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PROJECT 3 ABSTRACT
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Genetic diversity for resistance to Fusarium head blight of wheat is desirable to assure durability of resistance. Moreover, currently available sources of resistance do not provide total protection against head blight development in the field nor do they adequately protect grain quality.

We have identified high levels of type II and type I resistance within several accessions of hexaploid wheat. We are in the process of characterizing the resistance of these lines and studying inheritance of their resistance. We hypothesize that these lines contain genes different from those in Sumai 3, and that these genes will act additively with those in Sumai 3 or other resistant cultivars to confer a higher degree of resistance than is currently available.

We will carry out several experiments:

1) Evaluate recombinant inbred lines from crosses involving Mentana-4 and Paula VZ 434. Mentana-4 has good type II resistance and excellent type I resistance. Paula VZ 434 has good type II resistance and moderate type I resistance. We will evaluate F_6 families from Mentana-4/Sumai 3, Paula VZ 434-3/Norm, Paula VZ 434-3/Ning 7840, Paula VZ 434-3/Mentana-4, and Clark/Chokwang. We will evaluate F_4 families from crosses involving several other resistant selections.

2) We will evaluate the accessions we have screened for type II and type I resistance for resistance to kernel invasion by *F. graminearum* and for DON.

3) We will investigate the extent to which nongenetic variability within lines declines with inbreeding and the correlation between parent and progeny reactions to infection by *F. graminearum*.

4) From intercrosses of different resistant cultivars, we will continue selection of lines with a very high degree of type II resistance. We will also evaluate these lines for type I resistance and resistance to kernel invasion and DON accumulation.

This work will result in germplasm that may be used by wheat breeders. It will also provide information on inheritance of resistance and stability of expression of different types of resistance.