

USAGE REPORT

Vehicle: SRBC 18

Date: 05/03/2026

Location: Valence

Missions: 1

Mission 1

Trial date 2026-03-05

Location Valence, Drome, France

Operator Nicolas

Start time 16:10

End time 18:02

Weather

Precipitation type None

Temperature 20 °C

Sun position Ouest

Terrain

Slope 3 %

Cross slope 7 %

Soil

Texture Sandy loam

Dominant particle size Gravel 2-20 mm

Moisture condition Friable (optimal)

Adjacent environment

Tall vegetation Yes

Tall buildings No

Metallic structures Yes

Ditch or embankment No

High voltage lines No

Roads No

No network zone No

Robot configuration

Robot weight 220 kg

Robot width 1.75 m

Tool

Tool name	Support à roues sans outils
Tool type	Trailed
Tool weight	100 kg
Tool length	1.1 m
Tool width	1.75 m
Tool height	0.6 m
Tool total length	1.1 m



Figure 1.1: Mission presentation photo

Mission presentation

Mission parameters

Trajectory	rectiligne, square turn
Working speed	2.8 km/h
Mission file	Valence3.json

Organization

Workforce

Total number of employees	1
Employees on robot task	0

Surface

Theoretical surface of the plot	0.02 ha
Worked plot surface	0.0309 ha
Plot fragmentation	Consolidated (<0.5 km)

Trajectory

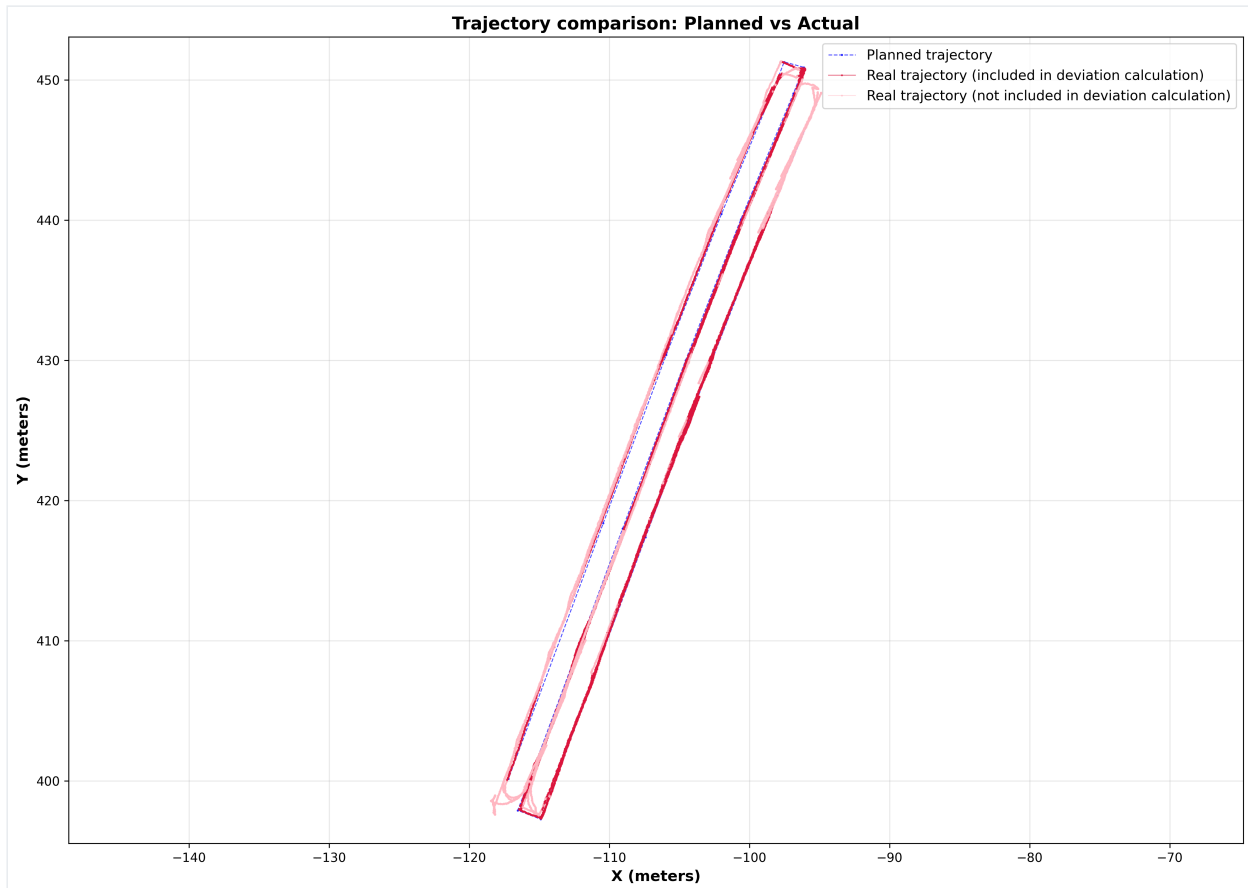


Figure 1.1: Planned vs actual trajectory comparison

Agronomic Summary

Energy per hectare	1.47 kWh/ha
Work rate	0.12 ha/h
Autonomy per battery	1.73 ha/batterie

Time tracking

Tool setup	15 min
GPS connection wait	45 min
Wi-Fi connection wait	0 min
Supervision time	110 min
Travel time	10 min
Restart count	3
Stop count	14
Stop causes	Derive de la trajectoire en devers. Pas de demis tour avec le robot à roues

Work assessment

Quality assessment	Somewhat dissatisfied
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Crop damage

None

Performance Indicators

Agronomic ^[1]

Indicateur	Valeur	Unité
Crop species	N/A	
Growth stage	N/A	
Soil texture	Sandy loam	
Soil moisture	Friable (optimal)	
Weed pressure	0	%
Planned operation	N/A	
Work quality assessment	Somewhat dissatisfied	
Crop damage	None	

Energy ^[2]

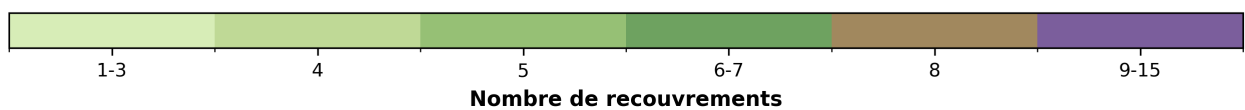
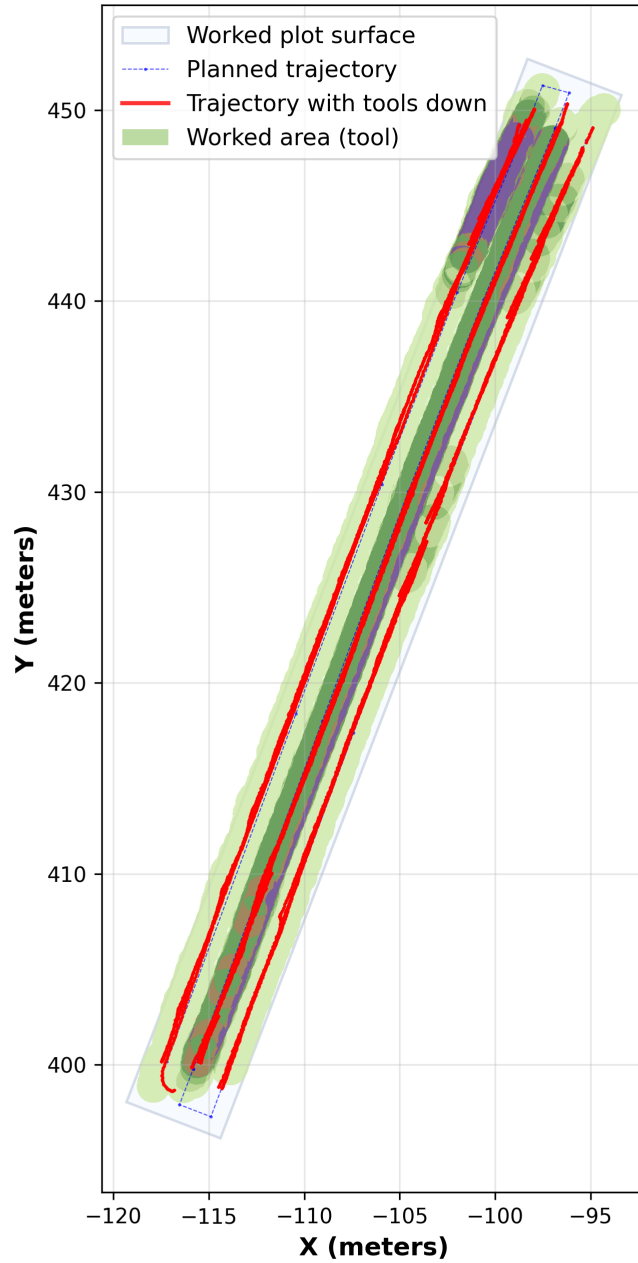
Indicateur	Valeur	Unité
SOC at start	82.90	%
SOC at end	71.40	%
Total discharge ^[3] <i>For a battery pack capacity of: 2.54 kWh</i>	12.45	%
Total energy consumed	0.32	kWh
Average power	0.18	kW
Energy per hectare	1.47	kWh/ha
Autonomy per battery <i>Reference battery: 2.54 kWh</i>	1.73	ha/batterie

Work Rate ^[4]

Indicateur	Valeur	Unité
Work rate ^[5]	0.12	ha/h
Area covered ^[6]	0.22	ha
Worked plot surface ^[7]	0.03	ha
Worked area ^[8]	0.14	ha
Effective area ^[9]	0.03	ha
Coverage rate ^[10]	377.64	%

Indicateur	Valeur	Unité
Average speed (km/h)	1.40	km/h
Max speed (km/h)	3.60	km/h

Trajectory with tools down and worked area



Economic ^[11]

Indicateur	Valeur	Unité
Electricity price	N/A	€/kWh

Indicateur	Valeur	Unité
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 <i>Prix de l'électricité non disponible dans le COD</i>	N/A	€
Total cost per hectare	N/A	€/ha

Environmental ^[12]

Indicateur	Valeur	Unité
Temperature	20	°C
Precipitation type	None	
CO ₂ emissions ^[13] <i>Emission factor applied: 317 g CO₂ per kWh.</i>	0.10	kg
Plot fragmentation	Consolidated (<0.5 km)	

Mission ^[14]

Indicateur	Valeur	Unité
Planned distance ^[15]	169.61	m
Performed distance ^[16]	1229.32	m
Distance deviation	1059.70	m
Performed distance (%)	724.78	%
Mean lateral deviation <i>Without half-turn</i>	12.98	cm
Max lateral deviation <i>Without half-turn</i>	20.00	cm
Mean lateral deviation (tool) <i>Without half-turn, tool distance: 110 cm</i>	12.19	cm
Max lateral deviation (tool) <i>Without half-turn, tool distance: 110 cm</i>	20.00	cm
Worked rows ^[17]	3	

Operational ^[18]

Indicateur	Valeur	Unité
Robot weight	220.00	kg

Indicateur	Valeur	Unité
Tool weight	<i>N/A</i>	kg
Total weight	220.00	kg
Energy per kg per hectare	0.01	kWh/kg/ha
Mean torque at work (% of nominal) ^[19] <i>Reference nominal torque: 2.39 N·m — Number of motors: 4.</i>	16.05	%

Safety ^[20]

Indicateur	Valeur	Unité
Geofencing exits	0	
Time outside geofencing (seconds)	0.00	s
Time outside geofencing (hours)	0.00	h
Local emergency stops	0	
Remote emergency stops	0	
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	0	
Error time (seconds)	0.00	s
Error time (hours)	0.00	h

Time [23]

Indicateur	Valeur	Unité
Total duration	6251.80	s
Total duration (hours)	1.74	h
Active time	3234.24	s
Active time (hours)	0.90	h
Inactive time	3017.56	s
Inactive time (hours)	0.84	h
Active time (%)	51.73	%
Inactive time (%)	48.27	%

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.