

APPLICATION OF LARGE EDDY SIMULATION TO QUANTIFY DISPERSAL OF VIABLE MAIZE POLLEN. Brian Viner, Ray Arritt, Mark Westgate and Susana Goggi. Graduate Research Assistant, Professor, and Professor, Department of Agronomy, Assistant Professor, Department of Seed Science, Iowa State University, Ames, IA 50011.

The creation of genetically modified (GM) crops has raised concerns regarding the transfer of genes from GM crops to wild relatives. To assess the risk of outcross, the development of numerical models that can accurately predict the movement depositional viability of pollen is needed. In maize, the primary mode of pollination is the transport of pollen by wind. Large Eddy Simulation (LES) is a tool to model turbulent motions that have the potential to lift pollen high into the atmospheric boundary layer and transport it over distances of at least five kilometers.

A LES model has been combined with a Lagrangian Dispersion Model to predict the transport and viability of pollen in the atmosphere. Predictions have been made for the deposition of maize pollen and of pollen viability upon deposition, as well as for vertical profiles of concentration and viability through the boundary layer. Viable pollen is modeled to be distributed throughout the boundary layer and transported over five kilometers before reaching the ground.