Irrigation Systems and Nutrient Management

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Presentation will be available at: http://ucanr.org/schwankl
Irrigation Systems

- Their design and management play a major role in good nutrient management.
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  - Source of water which can leach nutrients from the root zone.
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  - Source of nutrients through chemigation.
  - Source of water which can leach nutrients from the root zone.
  - Rainfall
Irrigation Systems

- Types of irrigation systems:
  - Surface irrigation – furrow and border strip
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  - Sprinkler irrigation
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  - Surface irrigation – furrow and border strip.
  - Sprinkler irrigation
  - Microirrigation
Irrigation Efficiency

- Measure of how much of the applied water goes to “beneficial uses”.
  - The major beneficial use is to supply plant water needs (ET)
Surface Irrigation

- Water losses can be from deep percolation and tailwater runoff.
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  - Minimize runoff losses by Tailwater Return Systems.
Surface Irrigation

- Losses can be from deep percolation and tailwater runoff.
  - Minimize runoff losses by Tailwater Return Systems.
  - Deep percolation losses are a challenge for surface irrigation systems.
ADVANCE PHASE
TIME (MIN) = 3.91
ADV. DIST. (M) = 20.0
ADVANCE PHASE
TIME (MIN) = 10.58
ADV. DIST. (M) = 40.0
ADVANCE PHASE
TIME (MIN) = 27.79
ADV. DIST. (M) = 80.0
ADVANCE PHASE

TIME (MIN) = 38.01

ADV. DIST. (M) = 100.0
ADVANCE PHASE
TIME (MIN) = 49.29
ADV. DIST. (M) = 120.0
ADVANCE PHASE
TIME (MIN) = 61.68
ADV. DIST. (M) = 140.0
ADVANCE PHASE
TIME (MIN) = 75.29
ADV. DIST. (M) = 160.0
ADVANCE PHASE
TIME (MIN) = 106.72
ADV. DIST. (M) = 200.0
ADVANCE PHASE
TIME (MIN) = 146.56
ADV. DIST. (M) = 240.0
Surface Irrigation

- Losses can be from deep percolation and tailwater runoff.
  - Minimize runoff losses by Tailwater Return Systems.
  - Deep percolation losses can be reduced by:
    - Irrigating the right amount at the right time (irrigation scheduling)
Surface Irrigation

- Losses can be from deep percolation and tailwater runoff.
  - Minimize runoff losses by Tailwater Return Systems.
- Deep percolation losses can be reduced by:
  - Irrigating the right amount at the right time (irrigation scheduling)
  - Having a well designed system (right length field, right flow rate, etc.)
Surface Irrigation

- Losses can be from deep percolation and tailwater runoff.
- Good management needed when added nutrients to irrigation water.
Sprinkler Irrigation

- Should be minimal runoff losses if designed correctly.
Sprinkler Irrigation

- Should be minimal runoff losses if designed correctly.

- Deep percolation losses can be minimized by good irrigation scheduling. Hardware gives better control.
Microirrigation Irrigation

- Minimal runoff.
Microirrigation Irrigation

- Minimal runoff.
- Deep percolation losses can be minimized with good irrigation scheduling. Again, hardware provides better control.
Irrigation - Summary

- If there is deep percolation associated with the irrigation, it can transport nutrients below the root zone.
Irrigation

- If there is deep percolation associated with the irrigation, it can transport nutrients to below the root zone.

- With fertigation, nutrients are applied with the irrigation water. Special care needs to be taken to make sure the nutrients stay in the root zone.
Questions?

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For Powerpoint presentation go to:
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