

# PRODUCTION



Strongfield Environmental Solutions held a field day in Alberta at the beginning of September to showcase drone technology and to lay the groundwork for a working group. The group will focus on fulfilling Pest Management Regulatory Agency research requirements needed to allow drones to apply crop protection products.

## Work starts on drone spraying rules

The PMRA does not allow crop protection products to be applied by aerial drones; experts say more research is needed

When the Canadian Aerial Applicators Association got wind that Don Campbell had been approved by Transport Canada to emit fluid from a drone, the group decided he needed to be stopped.

"Just because Transport Canada has approved them as an unmanned aircraft for flying, that does not mean that they have been approved by the Pest Management Regulatory Agency for crop applications of crop care products," said CAAA executive director Shara Tardif.

The association then contacted the PMRA about Campbell's approval, which was quickly rescinded.

In some regions of the United States drone applications were grandfathered into labels under the aerial applications section for planes and helicopters, but this is not the case in Canada.

"No label amendment applications for the use of drones for pesticide application have been submitted for approval in Canada," the PMRA website says, which means it will likely be years

before drones can legally apply crop protection products, beyond provisional approvals on a case by case basis.

However, this may not be a bad thing, according to spray expert Tom Wolf of Agrimetrix and [sprayers101.com](http://sprayers101.com).

He said the agriculture industry does not understand the behaviour of droplets emitted from drones.

"The aerodynamic behaviour of a fixed wing aircraft is relatively constant, it is fixed. The only thing that really changes is elevation or perhaps sidewind or headwind," Wolf said.

"In a multi-rotor drone, each individual rotor spins at a unique rate, depending on the place it needs to go. Every time the rotor speeds up or slows down it changes the aerodynamics underneath that aircraft."

He said much more study must be conducted before these complex patterns are understood. As well, he added, there are significant differences in the turbulence patterns created by the various drones on the market that must also be examined.

To address the lack of research into drone spraying in Canada,

Strongfield Environmental Solutions (SES) of Lacombe, Alta., is moving to set up a working group to address the research needs of the PMRA.

SES is a drone distributor and an environmental service company that offers vegetation management and land reclamation services. It has use-cases for drone sprayers in which they perform far better than other platforms.

"Spot spraying is where we see the biggest benefit of drone sprayers, whether this be on herbicide resistant kochia, for example in southern Alberta, or it could be prohibited noxious weeds in rangeland management," said Wade Mclean of SES.

"Instead of having to walk in with backpacks or drive in with UTVs across these native prairies, we could actually just fly there and not touch anything and remove any environmental impact from our footprint."

SES participated in drift and deposition studies with the U.S. Department of Agriculture in College Station, Texas, and Mclean said there's a need for similar research in Canada.

"There is a really big need for a working group because we want to make sure this is done right. We need to determine what the right application rates are, what the spray patterns are, what the drift is, what the appropriate nozzles are, appropriate height, speed, all of that," Mclean said.

SES held a field day in September to showcase drone technology and to lay the groundwork for a working group.

Invitations to join the group have been sent to representatives from the Alberta government, Health Canada, agronomists and those who register crop protection products.

"We just want to make sure that we are meeting the regulations that the PMRA wants to see," Mclean said.

"The main goal of the group is to get the drones sprayers approved so that we can get the labels amended."

Markus Weber, who instructs an agricultural drone class and is president of drone distributor LandView Drones, said he supports the idea of a working group and feels crop protection compa-

nies need to take the lead in dealing with label restrictions.

"If there was a company interested in getting (a) herbicide or two approved, I think that would open the door," Weber said.

"If they had a use-case for one product, they could just go to PMRA and say, 'here is the product, here is how we are going to apply it, and here is the research to say it's safe to apply it that way.'"

However, getting drone application on the label of crop protection products may cause more problems than it solves in the short term.

Wolf is worried that amending a pesticide's label to include drone application will legally allow drone pilots to apply the product with little or no training.

For instance, it takes approximately 90 minutes to complete an online Transport Canada course for a basic pilot certificate for drones under 25 kilograms. A drone system that can apply pesticides can be purchased for much less than \$10,000. These will be the only obstacles that someone will have to jump through to legally apply pesticides with a drone once a label is amended.





**This Strongfield Environmental Solutions drone uses course nozzles that emit large droplets, which are less likely to drift off target compared to fine droplets that spraying drones usually use.**

“One thing I like about the aerial business for piloted aircraft is the fact that they are all professionals,” Wolf said.

“These people in the cockpit took a course, a multiyear course. They apprenticed, they have been supervised by a very experienced person for years before they ever venture out on their own, and they know what they’re doing.”

He said he’s worried that the entire agriculture industry will suffer the consequences if something goes wrong, such as a fly-away with a drone carrying a load of pesticides that crashes and harms someone.

“Of course that will be rare, but when it does happen it will create a re-evaluation of the whole thing,” he said.

“It’s just simply not professionally governed right now.”

To fly a drone over 25 kilograms in Canada, operators need to receive a special flight operations certificate from Transport Canada, which Wolf likes because it takes the “semi-professionals” out of the business.

“This is a significant filter that filters out the hobbyist,” he said.

“You just can’t simply buy one of these things and fly it legally. You have to go through a lot more paperwork and certification to do that.”

Mathew Johnson, chief executive officer of Manitoba-based M3 Aerial, which offers training for drone pilots, said applying pesticides with a drone is as safe as applying with a plane or helicopter.

“It’s entirely possible to have a drone fly away with chemical in it, but it’s also entirely possible for a helicopter to lose control when it’s flying at a low level and it’s entirely possible for an airplane to crash,” he said.

“None of these things should be major roadblocks.”

He said people who are concerned that drones are unsafe compared to planes or helicopters don’t understand the abilities and capabilities of the drone industry.

“Transport Canada has taken a lot of time, despite what people think, to try and work through as many possibilities and opportunities as they can, but the fact that there are multiple government departments working on the same sort of project causes confusion,” Johnson said.

Spraying crop protection products with a drone is commonplace

in Asian countries such as South Korea and China, but information on the efficacy of this practice or the issues it’s caused have not been made available to the public.

Johnson said forcing drone pilots to join an association similar to the CAAA would just be another obstacle that isn’t necessary, but he does see the value of having a working group to help deal with PMRA regulator hurdles. He said the group should include all stakeholders, including Transport Canada, Health Canada, the CAAA and representatives from the drone industry, including Unmanned Systems Canada (USC).

USC is the national association that represents the unmanned systems industry, including business, researchers and government organizations who work with aerial, ground and marine remotely piloted vehicles.

However, only three percent of USC’s membership is involved in agriculture, and it has not established a working group to study applying pesticides with drones.

Weber said he sees the value of a professional association for drone applicators and thinks the drone industry should work with the CAAA instead of creating a new entity.

“I think the writing is on the wall for the aerial applicators,” Weber said.

“I don’t think we’re going to compete with them on large acreage application, but spraying underneath a power line, or right around a well site, there are a lot of places where drones can do it much more safely, much more efficiently.”

Companies that use spray planes and helicopters already have the expertise and clients, so Weber said they will likely be the biggest beneficiaries when drone spraying is allowed because they could easily integrate the technology into their business.

However, it’s unlikely the CAAA is going to promote drone research in Canada or invite people from the drone industry into the association.

“We are the aerial applicators, so if drones by the PMRA is considered aerial application, then that would be something as an association we would have to look at at that time and review,” Tardif said.

“Right now it’s just wait and see where this technology goes and what the regulating agencies decide to do with it.”



**Drones are commonly used to spray crop protection products in Asian countries such as South Korea and China. However, little is known about how effectively drone sprayers hit their target compared to spray planes and helicopters.**

Wolf said most agricultural spray drones have a limited product-carrying capacity, so they rely on low water volumes and very fine droplets to extend their coverage. Very fine droplets tend to drift off target.

“Often times stewardship means choosing not to go down a certain path because you know inevitably that you will be dealt some cards you can’t play, and shouldn’t play. That’s been my argument with dicamba,” Wolf said.

He said growers cannot have stewardship over dicamba because they cannot prevent it from volatilizing in environments where the vapour does harm.

“Therefore, the stewardship decision would have been to not intro-

duce that product into those environments. Those decisions are the hard ones because they are a business decision, and the drone world is the same,” Wolf said.

“Right now I have the feeling that the regulatory people are a little unsure how to proceed.”

He said it is possible to safely integrate drone sprayers into Canadian agriculture, but only after rigorous studies into how to safely use the technology are conducted.

Wolf said the Canadian public relies entirely on the good will of the agriculture industry because there isn’t a policing body that ensures proper practices are followed, which exist in countries such as Germany, where government officials visit farms to check

production records.

So in this unpoliceable environment, a working group that may eventually lead to a professional association that ensures the conduct of its members might be a good option, Wolf said.

Once the first domino drops, he added, when the first crop protection company receives a PMRA label amendment for drone application, all of the other companies will follow because they have to stay competitive.

“Everybody is going to buy these drones and they are going to put poison into them and fly them over areas,” Wolf said.

“Not happy about that at all.”