

Eclipse Soils SIRG tackles nutrient problem

Nearly 200 years of residential, agricultural and industrial development has highlighted the vulnerability of the beautiful Swan River plain's numerous waterways to nutrient run-off.

The sandy soil of the plain is extremely porous to stormwater carrying nutrients, particularly phosphorous, through groundwater into streams and rivers which consequently become polluted and environmentally degraded.

It's an issue that all governments have grappled with for more than half a century.

At the present time, technical literature published by the State Government Department of Water and Environmental Regulation proposes the use of "biofilters" also known as biofiltration systems, bioretention systems and rain gardens to remove pollutants from stormwater runoff.

In practice these "biofilters" are simply more modified versions of the commonly used infiltration basins to which stormwater is directed for disposal. That is: excavated basins filled with porous filter media and also planted with vegetation to remove pollutants from stormwater by filtration and biological uptake.

These stormwater basins have only been partially effective in limiting the flow of nutrients to our groundwater and from there to streams and rivers.

But fortunately for future generations, a scientifically proven method of capturing nutrients from stormwater run-off through the application of special phosphorous retentive soils has been developed by scientists at award-winning Kwinana-based company, Eclipse Soils.

Research at local universities and scientific organisations including CSIRO and Chemistry Centre of WA, has shown that soils which are high in aluminium, iron and calcium have high phosphorous retention capacity.

Taking this research, Eclipse Soils went to work to develop SIRG, a product which uses a mixture of gravelly-iron grit and a relatively porous near-yellow sand that can be added to the top layers of soil around any stormwater infiltration/bioretention basin.



Eclipse Soils SIRG at
a drainwater site in Bayswater.

Scientific studies show that SIRG dramatically increases the amount of phosphorous captured by the soil in the base of the basin as the stormwater enters and passes through the basin. The SIRG product chemically captures dissolved phosphorous and holds it in the base of the basin, and in this way prevents its export into receiving waters.

After extensive scientific testing, Dr Robert Gerritse, the retired head of the CSIRO's Land and Water division in WA, concluded that "if installed using the formulation used by Eclipse Soils... 100 years of phosphorus removal lifetime can be expected with good confidence" from SIRG soil amendment.

Eclipse Soils chief environmental scientist, Martin Bowman said the company had conducted extensive trials to determine the right depths and applications for the soil to produce optimum results in nutrient stripping.

"We have an internal hydro-geo-chemical model at Eclipse which we have used to estimate the depth of our SIRG product required to achieve various phosphorus removal lifetimes," said Mr Bowman.

Since development, SIRG has proved extremely popular with in new residential and industrial projects on the Swan River plain and has also been widely used to retrofit existing drainage basins.

"There is a much higher awareness of the need to strip nutrients from stormwater now and it's a government requirement for all new sub-division developments that stormwater be adequately dealt with," said Eclipse Soils general manager Sean Bennett.

"We have big new developments in the north-east towards Ellen Brook which feeds into the Swan, along the Canning River and its tributaries including the Southern and Wungong rivers to the south and in the Peel-Harvey estuary, all of which require a high level of nutrient stripping...and then of course, there is an enormous amount of work to be done future proofing established areas.

"We're very proud of this product. It makes an enormous difference to the quality of our waterways."

To read Dr Gerritse's report on SIRG and Martin Bowman's Eclipse Soils' technical papers on this and other products go to the website: eclipsesoils.com.au