

WHY OVERSEER SHOULD NOT BE USED IN ENVIRONMENTAL BENCH-MARKING

As the stranglehold of forcing farmers to limit their environmental foot-printing tightens and the BOP and Waikato Regional Councils wrestle with working out how to reduce contaminants entering waterways, science comes along with another anomaly which throws the environmental models out of the water, and this one is called attenuation. Attenuation is a word that farmers are going to love and the anti-farming vegan lobby are going to hate. Attenuation throws the Overseer modelling which some claim to be 'the only game in town' when it comes to predicting nitrogen losses into waterways completely out of the ball-park by a country mile on many soils.

I have never been in favour of using Overseer as a model for grand-parenting where a farmer whose historical nitrogen losses are used for limit-setting, as it tends to reward the polluters and punish the good conservative farmers who farm with little negative environmental impact. Overseer has been funded by MPI, AgResearch and the two big Fertiliser Co-ops Ravensdown and Ballance, and is a continually improving model for predicting what if scenarios of nutrients leaving the root zone. Because most farmers are members of at least one of the fertiliser co-ops, and have also paid taxes which have funded MPI and AgResearch, this model should be free for all to use and not something which farmers should be charged for using. As scientific knowledge improves, so the Overseer model will improve and become more accurate over time, hence each updated version of Overseer is truer than the previous version. However Overseer is limited to understanding what is leaving the root zone, but between the roots and what eventually gets into the groundwater and waterways is attenuation.

In physics, according to Wikipedia, attenuation is defined as 'the gradual loss of intensity of any kind of flux through a medium'. As far as nitrogen losses into ground water go, attenuation is the unaccounted disappearance of nitrogen through natural chemical processes such as denitrification, ammonification, absorption by clay colloids etc, and because of attenuation the quantities of N leaching into the environment when the Overseer model is used is over-exaggerated. At this month's annual Fertiliser and Lime Research Centre Conference at Massey University, attendees were told of some work done by Massey University researchers Dr Ranvir Singh and David Horne in the Rangitikei catchment that what Overseer predicted was leaving the root zone, and what actually entered the waterways could be vastly different. As a rough guide they suggested that on heavy silt loam and peat soils, attenuation could account for as much as 80-90% of N lost from the Overseer model, on silt loams there was medium attenuation which may account for 50% of the total N, and on stony and coarse textured soils the amount of N lost by attenuation could be 10-30%.

A keynote speaker at the conference was Danish professor Brian Kronvang who informed us of what had been taking place in Denmark for the past 30 years, where farmers have been forced to limit their farming operations based on environmental modelling. What the models for N leaching had predicted and how much actual N was being measured by monitoring were often vastly different. He said farmers had always been against modelling and were much more in favour of monitoring actual levels found in the water. As the models and the monitored hard data were contradictory, the past couple of years the models have been abandoned in favour of monitoring the nutrient levels in waterways.

Another interesting paper presented by Victoria University researchers promoted the LUCI (Land Utilisation and Capability Indicator) approach. One site they looked at, the Massey University Tuapaki Farm, Overseer predicted 8 kg/ha N was lost, whereas the actual amount of N measured was only 2.37 kg. The LUCI model was more accurate for both nitrogen and phosphorus losses compared to Overseer.

In my view, Overseer is an excellent model for predicting nutrient losses from the root zone, but that is all. Using Overseer for grand-parenting N losses, allowing bad polluters to continue being the worst polluters and penalising good farmers and restricting future development of under-developed farmland is inequitable and wrong. Setting catchment limits based on LUCI or some other Land Use Suitability/Capability model where every farmer and land-owner are on an equal footing makes more sense to me, and as the science improves and accumulation of hard data from monitoring grows, then adjustments and changes can be made along the way.

Hopefully the Waikato Regional Council Healthy Rivers and BOP Regional Council Rotorua Lakes submission process results in sensible, reasonable, and workable outcomes which are fair for all.

ROBIN BOOM CPAg, Member of the Institute of Professional Soil Scientists
Tel: 0274448764