



HINKLER AGTECH INITIATIVE

Drone Technology for Whitewashing Greenhouses

INTRODUCTION

This trial was undertaken as part of CQUniversity's Hinkler AgTech Initiative. The Initiative aimed to increase the productivity and profitability of the Bundaberg region's agricultural sector through greater availability and utilisation of agricultural technology (AgTech). An extensive consultative process undertaken with agribusinesses identified on-farm needs that may be addressed using AgTech. Trials of selected AgTech products and services were then undertaken in partnership with agribusinesses and technology providers to determine the technologies' efficacy in on-farm conditions. This summary provides an overview of findings from one of the technology trials, including grower feedback and considerations for other growers when deciding whether to utilise the technology in their own enterprise.

Background

Whitewashing of commercial greenhouse covers is a widespread practice by growers. The whitewash reflects sunlight and reduces the amount of heat that enters the greenhouse. This creates a cooler and more controlled environment for plants, which can increase growth and productivity. The practice of whitewashing greenhouse covers is particularly common in regions with hot climates, where elevated temperatures are a major challenge for growers. Traditional methods of whitewash application include manual spraying or aerial spraying via helicopter. These methods can be labour-intensive, expensive and involve health and safety risks. As the size and extent of greenhouses continue to increase throughout Australia, growers are looking for alternative, safe and cost-effective application methods.

The Technology

The XAGP30 is an aerial drone spraying system, fitted with a fully automated flight control system with GPS capacity. This system navigates the drone at centimetre-level accuracy, enabling the user to spray

precisely and only where needed. Each drone holds 16L of liquid spray and the droplet size and flow rate can be easily adjusted. The drone can also be used in conjunction with an automatic refilling system that saves considerable time and reduces exposure risks by avoiding direct contact between the operator and the spray medium.

The Trial

A qualified, licensed drone pilot deployed a XAG P30 drone to spray whitewash medium over 7ha of commercial greenhouse covers in the Bundaberg region. The grower had previously employed both manual and helicopter-based spray methods.

RESULTS

The drone completed the whitewash application in only 35hrs of flying time, covering the entire 7ha of covers at a constant rate of 2000m²/hr, with no need for resprays.



Value to Business

The greatest value of drone technology, compared to traditional whitewash application methods, are the significant cost and time savings. The table below summarises the comparative costs and application times:

Whitewash Method	Application Time	Cost (\$) *
XAG P30 Drone Operated by qualified owner / operator, including all auxiliary equipment	35hrs	7,000
Manual Spraying	3 weeks	11,200
Helicopter Including booking fee and flight time from/to base	2 days	30,000

These costs are exclusive of whitewash medium. Although a relatively small component, the trial demonstrated a saving in whitewash medium of 40% compared to the manual method and 60% compared to the aerial method.

A major disadvantage of helicopter spraying is the cost of booking the pilot and machine. Once engaged, the grower needs to spray the entire cover at the one time, to avoid re-booking. Engaging a local drone contractor avoids these issues as they can apply and reapply whitewash as needed, to sections of cover at a time, to suit the grower’s schedule.

Another significant value of drone technology is the health and safety benefits. The drone creates negligible spray drift compared to a helicopter, reducing risk of inhalation and enabling on-ground staff to continue working during the spray operation. There is also no need for the setup of ladders and scaffolding or workers to access high, fragile structures.

Grower Feedback

Trial Summary Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I see value in this technology					✓
I found the technology easy to use					✓
The technology was easy to integrate within my business					✓
I was satisfied with the service provided by the AgTech company					✓
I intend using this technology in my business					✓
I recommend this technology to other growers					✓

Other Considerations

When deciding whether to use a drone to apply whitewash, a grower should consider:

- The qualifications and experience of drone pilots. Rates charged by commercial drone pilots vary greatly but it is more cost-effective and safer to engage a pilot who is adept and experienced at flying in an agricultural setting.
- If considering buying a drone outright for personal use, the XAG P30 spraying drone used in this trial costs \$39,000* and requires specialised training and licensing requirements to fly with a full payload.

Further Information



For further information on this trial and results, email CQUniversity’s agricultural research team: agriculture@cqu.edu.au

The Civil Aviation Safety Authority (CASA) regulates the use of drones in Australia, including pilot licensing and accreditation: casa.gov.au

For further details on agricultural applications of drones, including the XAG P30 spraying system, contact OzTech Drones, Bundaberg: oztechdrones.com

Summaries of other technology trials undertaken through the Hinkler AgTech Initiative are available at: bundabergagtechhub.com.au

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