

FENWICK, ANN¹, REBECCA L. LARSON², PATRICK A. REEVES³, CHRISTOPHER M. RICHARDS³ and LEE PANELLA^{2*}, ¹Beet Sugar Development Foundation, ²USDA-ARS / SBRU, 1701 Centre Avenue, Fort Collins, CO 80526 and ³USDA-ARS, National Center for Germplasm Preservation, Fort Collins, CO. **Virus induced gene silencing of a gene repressing flowering in sugar beet.**

ABSTRACT

Exposure to a prolonged cold period during winter is necessary for flowering in the next spring in many biennial plants – a process termed vernalization. We have described *BvFL1*, a vernalization gene in sugar beet (*Beta vulgaris*), which is a repressor of flowering that is downregulated in response to cold. This gene is a homolog to the MADS-box gene *FLOWERING LOCUS C (FLC)* found in *Arabidopsis thaliana*. Flowering time is a trait of critical agronomic importance, and an assessment of function at this key regulatory locus may present an opportunity to study (and control) flowering time as a tool in applied plant breeding efforts. Virus induced gene silencing constructs were engineered into a *Barley stripe mosaic virus (BSMV)* vector for use in blocking expression of the *BvFL1* gene in sugarbeet. Four antisense constructs were designed to target sensitive regions of the *BvFL1* gene. Engineered BSMV was passaged through Quinoa (*Chenopodium quinoa*) and applied to sugar beet plants of varied ages to see if flowering could be induced without vernalization.