

Saturday, October 10, 9:35-10:25 a.m.

Malia A. Gehan, Donald Danforth Plant Science Center, St. Louis, MO, 63132

Phenes to genes: Exploring natural variation in abiotic stress response dynamics through genetics and high-throughput phenotyping

The geographical distribution of food and bioenergy crops is limited by several factors including temperature, soil salinity, and water availability. To tackle the daunting challenge of producing more food and fuel with fewer inputs a variety of strategies to improve and sustain crop yields are necessary. Plans for crop improvement may include: mining natural variation of wild crop relatives to breed crops that require less water; increasing crop tolerance to temperature extremes to expand the geographical range in which they grow; and altering the architecture of crops so they can maintain productivity while being grown more densely. These strategies can be approached with a variety of methodologies, but they will require both high-throughput DNA sequencing and phenotyping technologies. A major bottleneck in agricultural science is the ability to efficiently and non-destructively quantify plant traits (phenotypes) through time. The development of high-throughput phenotyping technologies and open-source, flexible, and translatable analysis tools that extract agronomically important traits in conjunction with is a major focus of this research.