

# 2022 NACTA Precision Agriculture Contest

## Hosted by Nebraska College of Technical Agriculture

**Contest Director:** Brad Ramsdale ([bramsdale2@unl.edu](mailto:bramsdale2@unl.edu))

### Contest Rules

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 given in each division
2. A school may enter a team consisting of four members. These team members must be registered and designated as team members prior to the contest.
3. Four additional contestants beyond the four-person team may participate from each school and are eligible for individual awards. If registering as an individual, contestants will be eligible for individual competition only and will not be included in a team score. They must register as individual competitors. Teams must consist of four designated members (noted during registration) to be eligible for the team award.
4. The overall contest will be divided into four areas with each area valued at 25% of the total score for both overall individual and team awards. All four team member scores will be included in the team score. Contest exams will include the following:
  - a) General knowledge exam (multiple choice)
  - b) Component ID from chemical application, planting, and harvesting equipment
  - c) Problem solving: mathematical and field scenarios
  - d) Lab practical
5. Each of the four exams will be allotted 60 minutes.
6. Tie breakers. There will be no ties in the final scores. Any individual or team scores that result in a tie will be broken according to the top score in the lab practical then component ID and problem solving if needed.
7. Contestants are responsible for bringing the following items to the contest: a calculator (not including a smartphone calculator), pencils, appropriate dress and attitude for an exam located in a farm shop/outdoor row crop setting.
8. No communication with other contests, contest areas, or anyone else except superintendents will be permitted after the contest begins. Coaches may not communicate with a team or individuals until the contest is finished. No text, chat, or other forms of electronic/social media contact will be allowed. Contestants violating this rule will be disqualified from the competition.
9. Announcements the day of the contest will take precedence over any announcements prior to the contest. Availability of equipment, weather, or other factors may require adjustments to equipment type or exam content. Teams should check for possible updates before the contest.

## **Contest Preparation Guidance**

The contest will be based on precision agriculture activities and equipment used during regular cropping seasons in the United States. In general, the contest will combine knowledge and skills from Agriculture Equipment Management, Agriculture Business, and Agronomy. Students wishing to form a team are encouraged to study these areas. Below are some general overviews of each contest area.

### A) General Knowledge Exam

- Suggested reference – Precision Agriculture Basics, 2018, American Society of Agronomy
- 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. Yield monitoring systems
  - iii. Remote sensing and sensors
  - iv. 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

### B) Component ID on Equipment

- Possible equipment will include: grain combine, forage harvester, swather, baler, liquid chemical applicator, dry chemical applicator, or seeding equipment.
- Any component that adds precision and efficiency to the equipment and operation

### C) Problem Solving

- Mathematical problems related to precision management of crop inputs: irrigation, fertilizer, seeds, pesticides.
- Interpretation and analysis of remote sensing maps, yield maps, grid soil sampling maps and other site-specific management decisions.
- Calibration of equipment – procedures and mathematical problems
- Scenarios and mathematical problems in crop harvest, handling and storage.

### D) Lab Practical

- The lab practical will evaluate the same general knowledge that is described in the General Knowledge Exam section; however, photos, product bulletins/resources, actual precision agriculture tools, etc. will be included with each question.