





Autonomous Connections

OMNiPOWER Kicks Off Second Growing Season Full of Learnings in Autonomous Agriculture

OMNiPOWER — the autonomous platform formerly known as DOT — is in the middle of its second growing season on the Olds College Smart Farm. With one year under its belt, Olds College has been applying learnings from its first year with OMNiPOWER to the 2021 growing season, and the upswing in efficiency has been impressive.

The Olds College Smart Farm has made two substantial improvements to OMNiPOWER in the 2021 growing season: a dedicated and expanded team, and increased data capture with new electronic data collection technology.

Omnipower Dedicated Team

Olds College put together a dedicated team to carry out the required work and data collection for the autonomous equipment including Roy Maki, Research Project Manager leading the College's autonomous agriculture equipment initiative for broad acre crop production; Yevgen Mykhaylichenko, Telematics & Autonomous Solutions Specialist; Sofia Bahmutsky, Data Scientist; Nicholas Zivcic, DFS Research Technician; and Julie Cobb, Research Assistant. With an expanded team, the College is able to collect and analyze more data to increase productivity and learnings, plus the enthusiasm in the department is contagious since the team members all have a passion for autonomous technology. "Based on the knowledge and experience gained from an exceptional 2020 team, we were able to assemble a robust and dedicated team this year who could capitalize on past operational experience and then excel in observational activities," says Roy Maki, Project Manager.

2020 Growing Season

Seeding	Spreading	Spraying
125.6 acres	240.7 acres	2078.6 acres

2021 Growing Season

Seeding	Spreading	Spraying
470 acres (274% increase in seeded acres)	328 acres (36% increase in spreaded acres)	1,945 acres *currently only 60% through the spraying season

Omnipower Data Collection

The team implemented two methods of data capture for OMNiPOWER this growing season compared to one method last year: the return of observational data and a new electronic data acquisition instrument called Somat-eDAQ. Both observational and electronic methods gather data and record events during each mission — mission being the term used when OMNiPOWER is carrying out an operation in a field after it has been programmed.

Observational data is gathered by the team with their own eyes and experiences during each mission. Team members are on site watching OMNiPOWER, making observational notes, and timing the various processes and missions that OMNiPOWER performs in the field. New this year is Somat-eDAQ, an electronic data acquisition instrument built for collecting layers of data in rugged environments. This device rides along with OMNiPOWER and electronically collects location specific data (GPS) and equipment data (CAN bus). This data comes in at a rate of two times a second and includes starts, stops, and field and fuel efficiency.



Photo Caption: An example of a canola seeding operation map from May 23, 2021 in Field 2E with data from the Somat-eDAQ equipment. The colours on the map represent the fuel rate (in litres per hour).

The ability to capture data electronically allows the team to produce new maps of collected data throughout each field, such as seeding operation maps. “This year, collecting vast amounts of electronic data gives us the ability to answer various research questions to a much more detailed and refined level than is possible from physical observations,” says Sofia Bahmutsky. “As we gather more data throughout the season, we gain potential insight into the performance of autonomous equipment using comparisons, statistics and visualization techniques.”

Data acquisition is a process throughout the season. Once the missions are completed and data is collected for the entire growing season, the team will compile the information to determine overall performance, learnings and efficiencies from one year to another; however, the first glimpse is promising.

In the second year of operations, based on what Olds College learned about autonomous ag equipment in the first year, the team is able to run the equipment more efficiently, get more acreage coverage, and improve field efficiencies and uninterrupted hands-off operation.

Part of a three year Smart Farm research project, Olds College will continue to collect information and observations from OMNiPOWER missions to understand the benefits and challenges of autonomous agricultural equipment. Nicholas Zivcic says, “The agricultural industry is quickly making technological advancements, and the OMNiPOWER equipment is no different. It has opened my eyes to how technology can be beneficial in agriculture and increase productivity and efficiency.”

Olds College is eager to share further OMNiPOWER updates at the end of the 2021 growing season. If you’re interested in learning more about autonomous equipment, visit AgSmart on August 10 and 11 at the Olds College Smart Farm College Smart Farm to see OMNiPOWER in action on the field.