

Precision Agriculture/Digital Agriculture Competency Matrix

Competency Area	Competency	Entry Level	Mid Level	Advanced Level
GIS & Mapping	Use of geospatial technologies to analyze and visualize field data.	Basic GIS software use; create simple field maps.	Perform layered GIS analysis; integrate soil, yield, and topography data.	Develop advanced models; customize GIS workflows for precision applications.
Data Analytics	Applying statistical tools and software to interpret agricultural data.	Collect and enter sensor/field data into systems.	Analyze multi-variable datasets to identify trends and recommend actions.	Build predictive models using big data, AI, and machine learning.
Sensor & Drone Technology	Use of UAVs, IoT sensors, and remote sensing tools.	Operate drones/sensors under supervision; gather basic imagery/data.	Independently plan drone flights; calibrate and troubleshoot sensors.	Design integrated sensor networks; analyze multispectral imagery for decision-making.
Agronomic Knowledge	Application of plant, soil, and crop science to digital tools.	Understand basic crop growth stages and input needs.	Tailor precision input prescriptions (fertilizer, irrigation, pesticides). Configure and maintain precision equipment; troubleshoot hardware/software issues.	Develop advanced sustainable practices integrating digital tools with agronomy.
Farm Equipment Integration	Linking digital tools with tractors, sprayers, and other smart machinery.	Operate precision-enabled equipment (e.g., GPS-guided tractors).		Design and manage full-scale precision equipment systems across farms.
Software & Platforms	Use of digital ag platforms for decision support.	Use farm management software for data entry and reporting.	Customize dashboards; integrate data streams from multiple sources.	Advise on enterprise-wide platform adoption; train stakeholders on advanced tools.
Sustainability & Compliance	Ensuring practices meet environmental and regulatory standards.	Understand basic sustainability goals (reduced fertilizer, water use).	Recommend practices aligned with compliance and sustainability goals.	Lead strategic initiatives on regenerative agriculture, carbon capture, and reporting.
Communication & Training	Educating and supporting farmers, agronomists, and stakeholders.	Provide basic guidance on data collection and reporting.	Train users on technology adoption; explain data-driven recommendations.	Lead workshops, develop training programs, and consult at enterprise level.