

SOIL AND WATER CONSERVATION CDE

Sponsored by:
Department of Biosystems and Agricultural Engineering
Oklahoma State University
Division of Agricultural Sciences and Natural Resources

Contest Superintendent

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Contest Details

Date: Saturday, April 25, 2009
Time: 7:00 a.m.
Location: Registration: Ag. Engr. Lab (Cleveland & Hall of Fame), OSU

Registration:

All schools may register 1 to 4 students. If only 1 or 2 students are entered in the soil and water conservation CDE they will count and compete for individual awards only. If 3 or 4 students are entered, they will count as a team and compete for both individual and team awards. A school may only register one team per CDE or one or two individuals.

The schools will be informed of the location for each event at registration. It is the students' responsibility to insure that they are at the proper location at the appropriate time.

Organization

Each participant will complete a written test/problem solving and two (2) skill activities. The test/problem solving will include all of the understanding competencies listed below. Both skills will be developed from the performance objectives listed below.

Safety and Equipment

Participants must provide eye protection, clear lenses, and any additional personal protection equipment that are appropriate for the activity.

Any student deemed to be a danger to themselves, others or shop equipment will be escorted from the area and will receive a zero (0) score for that activity.

Content

The following is a list of the subject matter statements with specific information, knowledge, and skills identified for each unit. Examination questions (written exam) will be developed primarily from the objectives of **UNDERSTANDING**, as listed below. **PERFORMANCE** as described below will define the "hands-on" skills competition.

1. Land Measurement and Surveying

1.1 UNDERSTANDING

- 1.1.1 Conversion of units of measurement (inch, foot, yard, rod, kilometer, etc.).
- 1.1.2 Expression of distance in full or plus stations.
- 1.1.3 Procedures for measuring distance by taping, stadia, pacing, odometer or EDM.
- 1.1.4 Conversions of units of area (square feet, acre, hectares, square miles, etc.).

- 1.1.5 Formulas for calculating areas (triangle, rectangle, trapezoids, etc.).
- 1.1.6 Differential, profile and topographic leveling.
- 1.1.7 Definition of leveling terms.
- 1.1.8 Procedure for proper use of level and rod.
- 1.1.9 Procedures for transcribing and checking differential, profile, and topographic surveying notes.
- 1.1.10 Definition and description of terms used with the rectangular survey system.
- 1.1.11 Writing of legal land descriptions.
- 1.1.12 Interpret topographic maps
- 1.1.13 Global Positioning System (GPS)
- 1.2 PERFORMANCE
 - 1.2.1 Set up instrument.
 - 1.2.2 Read a rod with and without the target.
 - 1.2.3 Determine difference in elevation between points.
 - 1.2.4 Complete a set of surveyor's notes.
 - 1.2.5 Measure horizontal distances on sloping ground with tape held horizontal using plumb.
 - 1.2.6 Measure distance by pacing.
 - 1.2.7 Use Abney hand level.
 - 1.2.8 Plot contour lines.
 - 1.2.9 Use common GPS units.
 - 1.2.10 Estimate slope by visual means only.
 - 1.2.11 Draw or plot profile and topographic data.

2. Soil and Water Conservation

2.1 UNDERSTANDING

- 2.1.1 Define contour farming, strip cropping, and terracing and the purpose of each.
- 2.1.2 Types of terraces and factors affecting their spacing.
- 2.1.3 Causes and remedies of water and wind erosion.
- 2.1.4 Types of water and wind erosion.
- 2.1.5 Universal Soil Loss Equation (USLE)
- 2.1.6 Rational method for estimating peak runoff.
- 2.1.7 Hydrologic cycle
- 2.1.8 Water measurement
- 2.1.9 Calculate soil infiltration rate
- 2.1.10 Water quality and supply
- 2.1.11 Intensity, duration, and frequency of rainfall
- 2.1.12 Irrigation principles

2.2 PERFORMANCE

- 2.2.1 Determine soil loss using the USLE
- 2.2.2 Determine peak runoff using rational method
- 2.2.3 Determine infiltration rates of different soil types
- 2.2.4 Measure water velocity and discharge in open channels

REFERENCES

- An Introduction to Agricultural Engineering. Roth, Lawrence O.; Field, Harry L., 1994, ISBN: 0834213087, Aspen Publishers, Inc.
- Oklahoma Core Curriculum
- Physical Science Applications in Agriculture. Buriak, Philip; Osborne, Edward W., 1996, ISBN: 0813430143, Interstate Publishers, Inc.
- Soil & Water Management Systems. Schwab, Glenn O.; Fangmeier, Delmar D.; Elliot, William J., 1995, ISBN 0471109738, John Wiley & Sons, Inc.