

Incorporation and Lime – Pushing the Boundaries

By Wes Lefroy and Joel Andrew, Precision SoilTech

“Increased awareness of the effect of subsoil pH has led to farmers wanting to address significant pH issues in the fastest manner to avoid the continual yield losses from acidity. The question now is how fast can we fix these issues with a mix of lime application and incorporation? What are the possible benefits and side effects of high rates and incorporation?”

The lime required to effectively ameliorate topsoil (0-10 cm) and subsurface (10-20 cm and 20-30 cm) acidity in one pass or treatment can be very high (more than 6t/ha) as the lime is being spread over 3x the volume of soil when compared to only treating the topsoil (approx. 2t/ha). Recently, many farmers and research groups have been exploring the use of tillage to incorporate the lime through the soil profile, increasing contact between lime and acidic soil which raises soil pH in a shorter period of time.

The amount lime required to effectively ameliorate soil acidity is mainly determined by the starting soil pH, the volume of soil to be treated and the neutralising value (NV) of the lime, amongst other things. For example, topsoil (10 cm of soil) with a starting pH of 4.5 will require around 2 t/ha of 96% NV limesand to increase the final pH to above 5.5. The lime required to effectively ameliorate an acidic topsoil (0-10 cm) and subsurface (10-20 cm and 20-30 cm) profile in one pass/treatment can be very high (more than 6t/ha) as the lime is being spread over 3x the volume of soil when compared to only treating the topsoil.

Farmers now want to explore the speed at high rates of lime and incorporation to increase subsoil pH; while assessing the possible side effects.

Aglime of Australia, together with CSBP and Precision SoilTech, are in the first year of running a high rate lime incorporation trial on the Yellow/Grey Sand plain at Lockier River (Peter Horwood's). This trial is running in symmetry with a similar Mingenew Irwin Group trial on the Red Clay Loam at Wongoondy (Steve Rowe's). A key aspect of these trials will be how much lime is needed to treat 30cm of acidic soil, how effective are different tillage techniques in incorporating lime and quantify the response of micro nutrients such as Zinc, Copper and Magnesium (lupins) to the high lime rates.

Aglime CSBP Lime Incorporation Trial Update

Precision SoilTech have conducted extensive sampling which provided a baseline to map any movement in pH's throughout the profile down to 50cm. At the Lockier River Trial, we found that pH's were higher in the topsoil (~6), though decreased to around 4 between 20 cm to 50 cm. Early work in soil pits at the site have also indicated that incorporation has done a good job of mixing lime down the profile; however it is too early in the trial to assess movements in pH and micronutrient levels. Germination across the site was relatively even due to Stuart Smarts lightweight seeding bar being used and should show some good results at harvest.

These trials have been designed as long term trials, and with results being taken over at least the next 5 years. Watch this space!

Dave Gartner (Aglime of Australia) and Luigi Moreschi (CSBP) will be speaking on Pushing the Boundaries with lime incorporation at the Spring Field day. Dave will also be sitting on the panel discussing techniques for improving soil.

Special thanks to Sebastian Recabarren (MIG), Peter Horwood (Farmer), Stuart Smart (Seeding and Mouldboarding) and Darryl Beatie (Lime spreading).