

Planning for the Rain: Lessons from Clearing the Land, New Era of Climate Action, Replanting for the Future



Field Work: Clearing land for tree planting

OVERVIEW	
Flying Labs	Zimbabwe Flying Labs
Location	Nyabira, Zimbabwe
Date	November - December 2025
Length (number of days)	10 Days
Sector program (optional)	Climate Action
Format	In-Person
SDGs	GOAL 13: Climate Action GOAL 15: Life on Land GOAL 17: Partnerships to achieve the Goal

SCOPE & OUTCOMES	
Flight Aim	<ol style="list-style-type: none"> 1. Land clearing of 120 hectares in various locations ahead of tree planting 2. Certify mission was completed successfully

Goal	Clearing the land, new era of climate action, replanting for the future.
Expected outcome for the mission	<ul style="list-style-type: none"> ● To provide images of completed geo-pinned locations ● To document the amount of pesticide sprayed at each location ● To return to obtain an accurate geo pin location for future mapping
Confirmed outcome after the mission	<ul style="list-style-type: none"> ● Certified spray in 8 locations
Eventual next steps	<ul style="list-style-type: none"> ● Revisit the site to ensure the land is cleared ● Use of a spreader for tree planting or shooting ● Monitoring tree health at intervals

CREW	
Profiles and number of participants	<ul style="list-style-type: none"> ● 4 Staff from organisations for field work ● 3 Staff from the internal team
Gender ratio	Male 5 : 2 Female
Who paid for the trial?	Organisation

CONTENT	
Resources used	<ul style="list-style-type: none"> ● Agras T30 x 2
Approaches and methods used	<ul style="list-style-type: none"> ● Planned scope: Target spray area 120 hectares. ● Actual outcome: 108.09 hectares sprayed (90% complete). ● Reporting: “Good to Fly” weather recorded; spray product, report. <p>Method</p> <ol style="list-style-type: none"> 1. Pre-mobilization: Crew accessed the geo-pin for the 10 fields, geo pin confirmed at site.

	<p>2. Deployment: Crew mobilized to the site and attempted to access multiple plots.</p>
<p>Operational Challenges</p>	<ol style="list-style-type: none"> 1. Seasonal Conditions <ol style="list-style-type: none"> a. During the November–December rainy season, fields became waterlogged and inaccessible. 2. Limited Take-off Areas <ol style="list-style-type: none"> a. Alternative take-off zones were not available at some locations due to distance and drone battery limitations. 3. In-Field Obstacles <ol style="list-style-type: none"> a. Trees, terrain features, and other obstacles complicated safe flight line planning. 4. Water Accumulation <ol style="list-style-type: none"> a. Low-lying areas collect water, creating operational hazards for drones. 5. Limited Water Access <ol style="list-style-type: none"> a. Water required for operations was not available near the operational sites. 6. Accessibility Issues <ol style="list-style-type: none"> a. Although weather logs indicated “Good to Fly” conditions, some fields were not reachable or had to remain unsprayed. 7. Terrain Risks <ol style="list-style-type: none"> a. Uneven terrain and obstacles threatened flight safety, reduced coverage accuracy, and required mid-operation adjustments, reducing efficiency.
<p>Best Practice Identified</p>	<p>The mission highlighted several best practices for agricultural</p>

drone operations.

1. Conduct Aerial Reconnaissance

Use a secondary aircraft to:

- Inspect access routes
- Identify in-field hazards
- Capture imagery for planning

This enables better operational decision-making before deployment.

2. Plan Alternative Launch Points

Where access is limited:

- Pre-identify secondary launch and recovery points
- Consider manual interventions where drone deployment is not feasible.

3. Conduct Full Site Assessments

Every operational site should undergo a complete site assessment before operations begin.

4. Use R-VLOS Flight Protocol

Due to terrain complexity, Restricted - Visual Line of Sight (R-VLOS) procedures should be implemented.

5. Deploy Observers

Observers should be present at all times to ensure operational safety.

6. Treat Water Accumulation as an Operational Risk

Low-lying areas that collect water may:

- Prevent safe take-off and landing

	<ul style="list-style-type: none">● Affect spray drift and coverage accuracy <p>Such areas should be flagged in advance, and spray plans should be adjusted accordingly.</p>
Conclusion	<p>This operation highlighted a key reality in agricultural drone operations:</p> <p>Planning, reconnaissance, and communication are just as critical as the drone technology itself.</p> <p>Seasonal conditions, terrain challenges, and field accessibility significantly influence operational success. Integrating pre-mission reconnaissance, improved site assessments, and flexible launch planning will improve efficiency and safety in future missions.</p> <p>The mission successfully demonstrated the role of drone technology in climate action and sustainable land restoration, laying the groundwork for future tree planting and ecological monitoring efforts.</p>