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PROJECT 1 ABSTRACT

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Scab resistance in wheat is complex and different “types” of resistance have been described. As is well known, Type II (resistance to spread within the head) has been studied the most, and the Type II resistance derived from Sumai 3 has been widely used in breeding for scab resistance. In particular a region of the 3BS chromosome has been shown to have a significant effect on scab resistance. Information about QTL other than those on 3BS and QTL for types of resistance other than Type II would be useful in developing genotypes with a higher level of resistance than those currently available. Our objectives in the research proposed are to identify SSRs associated with a putative scab resistance QTL on chromosome 7A, and to begin to identify QTL for ability to produce unshriveled kernels when infected with scab.

Based on research already conducted using chromosome substitution lines, we hypothesize that a QTL for scab resistance may be present on chromosome 7A. This hypothesis is based on data from substitution lines with individual Sumai 3 chromosomes inserted into the Chinese Spring background. This material is quite different from most populations that have been previously used for mapping Sumai 3 derived resistance. We will study chromosome 7A and attempt to identify SSRs associated with the putative QTL on 7A.

The second thrust of this proposal is to examine lines that produce sound, unshriveled kernels when infected with scab. In these lines the percentage of shriveled kernels produced is lower than would be expected on the basis of the level of symptoms observed in the heads. This type of resistance has been described previously. We will refer to this as “kernel retention” throughout the proposal. We have observed that Coker 9474 and IL94-1953 exhibit this type of resistance. Using several populations involving Coker 9474 and IL94-1653 crossed to scab susceptible lines we plan to work on identification of SSRs associated with QTL for this type of scab resistance.