2. Requirements List Specification Table

The following table prioritizes operational parameters including payload capacity, vehicle dimensions, terrain mobility, power supply, operational speed, and acceleration limits.

Class (D/W)	Requirement / Parameter	Quantitative / Qualitative Target	Rating (1–10)	Engineering Rationale
D	**Payload Capacity**	Must carry ≥ 5 L (5 kg) liquid pesticide + pump assembly	10	Mandatory to complete row spraying missions without mid-course refilling stops.
	Chassis Width / Size	Maximum vehicle width ≤ 60 cm		
	Terrain & Mobility	4-Wheel Drive (4WD) all-terrain navigation		
D	**Power Supply**	12V DC rechargeable battery system	9	Required for tetherless autonomous mobile operation away from fixed AC outlets.
D	**Spray Height Range**	Adjustable spray boom height ≤ 1.2 m	8	Ensures complete foliar spray coverage across various plant growth stages.
	Operating Speed	Nominal speed between 0.2 m/s and 0.5 m/s	7	
W	**Dry Vehicle Weight**	Total unladen mass < 20 kg		Lighter weight extends motor run-time, but can be compromised for structural rigidity.
	Battery Runtime	Continuous operation ≥ 60 minutes per charge	7	
W	**Vehicle Acceleration**	Smooth start/stop acceleration ≤ 0.2 m/s²		Prevents liquid sloshing in the payload tank during transient velocity changes.

ANSWER

Essential for traversing wet, soft, and uneven soil without slipping or getting stuck.	Maximizes field efficiency; battery quick-swaps serve as an acceptable fallback.	
Desirable for uniform chemical deposition; adjustable based on crop density.	Crucial geometric constraint to navigate narrow greenhouse crop aisles without plant damage.	

LIVEWORKSHEETS

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