

# The sky's the limit – rules and regulations for RPAs

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AN AERIAL PHOTO OF CROPS IN SOUTH AUSTRALIA'S MID NORTH, TAKEN USING A MULTI SPECTRAL CAMERA MOUNTED ON AN RPA.

There is a clear trend towards the use of remotely piloted aircraft (RPAs) in agriculture.

These automated flying aircraft, often referred to as 'drones', range from palm-sized indoor helicopters to larger fixed-winged craft and can be used for a variety of on-farm purposes including crop assessment, surveying, checking for pests and disease and monitoring crop health.

This trend is raising a variety of potentially problematic issues including air safety, the privacy implications of having camera-equipped aircraft roaming the skies and legal issues around potential misuse of the craft. Consequently, there are strict regulations on where and when one can use an RPA.

According to Peter Gibson, spokesperson for Australia's Civil Aviation Safety Authority (CASA), it is illegal to fly a model aircraft for commercial hire and reward unless you have an unmanned

operator's certificate covering that type of operation. He says farmers need to ensure they are well informed about the rules and regulations before operating a RPA for commercial use.

## WHAT ARE RPAS?

The term RPA refers to remotely piloted aircraft (also known as unmanned aerial vehicles). RPAs come in all shapes and sizes, from palm held models, to those that are as big as a 737. The term unmanned aircraft system (UAS) includes not only the aircraft, but all the ground support, equipment and personnel.

The term 'drone' is not readily used when referring to unmanned flying aircraft in the agricultural industry. Drones are used in military operations by troops in flying missions and military warfare as precision weapons systems.

"Any farmer wishing to use an RPA for commercial purposes must have an operator's certificate and approval from CASA. We set the safety standards, check to make sure people and companies follow the standards, issues licences and registrations, and provide safety education and advice.

"CASA also classifies unmanned aircraft by use. RPAs can be used for purposes such as fire fighting, search and rescue, disaster relief, border patrol, weather monitoring, hurricane tracking and law enforcement. From the CASA's perspective, the difference between an RPA and a model aircraft is that an RPA is used for commercial, government or research purposes and a model aircraft is flown for sport and recreation.

"The same rules apply to a palm-sized helicopter as to a larger fixed-winged machine. In general, the operator must keep below 400 feet, stay in line of sight, only operate in clear weather, stay 30 metres from people or property and not

operate in built up areas unless they have permission," he said. "In addition, one cannot fly within 5.5km of an aerodrome or landing site."

Peter says failing to obtain an operator's licence can result in legal issues, particularly with privacy matters.

"Privacy and RPAs is a real issue. CASA recommends that if you are applying for an unmanned operator's certificate you make yourself familiar with privacy issues and how these might affect your use of a RPA. The unmanned operator's certificate application process includes a reading list about privacy matters.

"There are fees associated with the operator's licence. It depends on the complexity of the application, but more than likely the fees will be several thousand dollars. However, it is essential for a business owner planning to use an RPA to obtain accreditation."

Peter says the use of RPAs will continue to grow in Australia, with the number of commercial operators increasing by at least 200% in the past two years.

"Already there are more than 130 approved operators in Australia. This will most certainly grow in the next 12 months.

"Our role at CASA is to make sure the RPA sector can continue to grow while maintaining and improving safety performance. We will be reviewing the rules to ensure they are up to date with technology and the uses for RPAs," he said.

**Leighton to the skies**

SANTFA Communication and Extension Officer, Leighton Pearce has begun his own research and development into the use of RPAs and has obtained a Controlled Operator's certificate to fly fixed-wing and multi-rotor craft.

Leighton, who is based in the Riverland, obtained his licence after completing a two-week course in Queensland.

"I ventured down this path almost 12 months ago to see what was out there and what was possible for the commercial use of RPAs," he said. "I found there was a myriad of information and misinformation on the subject.

"It is an emerging industry, so all the rules and regulations are still being set and the old regulations are now out of date. When I started looking into the facts I discovered that one needed to become accredited to operate an RPA, so I signed up for a two-week course in Queensland."



LEIGHTON PEARCE WITH A FIXED-WING RPA.

Leighton received his RPA Controlled Certificate in July this year. This allows him to safely and legally fly an RPA but there are still many requirements he needs to abide by to ensure he is not breaking the law.

"There are a lot of legal matters relating to operating a RPA. For instance, I am only allowed to fly in daylight, I am not to fly in cloud or fog, I must not fly within 30 metres of a person on the ground and I must not fly the RPA

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within 5.5km of any aircraft landing area, such as Adelaide airport,” he said.

“An RPA must not fly more than 400 feet above the ground because passenger planes fly at 500 feet and there needs to be a buffer zone between commercial aeroplanes and RPAs.

“Our property is located near Loveday, south-west of Barmera, in the Riverland,

and it is a challenge to not fly over a nearby property, a populous area or an area that may cause significant or unreasonable risk to life, safety or property,” he said.

Despite the responsibilities and possible complications around operating an RPA, Leighton sees great potential in the technology for agricultural monitoring

and plans to invest in a fixed wing and rotor craft for use in aerial photography, mapping, and crop management.

“RPAs will allow monitoring of more area in less time.

“We hope to use RPAs to monitor crop health and obtain a bird’s-eye view of paddocks. They will be able to be fitted with monitoring equipment including an NDVI (multi spectral) camera that will enable us to determine the nitrogen (N) status of crops from another perspective and monitor N application. We will also produce drainage and subscription prescription maps.”

Producers, particularly horticulturalists, have been using RPAs for aerial spraying in Australia, but according to CASA, aerial spraying is illegal under the current licensing unless an operator has an exemption to their licence.

“The licence I have states that the operator must not drop or discharge anything from a craft in a way that creates a hazard or risk to any aircraft, person or property,” Leighton said. “However, all these regulations are currently being reviewed and updated, so this may change in the next year or two.”

Leighton says the cost of a RPA can vary from \$1,000 to \$70,000, depending on the type of craft, yet there are few companies who will insure them.

“Insuring an RPA is another issue for growers. There are only a couple of insurance companies in Australia who will insure an RPA and they will definitely not insure the craft if the operator does not have accreditation,” he said.

He attributes the increasing popularity of RPAs in agriculture in part to developments like better adaptations towards production, robust craft built around strong, lightweight frames made from carbon fibre and improvements in battery technology that have increased the time a craft can spend in the air.

“The batteries now used in RPAs are lithium polymer, which have a longer life but expand when they get hot and can self-combust if exposed to moisture.

“Sensors and robotics in RPAs are becoming much more sophisticated and GPS, which enables images to be linked back to specific locations on the ground, is becoming more readily available.

“The opportunities for RPAs in agriculture are endless and I expect they will have a great future in the industry.”

## LICENSING, RULES AND REGULATIONS

### RPA

- To fly an RPA of any size for commercial reward the operator needs an unmanned aerial vehicle (UAV) controller’s certificate and an unmanned operator’s certificate (UOC).
- Unmanned aircraft activities are approved for operations over unpopulated areas at heights up to 400 feet (120 metres) above ground level or higher with special approval.
- Operation of an RPA is not permitted in controlled airspace without CASA approval and coordination with Airservices Australia.
- An RPA can be operated in visual meteorological conditions (VMC) and/or instrument meteorological conditions (IMC) with appropriate approvals.

### MODEL AIRCRAFT

- Operators do not need formal piloting qualifications to operate a radio-controlled model but need to be aware of CASA rules and regulations.
- Operators may fly a model aircraft only in line-of-sight (must be directly visible to the operator at all times), in day visual meteorological conditions (VMC). This excludes night flying or flying in or through cloud or fog.
- Operators must not fly a model aircraft over populous areas such as beaches, backyards, heavily populated parks or sports ovals where there is a game in progress.
- In controlled airspace, which covers most Australian cities, model aircraft must not be flown higher than 400 feet (120 metres).
- Operators must not operate a craft closer than 5.5km from an airfield.



RPAS COME IN MANY FORMS, INCLUDING MULTI-ROTOR CRAFT LIKE THIS ONE. WHATEVER THEIR SPECIFICATIONS, IF THEY ARE TO BE USED FOR COMMERCIAL APPLICATIONS THEIR CONTROLLER MUST HAVE A CONTROLLED OPERATOR’S CERTIFICATE.