

Agrobacterium*-mediated Transformation of *P. hallii

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Project Goals

Panicum hallii Vasey (Hall's panicgrass) is a diploid, self-compatible, compact, perennial C₄ grass in the family Poaceae, which has the potential to serve as a model for perennial bioenergy grasses like switchgrass (*Panicum virgatum* L.). Our goal is to develop tools and resources that will enable us to use *P. hallii* to understand the role and function of genes of interest in switchgrass.

Abstract

Switchgrass (*Panicum virgatum* L.) is native to the tallgrass prairie of North America. The high yielding potential and the ability to grow well in marginal lands make switchgrass an ideal species as a dedicated bioenergy feedstock. However, its large genomes with varied ploidy levels from diploid (2x) to dodecaploid (12x) with tetraploid and octoploid being the most common, large stature, long-life cycle, and self-incompatibility, makes genetic and gene function analysis difficult. *Panicum hallii* is closely related to switchgrass, has a compact diploid genome, a shorter generation time, is perennial, and self-compatible. These features permit replicated experimentation in a laboratory setting. *P. hallii* also shows massive genetic variation in many important traits related to biomass production, including timing of flowering, growth rate, disease susceptibility, and drought tolerance. This combination of genomic and physiological attributes makes *P. hallii* an ideal genetic model for switchgrass and other C₄ perennial grasses. Here we describe the development of genetic transformation for *P. hallii* using the FIL2 genotype (*P. hallii* var. *filipes*), a representative of the lowland ecotype of *P. hallii*.

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