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PROJECT 1 ABSTRACT

(1 Page Limit)

The efficiency of breeding and genetically analyzing self-pollinated plants for complex traits - such as FHB resistance – is enhanced when the biological materials are homozygous. Doubled haploids are 100% homozygous and therefore a useful tool for FHB resistance breeding and genetics. Doubled haploid production requires skill and a feeling for the organism – therefore, it is cost-prohibitive for most programs to establish and maintain their own doubled haploid facilities. To facilitate access to doubled haploid capacity, we offer a centralized service. This service differs from a conventional service lab in that the doubled haploid production is a truly collaborative enterprise. F1 seed is received from cooperators. If the F1 is winter growth habit, plantlets will be vernalized. If the F1 is facultative or spring habit, the F1 seed will be planted directly. Anthers are excised from F1 plants. The anthers disgorge microspores. Sequential tissue culture procedures lead to embryogenesis. Plantlets spontaneously double chromosome numbers. The resulting plantlets, in Magenta boxes, are shipped (insured and appropriately marked as "live plant material") to the cooperator (cooperators). Cooperators transplant plantlets to soil and raise them to seed. There is, on average, a 40% loss rate between plantlet and seed harvest due to seedling mortality, failure to double spontaneously, or excessive doubling to high ploidy levels. Participants will receive plantlets ~ starting at 8 months after submitting F1 seed. If 1,666 plantlets are successfully transplanted, 1,000 doubled haploids should be recovered.