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**Project Title: Development, Evaluation and Distribution of International Fusarium Spring Wheat Nurseries**

## PROJECT 1 ABSTRACT

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In recent years many developed countries have introduced new regulations in relation to mycotoxins to enhance food safety. As a result, research aimed at minimizing mycotoxin levels in cereals is becoming a higher priority for grain producing countries. The International Maize and Wheat Improvement Centre (CIMMYT) has been active on this research effort through the Global Fusarium Initiative for International Research (http://globalfusarium.org/). At a workshop convened by CIMMYT in 2006, participants agreed that the global effort on *Fusarium* would be enhanced by the addition of two new international spring wheat nurseries where breeders from wheat improvement programs most active on scab would directly contribute with their elite and promising entries to have them tested across other environments. The task of developing and distributing the nurseries on an annual basis was assigned to CIMMYT. The overall objective of these two nurseries is to make useful materials for Fusarium Head Blight (FHB) available throughout the world. The two nurseries will comprise:

1) **Fusarium International Elite Spring Wheat Nursery (FIESWN).** The specific objective of this nursery is to test the performance of entries across a range of environments, and to allow participants to identify useful sources of resistance from other programs. The nursery includes elite FHB resistant spring wheat lines (registered or near-registered resistant cultivars) that have performed well in regional FHB nurseries. The inclusion of regionally resistant and susceptible checks is an important component of the nursery to verify potential differences in virulence and epidemics across locations.
2) **Fusarium International Preliminary Spring Wheat Nursery (FIPSWN)**.The specific objective of this nursery is to: a) identify new sources of Fusarium resistance; b) examine the stability of QTL's for FHB resistance; c) provide surveillance for new and/or problematic pathogen strains; and d) generate knowledge and/or solutions for issues such as the negative correlation between resistance QTL's and other traits. Entries for this nursery are proposed by the contributor and can include any materials which address the objectives listed above including NILs of FHB QTL's and parents of mapping populations, etc.

Project activities include: 1) Increase, distribution of nurseries and data collection/sharing, 2) Evaluation of FHB symptoms at CIMMYT, 3) Haplotyping FHB QTL's at USDA- ARS, Fargo.

In this study, altogether 18 DNA markers associated with *Fhb1* of Sumai 3 and other putative resistance QTLs derived from Frontana, Chinese lines CJ9306 and Wuhan 1, and *T. dicoccoides* will be used to investigate the haplotype diversity around the chromosome regions carrying the resistance QTLs among the entries tested and distributed through CIMMYT. The new and novel resistance sources identified based on both the phenotypic data (FHB index and DON level) and DNA marker data will provide U.S. spring wheat breeders with access to international elite germplasm collections.
Information on FHB and DON resistance in novel sources will be distributed with the nurseries and users will know if the 'new' sources of resistances are truly 'novel' through marker haplotyping and allelism testing.