Agpipe Drainage Investigation

Background

In addition to the agronomic solutions available, there are engineering/mechanical solutions to waterlogging. Slotted drainage pipe (Agpipe) can be used to remove water from waterlogged crops. It is expensive to install and hence it is important to know how close it must be installed to be effective.

What was done

One line of agpipe was installed in the bottom of a gully at Pontifex's Harriet Rd property. The bottom of the gully was gently sloped allowing it to drain into a nearby creek. Both sides of the gully were about 50m long and over this distance each side had a fall of approximately 2m. This is considered a steeper than average slope for Kangaroo Island cropping paddocks. Piezometers were installed ranging from 2.5 to 50m out of the gully, perpendicular to the agpipe. The aim was to determine the effect of the agpipe on the perched water table during waterlogged conditions**.**

Results

Figure 1 shows the impact of distance from the agpipe on the perched water table. To visualise the water table the soil surface is the horizontal line starting at zero.

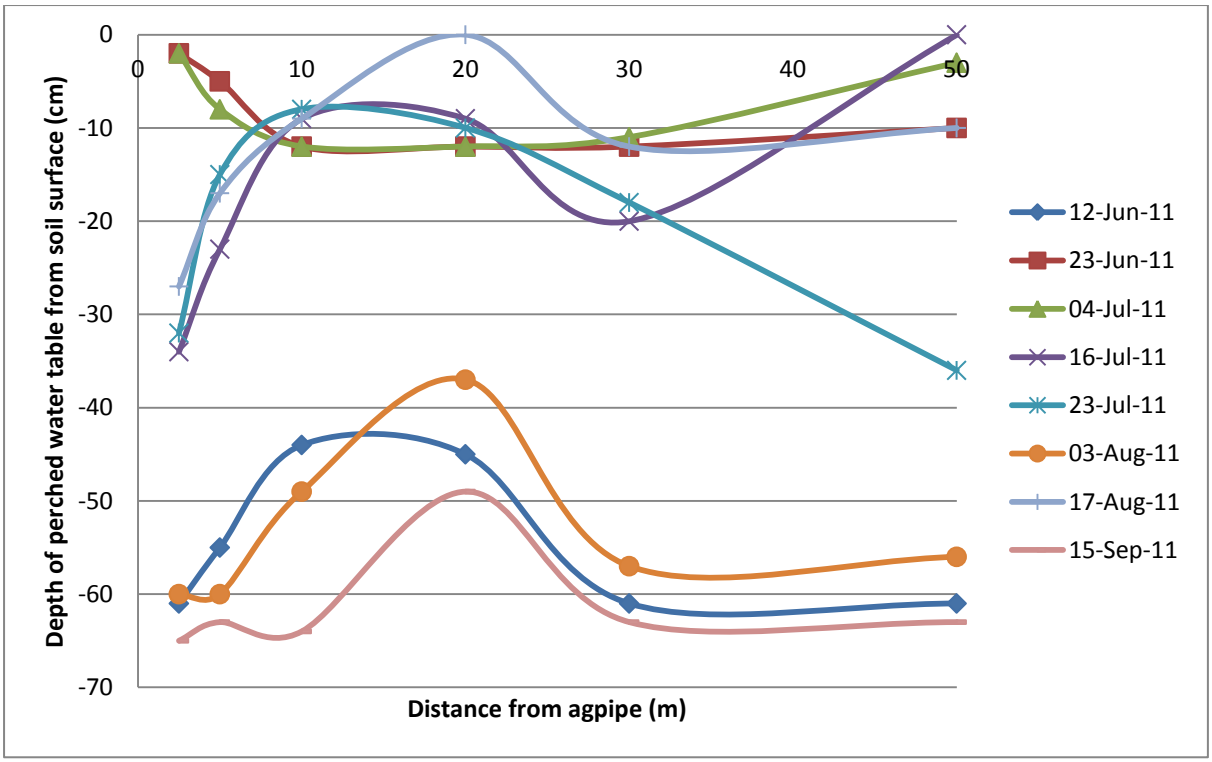

FIGURE 1 - the impact of distance from agpipe drainage on depth of water table.

Figure 1 above shows an irregular effect of the proximity to agpipe on depth to the perched water table. With the exception of late June and early July, the water table seems to be lower for a distance of approx 5m from the agpipe. This indicates that waterlogging could be less of a problem at close proximity.

Whilst no yield data was collected, the visual growth of the canola crop in the gully was very poor, including within 5m of the agpipe. This is most likely attributed to waterlogging.

A possible scenario is that the agpipe did not have the capacity to keep up with all the water falling in the gully in the form of rainfall. This is unlikely as a similar gully in the same paddock had a 1m deep trench dug and left open in preparation for agpipe installation and crop growth was also poor. As this excavator trench could handle any amount of water that fell on the gully, the trench nor the agpipe are likely to be the limiting factor for drainage. It is most likely the time taken for the water to progress down the slope to the agpipe or trench and hence the horizontal hydraulic conductivity of the soil causing the problem.

The agpipe trial also has the limitation of not having a control. We need to know what the water table profile would have been like in that gully without the agpipe. Would the water table have been the same without the agpipe installed?

To help answer this, piezometers have been installed in Berry's paddock on Wests Rd which is earmarked for agpipe installation in 2012. The depth to the water table was measured across a transect of the paddock in 2011. The paddock will be monitored in 2012 with the inclusion of agpipe, and this will allow us to make the comparison, with 2011 data effectively forming the control.

Further information contact

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Take home messages

- In this trial the Agpipe was not effective in the bottom of a gully
- Key limitation is likely to be the flow of water through the soil to the agpipe
- Agpipe spacing is critical for it to be effective, future trial work should help determine required spacings.

Sponsors and contributors

- GRDC funding administered by AgKI
- Pontifex family for providing trial site and installing agpipe

Growth of the canola is poor in the gully except a few meter wide strip up the middle above the agpipe