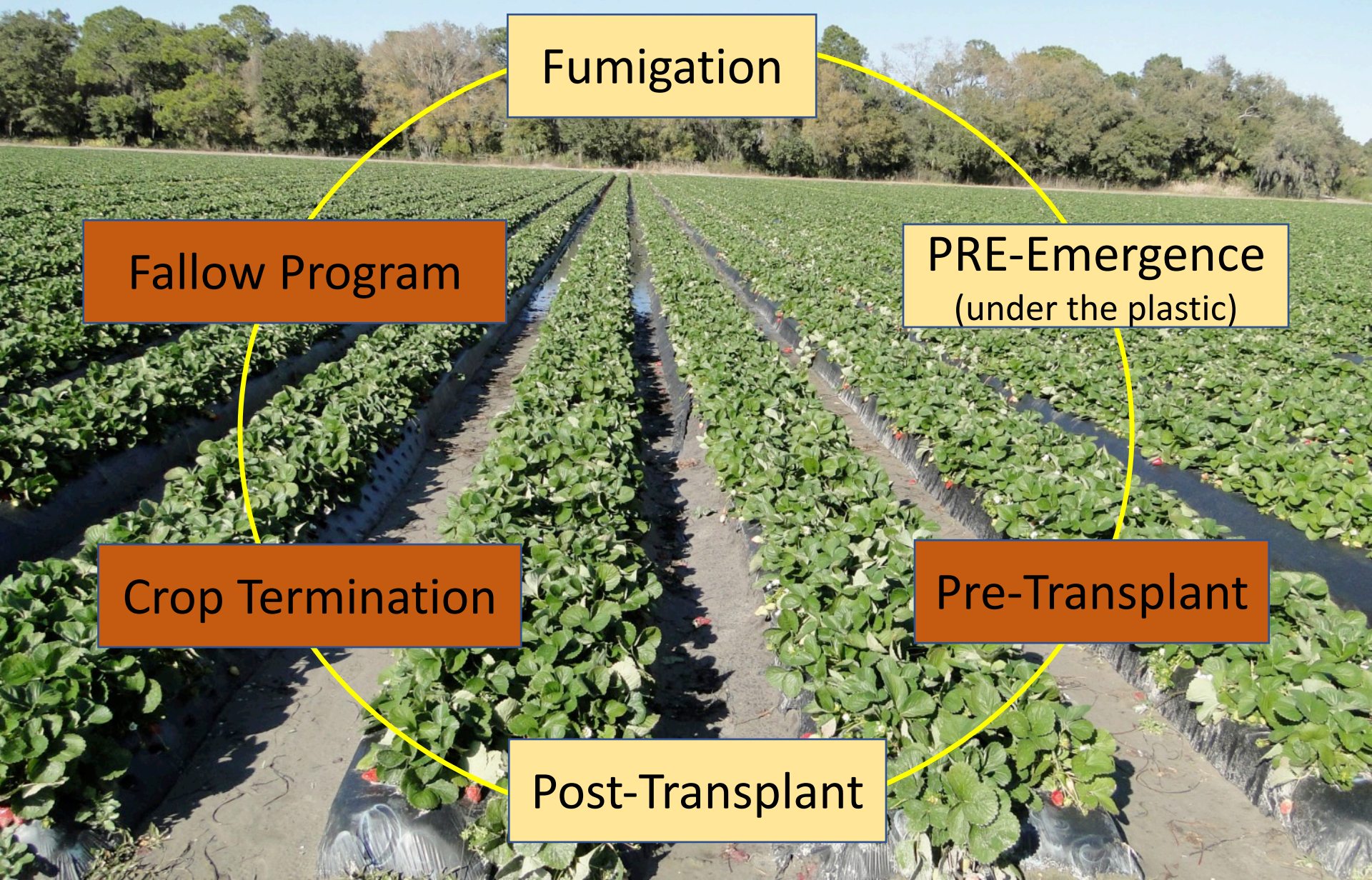
# Keys to successful management

- Apply Chateau before it emerges
- Cultivation or hand removal in row middles and field borders
- Do not allow it to produce seeds in the field
- Glufosinate or cover crops during the fallow period
- Working towards registration of glufosinate for use in row middles.





# INTEGRATED WEED MANAGEMENT PROGRAMS



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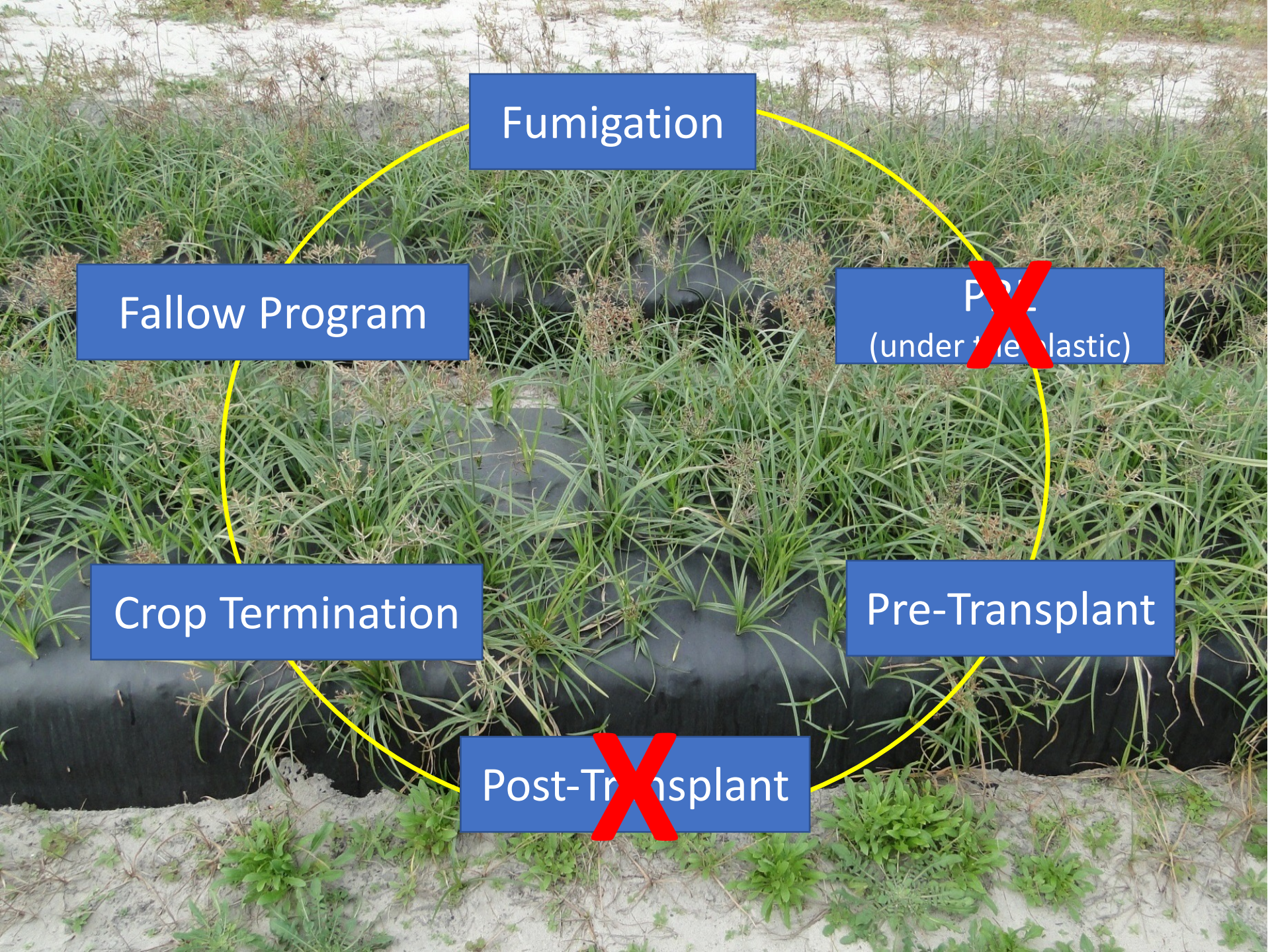


# Nutsedge Management in Strawberry

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Fumigation

~~Pre-Transplant~~  
(under the plastic)

Pre-Transplant

~~Post-Transplant~~

Crop Termination

Fallow Program



# Nutsedge Management

- Crop Termination
  - Paraquat has limited effect on tubers.
  - Injected fumigants such as metam potassium are more likely to kill nutsedge tubers







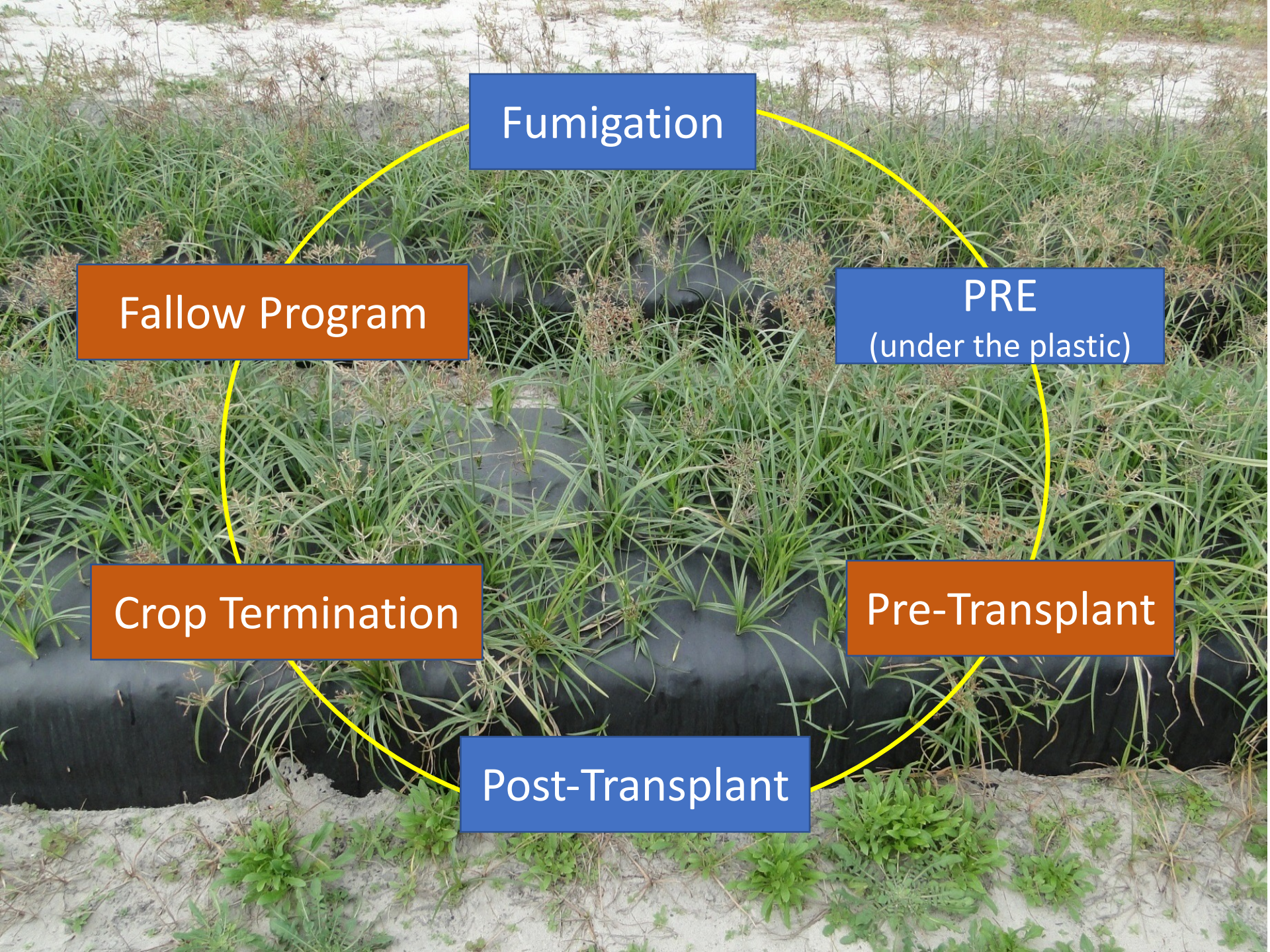
## FALLOW PROGRAMS

- Cover Crops prevent population growth but do not reduce or eliminate the population.
- Herbicides such as glyphosate are the most effective management option









Fumigation

PRE  
(under the plastic)

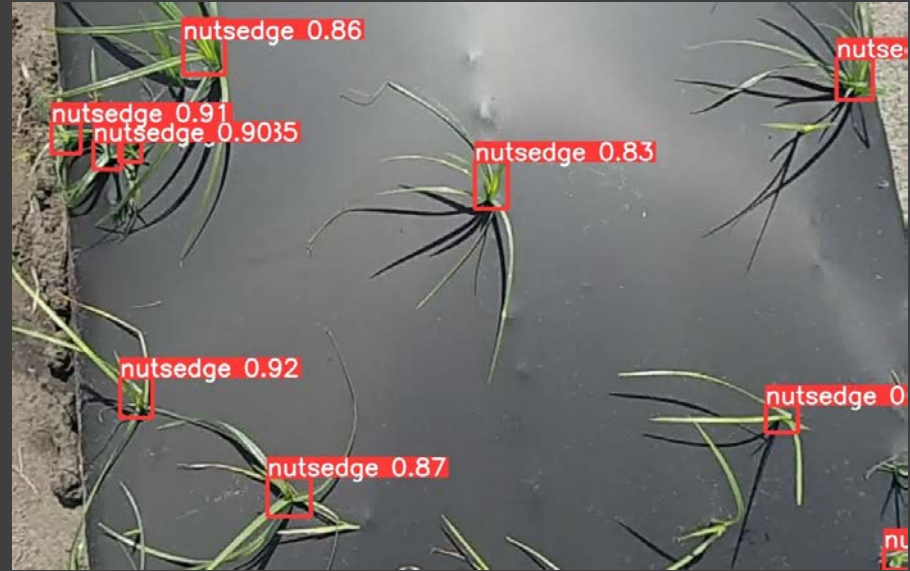
Pre-Transplant

Post-Transplant

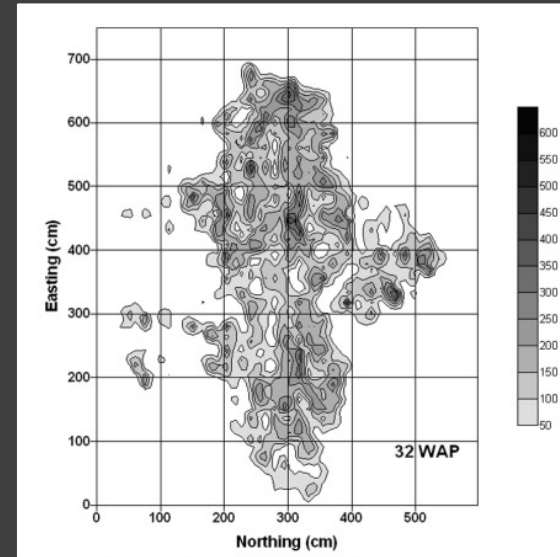
Crop Termination

Fallow Program









Webster (2005)

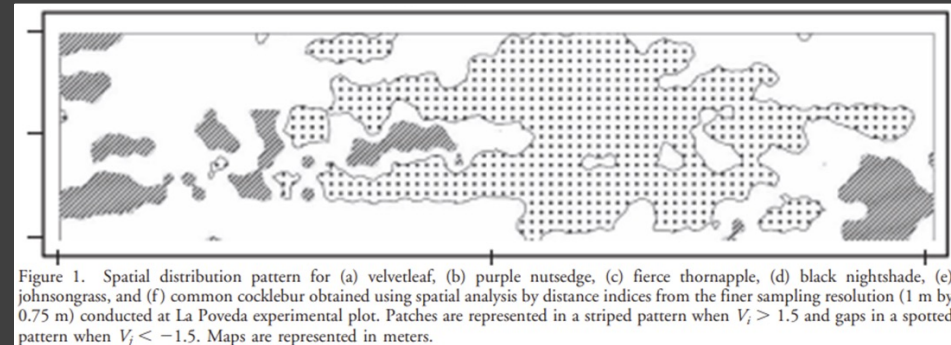


Figure 1. Spatial distribution pattern for (a) velvetleaf, (b) purple nutsedge, (c) fierce thornapple, (d) black nightshade, (e) johnsongrass, and (f) common cocklebur obtained using spatial analysis by distance indices from the finer sampling resolution (1 m by 0.75 m) conducted at La Poveda experimental plot. Patches are represented in a striped pattern when  $V_i > 1.5$  and gaps in a spotted pattern when  $V_i < -1.5$ . Maps are represented in meters.

San Martin et al. (2015)





Targeted Weed Management in Row Middles







**Controller**  
(Trained neural network)

**Herbicide**

**Power source**

**Solenoids & nozzles**





Targeted Row Middle Applications



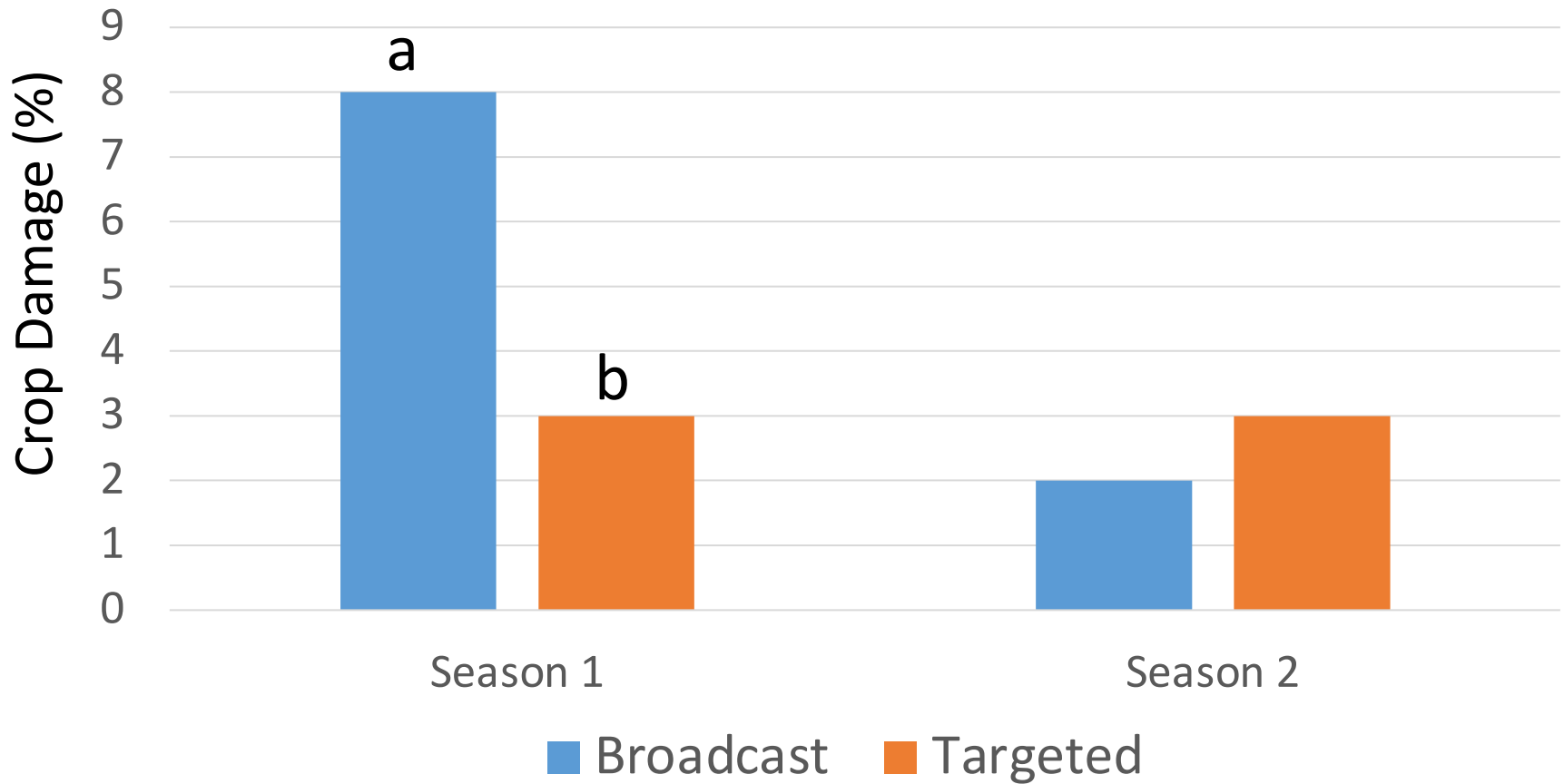


## Experiment 1

- Banded and targeted applications of POST emergence herbicides (diquat and glyphosate).

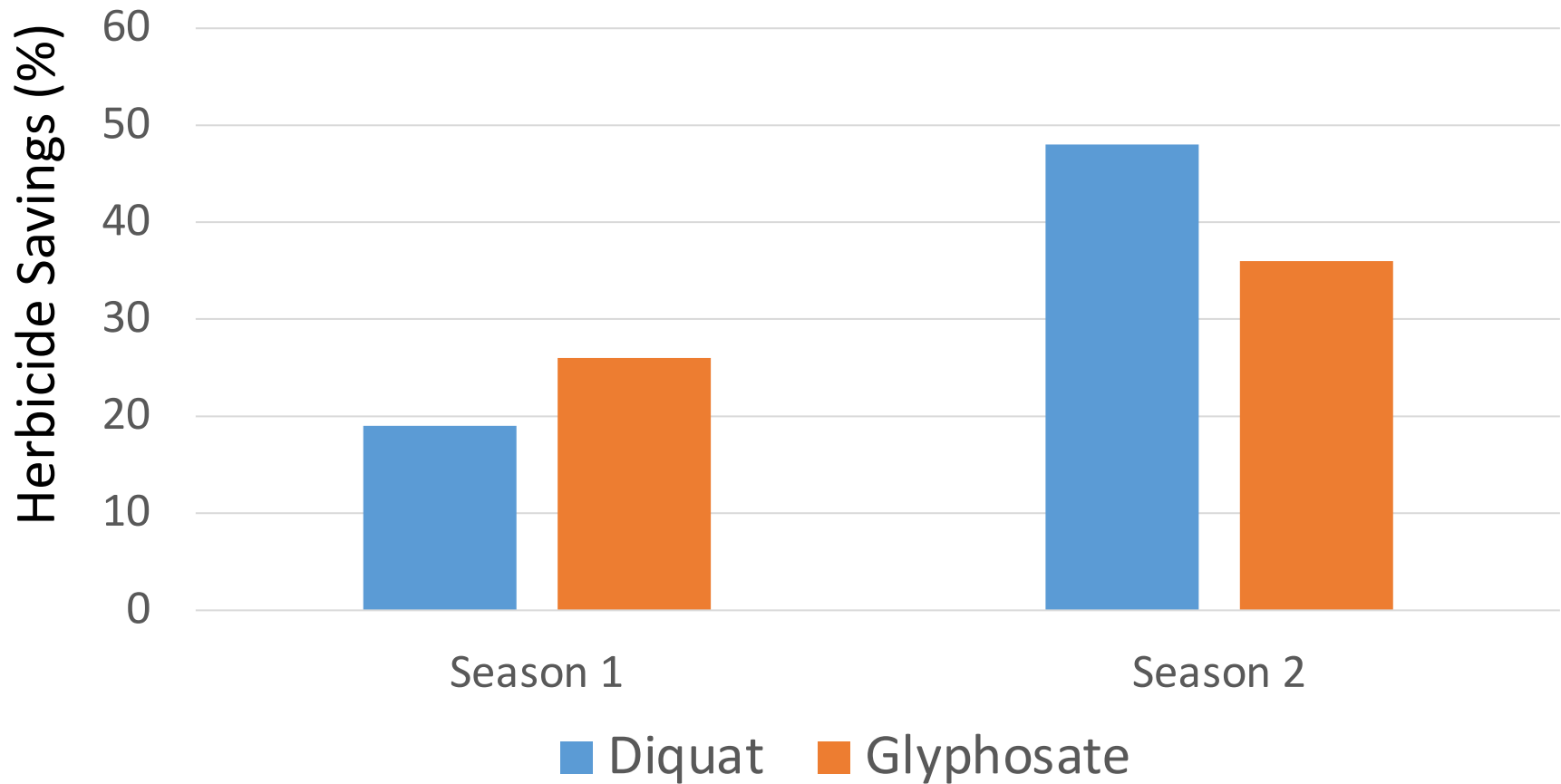


# Crop Damage with Targeted and Banded Sprays in Row Middles





# Herbicide Savings Achieved With Targeted Herbicide Applications Versus Banded Applications





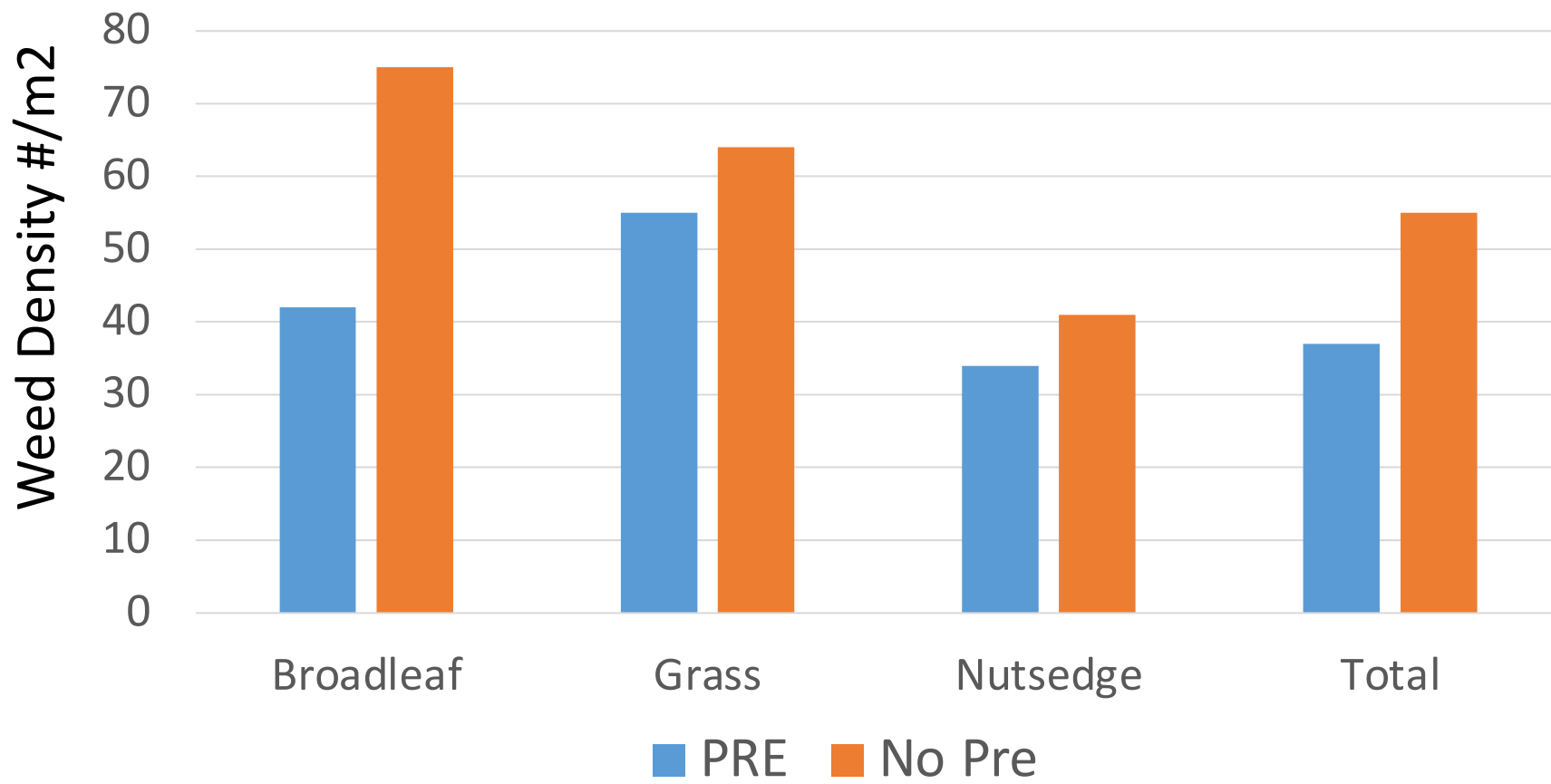


## Experiment 2

- Presence or Absence of Banded applications of Flumioxazin.
- 1 or 2 POST emergence applications of banded or targeted glyphosate applications



# Weed Density With and Without a PRE Flumiozazin in Row Middles





Nontreated







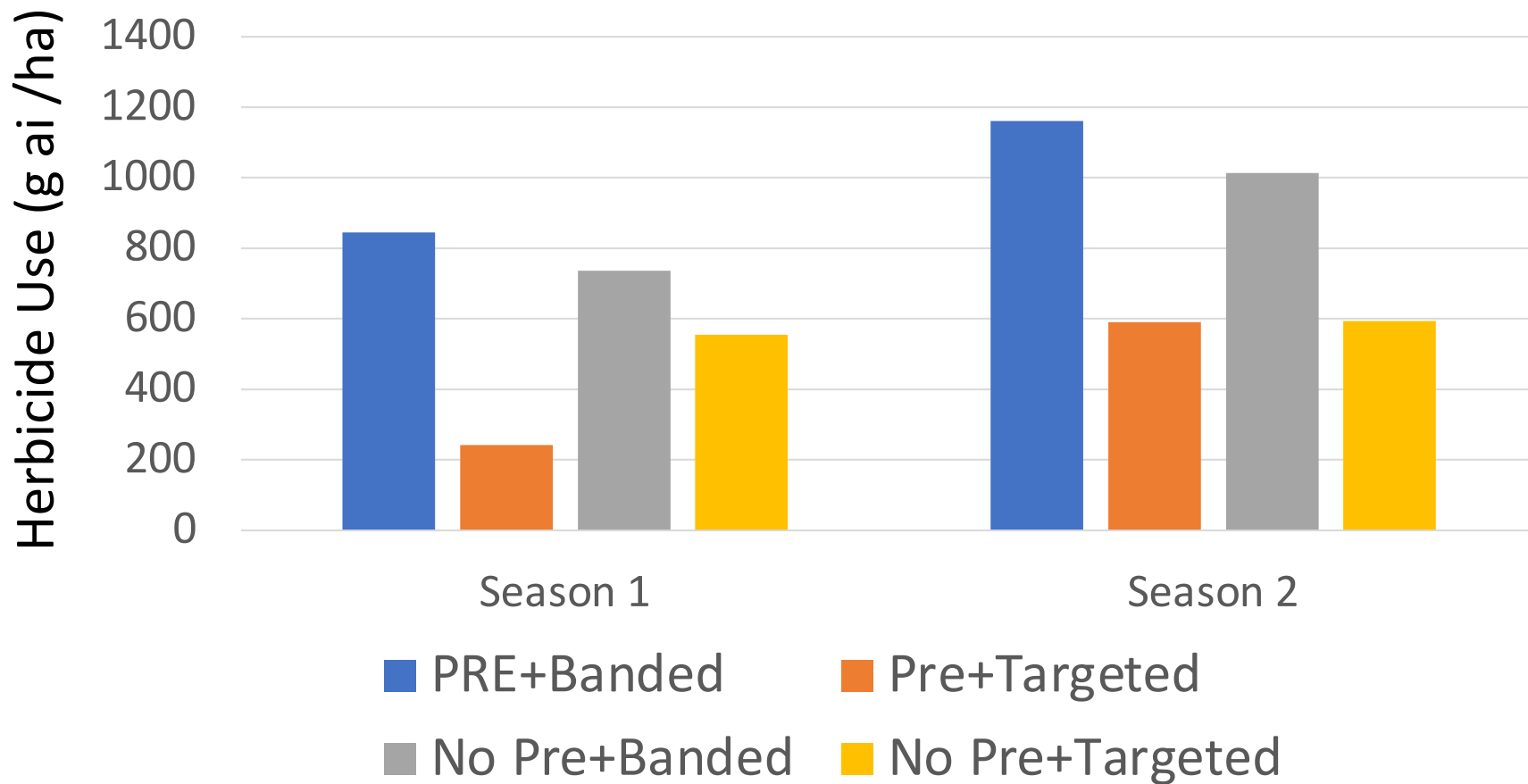
Flumioxazin



No Flumioxazin

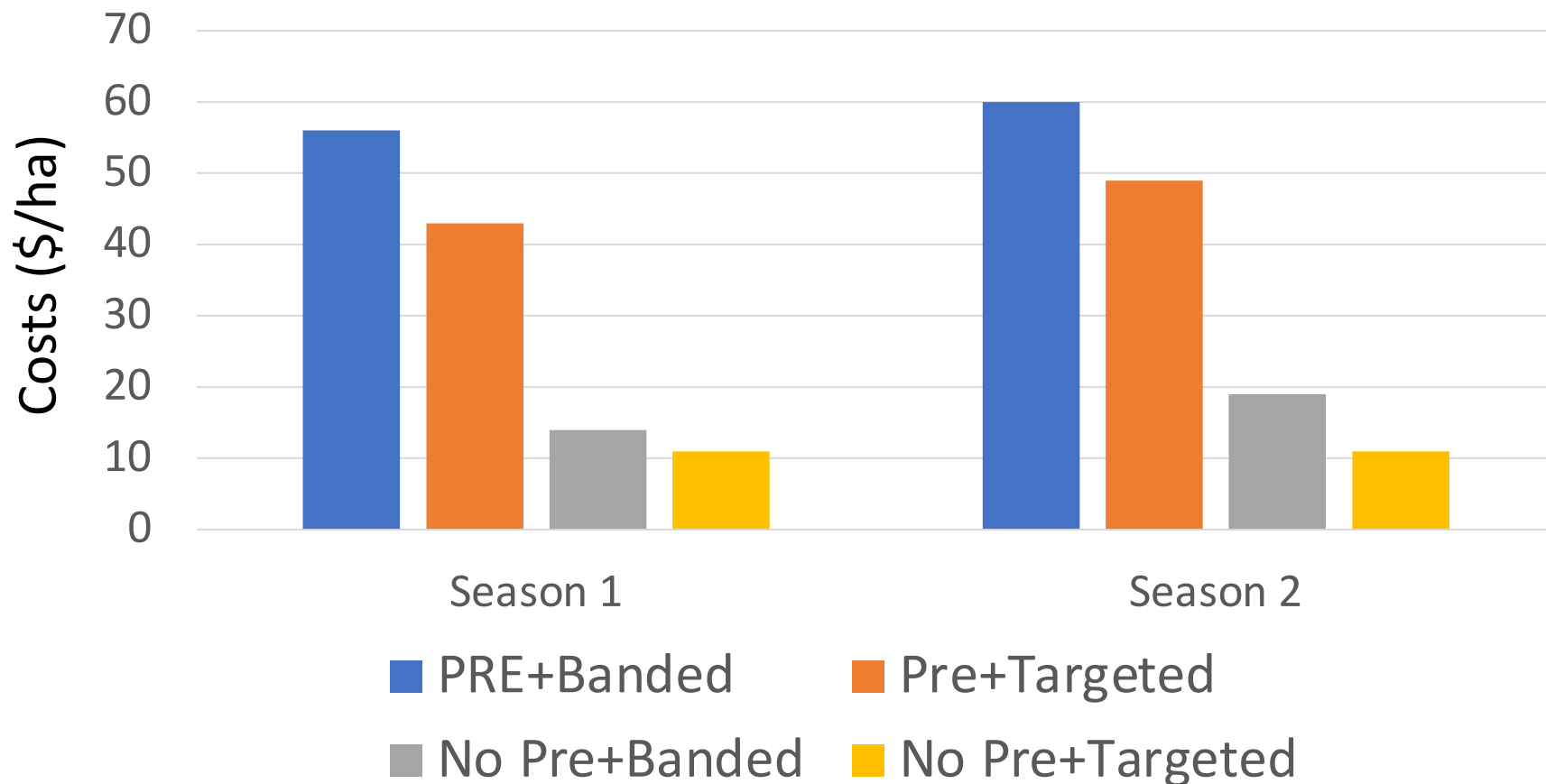


# Herbicide Use With and Without PRE Herbicides in Row Middles



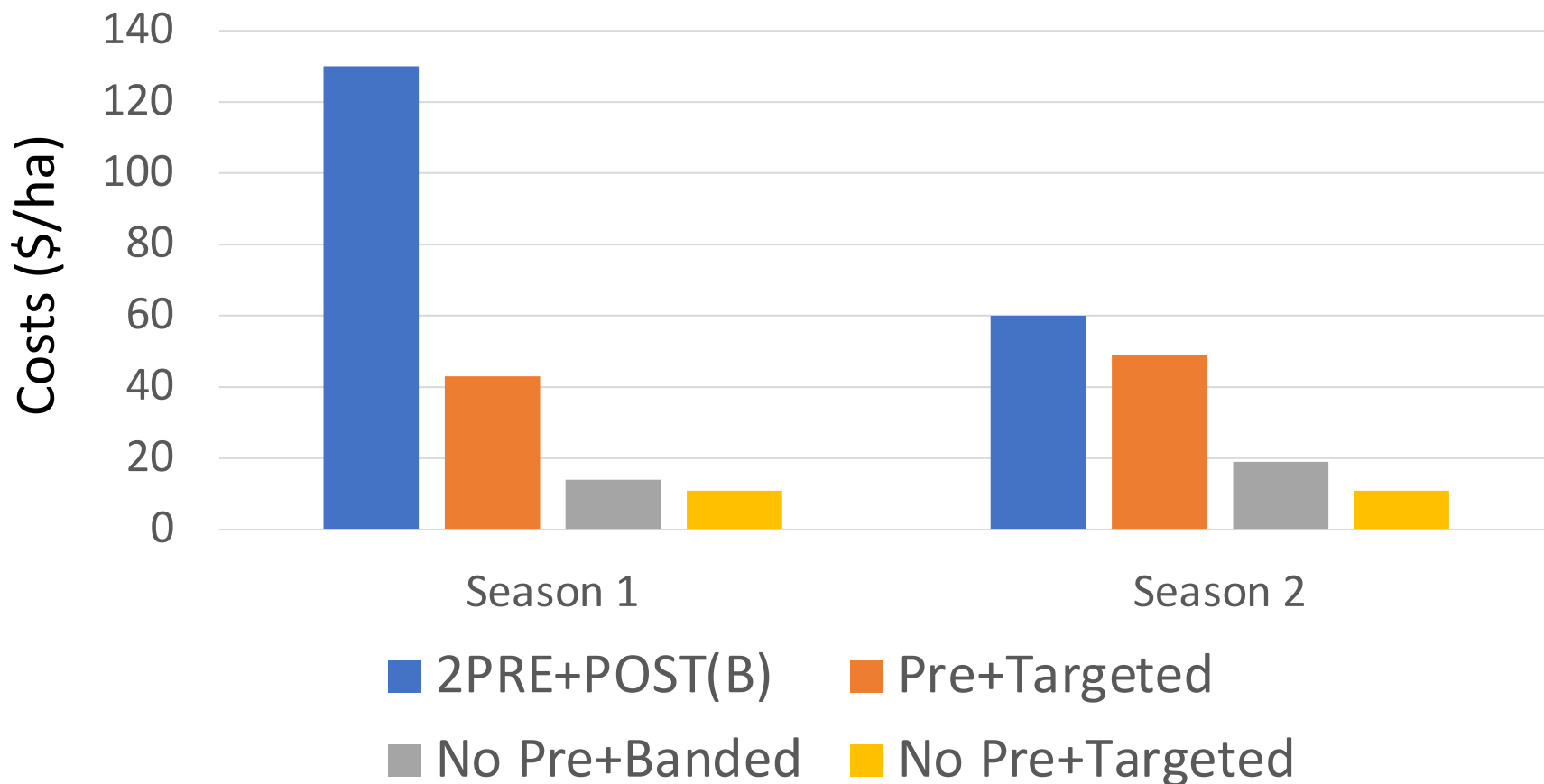


# Herbicide Costs With and Without PRE Herbicides in Row Middles





# Herbicide Costs With and Without PRE Herbicides in Row Middles





# Summary

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- Targeted weed management effectively controls weeds.
- Targeted weed management lowers risk of crop damage.
- Targeted weed management lowers PHI in some cases
- Targeted weed management lowers herbicide input costs





# Acknowledgments

- Weed Science Team at GCREC
- Research Was Partially Funded by FSREF.



**Florida Strawberry  
Growers Association** <sup>SM</sup>