



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?



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 2. Irrigation efficiency – low evaporation, no runoff.



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 3. **Placing water right where the roots are.**



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 4. **Reduced summer weed pressure.**



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 5. **Can irrigate during harvest.**

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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

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 1. **Can't see if it is working.**



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Adult pocket gopher, *Thomomys* sp.

Photo by Jack Kelly Clark.

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 4. Pinching off by roots.
 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".



SDI in Almonds

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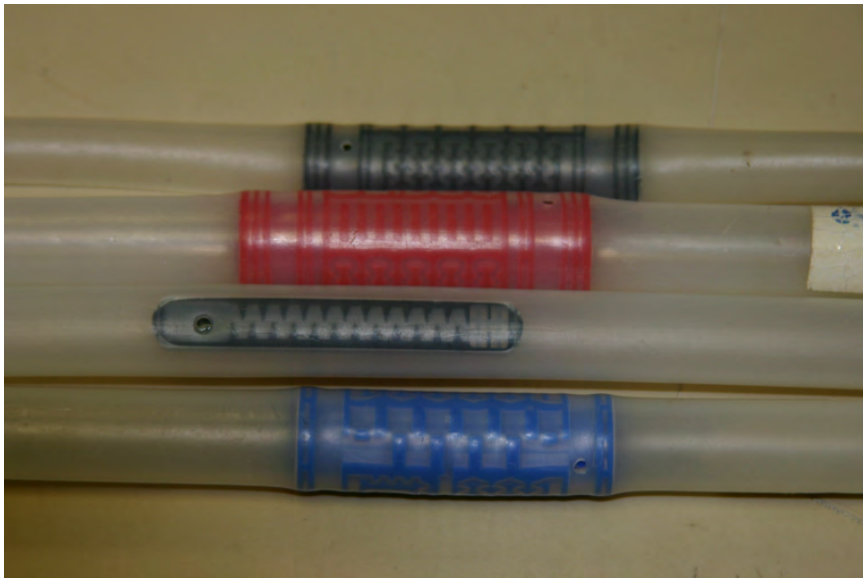
- Most has gone in at around 12-14" deep.
- Has been installed as deep as 24" and shallower than 12".
- **Timing of installation, rodent damage, surface wetting (good or bad?), installation difficulties, and repair considerations all play a role in deciding on installation depth.**



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.



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 - Needs to meet peak ET rates.



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 - **Lower the dripper discharge, less “chimneying”.**



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 - **Number of drippers/tree = function of Peak ET, dripper discharge, hrs. of irrigation/day.**

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 - 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?**

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5. **How long will it last?**



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7. **Tree establishment.**
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7. **Tree establishment.**
 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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