



Irrigation Management:

Pre-season checks

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Irrigation system maintenance is an important though often overlooked operation. It will extend the trouble free life of the system itself and maximise returns on your investment. Of course, you began your irrigation system maintenance some months ago – when you closed it down for the winter at the end of last irrigation season. Didn't you? Preventative rather than corrective maintenance is more economical and less traumatic.

The aim of irrigation is to ensure the crop gets the right amount of water to maximise marketable yields. Previously we discussed the importance of uniformity to ensure each plant gets the amount of water we intend. And we discussed a number of key performance indicators that show us we have the performance we expect. We need a well designed system, well maintained and well managed. Then we can get the fruit size and quality that is so essential.

Let's think about what we should be doing to get ready for the coming season. Hopefully, you received maintenance guidelines when the system was first installed. They should tell you what to do, and set out critical check points. You should know what the design pressures are at specified places through the system, and the flow to be expected in each block or station.

At the beginning of a new season, it is important to run through the system and make sure it is functioning correctly. And it is the time to start routine operational checks. A number of things can go wrong in the period between irrigation finishing and starting again the following season.

Harvest and pruning operations can be hard on orchard irrigation systems. Sprinkler heads are often damaged or lost completely. Risers are knocked over. Insects and slugs seem able to get into tiny orifices. Spiders decide to set up home. And algae and bacteria can grow in the lines as well.

In the Irrigation Evaluations we've conducted, lateral tube damage has shown to be a major factor causing bad performance in some systems.



Driplines can become clogged with algae

If your lateral or drip-lines are lying on the ground, this can be a particular worry. Picking ladders can cause severe damage – puncturing the pipes and pushing soils and debris into the lines.

Take your log book with you (you do have one, don't you?) when you go out to do your checks. Record the date, and record all the readings you make. Compare them to the design values, and to the values you got last time. Be alert for any significant differences.

Start at the very beginning of the system. If appropriate, check water depth in your well – many areas have had record low levels this winter. Do a visual check around the pump, power and controllers. Cast an eye over the headworks and check filters are clean too. It's usually worth a quick trip around the orchard to identify any obvious problems before you go much further. Replace any missing or damaged sprinklers and do any other repairs needed.

Set the system to run on a particular block (write down which one). Once you have the system running, check and record the pump discharge pressure. When pressure is stabilised, check and record the system flow rate using the water meter. You may need to take a first reading, then a second one after a certain time to calculate flow rate. (You might like to check power consumption rates at the same time.) If the values you get are sensible, proceed with the rest of the check.

If flow or pressures are outside normal ranges, you'll need to look for the cause.

Increased flows can result if there are leaks or breaks in the system, if pressures are too high, or if valves have incorrectly turned on or failed to turn off. Decreased flows may indicate blocked emitters or sprinklers, blocked filters or mainlines or trouble with well water levels or foot valve operation.

Check pressures before and after the filters, and along the mainline. Pressure test points should be fitted to allow this. Check the operation and settings on field valves as you go. We've found valves almost completely closed, which severely reduced performance. Once again, record the readings in your log book, and check against expected records. Investigate any variations.

It is also a good idea to check pressures in the laterals in a number of blocks. Pressure is a very good health indicator. A simple way to do this is to fit a 'pitot tube' to a pressure gauge. Make a hole in the lateral with a punch, take the pressure reading then repair the hole with a goof plug.

If you have thinwall dripline you'll need to make up a Tee with a pressure gauge and repair the line after you've made your readings.

You will need a low pressure gauge – as a rule try to use a gauge that reads about twice the pressure you are measuring.



Testing pressure in the laterals

I suggest taking six readings per irrigation block, three on the lateral closest to the manifold inlet and three on the lateral at the end on the manifold. Take one reading at the start, one in the middle, and one at the end of each lateral. Record your readings and check they are within expectations. You can use the first reading on the first lateral to indicate the

block pressure, and compare pressures in a number of blocks.

Check some sprinkler or emitter flow rates. You need to do a reasonable number to get a fair test of performance. Because pressure changes rapidly at the beginning of a lateral, its best to check flows in the middle or at the end. The block that is furthest from the filters is often where blockages start to show up. Checking there may give warning of problems about to occur elsewhere.

I suggest you check flows of sixteen outlets in a block. Work out the average flow. Work out the average of the four outlets with least flow. Divide the low average by the whole average. The result should be at least 0.90 in a micro-irrigation system. If you find low flows, cut a few emitters or sprinklers open and find the cause.



Flushing laterals can help with finding the cause of blockages

You should flush the system; starting at the pump and progressing to the last lateral ends. Keep an eye out for any contaminants – you want to know what they are. Take your nylon stockings with you when flushing laterals. Stretch the stocking across your hand and filter the flush water through it. Carefully inspect your trappings – they can tell you exactly what's causing any problems and what you need to do to fix it.

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