

Investigating the application of unmanned aerial vehicles in agriculture in the SAMDB region



Background

Unmanned aerial vehicles (UAV) are a new technology still in the early phase of development therefore the adoption of the technology has not been widespread.

This project was developed to investigate the uses for UAVs in three different farming situations – broad acre cropping, livestock and horticulture.

There are many potential uses for UAVs in different farming situations and the possibilities will continue to grow as the technology improves.

Some examples of current uses for UAVs include:

- Broad acre cropping – to identify different paddock zones, monitor crops and property infrastructure.
- Livestock enterprise - to monitor stock, monitoring pastures, checking fences and watering points.
- Horticultural enterprise - used for scaring birds, checking for pests, identifying production issues or checking irrigation.

The method

Three landholders were engaged to work on the project, all with different enterprises.

The UAVs were trialed in a livestock enterprise at Waikerie, a broad acre cropping enterprise at Loxton and a horticultural enterprise at Murtho.

The landholders were surveyed and case studied.

A set of principles and recommendations for the use of UAV's in each situation was then developed to help landholders implement the technology more broadly in the future.

The results

In general the UAVs performed as required, however during the project there were several challenges, which included the robustness of the flying platforms, software issues and changing weather conditions.

Over 300 hours of operation were accumulated using different multi rotors. This has provided a great deal of information and experience that has been documented and can be used for developing future projects.

Three publications have been developed by Growing Solutions, to help support local landholders wishing to implement UAV systems.



The publication, 'Anatomy of a Drone', details the components of UAVs, the risks, facts and safety aspects to ensure trouble free flying.

Case studies have been prepared detailing landholder experiences and have captured the results of the work.

As each landholder was using the UAV system in a different situation the objectives and requirements of the UAV varied. Therefore, before deciding on purchasing a UAV, the user must determine the most suitable UAV for their situation.

A 'Principles and Learnings' manual has also been developed detailing the results of the project and includes the technical, financial and feasibility information that is required when implementing a UAV system on farm.



Leighton Pearce getting ready to operate an unmanned aerial vehicle

Recommendations

Several barriers exist and need to be addressed before widespread adoption of UAV technology will occur.

The barriers include:

- The cost of the systems that fly autonomously and process data, which at this stage can be over \$15,000.
- Significant training is needed to operate and maintain the equipment, as UAVs are easy to crash and difficult to repair.
- Government regulations can affect how landholders can use the technology.
- Lack of credible information to date to inform landholders of the benefits of UAVs.
- Understanding what data to capture and how to capture and analyse it.

Conclusion

UAVs are an exciting new technology that can provide users with data that is on demand, timely, detailed, low cost and versatile.

There are many different uses that can be tailored to suit the enterprise.

It is recommended landholders seek experienced advice and training in UAV operation to get the most from implementing the system on farm

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