

INDIANA CORN AND SOYBEAN INNOVATION CENTER

The Indiana Corn and Soybean Innovation Center (ICSC) is a multi-user facility that serves Purdue researchers and students. The 25,500 square foot facility supports research through plant processing, seed and plant analysis, threshing and shelling, grinding, seed treating, weighing and other physical plant measurements. ICSC also provides a 5,000 square foot high bay space that allows for innovative sensor tool development. Such as large scale ground base sensing equipment and unmanned aerial systems. ICSC's location on Purdue's Agronomy Center for Research and Education (ACRE) provides the ideal location for plant and seed processing as well as UAV deployment and plant sensing research. The three large, open seed and plant processing labs provide a great workspace for any lab's needs.

PLANT AND SEED PROCESSING

ICSC is equipped with a threshing and shelling line with ten stations inside the facility as well as three stations under a covered canopy outside. The threshing and shelling equipment support sample processing of maize, soybeans, sorghum and small grains as well as many other species of plants. ICSC also has three large plant and seed grinders as well as two smaller sample grinders. ICSC is also equipped with two small batch seed treaters to treat seeds. The facility has two large ovens for drying seed and plant samples. As well as a cold room for short term seed and plant storage.

IMAGING AND MEASUREMENT

The labs at ICSC is equipped with four different types of high speed seed counters. One of the seed counters is also equipped to take seed measurements and is capable of sorting the seed by size, shape color or even by the soybean hilum. The Innovation center also possesses the capabilities to take maize ear measurements, leaf area measurements, root measurements and seed moisture measurements. The facility also contains secure storage for labs sensors and instruments. This storage has access control and contains lockable cabinets and cages.

IMAGE COLLECTION AND PROCESSING

ICSC is connected to the campus high speed computing with a 10 gb/second fiber optic line. This connection may be used to transfer the images collected at the ACRE farm to campus computing for processing. Images may be collected with ground base equipment such as Purdue's PhenoRover. You may also use ICSC as a base for taking field measurements with robotic or UAV platforms. ICSC also has several hand-held sensors and imaging equipment for researchers field needs.

For high-throughput in-field survey, ICSC provides an end-to-end UAV-based imaging system. The system consists of a DJI quad-rotor UAV and the Red-edge multispectral remote sensing imaging system. Crop/field images acquired by the UAV imaging system are processed by the Pix4D software to provide information-rich, actionable data set.