Validating and Extending the National “Better Fertiliser Decisions” for Pasture Critical Values for Phosphorus

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Viable pasture based grazing systems in south-western Australia have been made possible over much of the landscape through input of nutrients to soils which were impoverished when first cleared. Initial dramatic increases in production stimulated subsequent applications of fertilisers, particularly phosphatic fertilisers, ever since. However, excessive fertiliser application can be tied to environmental impacts including the loss of phosphorus (P) to waterways impacting on water quality. A large body of evidence has been accumulated (3000 experimental years of data) to define critical P, potassium (K) and sulphur (S) concentrations in the soil through an Australia-wide collaboration in the Better Fertilisers Decisions (BFD) project. Extension of this information has been carried out by DPIRD in conjunction with a number of partners since 2009 by providing soil testing and interpretation based on this evidence. More than 200,000 ha and 17,500 pasture-based paddocks sampled highlight that 70% of paddocks do not require P, but often show constraints to K, S and pH. Some growers, fertiliser representatives, and agronomists are concerned that the national BFD response curves for P are either not suited to WA conditions, or that contemporary pasture varieties have a greater P requirement than those varieties used to establish the BFD response curves. A collaborative project between fertiliser companies, farmers, researchers, catchment groups and government is revisiting the response curves through an ambitious assessment of 36 pasture trials across six catchments in WA. A framework that targets different soil types and P fertility levels acquired through soil testing from earlier extension programs forms the basis of site selection. Trials include 0, 5, 10, 20 and 40 kg P/ha with basal nutrients, and controls of 0 and 40 kg P/ha without basal nutrients. Results from the first year of trials are largely consistent with previous BFD datasets. Large increases in production with application of nutrients (N, K, S) in situations where nutrients other than P are limiting are evident, reinforcing the need to look at adequate nutrition for all macro nutrients to maximise productivity. These new trials are being used as an opportunity to extend soil testing information to farmers as well as assess new techniques for measuring pasture growth including ultrasonic scanners and drone imagery. Uptake of management practices requires both the provision of evidence-based measurements as well as the perception of local applicability of that evidence. This trend indicates a requirement for sustained extension and local provision of evidence for a questioning rural audience.