

USAGE REPORT

Vehicle: SRBC 18

Date: 25/02/2026

Location: SABI AGRI

Missions: 1

Mission 1

Trial date 2026-02-25

Location SABI AGRI, Auvergne, France

Operator Nicolas

Start time 17:05

End time 17:52

Weather

Precipitation type None

Temperature 15 °C

Sun position Couché

Terrain

Slope 0 %

Cross slope 0 %

Soil

Texture Clay loam

Dominant particle size Blocks >200 mm

Moisture condition Very wet (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
<i>Tool</i>	
Tool name	Bineuse
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	Binage
Trajectory	rectiligne, square turn
Working speed	2 km/h
Mission file	mission_carotte_rang3_square.json

Organization

<i>Workforce</i>	
Total number of employees	1
Employees on robot task	0
<i>Surface</i>	
Theoretical surface of the plot	0.015 ha

Worked plot surface	0.0625 ha
Plot fragmentation	Consolidated (<0.5 km)

Trajectory

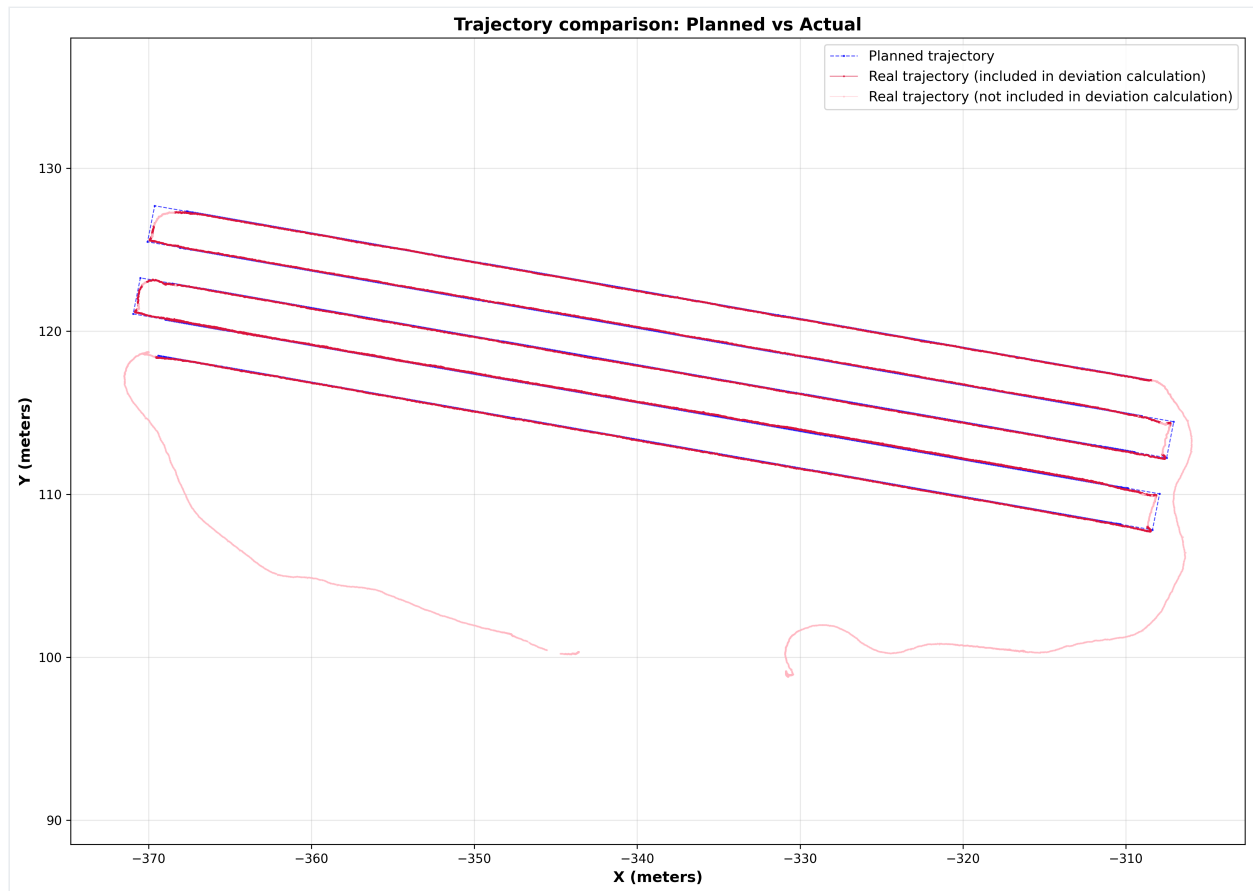


Figure 1.1: Planned vs actual trajectory comparison

Agronomic Summary

Energy per hectare	5.43 kWh/ha
Work rate	0.05 ha/h
Autonomy per battery	0.47 ha/batterie

Time tracking

Tool setup	5 min
GPS connection wait	0 min
Wi-Fi connection wait	0 min
Supervision time	60 min
Travel time	5 min
Restart count	0
Stop count	6
Stop causes	demis- tour non fonctionnels en version roue

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	Very wet (plastic)	
Weed pressure	50	%
Planned operation	Soil preparation	
Work quality assessment	Generally satisfied	
Crop damage	None	

Energy ^[2]

Indicateur	Valeur	Unité
SOC at start	88.40	%
SOC at end	85.00	%
Total discharge ^[3] <i>For a battery pack capacity of: 2.54 kWh</i>	8.33	%
Total energy consumed	0.21	kWh
Average power	0.27	kW
Energy per hectare	5.43	kWh/ha
Autonomy per battery <i>Reference battery: 2.54 kWh</i>	0.47	ha/batterie

Work Rate ^[4]

Indicateur	Valeur	Unité
Work rate ^[5]	0.05	ha/h
Area covered ^[6]	0.04	ha
Worked plot surface ^[7]	0.06	ha
Worked area ^[8]	0.00	ha

Indicateur	Valeur	Unité
Effective area ^[9]	0.00	ha
Coverage rate ^[10]	15.34	%
Average speed (km/h)	1.49	km/h
Max speed (km/h)	3.60	km/h



Economic ^[11]

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

Environmental ^[12]

Indicateur	Valeur	Unité
Temperature	15	°C
Precipitation type	None	
CO ₂ emissions ^[13] <i>Emission factor applied: 317 g CO₂ per kWh.</i>	0.07	kg

Indicateur	Valeur	Unité
Plot fragmentation	Consolidated (<0.5 km)	

Mission ^[14]

Indicateur	Valeur	Unité
Planned distance ^[15]	324.89	m
Performed distance ^[16]	608.99	m
Distance deviation	284.10	m
Performed distance (%)	187.45	%
Mean lateral deviation <i>Without half-turn</i>	5.46	cm
Max lateral deviation <i>Without half-turn</i>	19.56	cm
Mean lateral deviation (tool) <i>Without half-turn, tool distance: 80 cm</i>	5.99	cm
Max lateral deviation (tool) <i>Without half-turn, tool distance: 80 cm</i>	19.86	cm
Worked rows ^[17]	5	

Operational ^[18]

Indicateur	Valeur	Unité
Robot weight	220.00	kg
Tool weight	<i>N/A</i>	kg
Total weight	220.00	kg
Energy per kg per hectare	0.02	kWh/kg/ha
Mean torque at work (% of nominal) ^[19] <i>Reference nominal torque: 2.39 N·m — Number of motors: 4.</i>	28.00	%

Safety ^[20]

Indicateur	Valeur	Unité
Geofencing exits	1	
Time outside geofencing (seconds)	99.91	s
Time outside geofencing (hours)	0.03	h
Local emergency stops	0	
Remote emergency stops	0	
Bumper activations	1	

Reliability ^[21]

Indicateur	Valeur	Unité
Output errors	0	
Input errors	0	
Battery errors	0	
Motor errors	0	
Cylinder errors	2	
Total errors	2	
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)	0.52	s
Total error time (seconds)	0.52	s
Error rate per hour	2.54	/h
System availability	99.98	%

Localization ^[22]

Indicateur	Valeur	Unité
Localization errors	1	
Error time (seconds)	1.00	s
Error time (hours)	0.00	h

Time ^[23]

Indicateur	Valeur	Unité
Total duration	2833.12	s
Total duration (hours)	0.79	h
Active time	2387.72	s
Active time (hours)	0.66	h
Inactive time	445.40	s
Inactive time (hours)	0.12	h
Active time (%)	84.28	%
Inactive time (%)	15.72	%

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. $(\text{worked area} - \text{effective area}) / \text{effective area} \times 100$. 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] CO₂ 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.