USAGE REPORT

Vehicle:	SRBC 18	**Date:**	26/02/2026
Location:	SABI AGRI	**Missions:**	1

Mission 1

Trial date	2026-02-26
Location	SABI AGRI, Auvergne, France
Operator	Nicolas
Start time	15:20
End time	16:38
Weather	
Precipitation type	None
Temperature	15 °C
Sun position	Zenith
Terrain	
Slope	0 %
Cross slope	0 %
Soil	
Texture	Clay loam
Dominant particle size	Blocks >200 mm
Moisture condition	Wet (semi-plastic)
Crop	
Growth stage	Soil preparation
Weed pressure	50 %
Planned operation	Soil preparation
Adjacent environment	
Tall vegetation	No
Tall buildings	No
Metallic structures	Yes
Ditch or embankment	Yes
High voltage lines	No
Roads	No

No network zone	No
Robot configuration	
Robot weight	220 kg
Robot width	0.64 m
Tool	
Tool name	Herse Etri
Tool type	Mounted
Tool weight	30 kg
Tool length	0.8 m
Tool width	0.1 m
Tool height	0.6 m
Tool total length	0.8 m
Working depth	0.05 m

Figure 1.1: Mission presentation photo

Mission presentation

Mission parameters	
Task to perform	Grattage
Trajectory	rectiligne,square turn
Working speed	2 km/h
Mission file	mission_carotte_complete.json
Organization	
Workforce	
Total number of employees	1
Employees on robot task	0
Surface	
Theoretical surface of the plot	0.084 ha

Worked plot surface	0.0819 ha
Plot fragmentation	Consolidated (<0.5 km)

Trajectory

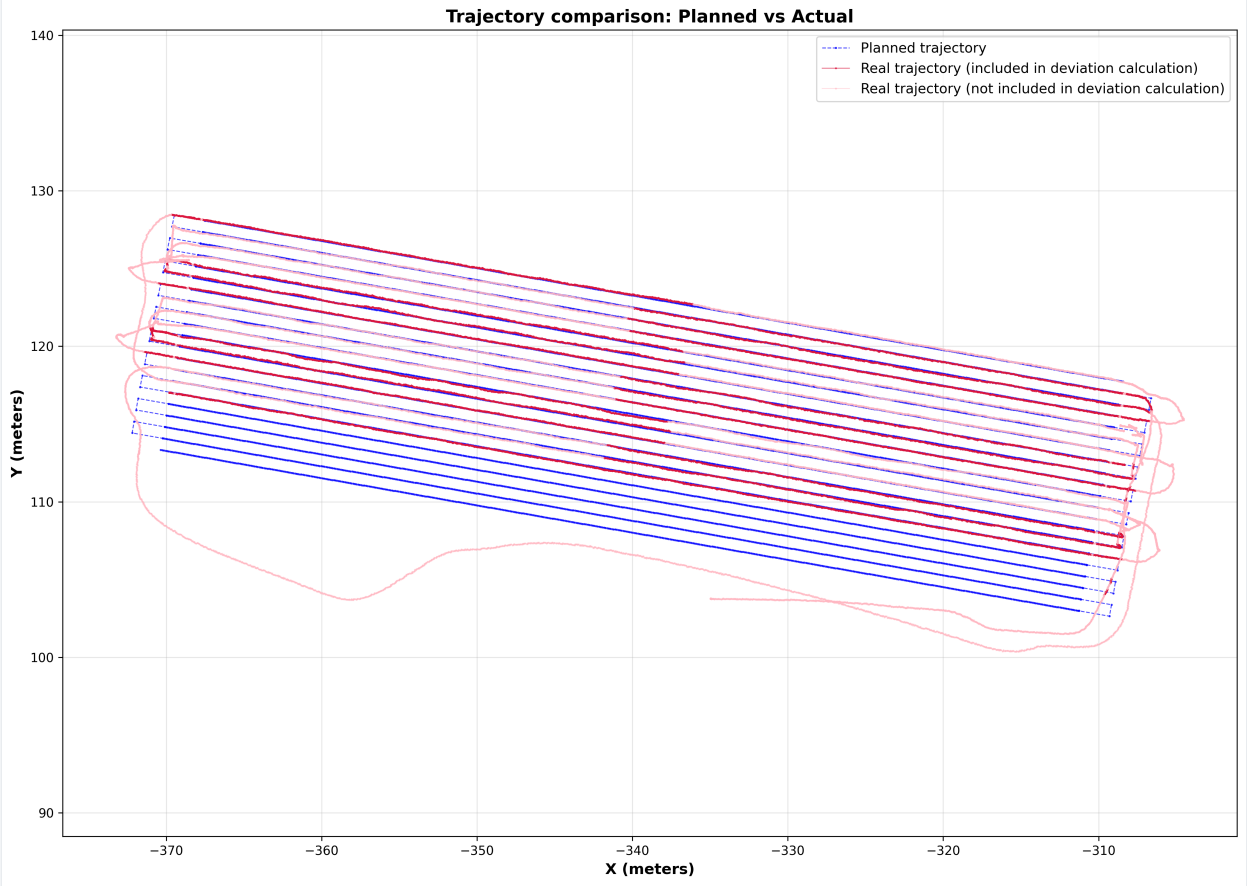


Figure 1.1: Planned vs actual trajectory comparison

Agronomic Summary

Energy per hectare	3.60 kWh/ha
Work rate	0.08 ha/h
Autonomy per battery	0.71 ha/batterie

Time tracking

Tool setup	5 min
GPS connection wait	20 min
Wi-Fi connection wait	0 min
Supervision time	80 min
Travel time	5 min
Restart count	1
Stop count	1
Stop causes	perte de rtk

Work assessment

Quality assessment	Generally satisfied
Crop damage	None

Performance Indicators

Agronomic [1]

Indicateur	Valeur	Unité
Crop species	*N/A*	
Growth stage	**Soil preparation**	
Soil texture	**Clay loam**	
Soil moisture	**Wet (semi-plastic)**	
Weed pressure	**50**	%
Planned operation	**Soil preparation**	
Work quality assessment	**Generally satisfied**	
Crop damage	**None**	

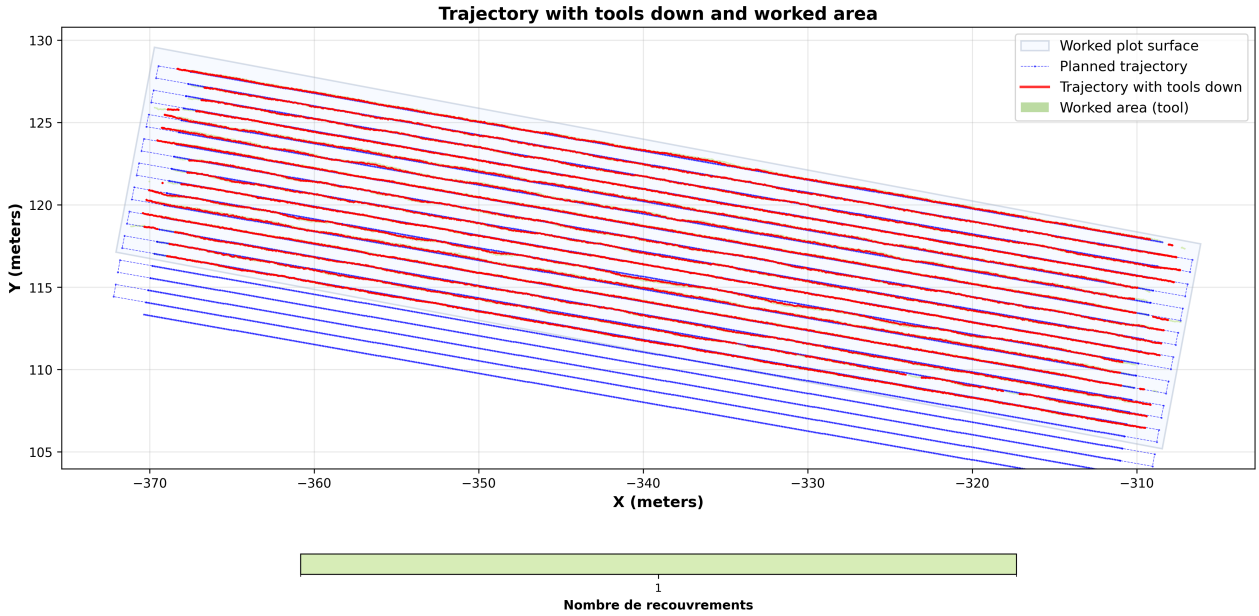
Energy [2]

Indicateur	Valeur	Unité
SOC at start	**82.20**	%
SOC at end	**77.30**	%
Total discharge [3] *For a battery pack capacity of: 2.54 kWh*	**14.14**	%
Total energy consumed	**0.36**	kWh
Average power	**0.28**	kW
Energy per hectare	**3.60**	kWh/ha
Autonomy per battery *Reference battery: 2.54 kWh*	**0.71**	ha/batterie

Work Rate [4]

Indicateur	Valeur	Unité
Work rate [5]	**0.08**	ha/h
Area covered [6]	**0.10**	ha
Worked plot surface [7]	**0.08**	ha
Worked area [8]	**0.01**	ha

Indicateur	Valeur	Unité
Effective area [9]	0.01	ha
Coverage rate [10]	0.00	%
Average speed (km/h)	1.59	km/h
Max speed (km/h)	3.60	km/h



Economic [11]

Indicateur	Valeur	Unité
Electricity price	N/A	€/kWh
Labor cost per hour	N/A	€/h
Employees assigned	0	
Labor cost per hectare	N/A	€/ha
Energy cost	N/A	€
Energy cost per hectare	N/A	€/ha
Total cost *Prix de l'électricité non disponible dans le COD*	N/A	€
Total cost per hectare	N/A	€/ha

Environmental [12]

Indicateur	Valeur	Unité
Temperature	15	°C
Precipitation type	None	

Indicateur	Valeur	Unité
CO_2 emissions [13] *Emission factor applied: 317 g CO_2 per kWh.*	0.11	kg
Plot fragmentation	Consolidated (<0.5 km)	

Mission [14]

Indicateur	Valeur	Unité
Planned distance [15]	1354.53	m
Performed distance [16]	1561.35	m
Distance deviation	206.82	m
Performed distance (%)	115.27	%
Mean lateral deviation *Without half-turn*	4.44	cm
Max lateral deviation *Without half-turn*	19.93	cm
Mean lateral deviation (tool) *Without half-turn, tool distance: 80 cm*	6.89	cm
Max lateral deviation (tool) *Without half-turn, tool distance: 80 cm*	19.97	cm
Worked rows [17]	16	

Operational [18]

Indicateur	Valeur	Unité
Robot weight	220.00	kg
Tool weight	*N/A*	kg
Total weight	220.00	kg
Energy per kg per hectare	0.02	kWh/kg/ha
Mean torque at work (% of nominal) [19] *Reference nominal torque: 2.39 N·m — Number of motors: 4.*	25.15	%

Safety [20]

Indicateur	Valeur	Unité
Geofencing exits	1	
Time outside geofencing (seconds)	77.25	s
Time outside geofencing (hours)	0.02	h
Local emergency stops	0	
Remote emergency stops	0	

Indicateur	Valeur	Unité
Bumper activations	0	

Reliability [21]

Indicateur	Valeur	Unité
Output errors	0	
Input errors	0	
Battery errors	0	
Motor errors	0	
Cylinder errors	0	
Total errors	0	
Output error time (seconds)	0.00	s
Input error time (seconds)	0.00	s
Battery error time (seconds)	0.00	s
Motor error time (seconds)	0.00	s
Cylinder error time (seconds)	0.00	s
Total error time (seconds)	0.00	s
Error rate per hour	0.00	/h
System availability	100.00	%

Localization [22]

Indicateur	Valeur	Unité
Localization errors	7	
Error time (seconds)	1230.84	s
Error time (hours)	0.34	h

Time [23]

Indicateur	Valeur	Unité
Total duration	4682.25	s
Total duration (hours)	1.30	h
Active time	2291.63	s
Active time (hours)	0.64	h
Inactive time	2390.62	s
Inactive time (hours)	0.66	h
Active time (%)	48.94	%

Indicateur	Valeur	Unité
Inactive time (%)	**51.06**	%

Descriptions of indicators

Bracketed numbers refer to definitions, assumptions and sources listed below.

[1] Agronomic indicator: value from the recorded crop trial context.

[2] Energy indicator: derived from electrical measurements, consumption and SOC logged during the mission.

[3] Total discharge (%): energy consumed during the mission (change in cumulative energy, in kWh) divided by nominal battery pack capacity (kWh), multiplied by 100. This indicator does not use start or end SOC; reference pack capacity is stated in the note when known.

[4] Work-rate indicator: derived from worked areas, speeds and time on field.

[5] Work rate: amount of work completed per unit of time, in ha/h. Hourly rate = area covered (ha) ÷ total mission duration (h).

[6] Area covered: this is the area swept by the robot = cumulative odometric distance × robot width.

[7] Worked plot surface: area of the plot worked by the robot. It is modeled as an oriented bounding box (OBB) with a margin equal to half the robot width around the planned trajectory that was worked.

[8] Worked area: area processed by the implement (tool width × path length with implement lowered). Each pass counts; overlaps add up.

[9] Effective area: area worked by the implement excluding overlaps.

[10] Coverage rate: ratio of worked area to effective area. (worked area − effective area) / effective area × 100. A high value indicates many passes over the same zones.

[11] Economic indicator: computed from cost settings and mission energy/time aggregates.

[12] Environmental indicator: derived from weather context or consumption using the documented method.

[13] CO_2 emissions from grid electricity consumed during the mission (kWh × 0.317 kg/kWh). Source: French Ministry for Ecological Transition — Key Climate Figures (digital edition), chapter on GHG emissions from industry / electricity production (statistiques.developpement-durable.gouv.fr).

[14] Mission indicator: derived from actual path, plan and computed geometric deviations.

[15] Theoretical mission distance: cumulative length of the planned trajectory from the mission JSON file. Does not match the robot's actual path.

[16] Distance actually traveled by the robot. May include movement before the mission effectively starts and after it ends, depending on the recorded data.

[17] Number of distinct rows worked (tool lowered).

[18] Operational indicator: derived from kinematics, implement data or documented masses.

[19] Mean absolute motor torque only when the tool is lowered, as a percentage of the motors' nominal torque.

[20] Safety indicator: derived from safety-related events and durations.

[21] Reliability indicator: derived from fault codes and error time per subsystem.

[22] Localization indicator: derived from localization faults or downtime during the mission.

[23] Time indicator: derived from timestamps and activity states during the mission.