2026 NACTA JUDGING CONFERENCE

ILLINOIS STATE UNIVERSITY

NACTA
NORTH AMERICAN COLLEGES AND TEACHERS OF AGRICULTURE

ILLINOIS STATE Agriculture

Precision Ag

Contest Official Rules

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Hosted by Illinois State University

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GENERAL RULES AND PROCEDURES Two-year and Four-year Divisions

1. All official contestants and unofficial participants must be currently enrolled in a two-year or a four-year institution and pursuing an undergraduate degree. Two-year and four-year teams will evaluate the same contest components. Separate awards will be made for both team and overall individuals in each division.
2. A school may enter one four-person competing team and its members must be designated at registration.
3. Individual awards will be decided by Rotation W, the written practical exam.
4. Team awards will be decided by a sum of all four team members' Rotation W score plus the team's score on the other rotations. For Rotations E, P, H, and S, all (four) team members will work together.

a. Teams of less than 4 are allowed. The total team score remains a sum.

5. Additional contestants can compete in the Precision Ag Contest. They will be in the running for individual awards based on their Rotation W score. Non-team contestants may participate in Rotations E, P, H, and S for exhibition alone or in small groups of up to four with other non-team contestants. Any communication with competing teams is not allowed and will result in dismissal from the facility.
6. Contest coordinators reserve the right to adjust the contest as needed based on weather, equipment availability, and safety procedures (to be explained day-of). All safety guidelines are to be strictly adhered to. Disqualification will result for breaches of described rules.
7. No communication with contestants or anyone else except superintendents will be permitted once the contest has started. Coaches may not communicate with a team or individuals until the contest is finished.
8. No cell phones, text messaging, or conferring during the contest will be allowed except where permitted during Rotations E, P, H, and S. Contestants observed in violation of this WILL be disqualified from the competition.
9. Contestants must bring a #2 lead pencil and should bring a hand-held, non-programmable calculator and clipboard into the contest. No device capable of sending or receiving wireless messages may be used as a calculator. All other necessary materials will be provided. Contestants may not bring notes or reference material of any kind. The superintendents will be responsible for preparation of all contest materials, setting up the contest, providing official keys for scoring, and overseeing the contest operation and scoring of papers. Room supervisors will be assigned to each section of the contest and will be responsible for the operation and conduct of each section. Coaches are asked to help grade papers during and after the contest.
10. Tie Breakers. Ties for teams will be broken using the following contest Rotations:
    a. W b. P c. H d. E e. S Ties for individuals will be broken using team scores.
11. Announcements made at the coaches meeting or on the contest day will take precedent over the previously published rules. Updates will be sent in the days leading up to the contest.

The contest will be divided into five rotations as follows:

W. Written Practical Exam
P. Team Planting Lab Practical
H. Team Harvesting Lab Practical
E. Team Emerging Technology and UAV Lab Practical
S. Team Spraying/CropProtection Lab Practical

Some overview of the exam and practical in each rotation is included below to help guide preparation.

Exam and Practical Prep for Rotations

Format will consist of a written exam with questions of various formats and covering topics including but not limited to those covered in Precision Agriculture Basics (ASA/CSSA/SSSA).
The contest will be based on precision agriculture activities and equipment used during regular cropping seasons in the United States.
Additional topics ideas:

- Precision agriculture terminology, management strategies, and technology in increasing crop production efficiency, utilization of inputs, and environmental protection
- Major knowledge categories will include:
    i. Global positioning systems and guidance
    ii. Seed monitoring and Yield monitoring systems
    iii. Remote sensing and sensors
    iv. Zone vs Grid soil sampling and soil sensors
    v. Variable-rate application
    vi. Site-specific management
    vii. Remote monitoring and controls
    viii. Geographic information system software
    ix. Irrigation controls and sensors
- Component ID on Equipment
    i. Possible equipment may include: grain combine, forage harvester, swather, baler, liquid chemical applicator, dry chemical applicator, or seeding equipment
    ii. Any component that adds precision and efficiency to the equipment and operation
- Mathematical problems related to precision management of crop inputs:
    i. Irrigation, fertilizer, seeds, pesticides

    ii. Seeding rate calculations, calibration validation, seed spacing given seeding rate and row width, seed required to meet seeding rate prescription, seeding costs and cost comparisons, etc
    iii. Sprayer calibration calculations, calibration validation, pressure-volume relationships, calculate amount of chemical added to meet label recommendations given tank size and delivery rate, pesticide application costs and cost comparisons, etc
    iv. Combine harvest loss, harvest efficiency, harvesting costs and cost comparisons, etc
    v. Conversions, costs, calibrations
- Interpretation and analysis of remote sensing maps, yield maps, grid soil sampling maps, and other site-specific management decisions
    i. Troubleshooting problems
    ii. Adjustments to units to optimize performance and to switch crops
    iii. Planning planting and harvest and optimization during based on common apps and monitors
    iv. Prescriptions
- Calibration of equipment – procedures and mathematical problems
- Scenarios and mathematical problems in crop harvest, handling, and storage
- Nozzle selection based on given parameters and/or label restrictions
- Adjustments for changing delivery rates, spray patterns, drift potential, etc. to optimize sprayer performance
- Guidance systems, boom and nozzle control, evaluate performance from spray pattern maps
- Analysis and interpretation of field data and/or maps
- Managing and assessing field variability
- Describe actionable steps to address issued identified
- Precision Ag concepts applied to Regenerative Ag (Digital Regen Ag)
    i. PA tools (sensors, AI, drones) optimize Regen Ag practices (no-till, cover crops, diversity) for site-specific management, reducing inputs while boosting resilience, soil health, and long-term profitability, addressing climate challenges with data-driven ecological awareness
    ii. Recognizing the farm/production system as a part of the ecosystem in which it exists
    iii. Nutrient Loss Reduction Strategies (Source: extension,illinois,edu)
- International Certified Crop Adviser (ICCA) Performance Objectives
- Herbicide management (classification of herbicides, crop injury symptoms, managing herbicide resistance, herbicide programs, application timing terminology, and strategies)

- Pest management alternatives (cultural and biological control practices, IPM principles, pest scouting and monitoring, role of beneficials, etc.)
- Pesticide use and management (pesticide stewardship, safety, restrictions, formulations, adjuvants, trade/common names of major pesticides, etc.)
- Nutrient management (soil testing, soil test reports/recommendations, fertilizers and fertilization, fertilizer application and nutrient stewardship, four R's - source, rate, timing, placement)
- Managing soil pH, lime and liming, description and management of saline and sodic soils
- Soil water management (irrigation, drainage, erosion, leaching, evapotranspiration, conservation, etc.)
- Precision Ag advances in animal science