4484-Q NOV. 2005

Soil & Water

MANAGEMENT **MODULE 4**
Water and Solute Transport in Soils

CCA 1.5 CEU SW

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 always flows from
   [ ] a. Wet soil to dry soil
   [ ] b. Dry soil to wet soil
   [ ] c. Higher potential energy to lower potential energy
   [ ] d. Lower potential energy to higher potential energy

2. When water flows through large soil macropores, and bypasses large areas of soil, this phenomenon is referred to as:
   [ ] a. Dispersion
   [ ] b. Hydraulic conductivity
   [ ] c. Saturated flow
   [ ] d. Preferential flow

3. Which of the following pesticides would persist in the soil the longest under normal field conditions?
   [ ] a. Dicamba
   [ ] b. Malathion
   [ ] c. Picloram
   [ ] d. 2,4-D

4. Hydraulic conductivity generally decreases as
   [ ] a. Soil water 'potential energy' increases
   [ ] b. Soil water content decreases
   [ ] c. Infiltration rates increase
   [ ] d. Soil water 'potential energy' decreases

5. A pesticide with a high K_{OC} value will
   [ ] a. Sorb weakly to soil colloids
   [ ] b. Sorb strongly to soil colloids
   [ ] c. Persist for long periods of time in soil
   [ ] d. Degrade quickly in soil

6. Which of the following soil conditions is most prone to compaction?
   [ ] a. A soil at field capacity
   [ ] b. A frozen soil
   [ ] c. A soil at permanent wilting point
   [ ] d. A highly aggregated soil

7. Which of the following soils would most likely have the greatest initial infiltration (assume preferential flow is not a factor and the soils are dry)?
   [ ] a. Sandy loam
   [ ] b. Clay loam
   [ ] c. Silt
   [ ] d. Loam

8. In general, the rate of water infiltration into a dry soil is initially
   [ ] a. Lower than infiltration into a wet soil
   [ ] b. Higher than infiltration into a wet soil
   [ ] c. Much lower than it is at steady state
   [ ] d. Similar to that of infiltration into a wet soil

9. When all applied irrigation water infiltrates the soil, the infiltration rate is
   [ ] a. Equal to the rate of water being applied
   [ ] b. Less than the rate of water being applied
   [ ] c. Greater than the rate of water being applied
   [ ] d. Inversely proportionate to the rate of water being applied

10. An advantage of using K_{OC} over K_D to measure a pesticide's general ability to sorb to soil is
    [ ] a. K_{OC} is highly dependent of soil type
    [ ] b. K_{OC} does not take into account the influence of organic carbon on sorptivity
    [ ] c. K_{OC} is independent of soil type
    [ ] d. K_{OC} is easier to measure

11. Heavy axle loads typically cause
    [ ] a. Surface compaction
    [ ] b. Preferential flow
    [ ] c. Sub-surface compaction
    [ ] d. Freeze/thaw processes

12. Compared to the no-rip treatments, results from a Montana study, found infiltration rates after 1 hour following spring thaw on the rip tilled soils to be approximately
    [ ] a. 7 times less
    [ ] b. 23 times greater
    [ ] c. 10 times less
    [ ] d. 5 times greater

13. Which of the following pesticides would you expect to have the lowest leaching potential, based on the properties given?
    [ ] a. Pesticide W: half-life: 90 days; water solubility: 420 ppm; K_{OC}: 16 µg/g
    [ ] b. Pesticide X: half-life: 60 days; water solubility: 50 ppm; K_{OC}: 100 µg/g
    [ ] c. Pesticide Y: half-life: 7 days; water solubility: 0.1 ppm; K_{OC}: 10,000 µg/g
    [ ] d. Pesticide Z: half-life: 300 days; water solubility: 620 ppm; K_{OC}: 150 µg/g

14. For preventing pesticide leaching, flood irrigation works best when coupled with which type of pesticide application?
    [ ] a. Surface
    [ ] b. Chemigation
    [ ] c. Incorporated
    [ ] d. Foliar

15. A hydrophobic soil
    [ ] a. Infiltrates water quickly
    [ ] b. Has a high hydraulic conductivity
    [ ] c. Repels water
    [ ] d. Is prone to pesticide leaching

SELF-STUDY EVALUATION FORM

SOIL AND WATER MODULE #4

	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: _____

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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