1907 Cotton Leaf Crumple Virus as a vector for virus-induced gene silencing in Gossypium hirsutum

Mr. John Richard Tuttle III , North Carolina State University, Raleigh, NC
Dr. Ali M. Idris , The University of Arizona, Tucson, AZ
Dr. Candace H. Haigler , North Carolina State University, Raleigh, NC
Dr. Judith Brown , The University of Arizona, Tucson, AZ
Dr. Dominique Robertson , North Carolina State University, Raleigh, NC

Virus-induced gene silencing vectors are part of an established system for characterizing gene function in plants. We developed a VIGS system for cotton using the geminivirus Cotton Leaf Crumple Virus (CLCrV). The CLCrV coat protein gene was replaced with a multiple cloning site for inserting gene fragments. *Gossypium hirsutum* cv. Deltapine 5415 was bombarded with the CLCrV vector that contained a fragment of the ChlI gene. This gene encodes the small subunit of magnesium chelatase and its down-regulation resulted in a loss of chlorophyll in new growth that began as early as 17 days post infection (dpi) and persisted for more than 70 dpi. The CLCrV vector was also used to express the gene for Green Fluorescent Protein (GFP). Although previous experiments showed that ChlI silencing was evident throughout leaf tissues, GFP fluorescence was confined only to vascular tissue, suggesting that CLCrV is phloem-limited in the absence of the coat protein gene. Despite the phloem limitation, our results indicate that this system is a suitable tool for the rapid analysis of gene function in cotton.