Hardware Components for Crop Canopy Sensor-Based N Management

The Project SENSE applicator uses the OptRx® system from Ag Leader® which is a commercially available, integrated variable-rate Nitrogen (N) application system that uses crop canopy sensors to apply liquid N in real-time based on plant needs. The OptRx system may be retrofitted to an existing high-clearance liquid N applicator which uses an electronic spray rate controller.

Existing spray rate controller components must be functional for retrofitting the OptRx system, these include:

- Electronic spray rate controller (available from multiple manufacturers)
- Electronic flow meter
- Motorized boom flow valve or pump speed hydraulic valve
- GPS (preferred) or other ground speed sensor

The following components are necessary to integrate the OptRx system onto an existing liquid N fertilizer applicator:

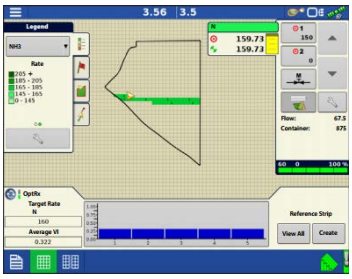
- Ag Leader in-cab monitor (currently InCommand™ 1200 and Integra monitors are supported)
- OptRx sensors (minimum of two required, one sensor per 20 ft of boom recommended)
- GPS unit (recommended for ground speed and as-applied mapping)
- Ag Leader Master and Application Rate control modules
- Cables for sensors and Ag Leader system (cables required are unique to the number of sensors)
- Serial cable (for Ag Leader monitor/existing electronic spray rate controller communication)

Integrated variable rate control systems that use crop canopy sensors are available from multiple manufacturers:

- OptRx from Ag Leader: www.agleader.com
- CropSpec from Topcon: ag.topconpositioning.com
- GreenSeeker from Trimble: www.trimble.com/Agriculture/

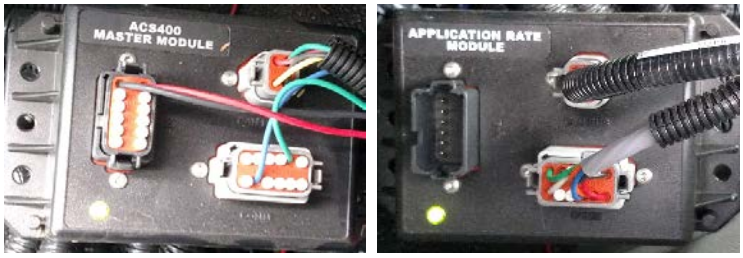
Additional information about Project SENSE can be found at:

- UNL CropWatch: http://cropwatch.unl.edu/farmresearch



The Ag Leader monitor receives OptRx sensor data with ground speed and provides target N (lb/ac) to rate controller using a Sufficiency Index algorithm.

Two sensors (minimum) are required for OptRx system operation, one sensor per 20 ft of boom is recommended.



The master module (left) enables connection between the OptRx sensors and in-cab monitor. The application rate module (right) communicates with the electronic rate controller via serial interface.

Sensors may be mounted ahead of the applicator boom. Nozzle drops are required for liquid N application.