FOV4 INOCULUM DENSITY DYNAMICS AND YEAR-TO-YEAR VARIATION IN FUSARIUM WILT RISK

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Abstract

Concern regarding *Fusarium oxysporum* f. sp. *vasinfectum* race 4 (FOV4) continues in west Texas. Inoculum density quantification at high spatial resolution and at multiple time points in research fields indicates that inoculum density varies appreciably even within small areas (Figure 1), and that variation is associated with cotton plant type. This research was motivated by the potential to provide information to variety trials in the form of pre-season infection risk, and by the possibility that variation in cotton susceptibility to infection may affect inoculum density dynamics through time. In 2020, the PCR-based inoculum density metric was validated. Reproducibility of qPCR-based quantifications was confirmed between labs and using different instruments. In Spring 2020 investigations were begun with the purpose of understanding causes of inoculum density variation across space. Understanding within-field temporal dynamics of inoculum causing Fusarium wilt will enhance risk assessment. Practices (including cultivar selection) associated with inoculum reduction can be identified using data collected in this research.

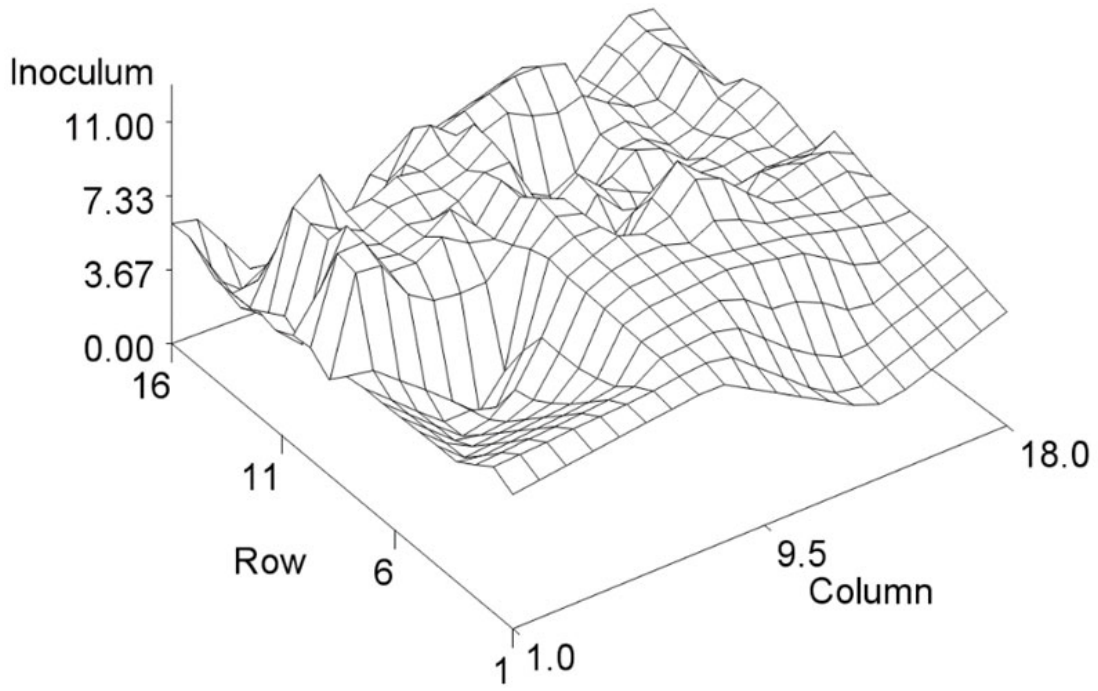

Figure 1: Spatial variation in inoculum density, as assessed by qPCR on soil samples collected in October 2020 from a research field. The "inoculum" axis is shown as a fold range, from 0 (a reference, the minimum observed density) to the maximum observed density, which is 11-fold higher.

Inoculum density projections across space are being generated for each time point at which soil samples were collected. Where soil sampling was able to be repeated at definite sites between time points within or between years, inoculum density trajectory can be studied, and will be used to infer inoculum density dynamic response to the presence of different cotton cultivars or environmental conditions.

TM Chappell made an error during the oral presentation of this work at the 2021 Beltwide Cotton Disease Council meeting. Between 2019 and 2020 plots were not revisited precisely for sampling, so that increase or decrease between years was not able to be estimated at the time of presentation. As such, the indicated increase in inoculum density could not be attributed to time as was said, and is likely due to both change or time and variation across space. Analysis of repeated measures of precise field locations is underway.

Acknowledgements

Thanks to Joel Arce, Jennifer Chagoya, Jensen Hayter, Cecilia Monclova-Santana, and Jasmine Yan for assistance with field sampling, technique development, and validation efforts. Thanks to Robert L. Nichols for conceptual development. This research was primarily supported by Cotton Incorporated.