Subsurface Drip Irrigation in Almonds

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

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Buried Drip Irrigation = Subsurface Drip Irrigation = SDI
Subsurface Drip Irrigation

- **What is it?**
  - Drip irrigation below ground
    - Drip tape has been tried, but most often hard tubing with built-in (in-line) emitters is used.
Subsurface Drip Irrigation

- Why **would** you want to use SDI in Almonds?
  1. Increased yield?
Subsurface Drip Irrigation

- Why would you want to use SDI in Almonds?
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  2. Irrigation efficiency – low evaporation, no runoff.
Subsurface Drip Irrigation

Why **would** you want to use SDI in Almonds?

1. Increased yield?
2. Irrigation efficiency
3. Placing water right where the roots are.
Subsurface Drip Irrigation

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4. Reduced summer weed pressure.
Subsurface Drip Irrigation

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5. Can irrigate during harvest.
Subsurface Drip Irrigation

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4. Reduced summer weed pressure.
5. Can irrigate during harvest.
6. Drip system is protected from damage.
   - Equipment, careless 2-legged animals, coyotes, etc.
Subsurface Drip Irrigation

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5. Can irrigate during harvest.
6. Drip system is protected from damage.
7. Dry orchard – disease issues.
Subsurface Drip Irrigation

- Why wouldn’t you want to use SDI in Almonds?
  1. Can’t see if it is working.
Subsurface Drip Irrigation

**Why wouldn't you want to use SDI in Almonds?**

1. Can't see if it is working.
2. Rodent damage.
Subsurface Drip Irrigation

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Subsurface Drip Irrigation

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Subsurface Drip Irrigation

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5. Wet surface by “chimneying” – weeds.
6. Salinity control.
SDI in Almonds

Questions / Issues

1. What depth do I install the tubing at?
   - Most has gone in at around 12-16” deep.
   - Has been installed as deep as 24” and shallower than 12”.

![Cartoon of a worker digging with the question "How deep is it?" in a speech bubble.](image)
SDI in Almonds
Questions / Issues

1. What depth do I install the tubing at?
   - Most has gone in at around 12-14” deep.
   - Has been installed as deep as 24” and shallower than 12”.
   - Timing of installation, rodent damage, surface wetting (good or bad?), installation difficulties, and repair considerations all play a role in deciding on installation depth.
SDI in Almonds
Questions / Issues

1. What depth do I install the tubing at?

2. What drip tubing should be used?
   - Root intrusion into emitters is a real problem.
   - Needs to be protected against.
     - Trifluralin, chlorine, and copper have all been used.
SDI in Almonds
Questions / Issues

1. What depth do I install the tubing at?
2. What drip tubing should be used?
3. How many drip lines per tree row are needed? 1 or 2?
   - Always needs to be designed to meet tree water (ET) needs.
   - Soil type influences decision.
SDI in Almonds
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   - Needs to meet peak ET rates.
SDI in Almonds
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   - Lower the dripper discharge, less “chimneying”.

Image of almond trees in a row.
SDI in Almonds
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   - Needs to meet peak ET rates.
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   - Number of drippers/tree = function of Peak ET, dripper discharge, hrs. of irrigation/day.
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   - Needs to meet peak ET rates.
   - Lower the dripper discharge, less “chimney-ing”.
   - Number of drippers/tree = function of peak ET, dripper discharge, & hrs. of irrigation/day.
   - Lots of drippers are better, right?
SDI in Almonds
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2. What drip tubing should be used?
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5. How long will it last?
SDI in Almonds

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7. Tree establishment.
   1. Usually established with surface drip or surface drip + subsurface drip.
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   1. Usually established with surface drip or surface drip + subsurface drip.
   2. Must be designed for final SDI system.
   3. Don’t limit the wetted soil volume in early years.
SDI in Almonds
Questions / Issues

Conversion to SDI

- Can, and has been, done.
- Some root pruning.
SDI in Almonds
Questions / Issues

Conversion to SDI

- Can, and has been, done.
- Some root pruning.
- Switch over in Spring of year and give plenty of water – root growth has to adapt.
- If flood or sprinkler, may consider giving a “transitional” irrigation with the old system.
Questions?

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For Powerpoint presentation go to:
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