VIRUS-MEDIATED DELIVERY OF FLORIGEN UNCOUPLES FLOWERING FROM PHOTOPERIOD: A METHOD TO PROMOTE FLOWERING IN ANCESTRAL ACCESSIONS Róisín C McGarry Brian G Ayre University of North Texas Denton, TX

<u>Abstract</u>

Ancestral cotton is a tropical perennial that flowers in response to short-day photoperiods whereas modern cultivars in the U.S. are day neutral and are grown as annuals. Modern cultivars have restricted genetic diversity while primitive accessions are a tremendous reserve for desirable traits affecting fiber quality and biotic and abiotic stress tolerance. However, differences in the onset of flowering complicate breeding between modern and ancestral lines and increase costs. To induce early flowering in ancestral lines and facilitate breeding efforts, we have modified a disarmed Cotton Leaf Crumple Virus (CLCrV) to express the *Arabidopsis thaliana FLOWERING LOCUS T* gene (*FT*, encoding florigen) from the coat-protein promoter, and used biolistic bombardment to infect the ancestral accession TX701. Under long-day, greenhouse conditions, where TX701 would not normally flower, TX701 infected with pCLCrV::FT initiated reproductive growth concurrently with day-neutral cultivars. Open flowers on induced TX701 plants were used as pollen donors to pollinate a day-neutral, modern cultivar, and F1 seeds were obtained. The F1 progeny demonstrated phenotypes intermediate to the short-day and day-neutral parents indicating a successful cross. The suitability of using "Virus-Induced Flowering" to facilitate breeding between short-day ancestral lines and modern cultivars is being further evaluated.