MODULE 1. - Essential knowledge

5. Irrigation Management

This fact sheet provides a basic outline of the critical components of good irrigation practice with links to supporting fact sheets.

Effective irrigation is about much more than turning on a tap when things look dry and turning it off when it looks wet enough. Just relying on a simple surface wetness approach can miss many things that can go wrong including salt build up, uneven watering stressing plants, rising water tables on top of impervious clay layers etc. These potential issues need to be checked and managed correctly when they are present or yields will be sacrificed.

Under and over watering both have serious effects on root health. Over watering during winter when roots are slow is a common problem and can seriously affect root health and disease levels. Adding compost changes the way the soil looks and behaves so that it is easy to under water seedlings and over water more established plants.

- *Effective irrigation systems need to be designed and operated according to the soil type, and seasonal variation in crop needs.*
- *A good irrigation system in greenhouses must include overhead sprinklers to leach salts out of the soil in between crops as part of a complete salt management program.*

Here are some important things to pay attention to make your irrigation program a positive instead of a liability.

Set up a good irrigation system that will be effective on your soils by:

1. Sampling your soil profile to **work out the soil texture of each layer**. This enables you to calculate how much water your active soil profile can hold (**field capacity**) so you deliver just what is required to recharge soil water

2. Working out the **readily available water (RAW)** in your soil when it is at field capacity. This is the amount of water plants can remove before it becomes too hard for them and they begin wilting (**refill point**). Some soils (heavy clays) can still be quite moist at this point, but plants are unable to use water that is tightly held in the soil. Lighter, sandier soils will show more obvious drying out.

3. **Designing**, **testing and maintaining a system that can efficiently supply the water requirements of their crop** evenly and not too quickly leading to overwatering, and not too slowly to relieve plant stress under very dry conditions.

   This requires a series of calculations based on irrigated area, the available vs required water pressure, the type of irrigation pipe or tape and drippers etc. that is best suited to delivering an even irrigation. This exercise requires either training or advice from an irrigation consultant.

Once a system is installed it must be maintained. This is not only about foxing leaks and dripper blockages, but performance testing and cleaning with a suitable chemical solution and adequate pressure. Training or advice is also very important to keep your system running correctly.

4. Manage the irrigation system to meet plant needs by:
   Understanding the need to varying irrigation delivery to meet the changing needs of the crop at different stages of growth and fruit set, and under different weather conditions, and in different soils:
   - Monitoring and managing water input to plant stage and fruit load and weather
   - Changes in moisture retention due to adding compost
   - Difficult soils including those with poor structure, high salinity and high water tables:

Costs and Benefits Related to Irrigation Management

Poor irrigation can result in heavy losses due to poor root development, diseases, water stress and drowning.

Phuong's changes in irrigation management included modifying his program for compost and keeping a close check on soil moisture in the root zone. If you think your irrigation system or your irrigation management may have serious issues create your own Cost-Benefit estimate for addressing any weaknesses that are reducing your yields. Click here for the *Module 4. Cost Benefit fact sheet and 'Capsicum Calculator'*.

Additional Fact Sheets And Videos

For detailed fact sheets on all of the key management practices above, (except 3. Designing and maintaining an irrigation system), see the Resource Index under *5. Irrigation management*. Information on designing, testing and maintaining irrigation systems is best presented in a training program with a manual including how to make the relevant calculations, to cover all of the relevant variables.

See also the fact sheet 'Tips for new users of compost' under *4. Soil health management* for information about how compost affects soil moisture holding; and *Module 3*, sections 'a. Good irrigation practices' and 'd. Detection and remediation of serious plant stress' for Phuong's perspectives on managing soil moisture.

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