Agricultural RPAS occurrences

Insights period: 22 November 2024 through to 16 February 2026

Overview

The Civil Aviation Authority (CAA) is working to share aggregated system-level risk insights in a way that supports greater awareness across the aviation sector. By highlighting key occurrences and trends, we aim to provide access to timely and relevant safety and security information that helps to meet safety obligations, strengthen collaboration, and ultimately contribute to a safer, more resilient aviation environment.

The insights provided are high-level and may not have been fully analysed. They are not shared to assign blame, but to emphasise that aviation safety relies on collective responsibility and collaboration across the system. It is also anticipated that these insights may help you identify or mitigate potential risks in your own aviation activities.

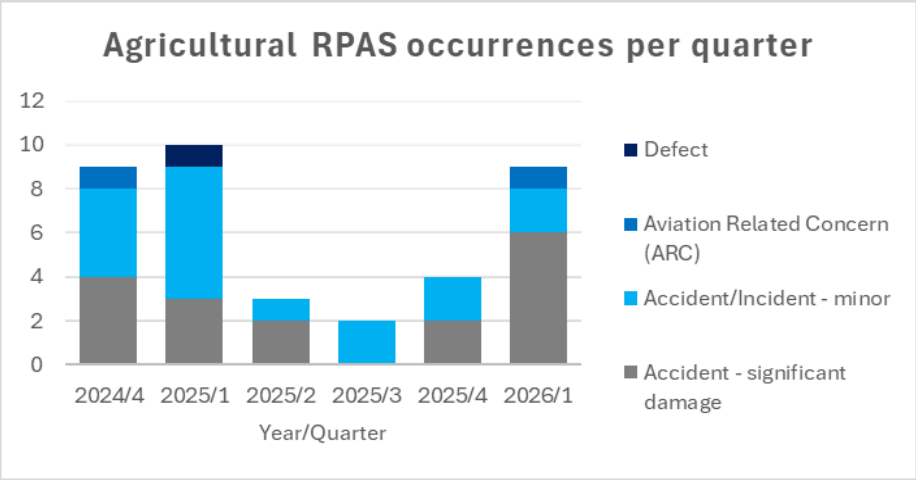
What to be aware of / advice

To strengthen industry safety and get meaningful value from occurrence reporting, operators should ensure every accident or incident report is complete, accurate and specific. This means including key information such as pilot, aircraft and operator details. Clear identification of the drone and its configuration help in understanding trends and prevents misinterpretation of events.

Operators should go beyond simply describing what happened. The time should be taken to understand *why* it happened. Applying simple root-cause methods, such as the "5 whys," helps identify contributing factors like poor pre-flight planning, inappropriate lost-link settings, or rushed pre-flight checks, rather than attributing events solely to the aircraft. Thoughtful analysis not only strengthens your own safety practices but also improves the quality of insights that can be shared across the wider industry.

Occurrence data

The graph below shows reported Remotely Piloted Aircraft Systems (RPAS) occurrences for the period 22 November 2024 to 16 February 2026.



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Key themes and insights

1. Accidents resulting in significant damage

A total of 17 accidents involved significant damage to RPAS. At least nine of these occurred during spraying operations. Nine of these accidents state they occurred during spraying/spreading operations, with another four suspected to be spraying/spreading operations given the size and type of RPA.

Key causes:

- 11 accidents resulted from collisions with obstacles (trees or wires), leading to crashes.
- 5 accidents were caused by loss of signal.
- 1 accident occurred when an RPA reacted to a terrain washout, altered altitude, and crashed.

RPAS used:

- 8 XAG P100 Pro
- 1 DJI AGRAS T50
- 8 unknown

2. Accidents/incidents resulting in minimal damage

There were 17 accidents where RPAS sustained only minor damage. Six of these accidents state they occurred during spraying/spreading operations, with another seven suspected to be spraying/spreading operations given the size and type of RPA.

Key causes:

- 10 accidents resulted from obstacle strikes due to manual error or failure of automated terrain-following systems.
- 4 accidents were linked to loss of signal or rapid battery depletion.
- 2 accidents involved unexpected autonomous landings without pilot command.
- 1 accident occurred due to pilot fatigue, leading to misjudgement of distance between the RPAS and a trailer during landing.

RPAS used:

- 6 XAG P100 Pro
- 1 DJI AGRAS T40
- 3 DJI AGRAS T50
- 7 unknown

3. Other incidents

- 2 aviation related concerns were lodged regarding RPAS flying over neighbouring property. These involved concerns about unwanted spray drift and potential unauthorised surveying.
- 1 defect was reported, cracks identified in DJI AGRAS T50 blades prior to flight.

4. Insights

Although pilots rely on obstacle-avoidance systems, terrain-following technology, and digital hazard mapping, these technologies can fail, increasing the risk of obstacle strikes and controlled flight into terrain (CFIT) events. These recent occurrences highlight emerging technical vulnerabilities, such as, GPS inaccuracy in cluttered terrain, battery and power-system reliability issues, communication faults, and instability during mode transitions (auto to manual).

The occurrences also show that agricultural RPAS operations are often being operated into environments that exceed the assumptions built into their automation, sensors, and pre-flight configuration workflows. Visual limitations, complex terrain, evolving farm hazards, and operator workload mean that pilots cannot safely rely on automation alone. At the same time, the weight and momentum of agricultural RPAS mean that small human or technical errors can quickly escalate into high-severity accidents.

Some aircraft require a pre-flight configuration that tells the aircraft how to respond if the command-and-control link is lost. This "lost-link response" must be programmed before take-off so the aircraft can take appropriate autonomous action, such as climbing to a safe altitude, attempting to re-establish the link, and, if unsuccessful, returning to the last recorded launch point. While not yet identified as a direct causal factor in recent events, incorrect or incomplete lost-link configuration remains a credible contributor to accidents and warrants closer attention.

Weight of RPAS

Of the 34 accidents reported, the model number is stated for 19 of them (or 56%). These models all weigh around 50-52kg, and with payload (depending on whether they are spraying or spreading) of a total weight between 90-103kg.

Number	Model	RPAS Weight	Max Take-off Weight
14	XAG P100	50kg	100kg
4	DJI Agras T50	52kg	92-103kg
1	DJI Agras T40	50kg	90-101kg

Of the remaining accidents where there is no model number given, seven involve spraying/spreading operations, so we could probably assume that they will also be of equal weight.

Therefore, at least 76% of accidents (with significant or minimal level of damage) would be an RPAS of 50kg in weight and weighing a total of 100kg with spray/spread on board.

The remaining 8 accidents appear to be surveillance type activity, so these RPAS could be smaller in size.

Sample of occurrence narratives

1. *Drone flew 20% of rectangular paddock relating to job spraying potatoes with pesticide completing several turns without incident, before asking if it should complete the row. Pilot confirmed to complete, then saw drone fly too close to hedge and pulled back on the sticks - nothing happened. Drone flew into hedge; job aborted due to damage.*

2. *Drone got caught up in an electric fence wire strung across hill. Which was put up by the neighbour that had earlier had animals grazing the property. Owner was unaware of wire so did not identify it during briefings and due to the thin size, it was not identified during surveying or during the drone's operation. This is a good reminder to drone pilots that even after having previously operated in the location and conducting up to date briefings with the landowner that the unexpected can happen.*

3. *Spraying gorse, drone took off on an automated flight plan with a full load and full battery. Drone descended to specified height and started to spray. Drone then, without warning, fell from the sky and hit the ground sustaining serious damage. DJI have studied the flightlog from the day of the incident and concluded that there was a malware failure between the drone and the battery and so have therefore admitted fault and will replace or fix the drone.*

4. *When manually flying the drone close to trees the drone pilot put in an incorrect control input and contacted the trees causing it to crash. Damage to 4 x blades, 1 fuselage arm, 2 skids, esc unit and spray disc and nozzle. Causal Factors and Actions taken: flight close to trees, reliance on obstacle avoidance. 5 why's report created and discussion with pilot about flying close to trees and obstacle avoidance reliance.*

5. *Flying the drone in manual plus mode with preset flight speed and altitude. Standing 15m away controlling the drone steering and spraying functions. Flying along at 3m above gorse bushes and it flew over the top of a small 1.5m wide washout in the side of the hill. It reacted to the washout and drastically dropped its altitude, but it was already passed the dip when it dropped lower. The drone then clipped its blades on a tree to the side of the drone and the drone tumbled down the hill about 15m. Flying near to a steep edge of hill face. I have assessed the operation area and, in the future, if there is any similar terrain, preset altitude will be set much higher and flight speed reduced to make sure there is no chance of drastic altitude drops causing the blades to come into contact with any objects beneath. A personal safety report has been filed within the company. Drone type: DJI Agras t50*

6. *Drone hit overhead powerline with outside propellor and lost flight stability resulting in total loss of control. Drone crashed to ground with full payload of 50L of spray on board when flight failed. Approximate estimated altitude when control lost: 20ft. Serious damage to most components of the Drone. Potential Inaccuracy from GPS system causing discrepancy of obstacle boundaries regarding programmed operation map. Potential poor estimation of heights given steep terrain by Pilot. Action taken: In future Pilot will completely exclude powerlines from autonomous flight maps.*

7. *Mapped out a paddock with big rows of trees using the map on the app. Created a boundary around the trees with knowledge that trees would have grown since and intended to make extra boundary clearance of 5 metres. Made a mistake in the setting by changing the obstacle clearance instead. Drone was flying at 13m/s and did not have time avoid trees when mistake was discovered. Mistake in pre-flight configuration. Will map out difficult paddocks in person or with drone for more accurate boundary. Will double check clearances before starting.*

8. *Tried to turn around to fly back and land the drone after ag ops, however by then I had realised the drone was not responding as it carried on to oscillate back and forth over-correcting itself each time, it did this another 4 or 5 times before finally doing a 180-degree flip and crashing into the ground from around 15 meters high. the drone crashed into the paddock causing no damage to anything other than itself.*

9. *Drone was coming into land at the end of the job, near the loading trailer. The distance between the drone and trailer was misjudged by pilot. Drone LH Aft lower prop connected with trailer cage as the drone lowered to the ground. Drone position was then corrected by pilot and landed safely. Likely cause of occurrence is pilot fatigue. Pilot has met with chief pilot to discuss fatigue and how to manage and avoid it. Discussion points included taking adequate food and water for days that can get extended beyond normal work hours, swapping out with other staff part way through the day, and the need to take time when landing and move to get the best possible view of any hazards around the drone landing area. Drone type: DJI T50*

10. *Drone was spreading Fertiliser on farmland, flying in an automated route with terrain following set at 8m AGL. Application area required the drone to operate amongst 12kva power lines which were identified and noted in the initial job hazard assessment, the drone passed over the lines as intended and descends down a gully following the contour of the land, at the end of its run it turned and climbed back up the hill and did not clear the drooping lines near the top of the hill, contacting them and causing the drone to crash to the ground. Difference in height between ground and wires where droop between poles happens. Terrain following method did not account for overhead obstacles, adjusting methodology of flight path planning would allow the drone to not be operating at 90 degrees to the lines and therefore would allow it to identify obstacles sooner and avoid them.*

11. *Drone lost signal to the controller and defaulted to its return to home height which was lower than its current position. The drone then landed next to a fence causing one corner to strike the wires on the fence, No damage to the fence. After reading other comments on that day about other operators having transmission issues it sounds like it could have been caused by the atmospheric conditions on the day. That said the return to home was set too low because we were further up the hill than anticipated and had not reset the RTH height. when the telemetry drop out the drone lowered down and the fence was in the way. The fix is to set the RTH above the highest point above the operating area so if the telemetry drops out the drone can return to home above any hazards or obstacle*

12. *While spraying a field one of the drone props clipped the customers overhead telephone wire causing damage to the prop. The overhead wire was identified in the JHA, however at the time of the incident the angle of the sun in relation to the drone pilot resulted in the overhead line no longer being visible to the pilot. Action taken - Our Hazard Register and Risk mitigations have been updated to include assessment of sun angle in early morning or late afternoon operations and for the pilot to place the sun at their back to eliminate the impact of the sun on visibility.*

13. *During agricultural operations, the RPAS experienced multiple uncommanded forced landings accompanied by "battery depleted or error" warnings, despite normal cell readings. The final incident occurred on sloping terrain, resulting in a minor rollover and damage to the right-hand arm. Suspected intermittent battery connection or communication fault. All batteries and terminals were inspected, cleaned, and firmware updated. Affected batteries were isolated for further testing, and replacement power connectors have been ordered.*

What's next

Thank you for continuing to report occurrences to the CAA. The information you provide is incredibly valuable for identifying key risk areas and generating insights that help others learn and operate more safely.

To further strengthen the usefulness of these reports, we encourage you to include complete and accurate details – such as aircraft type, model, operator information, pilot details and any analysis you've done to understand why the event occurred. Thoughtful, well-described reporting enables us to build a clearer picture of emerging risks and share more meaningful guidance back to industry.

If you have any further questions, or ideas for additional insights, please reach out to the Safety and Security Education team at education@caa.govt.nz.