

# Pesticide Spray Drift Buffers & Setbacks: What It Means to U.S. Growers?



Dan Perkins, PhD  
Ag Insight



Richard Brain, PhD  
Syngenta



# Background: Richard Brain

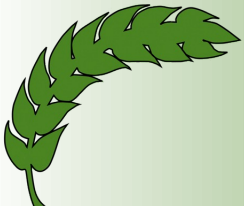
Ph.D. Environmental  
Toxicology  
BSc. Environmental  
Toxicology



Post-Doctoral  
Fellow



Ecotoxicologist





# Background: Dan Perkins

B.S. Agronomy – BYU

M.S., Agronomy- Purdue

Ph.D., Hydrology - UF

Ag Insight, LLC (Owner and CEO)



BYU

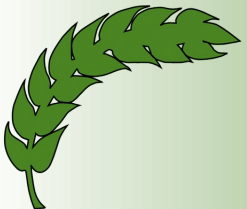
AgINSIGHT  
Science - Ideas - Innovation

P

FMC

syngenta

UF UNIVERSITY of FLORIDA



# Overview

- Pesticide registration in the United States
- How the EPA calculates buffers
- What field studies demonstrate
- YouTube experience
- What it all means to farmers and the environment

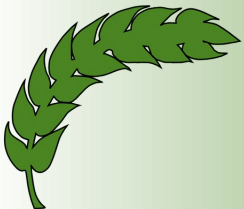


“

The farmer is the only man in our economy who buys everything at retail, sells everything at wholesale, and pays the freight both ways.

”

JOHN F. KENNEDY





# FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

[As Amended Through P.L. 112-177, Effective Sept. 28, 2012]

## TABLE OF CONTENTS<sup>1</sup>

- Sec. 1. [prec. 121] Short title and table of contents.
- Sec. 2. [136] Definitions.
- Sec. 3. [136a] Registration of pesticides.
- Sec. 4. [136a-1] Reregistration of registered pesticides.
- Sec. 5. [136c] Experimental use permits.
- Sec. 6. [136d] Administrative review; suspension.
- Sec. 7. [136e] Registration of establishments.
- Sec. 8. [136f] Books and records.
- Sec. 9. [136g] Inspection of establishments, etc.
- Sec. 10. [136h] Protection of trade secrets and other information.
- Sec. 11. [136i] Use of restricted use pesticides; applicators.
- Sec. 12. [136j] Unlawful acts.
- Sec. 13. [136k] Stop sale, use, removal, and seizure.
- Sec. 14. [136l] Penalties.
- Sec. 15. [136m] Indemnities.
- Sec. 16. [136n] Administrative procedure; judicial review.
- Sec. 17. [136o] Imports and exports.
- Sec. 18. [136p] Exemption of Federal and State agencies.
- Sec. 19. [136q] Storage, disposal, transportation, and recall.
- Sec. 20. [136r] Research and monitoring.
- Sec. 21. [136s] Solicitation of comments; notice of public hearings.
- Sec. 22. [136t] Delegation and cooperation.
- Sec. 23. [136u] State cooperation, aid, and training.
- Sec. 24. [136v] Authority of States.
- Sec. 25. [136w] Authority of Administrator.
- Sec. 26. [136w-1] State primary enforcement responsibility.
- Sec. 27. [136w-2] Failure by the State to assure enforcement of State pesticide use regulations.
- Sec. 28. [136w-3] Identification of pests; cooperation with Department of Agriculture's program.
- Sec. 29. [136w-4] Annual report.
- Sec. 30. [136w-5] Minimum requirements for training of maintenance applicators and service technicians.
- Sec. 31. [136w-6] Environmental Protection Agency minor use program.
- Sec. 32. [136w-7] Department of Agriculture minor use program.
- Sec. 33. [136w-8] Pesticide registration service fees.
- Sec. 34. [136x] Severability.
- Sec. 35. [136y] Authorization for appropriations.

## AN ACT

To regulate the marketing of economic poisons and devices, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

<sup>1-</sup>This table of contents is not part of the Act but is included for user convenience. The numbers in brackets refer to section numbers in title 7, United States Code.



U.S. Fish & Wildlife Service

# Pesticide Registration In the United States

## ENDANGERED SPECIES ACT OF 1973

As Amended through the

108th Congress

Department of the Interior  
U.S. Fish and Wildlife Service  
Washington, D.C. 20240

September 28, 2012

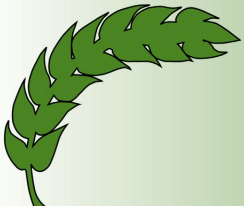
# Tiered Risk Assessment Framework



**Conservative/Screening-Level**

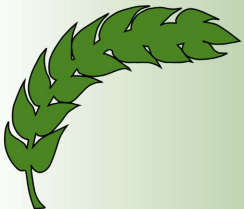


**Realistic/Refined**



# Screening-Level Assessment

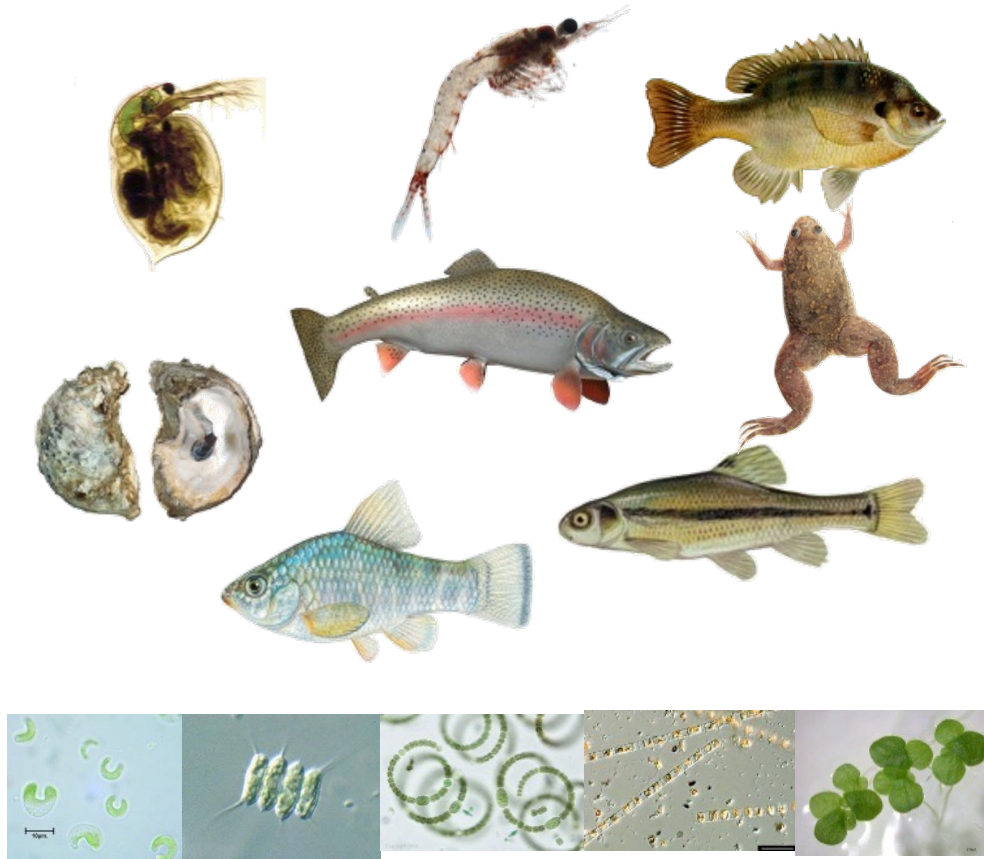
- USEPA, USFWS, and NMFS rely on conservative, screening-level methods to estimate exposure and potential risks to the environment
- **Screening-level assessments are intended to be highly conservative** to avoid false negatives (Type II errors; concluding a product or use poses acceptable risks when, in fact, it does not)
  - By design, such assessments have high false positive rates (Type I errors; concluding a product or use presents unacceptable risks when in fact it does not). That is, screening-level assessments are intended to overestimate risk
- In addition, **screening-level assessments are generic**; using the most sensitive surrogate test organism to represent the species of interest



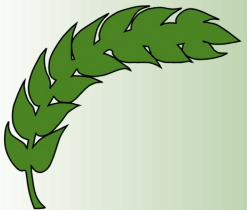
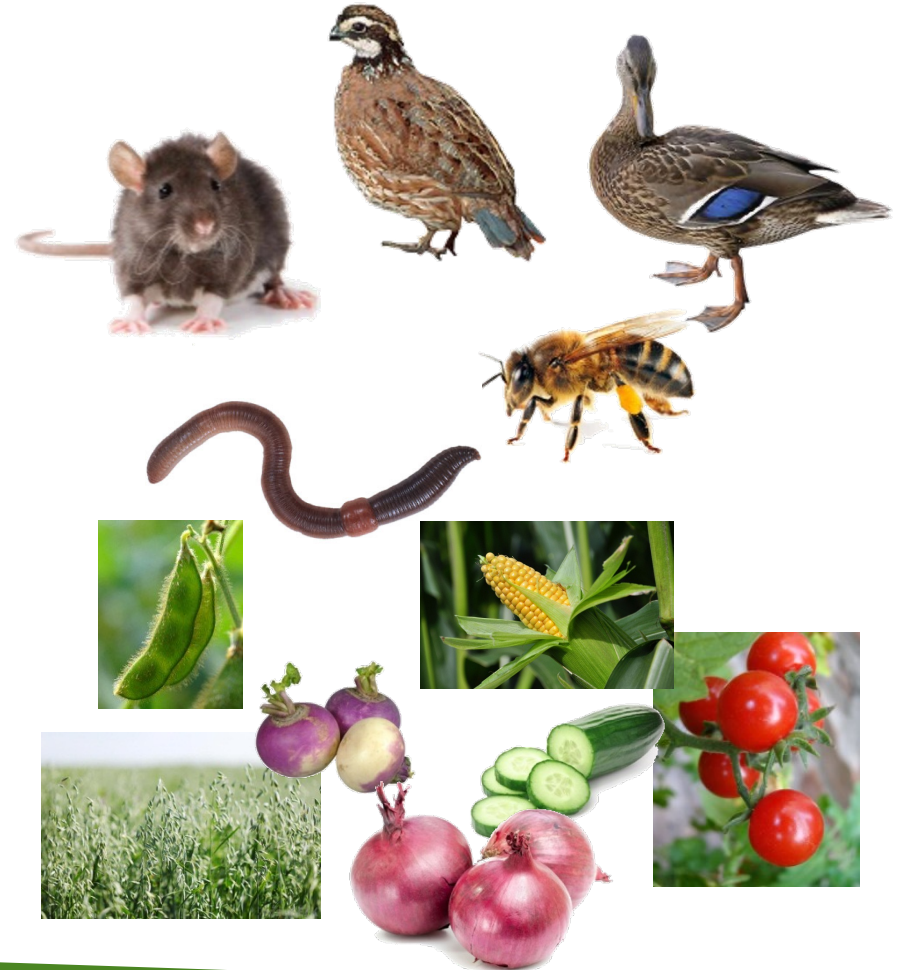


# Generating Effects Data

## Aquatic



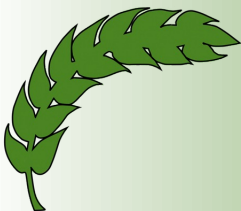
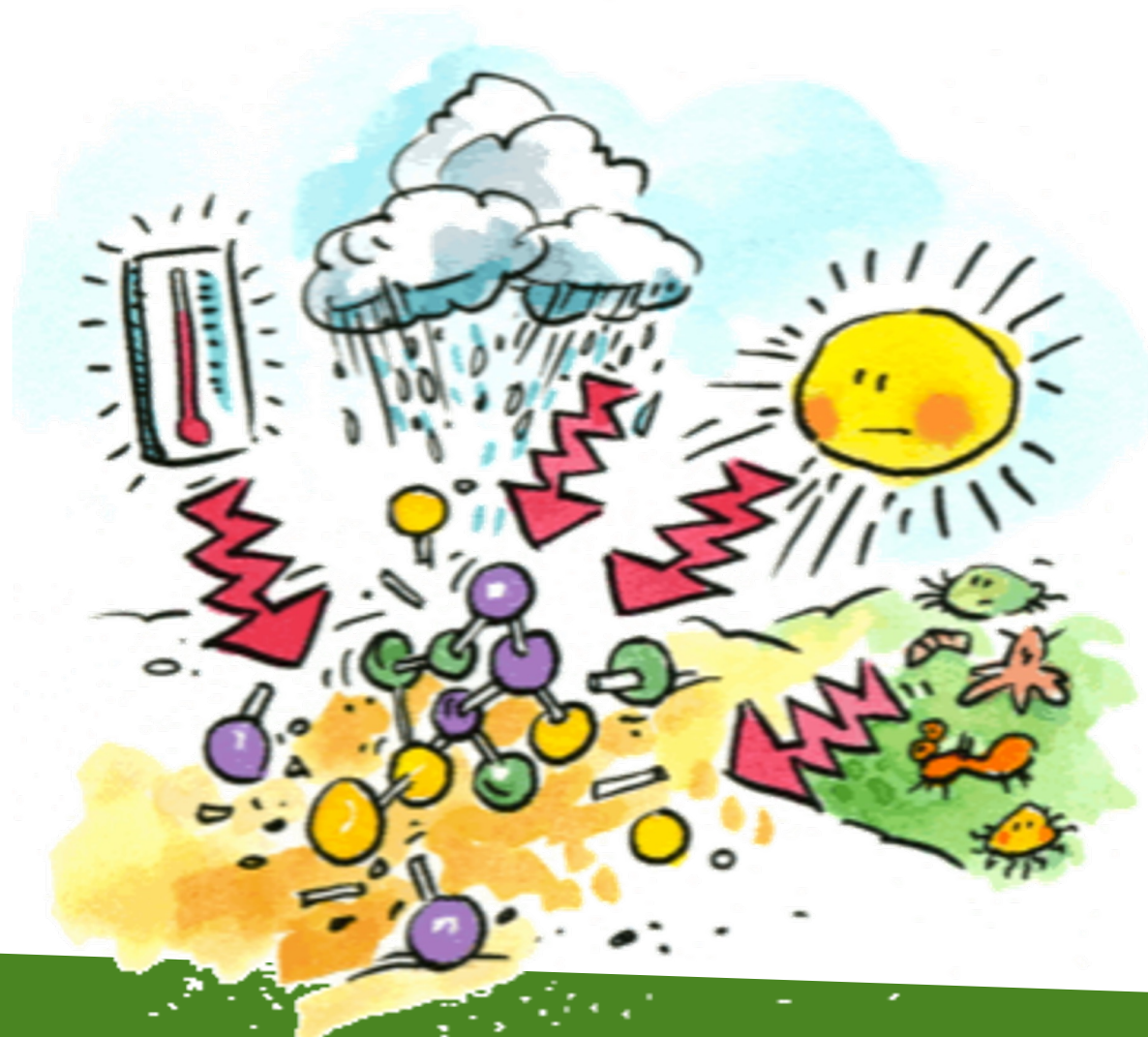
## Terrestrial



# Generating Environmental Fate (Exposure) Data



29.70 inHg ↑ 70°F ● 02/25/13 11:00 AM TX 01





# How Does the EPA Calculate Spray Buffers?

Generate endpoint in a spray chamber...



Parameterize the model and input your endpoint...

Stream Assessment

Geometry

Spray Block

Spray Line Length: 328.08 ft

Turn-Around Time: 30 sec

Stream

Width: 9.84 ft

Depth: 1.64 ft

Flow Rate: 396.3 gal/s

Flow Speed: 2.24 mph

Riparian Interception Factor: 0

Instream Chemical Decay Rate: 0 1/day

Recharge Rate: 0 gal/s/mi

Distance from edge of application area to center of stream: 164.04 ft

Control

Calculate results at:  a single point  given time(s)  given distance(s)

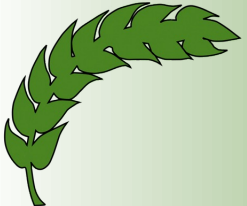
Provide one value and the others will be calculated.

Time: 0 sec Distance: ft Peak Conc.: ng/L (ppt)

Tier I Settings

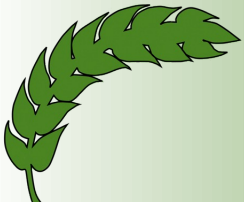
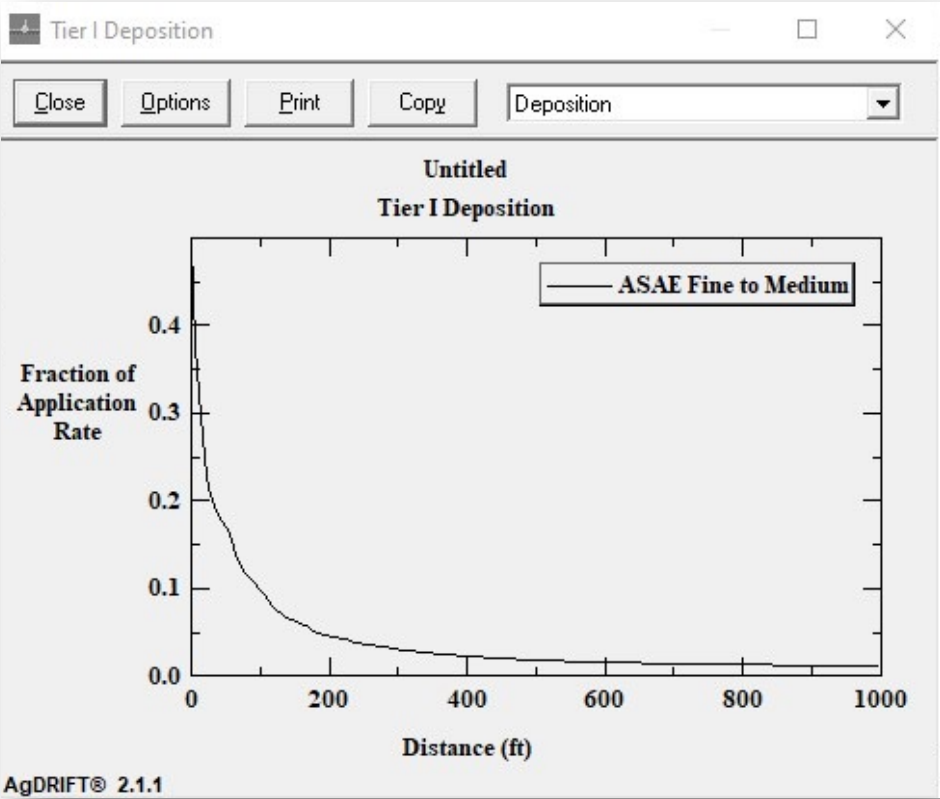
Active Rate: 0.2505 lb/ac

Plot Export EXAMS Calc Close

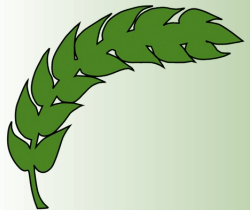




# What does AgDRIFT Predict?

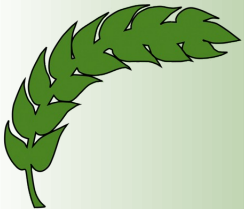
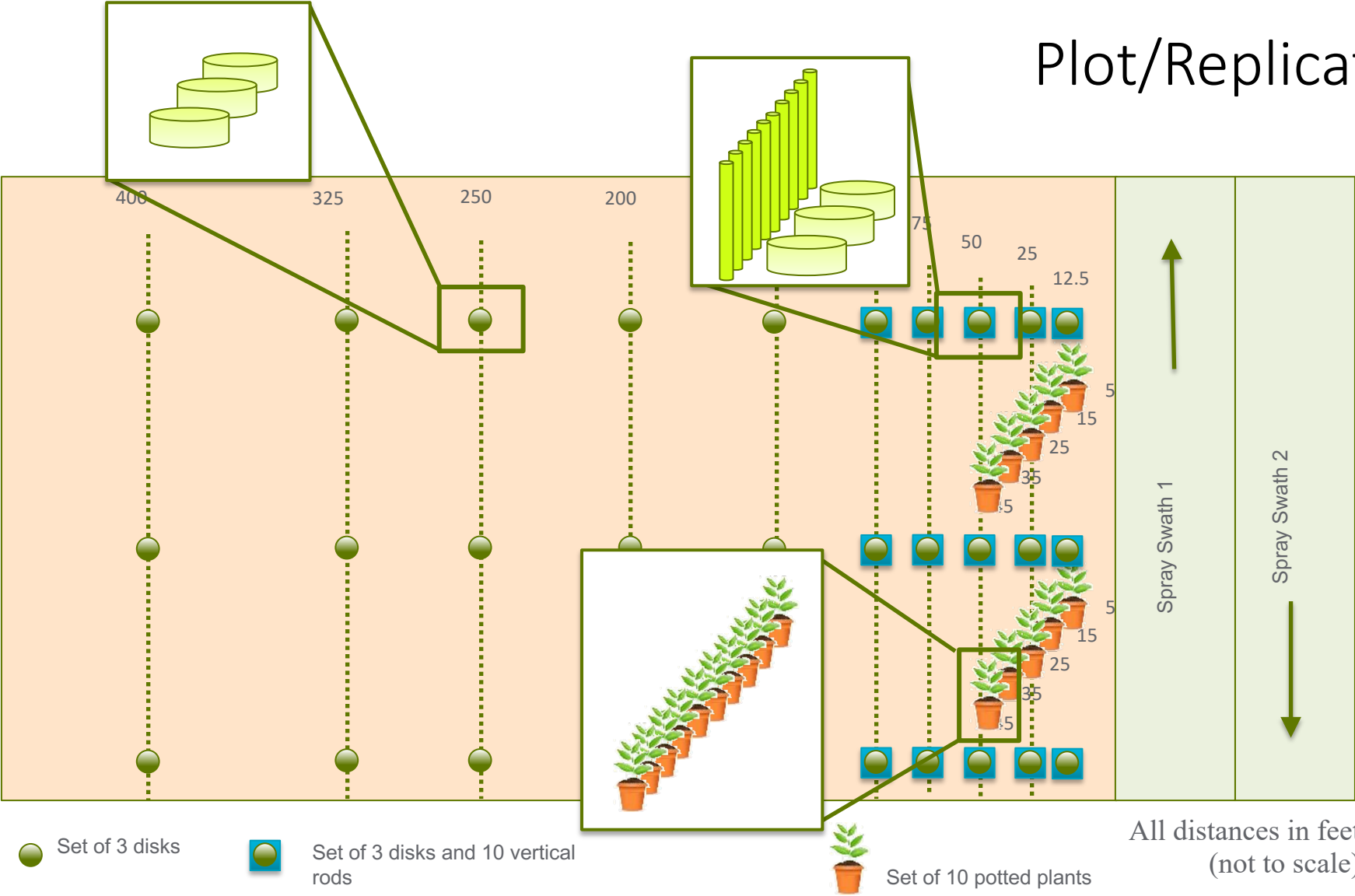


# Higher-Tier Study

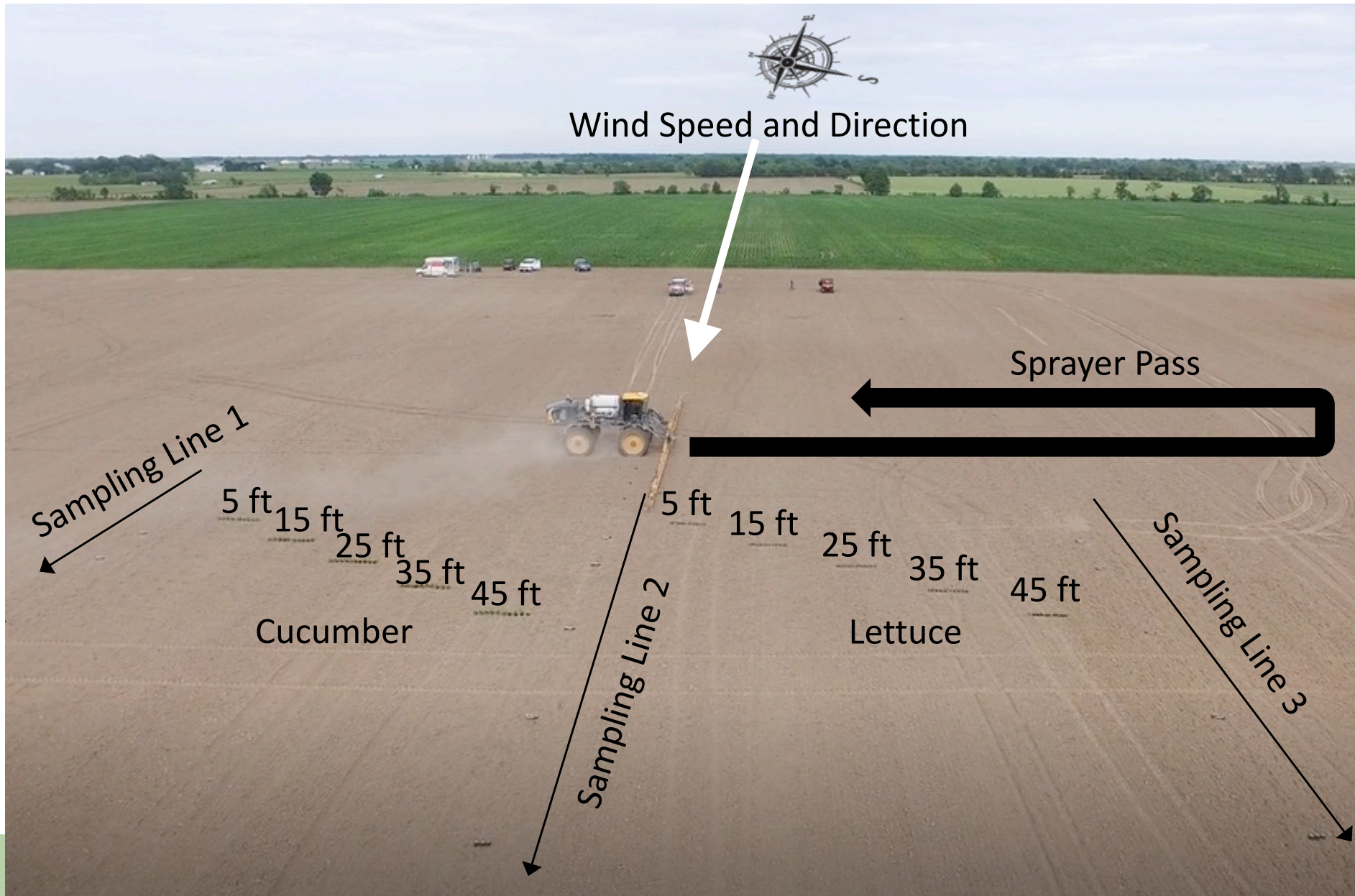




# Plot/Replicate Layout







Wind Speed and Direction

Sprayer Pass

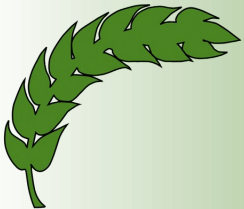
Sampling Line 1

5 ft  
15 ft  
25 ft  
35 ft  
45 ft  
Cucumber

Sampling Line 2

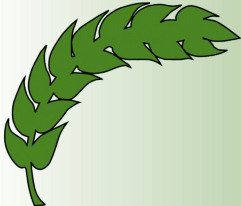
5 ft  
15 ft  
25 ft  
35 ft  
45 ft  
Lettuce

Sampling Line 3

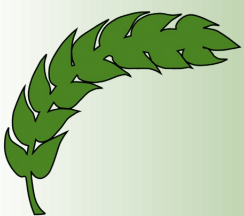
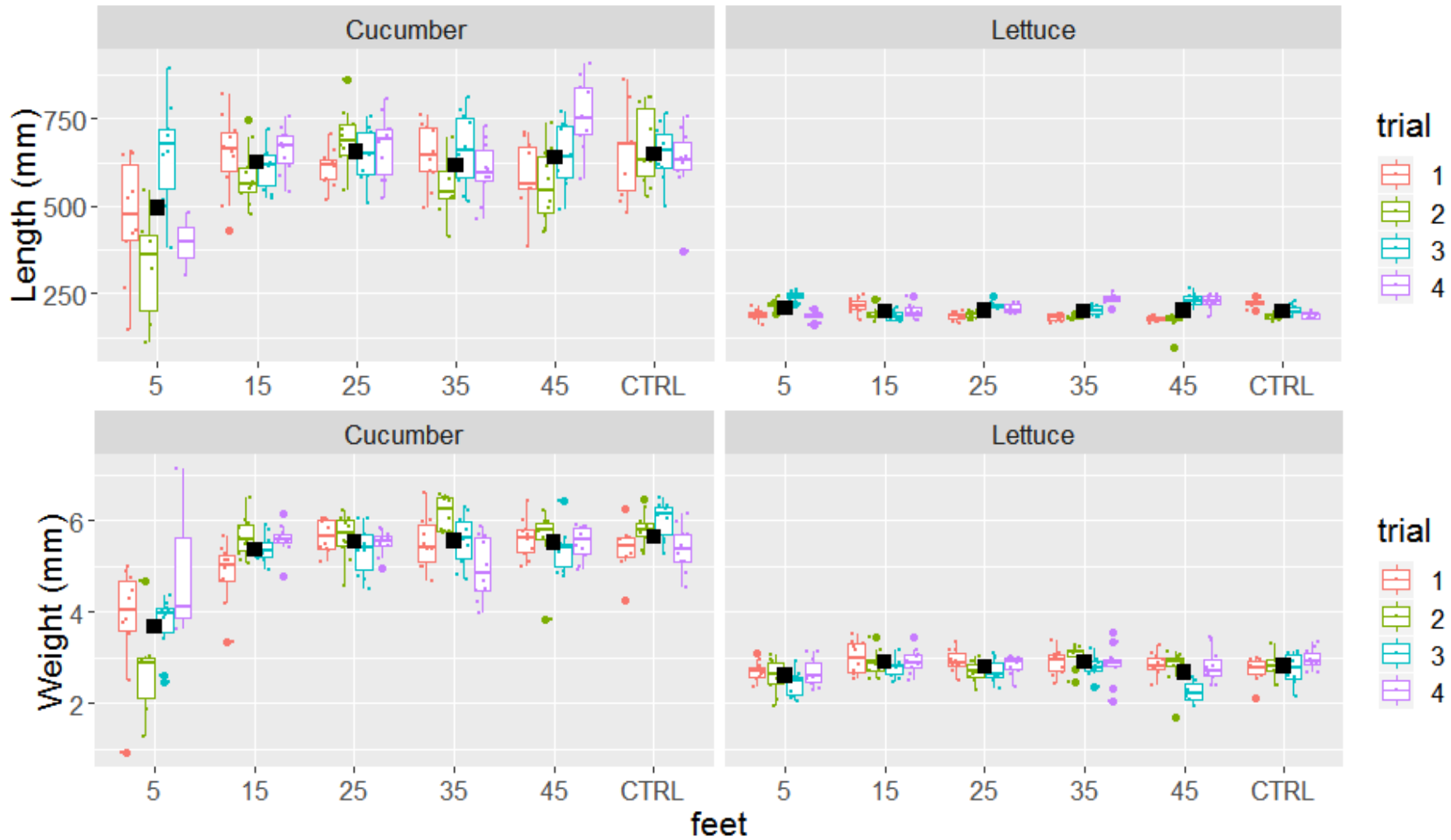




# Visible Biological Effects



# Visible Biological Effects Continued

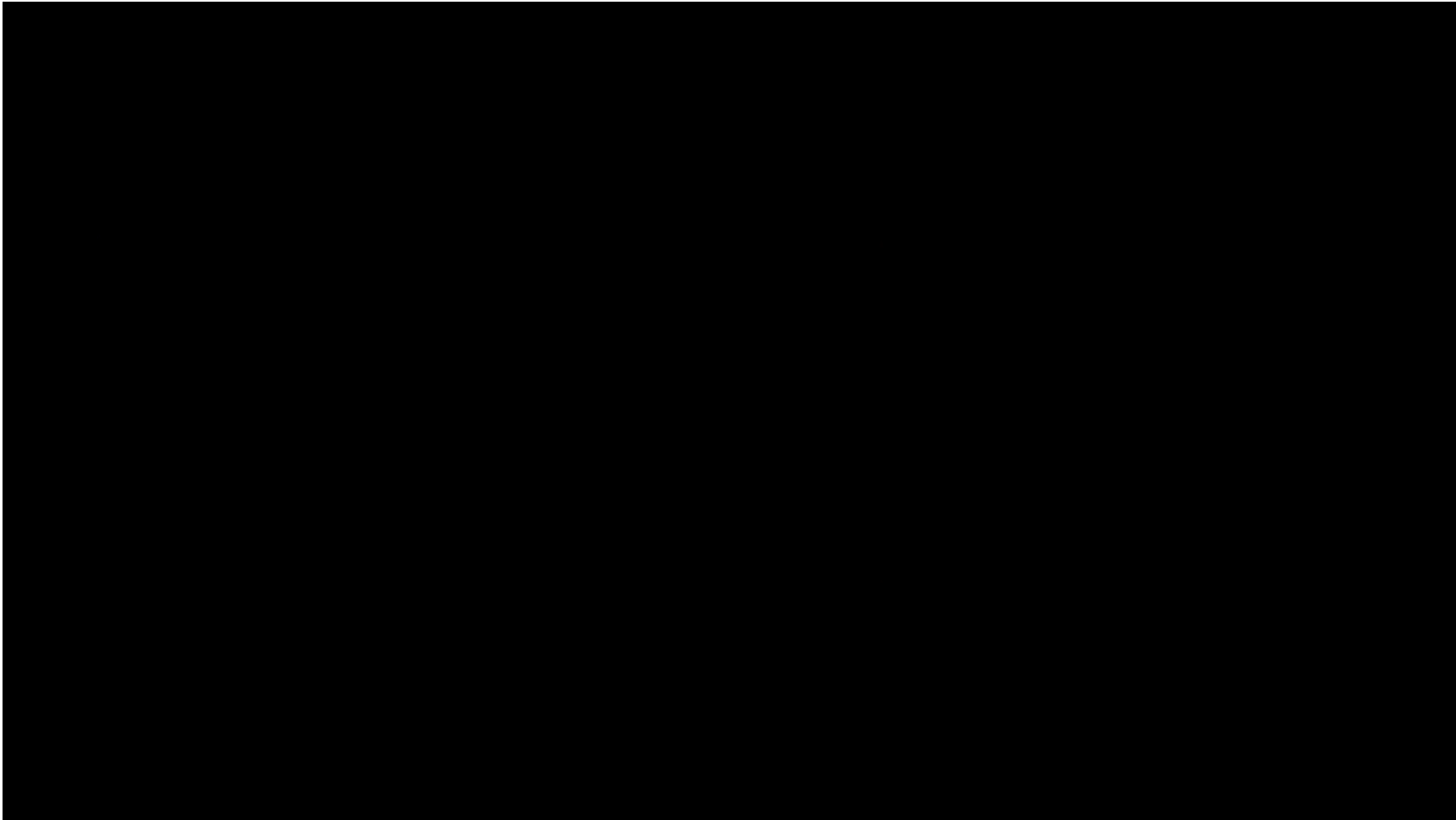




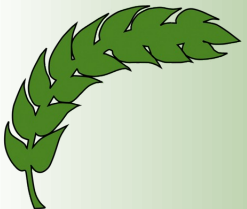
## YouTube Video:



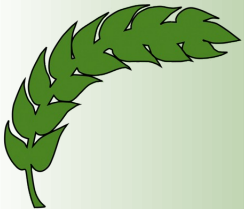
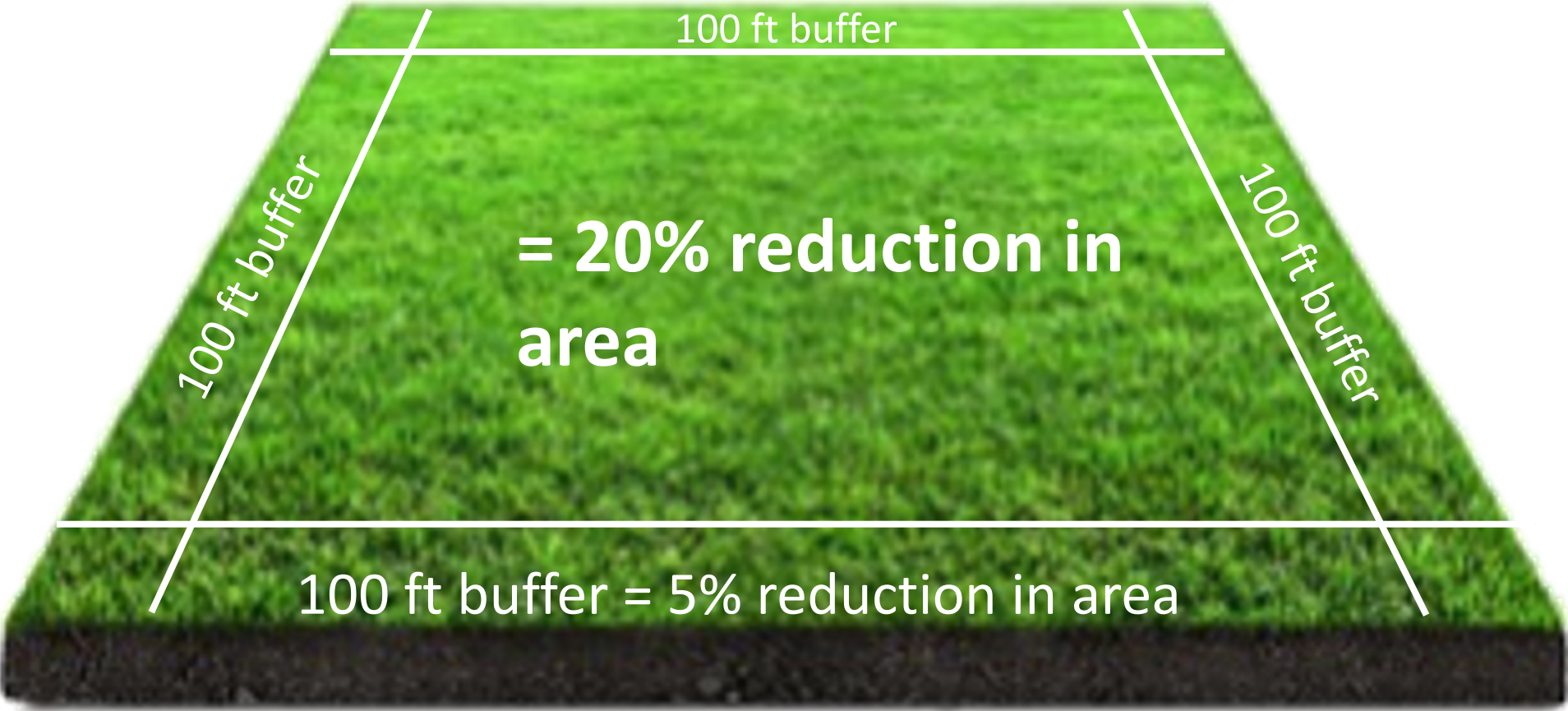
1,000 ft 'No Spray' Zone?!? What do farmers think?



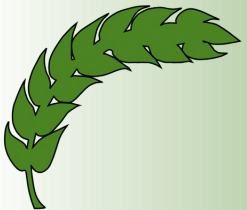
<https://www.youtube.com/watch?v=ecMFBLikZYc>



If we assume an average field size of 100 acres, and for simplicity we assume the field is a square...

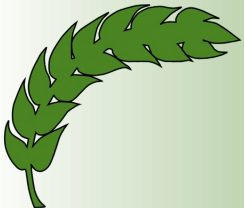
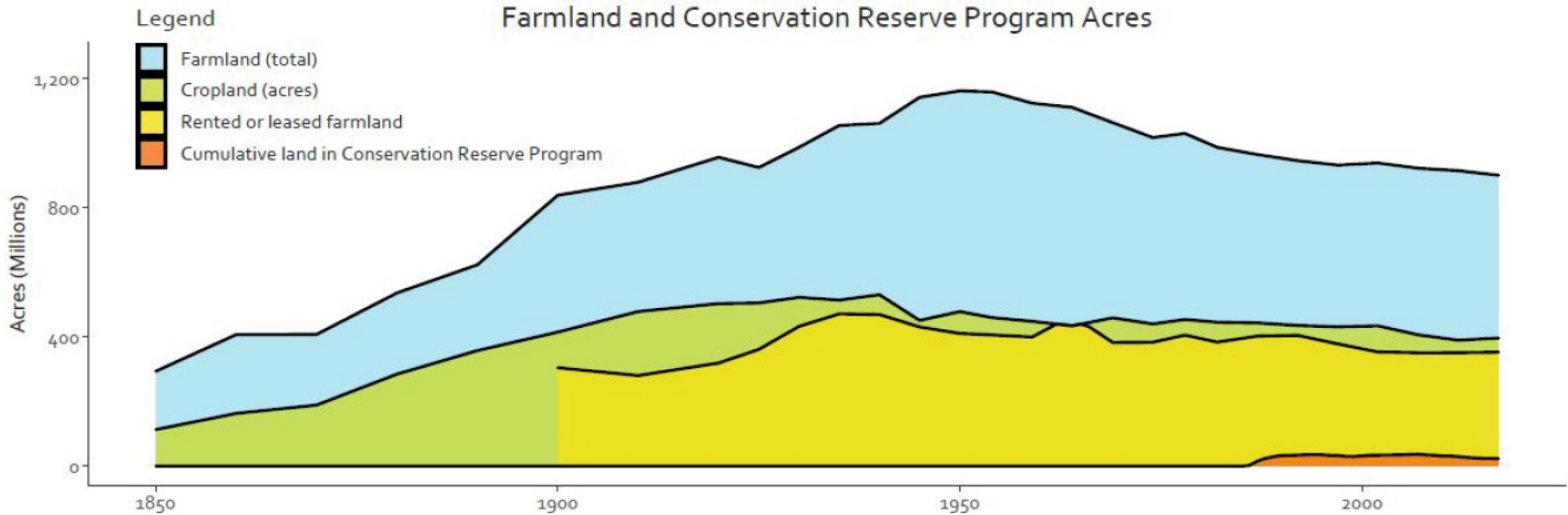


# The recourse for chemical prohibitions on implicated farmland?

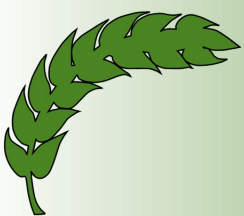
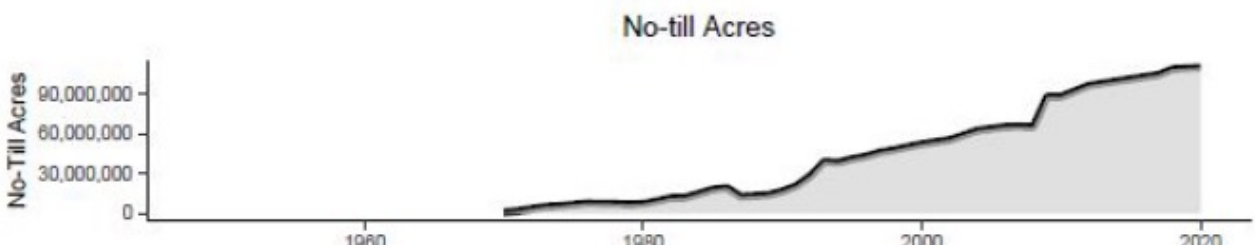
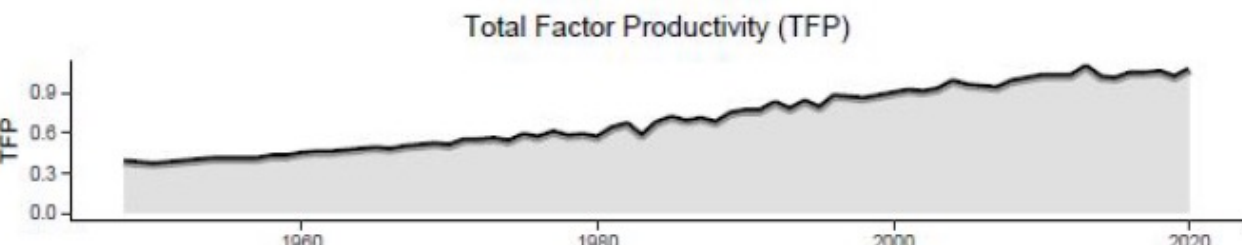
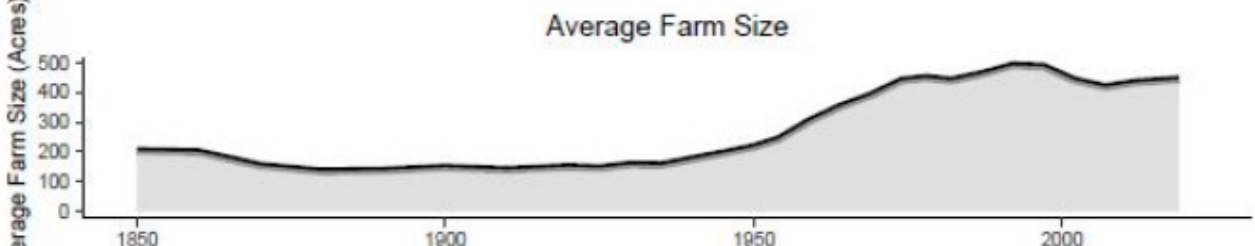
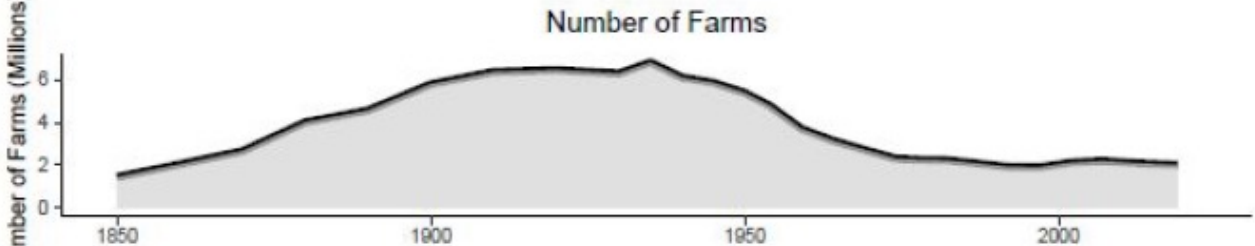
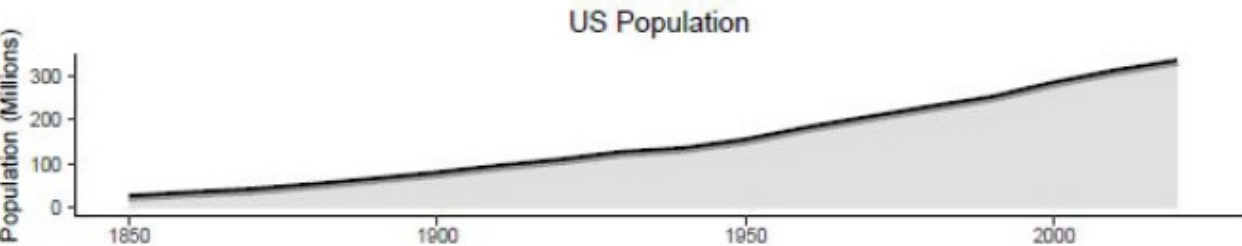




# Implications for Farmland, Production, and Conservation

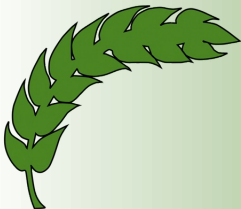


# Implications for Farmland, Production, and Conservation



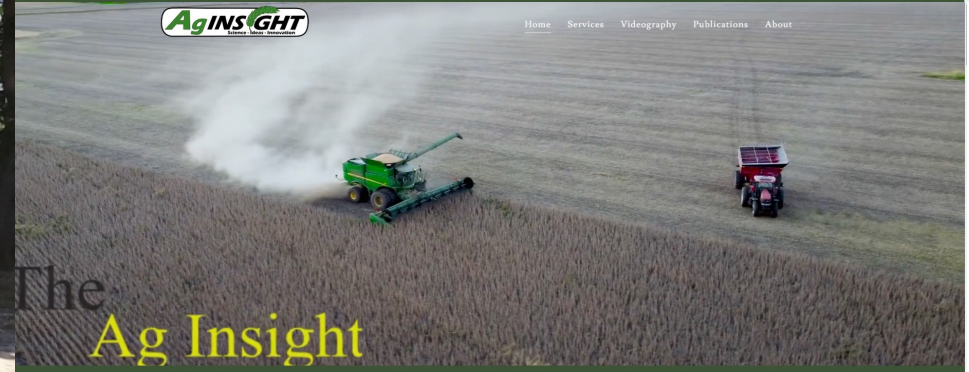
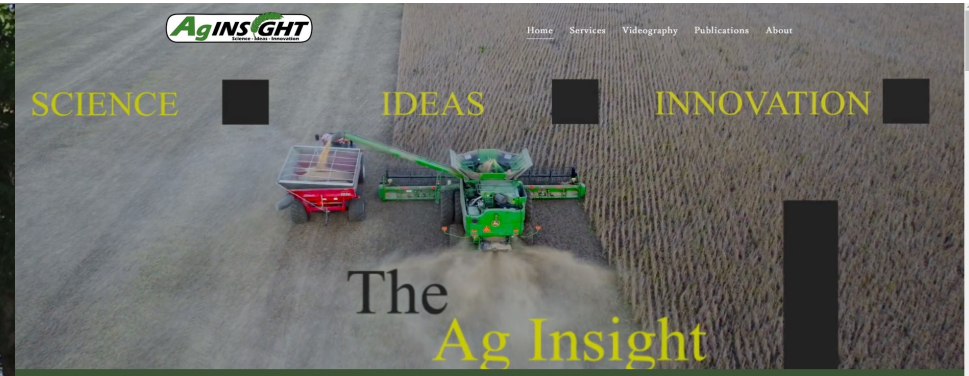
# What actions can growers take?

- Get involved with local commodities associations and engage with local political activities related to agriculture
- Be aware of how regulatory activities could affect agricultural production
- Consider volunteering for opportunities to partner in scientific research
- Engage in commenting on relevant EPA dockets regarding decisions related to product risk and stewardship
- Engage in social media





# Discussion



TheAgInsight.com