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PROJECT 1 ABSTRACT

(1 Page Limit)

Serious scab (Fusarium head blight) epidemics occurred in Kansas in 1982, 1990, 1993, 1995, 2008, 2009 and 2015 with annual losses averaging $6.5 million. Approximately one million acres of wheat in the eastern part of Kansas are annually at risk from scab where rainfall is higher during heading and corn residue is more prevalent. Since 1980, wheat acreage in the eastern one quarter of Kansas has declined by two thirds and a major cause of the decline has been farmer aversion to the risk of scab epidemics. Therefore, the availability of cultivars with resistance to scab is highly desirable for eastern Kansas. Additionally, there are three main reasons that scab has the potential to become much more prevalent in central Kansas where wheat is the traditional dominant crop (about 4 million additional wheat acres). First, there is a trend for increasing cultivation of corn in that part of the state, the main reservoir of inoculum of the scab pathogen. Second, there is a strong trend for decreasing tillage, which enhances spore production and release from the residue. Third, many prevalent varieties in central Kansas are susceptible to scab. Resistant wheat cultivars adapted to this area of Kansas would also be highly desirable. Genetic resistance offers the best hope for economic management of this disease. The long-term goal of this research is to develop hard red and hard white winter wheat cultivars adapted for Kansas with improved resistance to scab. Short term objectives are to: 1) test existing local cultivars for resistance, 2) test advanced breeding lines for resistance, 3) test exotic germplasm lines for resistance, 4) test the Hard Winter Wheat (Kansas, Nebraska, South Dakota, North Dakota) Scab Nursery for reaction to scab, and 5) incorporate new sources of scab resistance into the Kansas wheat breeding program. Testing will be done in misted field nurseries using soil-applied infested corn grain inoculum and in the greenhouse using single-floret inoculations. Visual disease evaluation methods will be used to rate the percentage spikelets infected by the pathogen and ground grain samples will be analyzed for the toxin DON. Data will be disseminated to wheat producers and used by wheat breeders as they make selections for future Kansas cultivars.