



Occupation: Precision Agriculture Technicians

[O*NET Code: 19-4012.01](#)

Competencies - On-the-Job Training (paid):

1. Document and maintain records of precision agriculture information.
2. Collect information about soil or field attributes, yield data, or field boundaries, using field data recorders and basic geographic information systems (GIS).
3. Use geospatial technology to develop soil sampling grids or identify sampling sites for testing characteristics such as nitrogen, phosphorus, or potassium content, pH, or micronutrients.
4. Test, augment, and measure soil biology and soil health.
5. Divide agricultural fields into georeferenced zones, based on soil characteristics and production potentials.
6. Install, calibrate, or maintain sensors, mechanical controls, GPS-based vehicle guidance systems, or computer settings.
7. Contact equipment manufacturers for technical assistance, as needed.
8. Set up and maintain water systems for efficient resource use.
9. Create, layer, and analyze maps showing precision agricultural data, such as crop yields, soil characteristics, input applications, terrain, drainage patterns, or field management history.
10. Analyze geospatial data to determine agricultural implications of factors such as soil quality, terrain, field productivity, fertilizers, or weather conditions.
11. Demonstrate the applications of geospatial technology, such as Global Positioning System (GPS), geographic information systems (GIS), automatic tractor guidance systems, variable rate chemical input applicators, surveying equipment, or computer mapping software.
12. Draw or read maps, such as soil, contour, or plat maps.
13. Project Management Software —Use Microsoft Office Suite to schedule and attend meetings, collaborate with team members, manage project tasks, and track progress.
14. Spreadsheet software — Use Microsoft Excel to analyze data, create spreadsheets, and perform calculations.
15. Analyzing Data or Information — Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.

16. Organizing, Planning, and Prioritizing Work — Developing specific goals and plans to prioritize, organize, and accomplish your work.
17. Making Decisions and Solving Problems — Analyzing information and evaluating results to choose the best solution and solve problems.
18. Communicating with Supervisors, Peers, or Subordinates — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
19. Establishing and Maintaining Interpersonal Relationships — Developing constructive and cooperative working relationships with others.
20. Communicating with People Outside the Organization — Communicating with people outside the organization, representing the organization to customers, the public, government, or other external sources.

Precision Agriculture Technicians

The Related and Supplemental Instruction (RSI) detailed below supports preparing for the competencies applied in on-the-job paid apprenticeship hours. The required **150 unpaid RSI per year** is delivered via a combination of online and in-person studies, activities, events, and collaborative projects with Open Source Ag.

Competency Exploration and Practice = 150 hours

Precision Agriculture Technician Skills:

60 +- hours

- Document and maintain records of precision agriculture information.
- Collect information about soil or field attributes, yield data, or field boundaries, using field data recorders and basic geographic information systems (GIS).
- Use geospatial technology to develop soil sampling grids or identify sampling sites for testing characteristics such as nitrogen, phosphorus, or potassium content, pH, or micronutrients.
- Divide agricultural fields into georeferenced zones, based on soil characteristics and production potentials.
- Install, calibrate, or maintain sensors, mechanical controls, GPS-based vehicle guidance systems, or computer settings.
- Create, layer, and analyze maps showing precision agricultural data, such as crop yields, soil characteristics, input applications, terrain, drainage patterns, or field management history.
- Analyze geospatial data to determine agricultural implications of factors such as soil quality, terrain, field productivity, fertilizers, or weather conditions.
- Identify spatial coordinates, using remote sensing and Global Positioning System (GPS) data.
- Apply precision agriculture information to specifically reduce the negative environmental impacts of farming practices.
- Demonstrate the applications of geospatial technology, such as Global Positioning System (GPS), geographic information systems (GIS), automatic tractor guidance systems, variable rate chemical input applicators, surveying equipment, or computer mapping software.
- Draw or read maps, such as soil, contour, or plat maps.
- Prepare reports in graphical or tabular form, summarizing field productivity or profitability.

- Contact equipment manufacturers for technical assistance, as needed.
- Support farm management tasks, including livestock care, pasture moves, garden harvesting, and crop planting.
- Test, augment, and measure soil biology and soil health.
- Set up and maintain water systems for efficient resource use.
- Keep work areas clean and organized, perform general farm maintenance tasks.
- Participate in farm team meetings to coordinate work and share knowledge.
- Record data pertaining to experimentation, research, or animal care.
- Prepare data summaries, reports, or analyses that include results, charts, or graphs to document research findings and results.
- Collect animal or crop samples. Examine animals or crop specimens to determine the presence of diseases or other problems.
- Determine the germination rates of seeds planted in specified areas.
- Assess comparative soil erosion from various planting or tillage systems, such as conservation tillage with mulch or ridge till systems, no-till systems, or conventional tillage systems with or without moldboard plows.
- Examine characteristics or behavior of living organisms.

O*NET

The skillsets below reflect priorities requested by employers and noted in the O*NET code for this sector: <https://www.onetonline.org/link/details/19-4012.01>

Microsoft Office Suite:

15+- hours

- Project Management Software: Utilize Microsoft Teams and Outlook to schedule and attend meetings, collaborate with team members, manage project tasks, and track progress.
- Presentation software: Microsoft PowerPoint: Create engaging visualizations.
- Spreadsheet software: Use Microsoft Excel to analyze data, create spreadsheets, and perform calculations.
- Word processing software: Use Microsoft Word to create and edit professional documents, reports, and correspondence.

Technology:

15+- hours

- Support and maintain computer databases and analytical or scientific software.
- Communicate projects and progress utilizing computer aided design CAD software.
- Utilize Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) to communicate and share data.
- Utilize graphics, photo imaging, or mapping software to communicate and share information.

Communication:

20+- hours

- Communicating with Supervisors, Peers, or Subordinates: Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Establishing and Maintaining Interpersonal Relationships: Developing constructive and cooperative working relationships with others.

- **Communicating with People Outside the Organization:** Communicating with people outside the organization, representing the organization to customers, the public, government, and other external sources.
- **Resolving Conflicts and Negotiating with Others:** Handling complaints, settling disputes, and resolving grievances and conflicts, or otherwise negotiating with others.
- **Performing for or Working Directly with the Public:** Performing for people or dealing directly with the public.
- **Interpreting the Meaning of Information for Others:** Translating or explaining what information means and how it can be used.

Analysis:

20+- hours

- **Identifying Objects, Actions, and Events:** Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- **Getting Information:** Observing, receiving, and otherwise obtaining information from all relevant sources.
- **Analyzing Data or Information:** Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.
- **Organizing, Planning, and Prioritizing Work:** Developing specific goals and plans to prioritize, organize, and accomplish your work.
- **Making Decisions and Solving Problems:** Analyzing information and evaluating results to choose the best solution and solve problems.
- **Evaluating Information to Determine Compliance with Standards:** Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.
- **Processing Information:** Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.

Operations:

20+- hours

- **Inspecting Equipment, Structures, or Materials:** Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- **Monitoring Processes, Materials, or Surroundings:** Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.
- **Documenting/Recording Information:** Entering, transcribing, recording, storing, or maintaining information.
- **Estimating the Quantifiable Characteristics of Products, Events, or Information:** Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.
- **Repairing and Maintaining Mechanical Equipment:** Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily based on mechanical (not electronic) principles.