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Research Area: CBC

Project Title: Prevention of sporulation of Fusarium in plant residue to reduce FHB and DON.

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PROJECT 2 ABSTRACT

(1 Page Limit)

Fusarium head blight has reduced the quality of barley grown in the midwest for the last decade due to fungus infected kernels, pinched grain and presence of the toxin deoxynivalenol (DON). Individual cultural and chemical controls measures have reduced disease, but are unsuccessful in getting the level of control necessary for the requirements of the malting barley industry. In addition the resistance sources that are available and are being used in barley breeding only afford moderate protection. It is clear that a reduction in spore load combined with the best available methods of control will be necessary.

The goals of this project to reduce Fusarium head blight (FHB) and DON in barley by reducing the in-field production of ascospores and conidia by *Gibberella zeae* (= *Fusarium graminearum*). It has been demonstrated that spores produced in-field are important in the epidemiology of the disease so that reduction of this source of inoculum should result in a decrease in disease and the associated toxin. In addition if this practice is adopted widely by farmers then the pool of spores originating from more widely dispersed fields will also be reduced, thus adding to a reduction in overall inoculum pressure experienced by the barley plant. The approach proposed is to use fungicides and biological control agents that are already shown to be effective and to use them to inhibit the growth or perithecial development of the fungus while it is in its saprobic phase in plant residues which host the pathogen.

In the field, sporulation of the fungus under the different treatments will be monitored by exposing barley spikes for fixed periods and then removing them, washing and counting, as well as use of Burkard volumetric spore traps. The impact of the reduction in sporulation on the incidence and severity of Fusarium head blight and DON toxin production in barley sown into chemical or biological treated stubble will be assessed.

In controlled environment experiments, a wider range of potential chemical and biological antagonists will be tested. Perithecial production under different treatments will be quantified and sporulation will be measured by trapping spores onto sticky surfaces placed above the treated plant residue