



Oh what a difference soil biological activity makes!

A soil health project Broadford cattle farmer Paul Fleming has been involved in since 2012 has led to a 20-30 per cent increase in productivity.

The project aims to improve soil health using non-chemical fertilisers such as gypsum, lime and trace elements in natural forms as well as evaluating the effectiveness of increasing soil biological activity on production.

The three properties involved in the trial are a 150ha site Paul owns, a 50ha site he leases and a neighbor's 150 ha site. Paul runs approximately 1840 cows across his two trial properties and another property of 120 hectares. His neighbor's site is also a cattle grazing property. Paul practices rotational cell grazing and estimates the dry matter/kg/ha over a 40-70 day period to indicate the rotation trigger.

Paul's property has a history of fertiliser applications. The other properties had little done to them so needed more input. The two 150ha properties have light clay silty loam (identified as Healy's and Capehorn's). The leased 50 ha property is heavy black basalt clay (identified as Zwars), which was of interest to others in the South West Goulburn Landcare who are observing the trial and who have similar soil types.

Paul says he'd been searching for solutions to improve his property soil for nearly 50 years. More recently he consulted Soil Management Systems of Orroroo in South Australia who recommended a soil amendment program designed to balance critical soil physical parameters the first priority.

The initial part of the trial, which began in 2012, involved establishing sites within each property of up to 20ha and a control site nearby. Visual observations during the trials were made at each site to observe plant and root and dry matter production. Soil test results and dry matter production were also compared across each trial site. Results on the two Healy's type paddocks were similar, however the site on the 50ha property performed quite differently.

The weather conditions were vastly different across the years, however, overall Paul could see that the treated pastures were significantly improving compared to the control sites (see photos above).

Applications were based on the soil reports and conducted over four years, with heavier amendments applied in year one and two.

The soil reports indicated the nutrient and cation imbalances as well as the macro and micro nutrient availability in the soil. The treatments were designed to create the recommended balance.

There was also a lot of emphasis placed on visual monitoring of soil texture, soil structure, smell, water infiltration, biological activity, soil root depth and pasture composition. A scoring system was used to define all of the visual observations.

In winter there is usually enough moisture for pasture growth but temperature is the limiting factor. Paul has found that increasing the soil's biological activity in the root zone has the potential to lift soil temperatures and increases winter pasture growth rates, a key project indicator.

Soil structure tests results show the calcium/magnesium ratio on the loamy soil has increased from 3.5 to 6.35. There has also been an increase in potassium, nitrogen, trace elements, total and Olsen phosphorus and calcium. Organic matter has also increased significantly.

On Soil Management System's recommendation Paul is now trialing aeration of the soils by placing rip lines on each site. Aeration allows more oxygen and organic matter to penetrate into the sub-soil and creates a zone that stores moisture and fosters microbial activity. Plant roots can grow deeper as the hard pan one is broken down.

Paul believes most landholders desire to enhance their property, to see it more productive, better in appearance, to manage it more effectively and to leave it in better shape for the next generation.

"We haven't had the need to drench livestock here for many years now," he says. "We're almost organic in terms of soil and animal health. It's in everybody's interest to learn more about soil management. Healthy soils will produce healthier livestock and hence healthier food!"

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