

Impacts of drought and pest community on wheat productivity

Jordan Bailey,
2013 REACCH Intern

Mentored by Dr. Dave Crowder,
WSU Department of Entomology



Climate change

- Global
- Implications for insects



Pacific Northwest

Research question

- How does wheat respond to a combination of stresses?
 - Climate
 - Soil pest – wireworm
 - Surface pest – aphid

Plant Defense Hypothesis



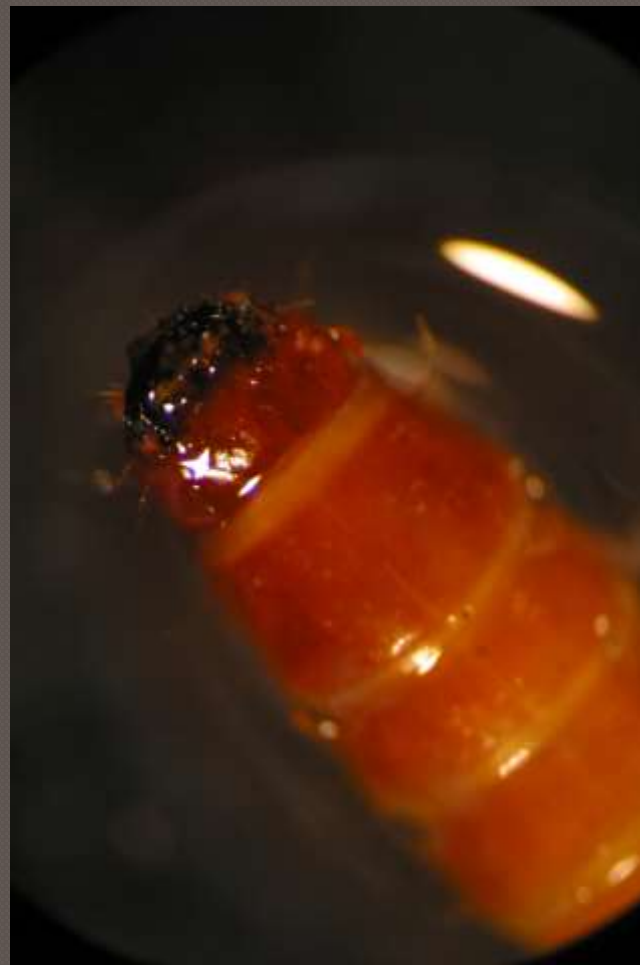
- A plant already under stress will devote more resources to defense
 - Peppers and capsaicin

Wireworms



L. californicus

- Present in 28% of WA spring wheat
- Most damaging



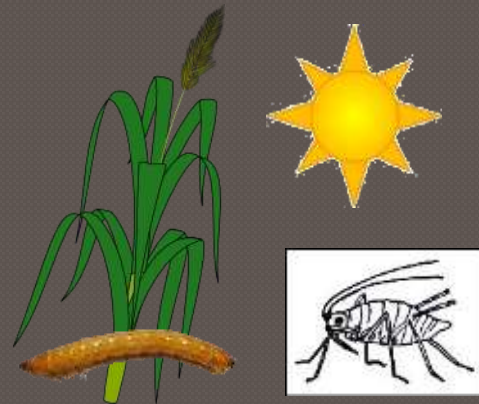
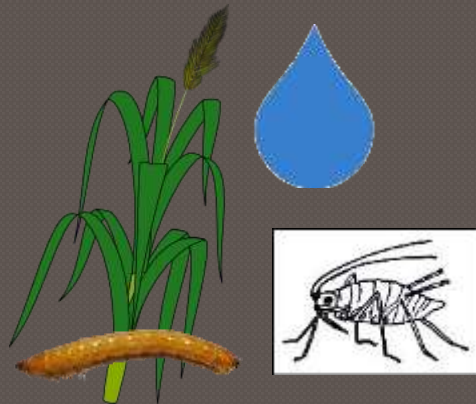
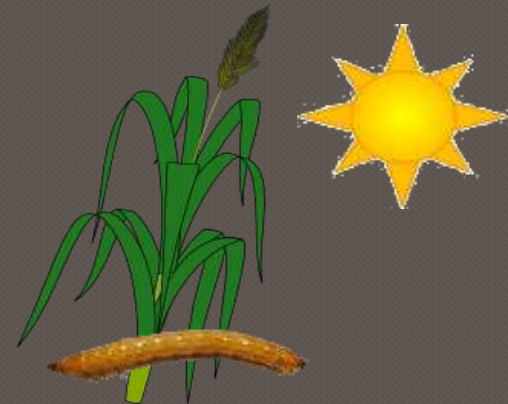
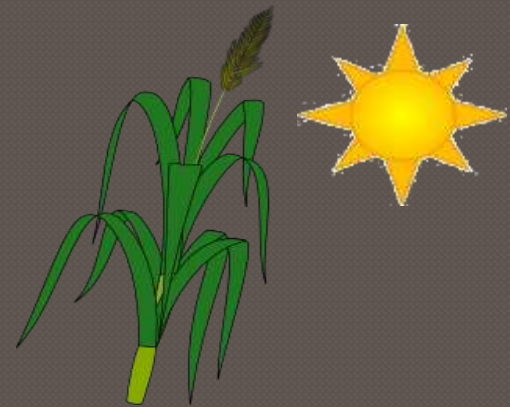
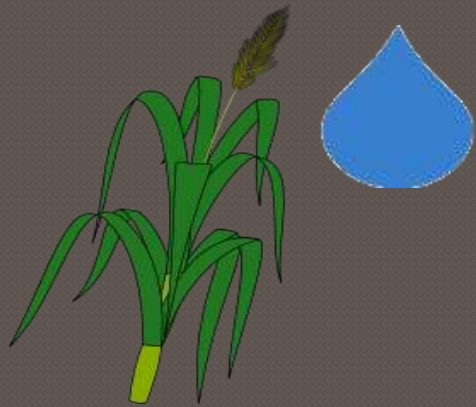


Antelope Flats, ID

Aphids

- Disease transmission
- *Rhopalosiphum padi*

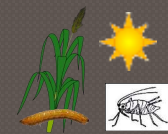
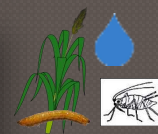




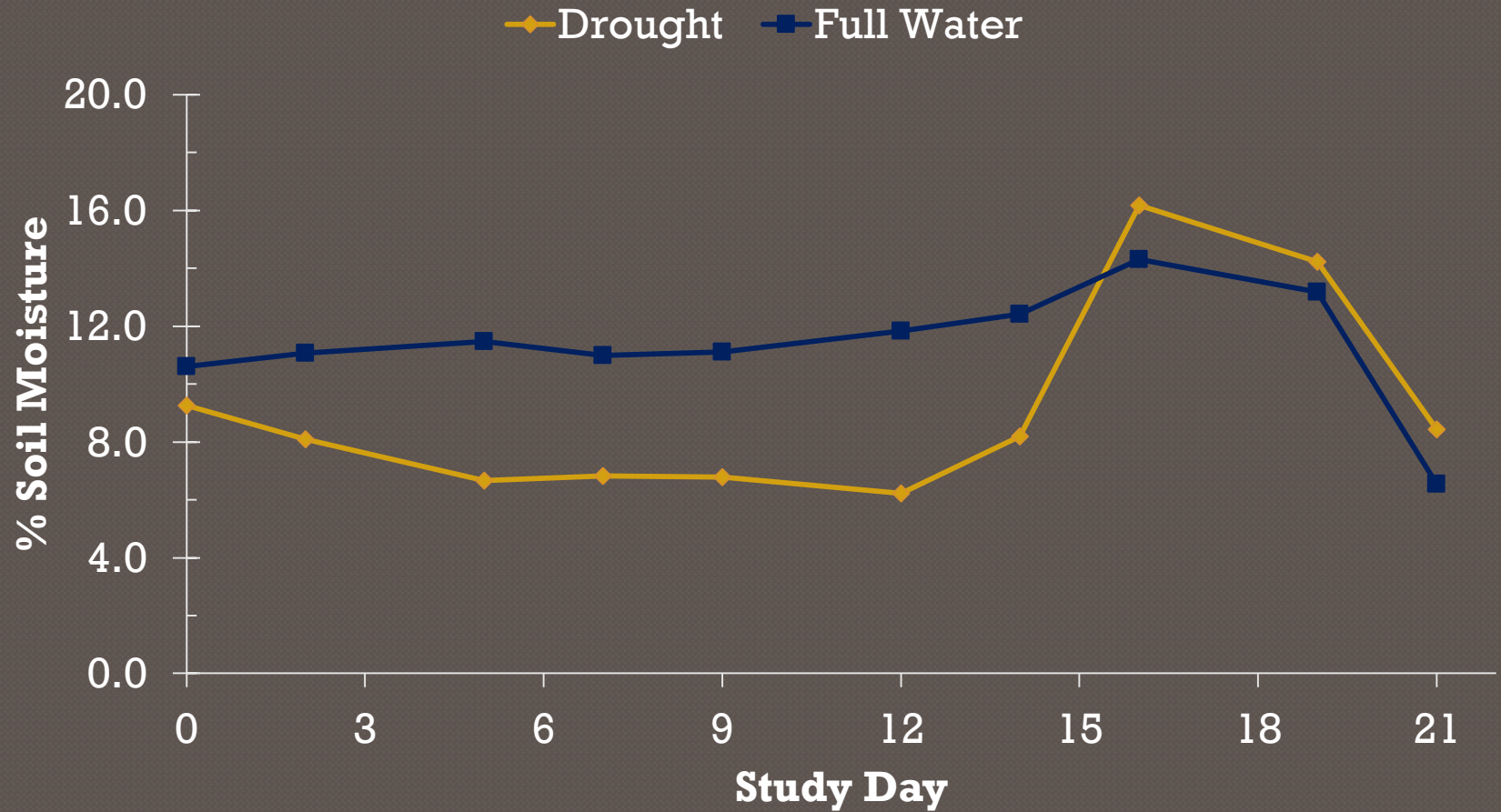
Experimental design



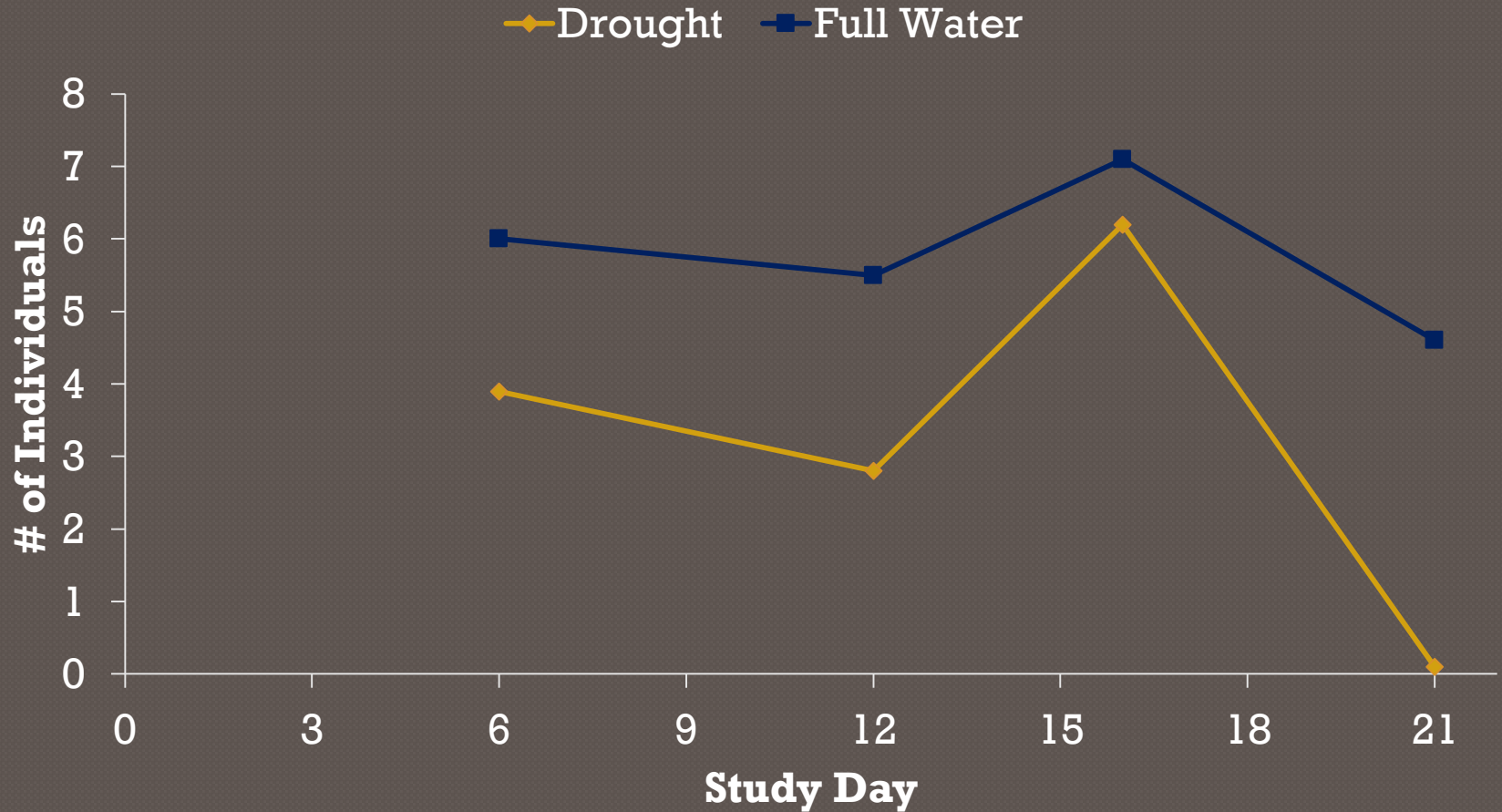
Wheat under stress



Moisture Treatment



Aphid Populations



Next Steps

- Dry weight
- Statistics
- Final interpretation



Preliminary Conclusions

- Wheat survival
- Aphid Survival

Further Study

- Repeated field tests
 - Organic compound analysis
- Differences in pests
 - Wireworm species
 - Aphid species
- Fertilizer impacts on defense

Acknowledgements

- ◉ Dr. David Crowder, research mentor
- ◉ Ivan Milosavljevic, PhD student
- ◉ REACCH directors
- ◉ WSU
- ◉ USDA and NIFA for funding