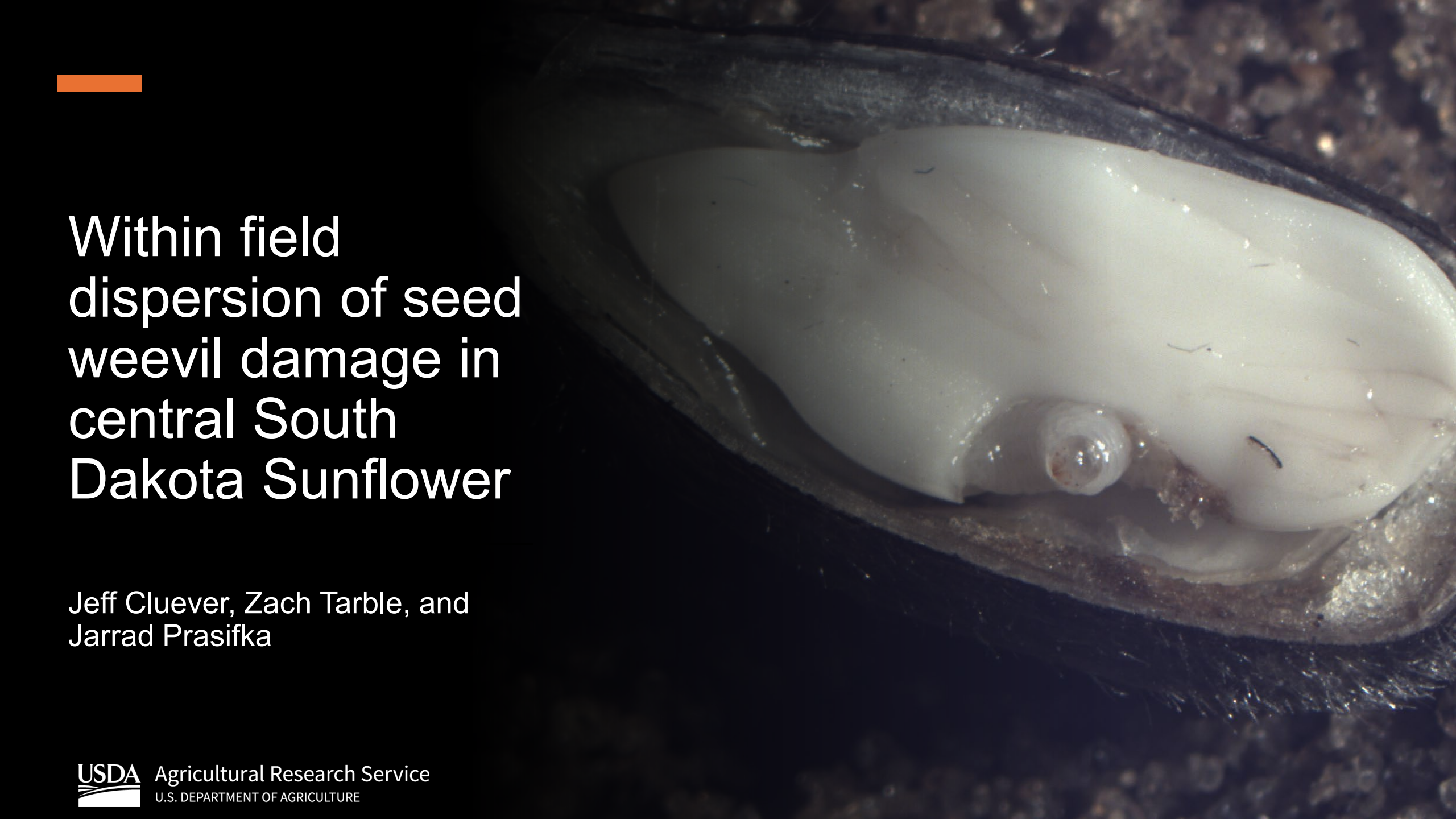
Within field dispersion of seed weevil damage in central South Dakota Sunflower

Jeff Cluever, Zach Tarble, and Jarrad Prasifka



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Sunflower

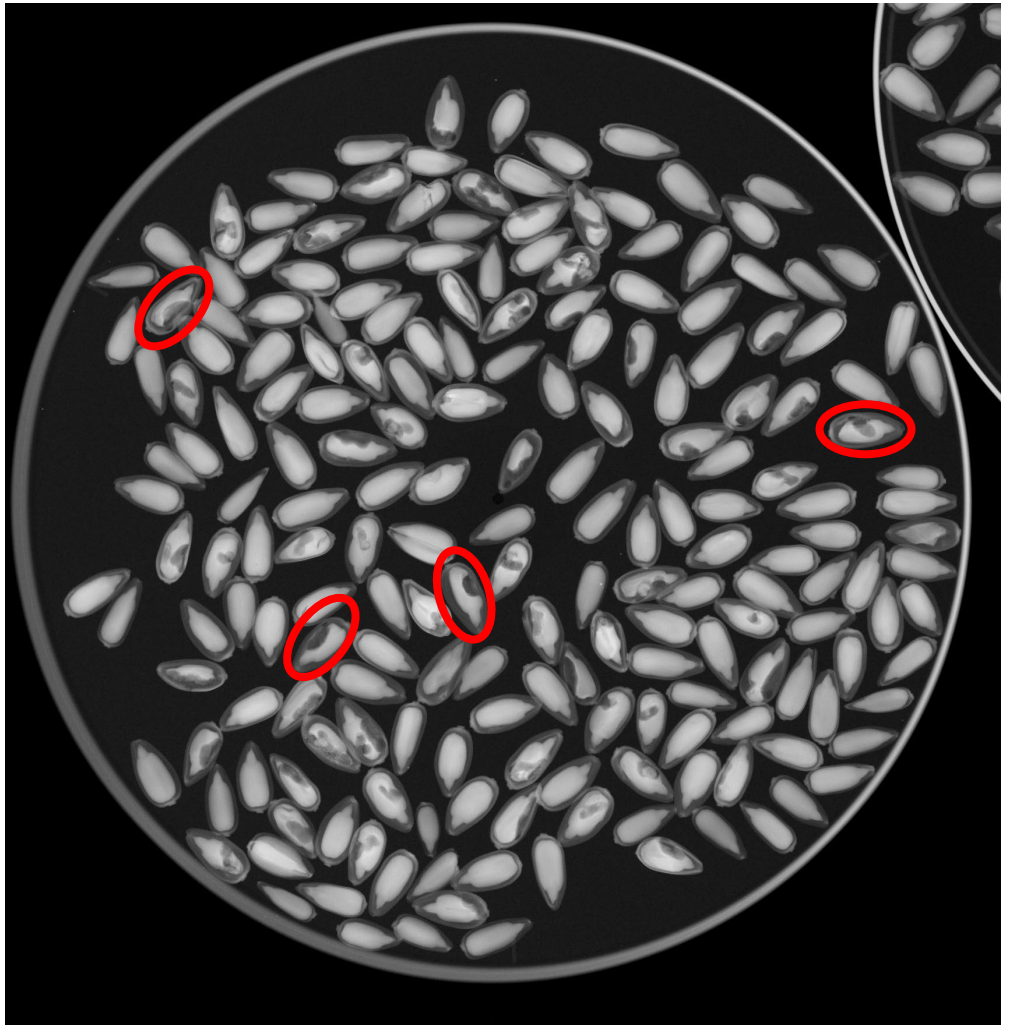
- Valuable oilseed crop (i.e., 3rd or 4th globally)
- Important component of rotations
- Can be challenging to grow
  - Banded sunflower moth
  - Dectes
  - Red sunflower seed weevil
  - Sunflower moth

Photo Credit M Dreiling; W. Cranshaw; J Cluever

Red sunflower seed weevil

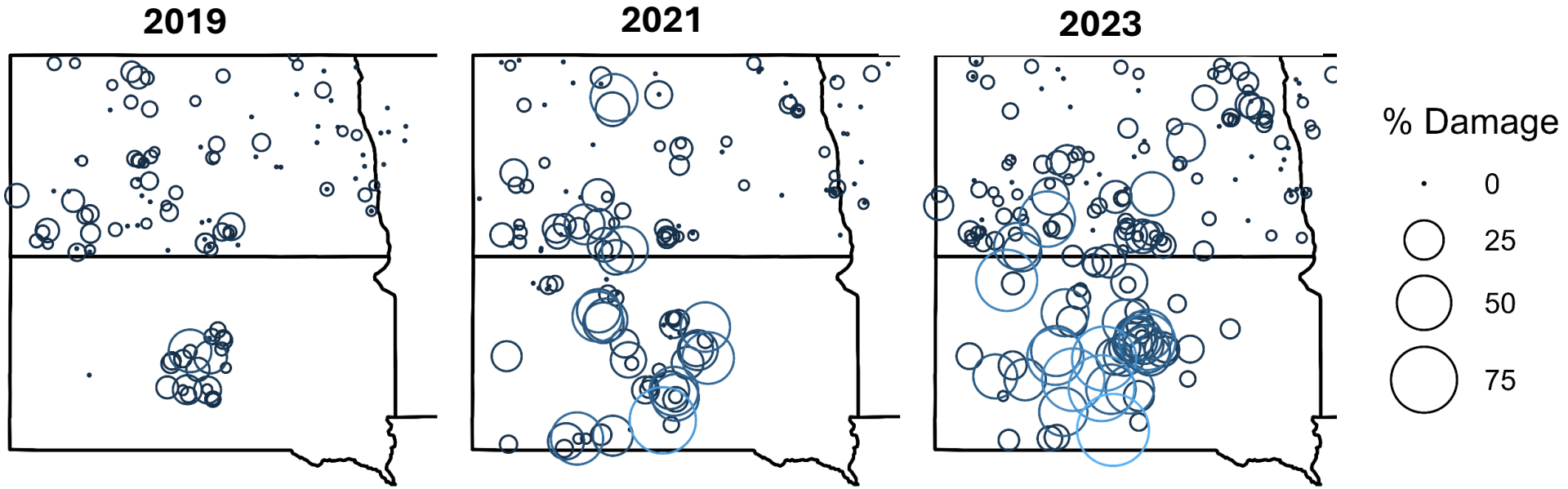
- 1 generation year $^{-1}$
- Larvae develop in achenes
  - Consume ≈ 1/3 of seed
  - Reduce oil content ≈ 1/4

Photo Credit: J. Cluever, J. Cluever, Z. Tarble



Problems with RSSW management

- RSSW feeding damage of 70% or more
- Populations well above threshold
- Pyrethroid resistance in SD
- High demand for aerial applicators



Cluever et al. 2025 https://doi.org/10.1093/jipm/pmaf004

RSSW Management

- Early Planting (i.e., 1st week of May in SD)
- Tillage
- Insecticide applications for adults
  - Border only applications

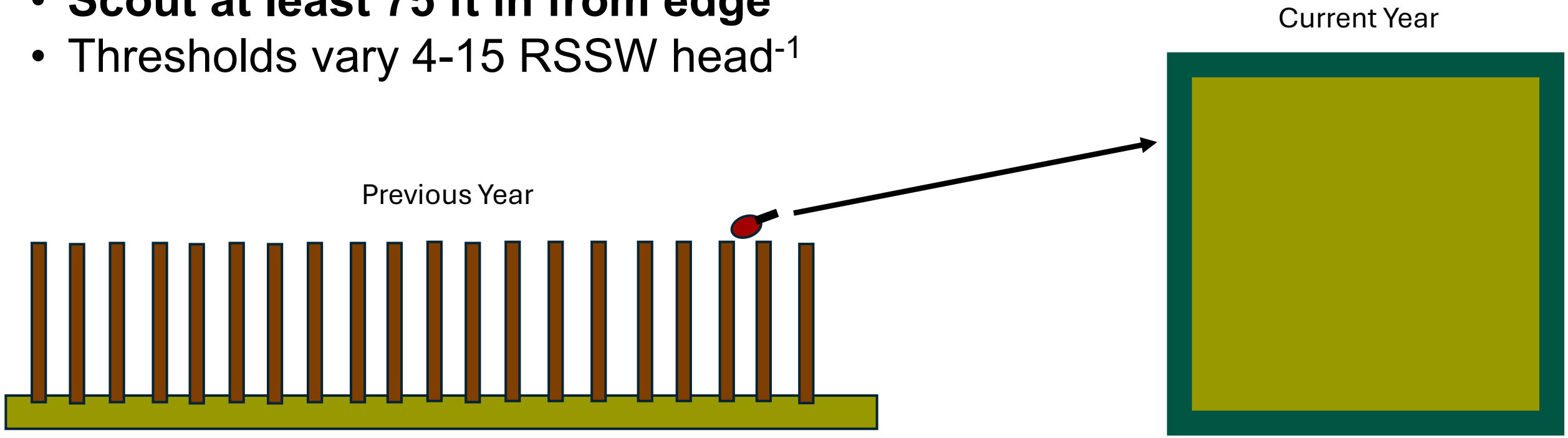
Photo Credit: J. Prasifka, Winfield Solutions

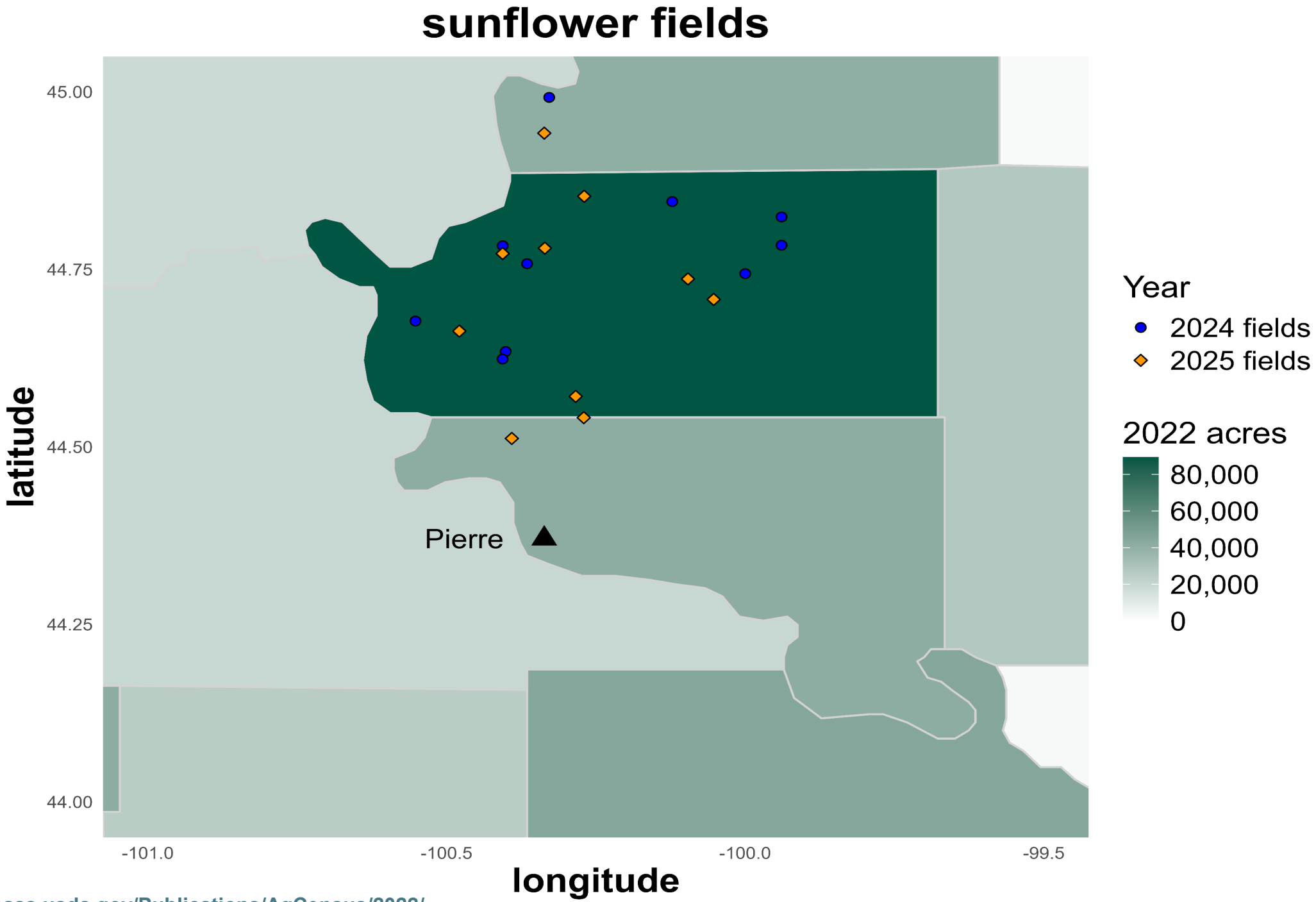
Assessing spray needs

- Start scouting at R5.0 (start of bloom)
- Check again every 5-7 days
- Use DEET-based repellent
- Scout at least 75 ft in from edge
- Thresholds vary 4-15 RSSW head^{-1}

Edge effect

- Start scouting at R5.0 (start of bloom)
- Check again every 5-7 days
- Use DEET-based repellant
- **Scout at least 75 ft in from edge**
- Thresholds vary 4-15 RSSW head^{-1}

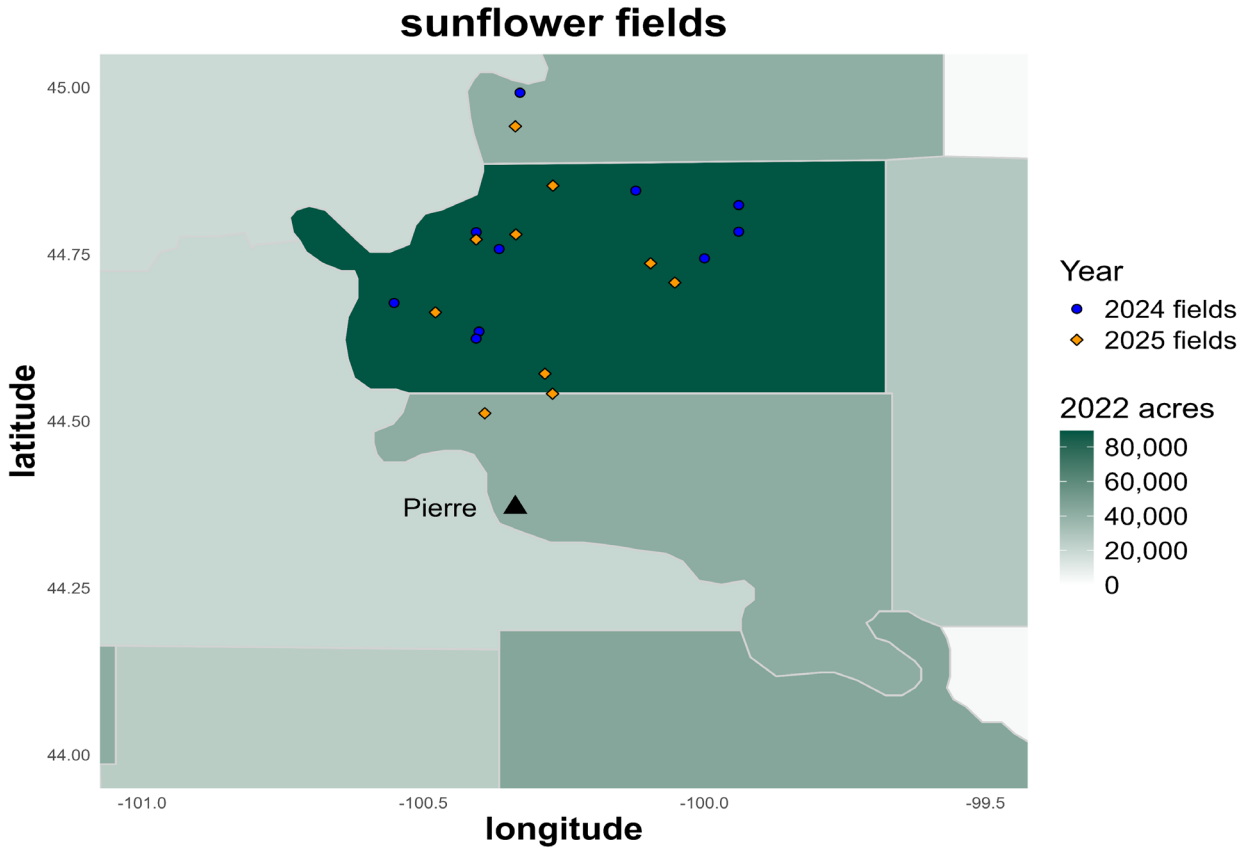




https://www.nass.usda.gov/Publications/AgCensus/2022/

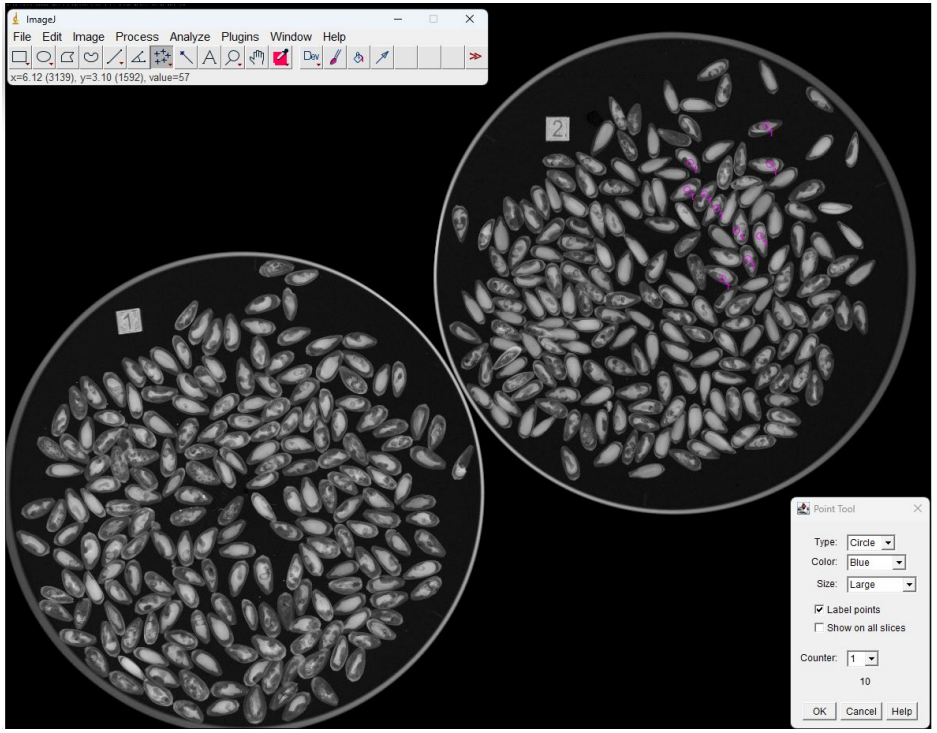
Methods

- Selected 10 fields in central SD in 2024 & 2025
- Gather 5 heads at 0, 16, 32, 65, 164, 328, and 656 ft from edge

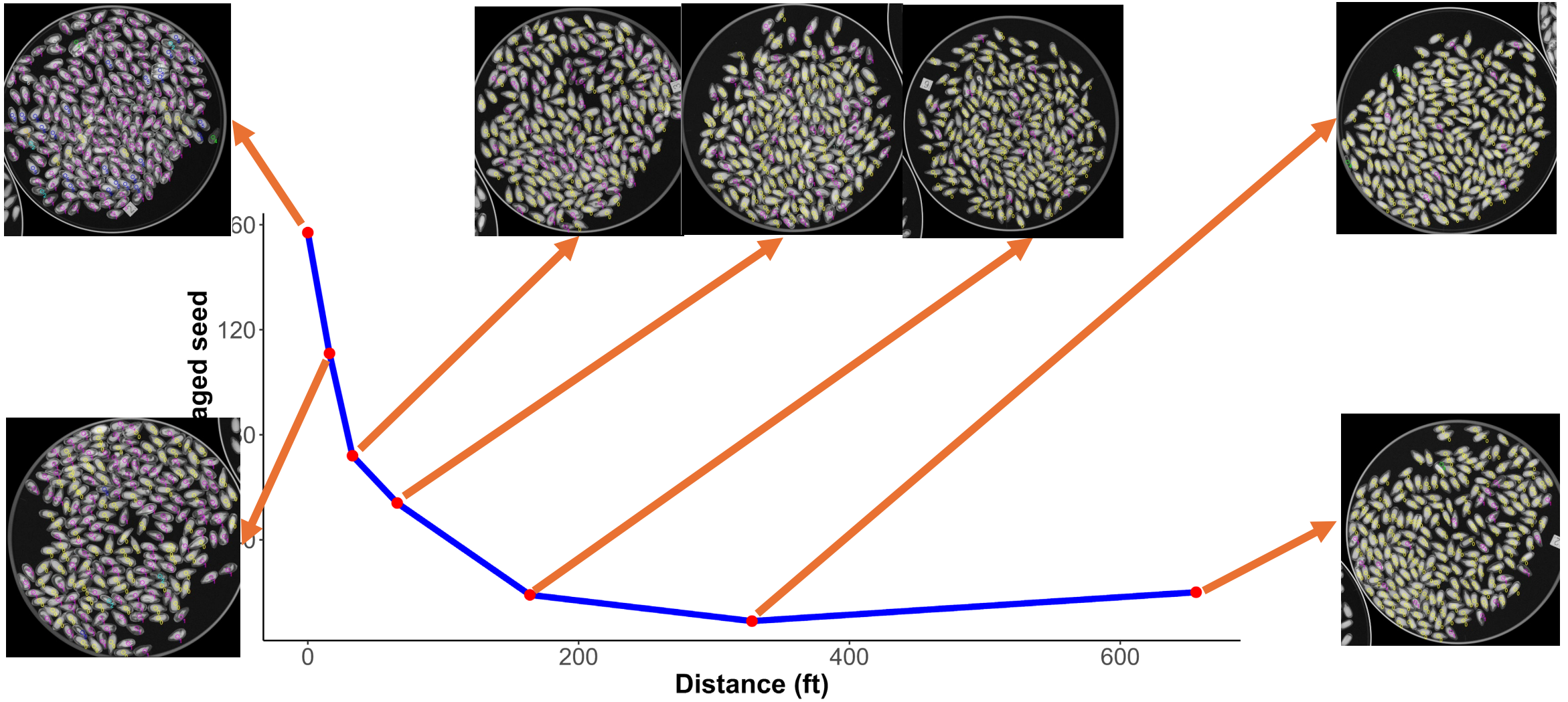


Methods

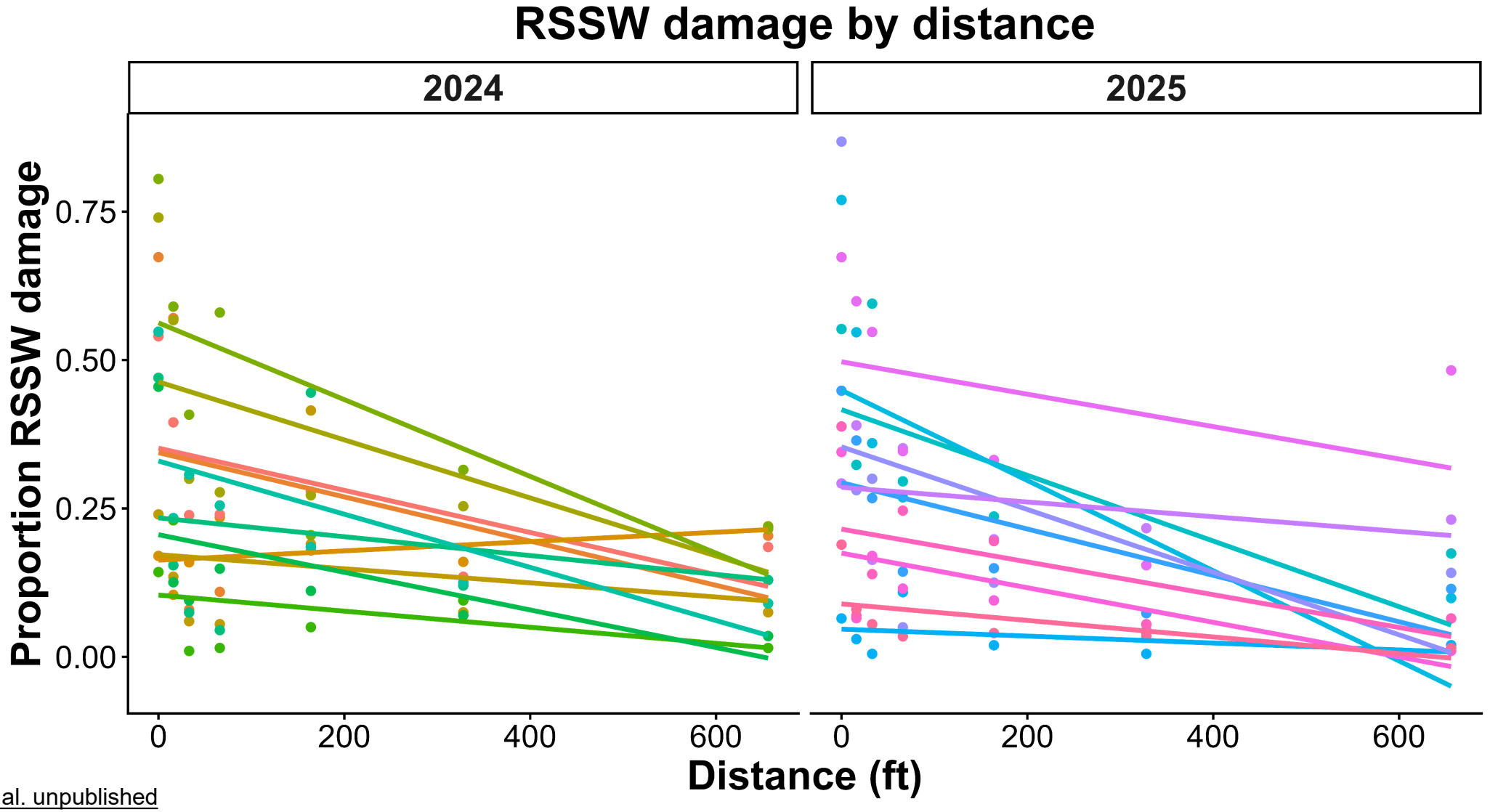
- Dried and threshed heads
- X-ray 200 seed samples
- Visually rated each seed



Edge effect example



Overall edge effect



Cluever et al. unpublished

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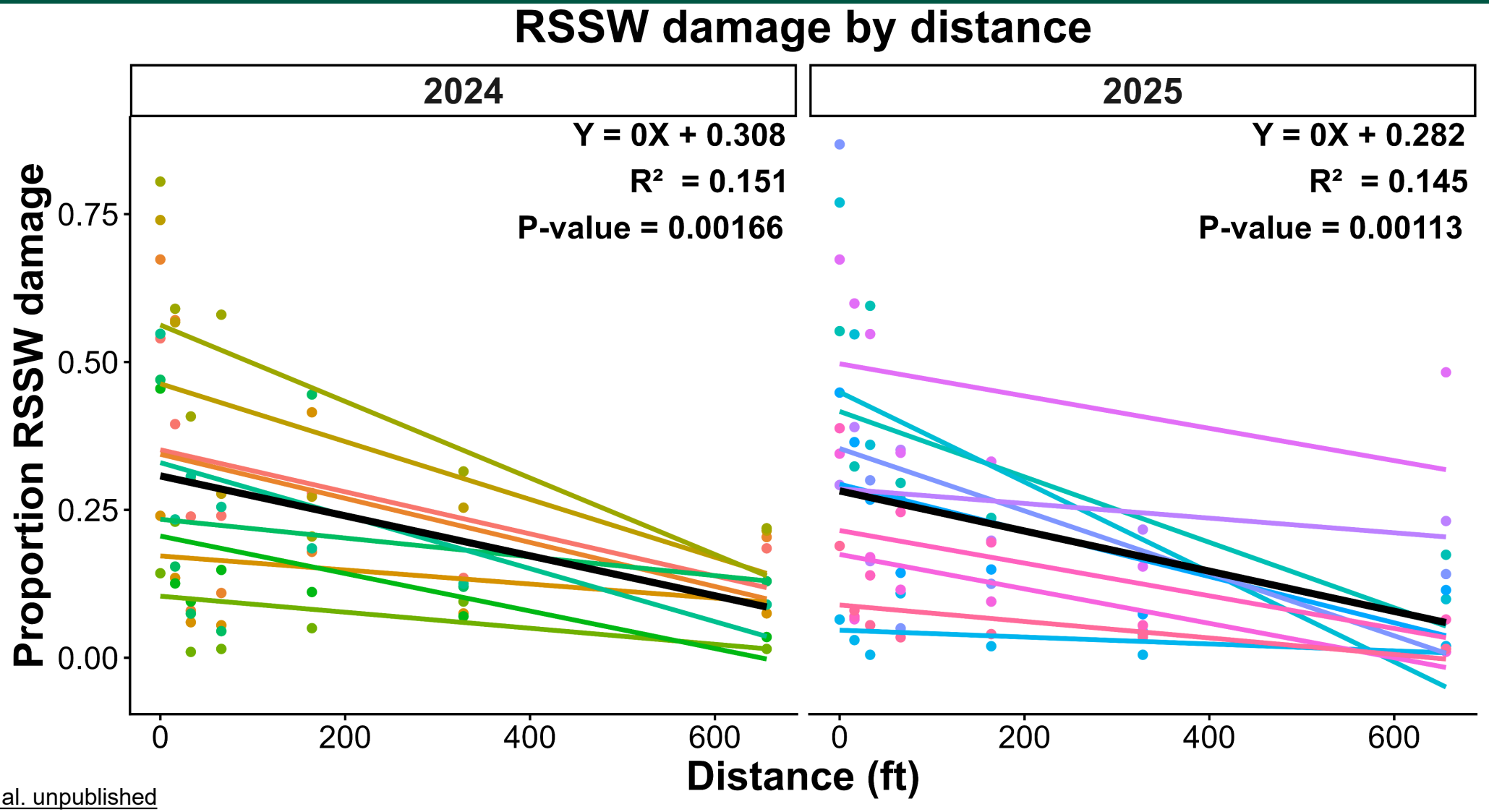

Cluever et al. unpublished

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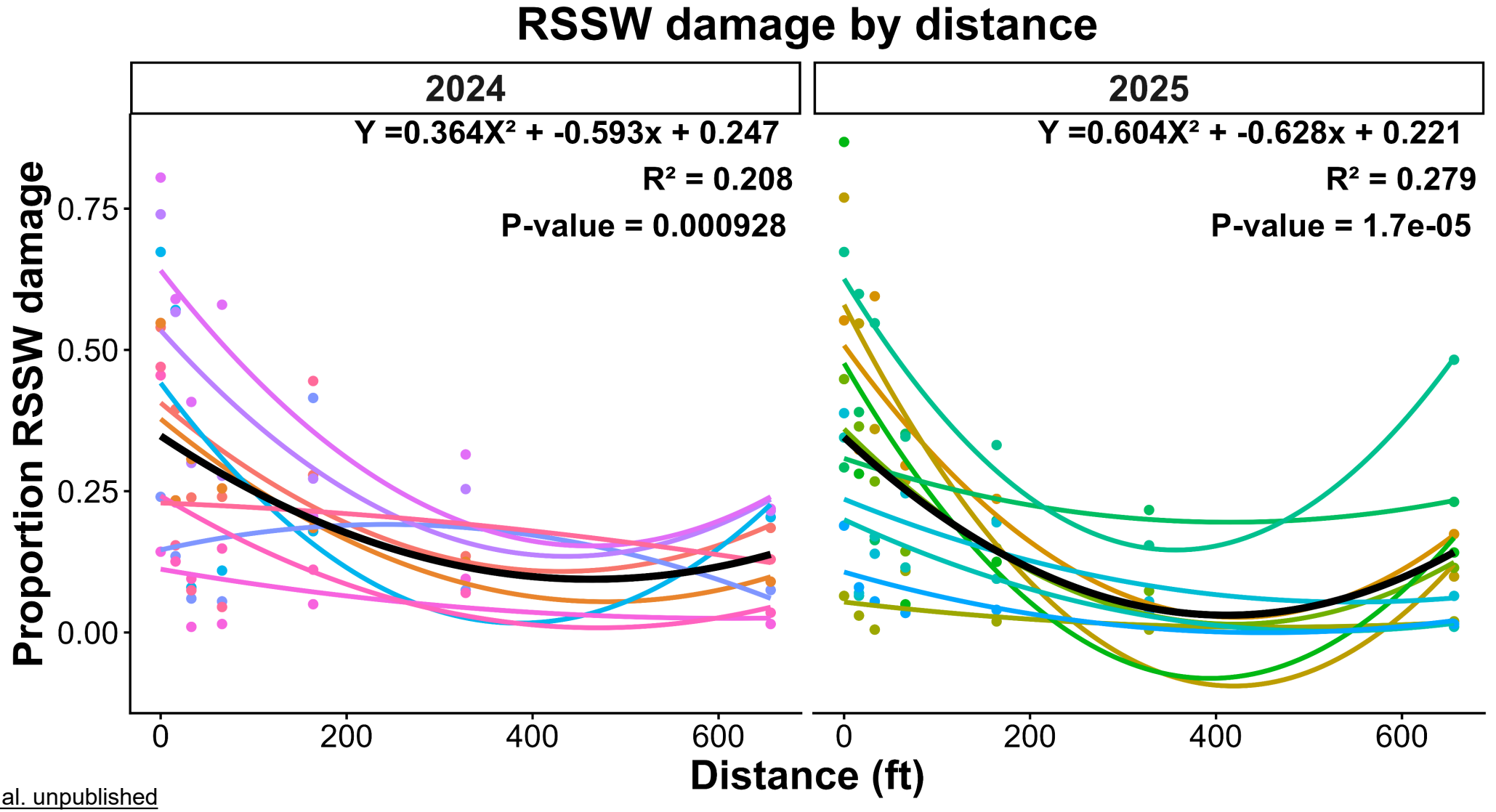

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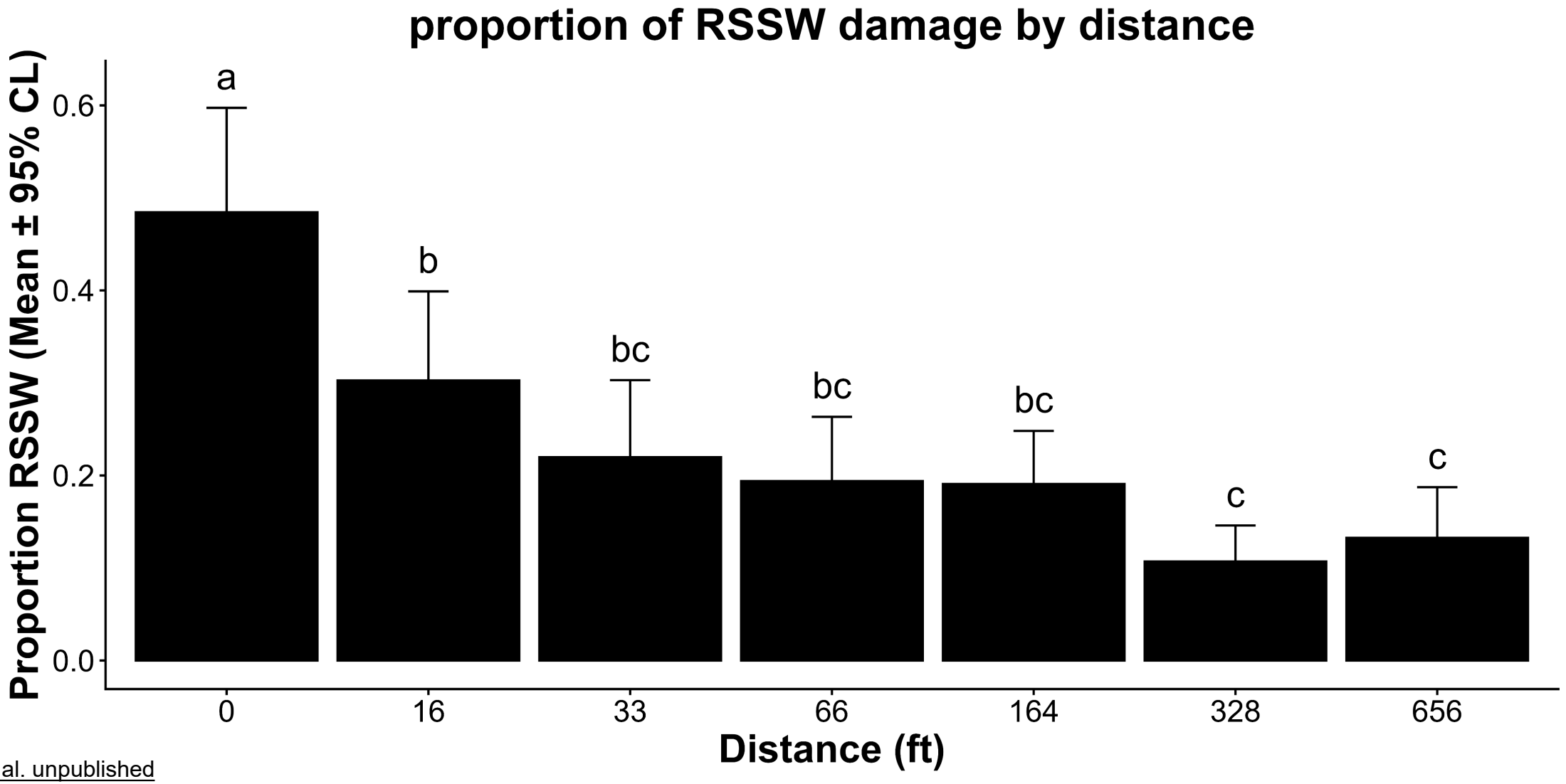
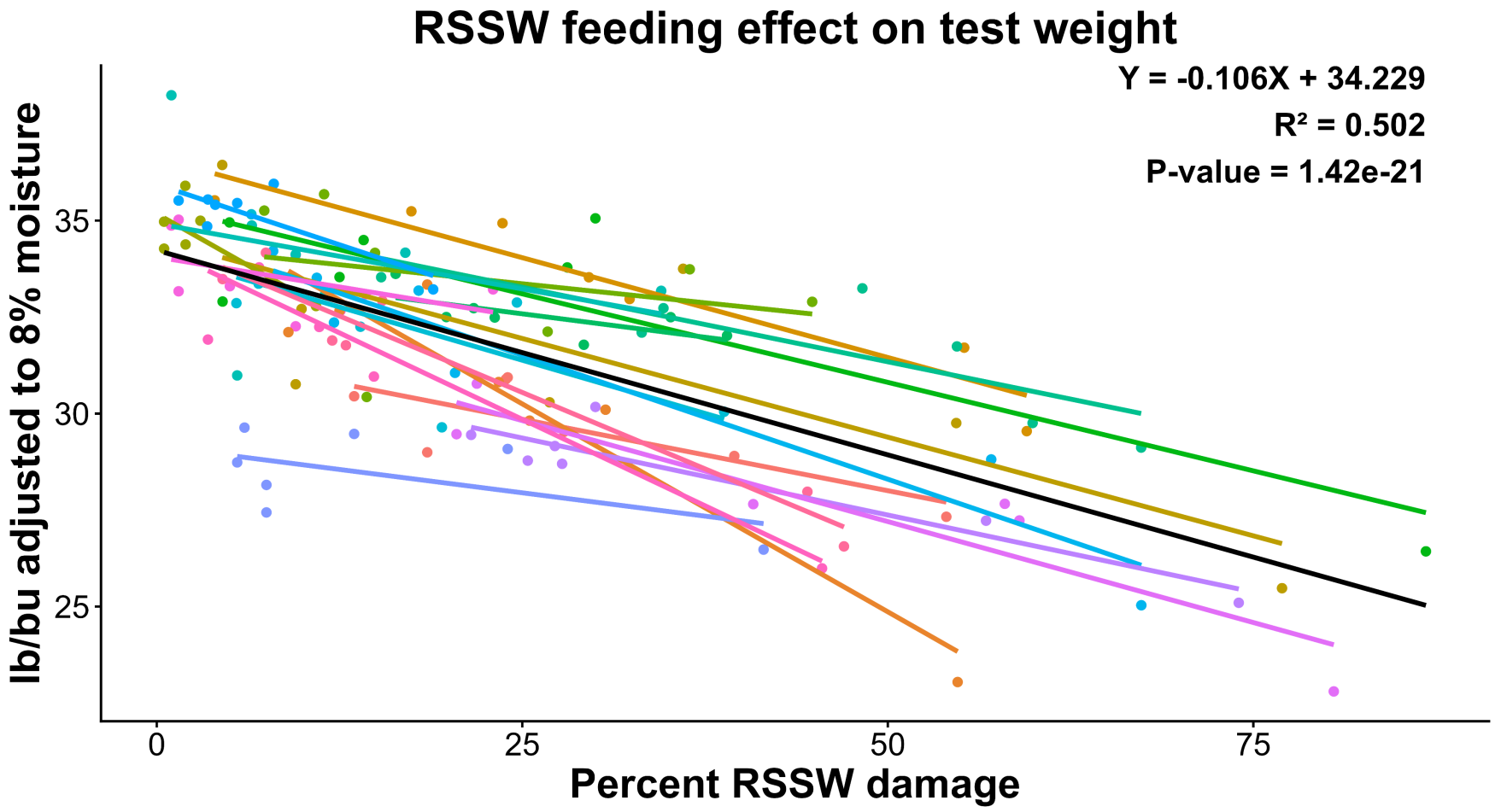


Cluever et al. unpublished

Implications



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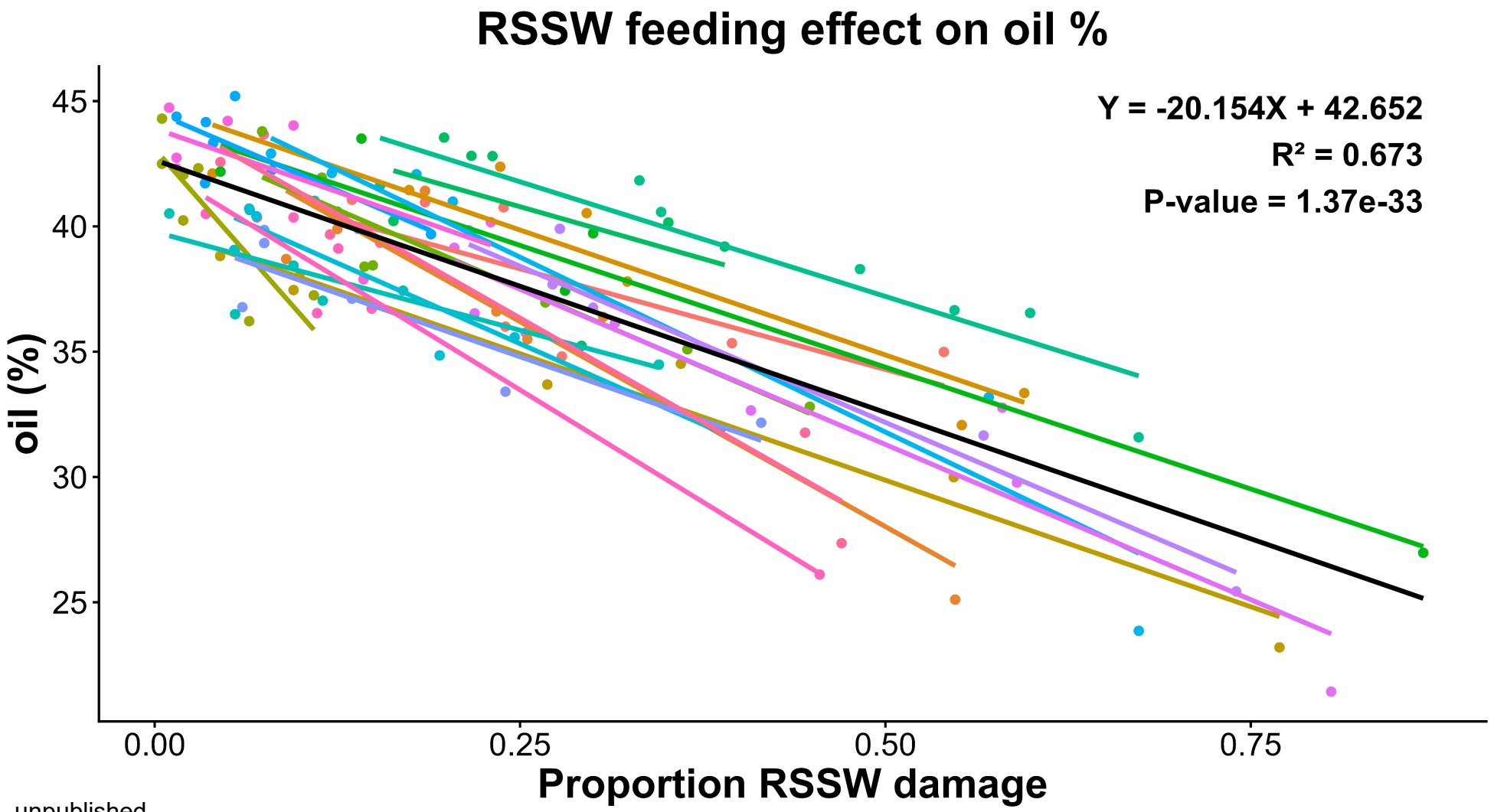

Cluever et al. unpublished

Implications

- Scouting from the edge may overestimate risk
- **High RSSW**
  - Long, narrow fields may increase your overall damage
  - Adjacent fields may spread out risk
  - Management (tillage, biological insecticides) on edges
- **Low RSSW**
- Border-only applications may be a feasible method of RSSW control

Questions & Acknowledgements

- Grower cooperators