

# Ag Drone School

Taber Legion Hall  
Nov 20-21, 2017

## Day One: Morning

Monday, November 20

**8:30 a.m. Welcome & Introductions**

**9:00 a.m. Crop Imaging using Drones**

While the focus of the school is safe drone operation, the magic really is in the sensor! This presentation will go through the current state of technology, including satellite, manned, and unmanned imagery collection. Explanation of the most common technologies, with focus on Normalized Difference Vegetation Index (NDVI) and benefits of multispectral imaging/calibration.

**10:15 a.m. Introduction to UAV's, Principles of Flight**

Students will learn about the basic components of all unmanned aerial vehicles and delve into basic maintenance procedures. Will also include discussion of principles of lift with fixed wing and rotary (multicopter) aircraft.

**10:45 Air Law & SFOC Process**

Introduction to the legislation around UAV operations, the Transport Canada regulations, and the process for acquiring a Special Flight Operations Certificate. Prairie & Northern Region SFOC Options 1 -3 and requirements for commercial operations will be covered.

## Day One: Afternoon

Lunch is provided

**12:30 p.m. Preflight Planning**

This session will include hazard assessment, airspace coordination, meteorology, and the issuing of NOTAM's.

**1:30 p.m. Establishing Your Flight Manual**

An operations manual is required when applying for an SFOC, and is also a useful tool for commercial operation.

**2:15 p.m. Flight Manoeuvres**

Participants will have an opportunity to conduct several safe flights individually or in small groups, under the direct supervision of an experienced operator and instructor. Weather permitting, this will include planning several autonomous mapping missions outdoors, in addition to indoor flight practice.

**3:30 p.m. Flight Mission Planning**

Students will learn about the details of planning a flight, including referencing the locations of airports and giving appropriate notice. Students will also be provided with examples of electronic systems for information and mission-control software. Working in small groups, students will prepare for the mapping missions they will be conducting later in the course.

**4:15 p.m. ROC-A Exam**

We have arranged to have the Industry Canada radiotelephony exam administered on-site, so that you won't need to locate an examiner yourself. The cost is included in your registration.

**4:30 p.m. School concludes for the day**

## Day Two: Morning

Tuesday, November 21

- 8:30 a.m. UAV Maintenance, Storage & Travel**  
Practical advice to ensure that your aircraft and its ground support elements are always in good repair, to ensure safe flight. Considerable focus will be put on battery management using DJI systems as examples.
- 9:30 a.m. UAV Emergency Management**  
Prudent operation of an unmanned aircraft requires preparation for various emergency scenarios, as does application for an SFOC. We will discuss various real-life scenarios and how to prepare for them.
- 10:15 a.m. Software for Ag Drones**  
A review of the various pieces of software required to get full value from a drone: flight control, map creation, agronomic/spectral analysis. A look at developments in remote sensing, with emphasis on the possibilities provided by machine learning and improvements in spectral sensing. Sample imagery and its agronomic interpretation will be discussed.
- 10:45 a.m. Review of Key Ground School Concepts**  
Preparation for testing. Students getting a score of 60% or higher will receive a ground school certificate from BlackHawk Aeronautical, showing that they have acquired the knowledge required to make application to Transport Canada for an SFOC.

## Day Two: Afternoon “Fly Day”

- 12:30 a.m. Written Quiz (20 questions)**
- 1:30 p.m. Mapping Missions**  
Continuation of flight planning and flight training. Participants will be presented with mission scenarios and asked to coordinate those missions as groups, with individuals being designated as pilots and observers. Various scenarios will be canvassed to help participants understand contingencies for which they will need to prepare when flying their aircraft.
- 3:15 p.m. Imagery Processing**  
Participants will learn about the general workflows for the creation of orthomosaic maps and digital elevation models from the imagery they gather. Software workflows from drone to final maps will be demonstrated for multispectral, near-infrared, and stock cameras.
- 3:45 p.m. Drone & Imagery Demonstrations**  
If weather permits, live demonstrations of drone flight capabilities. Imagery of the site will be reviewed to show possibilities for using vegetative indexes on farms today, using models and orthomosaics of the school site where possible. Q&A on specific products being offered for the 2018 crop year, from simple point-and-shoot systems, to basic investigative NIR systems, to full-blown multispectral mapping. Participants will discuss how they would like to see the technology developing for even more value to their business.
- 4:30 p.m. School concludes – thank you for attending.**

