M-124

Coupling enhanced carbon capture with targeted flux towards seed oil in soybean

*Hanh Nguyen**, Center for Plant Science Innovation, University of Nebraska-Lincoln, Nebraska, USA

Khang Hoang, National Center for Seed Testing, University of Nebraska-Lincoln, Nebraska, USA

Truyen Quach, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Nebraska, USA

Taity Changa, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Nebraska, USA

A genetic approach is being explored that simultaneously addresses enhanced carbon capture capacity with targeted flux to seed oil in soybean (*Glycine max* Merr.) through stacking of transgenes designed to increase photosynthetic capacity and sink strength to lipid biosynthesis during seed development. To this end, soybean events have been generated that carry a cyanobacterium putative inorganic carbon transporter designated ictB, stacked with the tomato sedoheptulose 1,7 biphosphatase (SBPase). Data gathered on events harboring the the gene stack, ictB/SBPase, under both greenhouse and field environments reveal higher photosynthesis capacity across three developmental stages V5, and R1 and R3. As a means to increase sink strength towards lipids a set of soybean events were developed that carry seed-specific expression cassettes harboring, the Arabidopsis diacylglycerol acyltransferase 1 (AtDGAT1), Arabidopsis AP2-type transcription factor wrinkled 1 (AtWRI1) and the Arabidopsis ß-ketoacyl-ACP synthases (AtKasII). The carbon capture and flux to lipids gene stacks are being combined, to create a five-gene stack via crossing, in soybean genotypes with oblate and lanceolate leaf phenotype. The derived biologicals will allow for the monitoring of the impact of the transgenic alleles on carbon capture/flux towards lipids and the phenotypic outcomes relationship with light through the canopy.