Environment Waikato

Integrated Catchment Management Newsletter

After a very dry late spring and summer, the recent rain in the Waikato has been most welcome for farmers and their stock. It should mean some lost production will be recovered and stock will gain condition before the winter.

Water is also an important element in the three topics covered in this summer's ICM newsletter.

- Research at Lake Rerewhakaaitu on retaining more phosphorous on-farm.
- An update on the effluent pond size calculator, including details of an effluent expo in March.
- Dry patch syndrome and hydrophobicity.

New round of farm plan visits

Environment Waikato recognises that the environmental plans that have been done in the ICM catchments are "living documents". They should be reviewed and updated regularly. To help with this the ICM team will be revisiting properties with farm plans over the coming months. We will update budgets, review progress and provide further assistance where required. If you are interested in getting an early visit please contact **Don, Paul or Ross on 0800 800 401**.

Controlling phosphorus on farm

Environment Waikato's work with farmers in the ICM pilot catchments of Little Waipa and Waipapa has been helping to spread nutrient management knowledge in our region.

Also, research by AgResearch since 2008 near Lake Rerewhakaaitu in the neighbouring Bay of Plenty region has been providing new insights on phosphorous.

Phosphorus farm loss can be reduced by directing runoff to paddocks by adding cutoffs on races like this.

Loss of phosphorous from farms is closely associated with sediment loss. Like pasture on farm, algae in water need phosphorus to survive and grow. Unfortunately, algae lower water quality and blue green algae produce a toxin which is very difficult to remove from water. It can affect both stock and humans.

The research results from around Lake Rerewhakaaitu include:

- sediment runoff from farm races was "far higher" than from paddocks
- most runoff is likely to occur when soils are saturated in late winter and spring
- when soils reach more than 40 per cent moisture content run off will occur
- run off from pasture will occur at lower moisture content levels when it is heavily grazed, pugged or compacted.

Although soil types might be different in the Waikato's ICM pilot catchments the same principles will apply. Other principles that apply regarding phosphorous include:

- the greater the slope the higher the P loss
- the higher the Olsen P the higher the P loss
- some soils will lose P faster than others - e.g. pumice soils.

Recommended mitigation measures include:

- if Olsen P levels are higher than the economic optimum apply less P fertiliser
- fence off streams and waterways
- riparian buffers greater than 10 metres will reduce P loss by overland flow
- minimise treading damage on wet soils by on/off grazing strategies
- avoid fertiliser applications near streams
- install drainage in wet areas to manage runoff
- install berms and cutoffs to channel runoff from farm races
- avoid applying fertiliser when rain may lead to runoff in the week following fertiliser application.

Effluent expo featuring pond storage calculator

The effluent pond calculator calculates a recommended size for new ponds like this one.

The new Waikato version of the effluent pond size calculator will be a feature of the free entry Effluent Solutions Expo to be held at Mystery Creek on 29 March from 9am to 5pm.

The expo – being organised by Environment Waikato and sponsored by DairyNZ – will include around 20 trade displays and seminars. Entry is free to farmers and rural professionals.

The pond size calculator has been developed by Massey University's Dr David Horne using the last 30 years of daily rainfall data from a number of sites around the country. The Waikato version draws on data from 30 sites in our region.

Besides rainfall data, the calculator needs information about water use at the milking shed, yard area, the effluent irrigation system and the catchment area of the shed, yard and feed pad. The level of sophistication of the calculator considers such detail as evaporation from the pond and evapotranspiration from plants and soil. After all this input, the calculator can then recommend an appropriate pond size for the property.

The calculator has highlighted the marked difference in the size of the pond needed on farms using low rate effluent application systems, which allow for more frequent effluent spreading and therefore don't generally require bigger ponds.

Environment Waikato has been training dairy industry personnel in the use of the calculator to help ensure professional advice to dairy farmers on effluent storage is well-informed.

Hydrophobicity

"Hydro-what?" some may ask. Well, as certain soils dry out, water repelling compounds coat soil particles. This resulting hydrophobicity in soils leads to localised dry patches.

The condition is generally associated with, but not limited to, coarse textured soils. Locally, Taupo pumice is more prone to hydrophobicity than other soils.

The hydrophobic substances come from waxes, fats and oils generated by the breakdown of organic matter. They coat soil particles and render the soil water resistant. Heat and soil fungi can exacerbate hydrophobicity.

The effect of hydrophobicity is seen when rain occurs after an extended dry period. Initially, water runoff is more likely. Structures, such as berms on races directing water to paddocks, can slow down the speed of water as it moves off the paddocks and into waterways. This helps prevent sheet and rill erosion in cultivated paddocks and reduces sediment and phosphorus loss in pastured paddocks.

On dairy shed effluent paddocks, dry patches caused by hydrophobicity force effluent into preferential bypass flows (down cracks in the soil), meaning valuable nutrients are lost from the pasture root zone. Increased overland runoff can also occur.

Dry patches apparent on pumice soil after good rain in mid January showing how such soils resist water infiltration.

Strategies to minimise the impact of hyrodophicity over a dry summer include:

- increasing soil microbial activity by using lime
- improving earthworm populations
- good dairy shed effluent management (little and often).

Applying lime lifts calcium levels and encourages biological activity among bacteria and fungi. It will also improve earthworm activity. Coincidently lime also has a drought sparing effect and will hold moisture in the soil longer. This soil moisture improves microbial activity helping to reduce hydrophobicity levels. Test soils first to ensure your application will achieve the optimum pH and calcium levels.

www.ew.govt.nz

Environment Waikato
REGIONAL COUNCIL

Environment Waikato
401 Grey Street
PO Box 4010
Hamilton East 3247

For more information call
Environment Waikato's freephone 0800 800 401
Fax (07) 859 0998
www.ew.govt.nz