

ROCKY MOUNTAIN CCA SELF-STUDY EXAMINATION

DIRECTIONS

1. Clearly mark an "X" in the brackets next to the best answer to each question. Complete evaluation form and registration form.
2. Tear out this page and place in envelope along with a \$15 check (processing fee) payable to the American Society of Agronomy (or fill out credit card information). Payment in U.S. currency only.
3. Mail self-study exam and fee to: ASA c/o CCA Self-Study Exam, 677 S. Segoe Road, Madison, WI 53711.

A passing exam score (70%) is worth 1.5 Rocky Mountain CEU's in soil and water management.

QUESTIONS

1. Water potential is
 - a. The rate at which water moves through the soil profile
 - b. The cycle of water from the soil through plants to the atmosphere
 - c. A measure of the capacity of soil water to do work
 - d. The movement of water from lower potential energy to higher potential energy
2. As the soil dries out, what physiological process in plants would be the first to slow down to conserve water?
 - a. Greater uptake of solutes
 - b. Photosynthesis
 - c. Cell expansion
 - d. Protein synthesis
3. Under what condition would you find the soil if the water potential was at -1500 kPa?
 - a. Permanent Wilting Point
 - b. Oven dried soil
 - c. Field Capacity
 - d. Plant Available Water
4. Effects of saturated soils on crops include
 - a. Lower mass flow of nutrients from high soil water content
 - b. Immediate wilting of new leaves
 - c. Increased O₂ and other gases, triggering rapid metabolism
 - d. Slowing of root development due to cooler soil temperatures
5. Why does PAW have a large range of water potential?
 - a. Water cannot be absorbed past the lower limit of PAW
 - b. It includes all water between field capacity and PWP
 - c. All plants can access water deep in the soil profile, increasing PAW
 - d. Annual precipitation varies so that water content is unpredictable
6. Evapotranspiration is
 - a. Not affected by photosynthesis
 - b. A measure of total water loss
 - c. Describes evaporation from plant leaves and transpiration only
 - d. Greater on calm days with high humidity
7. What group of crops show no specific critical period in which they must have adequate moisture but will do well with early rainfall or irrigation?
 - a. Grains, cereals and oil seed crops
 - b. Sugar beets
 - c. Determinate crops
 - d. Forages
8. Which term discusses rainfall and snowfall in relationship to how efficiently plants used it during the growing season?
 - a. Precipitation Storage Efficiency
 - b. Permanent Wilting Point
 - c. Water Use Efficiency
 - d. Precipitation Use Efficiency
9. If a tensiometer reads -8 bars, what does that equate to in psi?
 - a. - 8 psi
 - b. -120 psi
 - c. - 80 psi
 - d. -15 psi

10. In comparing Precipitation Storage Efficiencies, Nielsen et al. (2005), showed that
 - a. Reduced till methods had overall higher PSE than stubble/mulch methods
 - b. Stubble/mulch methods had lower PSE than plow/disc tilling
 - c. No till methods had approximately 10-30% greater PSE than plow/disc methods
 - d. No till methods had approximately 2-10% lower PSE than stubble mulch methods
11. Under what condition did applied P increase WUE by 50%, in a Montana study by Jones et al. (2005, 2003)?
 - a. Plants that were water stressed and in soil with low Olsen P levels
 - b. Plants that were water stressed and had no additional P added
 - c. Plants that were well watered and in soil with low Olsen P levels
 - d. Plants that were water stressed and in soils with medium Olsen P levels
12. In comparing operations, which has the least amount of residue lost?
 - a. Over winter weathering
 - b. Tandem disk 3" deep
 - c. Chisel plow with twisted points
 - d. Rod weeder
13. One benefit to increasing crop rotation and reducing the length of summer fallow is
 - a. Making use of soil water and spring/summer precipitation
 - b. Increasing PSE during the summer months
 - c. Lower WUE due to the additional yield from the summer fallow crop
 - d. Lower soil organic matter with the additional crop residues
14. Why is adequate NPK nutrition needed for water conservation in plants?
 - a. It is needed for photosynthesis
 - b. K is a chemical signal to open the stomata
 - c. They optimize abscisic acid formation by providing nutrients for metabolism.
 - d. These nutrients slow water conductance up the xylem
15. Why is ET high at the mid-season growth stage?
 - a. The crop has little foliage, leaving a large amount of soil surface exposed to evaporation
 - b. Crops have reached grain fill stage and the canopy shades the ground
 - c. Plants are reaching maximum growth and have high rates of photosynthesis
 - d. Days are relatively cool, increasing transpiration

SELF-STUDY EVALUATION FORM

SOIL AND WATER MODULE #5

		STRONGLY DISAGREE	←————→	STRONGLY AGREE	
Information presented will be useful in my daily crop advising activities	1	2	3	4	5
Information was organized and logical	1	2	3	4	5
Graphics/tables were appropriate and enhanced my learning	1	2	3	4	5
I was stimulated to think how to use and apply the information presented.....	1	2	3	4	5
The article addressed the stated competency area and performance objective(s)	1	2	3	4	5

What suggestions (general and specific) do you have to improve future modules?

Topics you would like to see addressed in future self-study materials:

SELF-STUDY EXAM REGISTRATION FORM—

FOR ROCKY MOUNTAIN CCA CREDIT

Name: _____

Address: _____

City, State, Zip: _____

CCA Certification #: _____ Credit Card Type and # _____

Expiration Date: _____ Name on Card: _____

A \$2.00 Processing Fee will be added to all credit card charges.

I certify that I alone completed this self-study course and recognize that an ethics violation may revoke my CCA status.

Signature of registrant as it appears on Code of Ethics

Date