

EAR ABNORMALITIES IN CORN: MYTH OR REALITY?

DWFI-Supported Student Research

Each year DWFI leverages Robert B. Daugherty Foundation funds and additional donor funds to support graduate and undergraduate student research and creative activity. Funds are matched one-to-one by their DWFI Faculty Fellow advisors. This year we had to cancel our annual research forum, scheduled for April 2, and missed seeing the students present their work in person.

To celebrate the incredible research being done, students have shared a brief summary of their work and its impact. We're excited to share their work with you here. View more research from DWFI's supported students » <http://dwfi.us/Gx3150ze6F5>



Student: Osler Antonio Ortez-Amador, for a Ph.D. in Agronomy

Advisor: Roger Elmore, Professor, Agronomy & Horticulture, University of Nebraska–Lincoln

WHAT?

- In 2019, about 10.1 million acres of corn were planted in Nebraska, a production value of \$6.78 billion. Optimizing productivity and closing yield gaps require an improvement in the use of resources.
- The development of abnormal ears has been reported across Nebraska and the region (Texas, Colorado, Iowa, and Illinois) in recent years.
- Abnormal ears translate into productivity losses in corn.
- Despite 70+ years of basic understanding in corn, causes of ear abnormalities remain a question.
- We study the causes of ear abnormalities and their implications for productivity losses in corn.

SO WHAT?

- In 2016, up to 60% of abnormalities were observed in Nebraska farmer fields.
- Experimental research began in 2018 and will continue through 2021.
- Some abnormalities have not been previously reported in the scientific literature.
- The abnormal symptoms and their widespread distribution suggest weather-related stress interacting with genetics and management.
- The loss of primary ears followed by secondary malformed ears has been constant.
- Abnormalities are especially consistent for specific hybrids.
- Farm management decisions can play a role in the causes.
- Preliminary results from experimental fields: 7% abnormal ears found in 2018 and 12% in 2019.

NOW WHAT?

- By understanding and mitigating abnormalities, agricultural productivity losses can be reduced and the utilization of resources can be optimized. This is an imperative step towards sustainable agriculture.
- After research completion, we hope to answer:
 1. What causes ear abnormalities?
 2. What productivity losses are the result?
 3. What genotypes are suited to specific environments?
 4. What can be done from the management standpoint to mitigate the issues?
 5. What direction should be taken in developing corn hybrids resilient to environmental stressors?
- Several presentations highlighting this research have been delivered locally, regionally, and nationally
- Ear abnormalities are not a myth, but in fact, a reality.