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Project Title: Risk of Fusarium Head Blight Based on Larger Scale Patterns of Land Management.

PROJECT 1 ABSTRACT
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The risk of Fusarium head blight is in part a function of weather conditions and crop management decisions such as tillage, rotation schemes, and choice of cultivars. Rotation schemes and tillage practices are important not only in fields currently planted to wheat or barley, but also in nearby fields that may supply inoculum. Risk as a function of weather variables is currently being analyzed by the Disease Forecasting Group of the U. S. Wheat and Barley Scab Initiative. This estimate of risk could also be adjusted to account for the risk posed by varying inoculum levels as a result of rotation and tillage practices within a field and in neighboring fields. For example, risk levels are probably quite different in regions with different levels of corn production and may also be different within a region as a function of cropping practices in neighboring fields.

Our overall project goal is to develop estimates of the risk of Fusarium head blight based on larger scale land use, specifically based on the regional pattern of corn, wheat, and barley planting and their management, as a tool for growers' decision-making.

Our supporting objectives are to

1. Estimate the effect of regional land use on Fusarium head blight risk as a function of the size, proximity, crop or other plant species, and management of nearby fields.
2. Determine the experimental requirements to avoid confounding in studies of how the pattern of land use in fields adjacent to wheat or barley fields influences the risk imposed by climatic parameters and management practices within a wheat or barley field
3. Determine whether thresholds exist such that risk increases substantially in an area when corn and/or wheat or barley plantings exceed a threshold density

We will accomplish these objectives through the following approaches:
(a) modeling Fusarium head blight severity as a function of land management on a county-by-county basis using existing data, (b) statistical background work for planning future field surveys, and (c) landscape modeling to simulate outcomes from different management scenarios.