

ANGASTON AG BUREAU FORUM – WOOTOONA – TUESDAY 6 MARCH 2012

- Soil tests are ideally carried out every 2-3 years to monitor soil nutrient status and microbial conditions aimed at optimising yields for productive grazing enterprises.
- Frequent assessment of soil, pasture and stock is essential for sustainable productive and profitable management of agricultural enterprises.
- Soil analysis is critical to this assessment to ensure that accurate management decisions can be made to build and maintain key nutrients for pasture production and animal health.
- Key components of soil health include:
 - sufficient organic matter (nitrogen), phosphorus and sulphur to promote optimal growth;
 - appropriate cations in balance (ie calcium, magnesium, potassium and sodium) to produce a mildly acidic pH (6.2 – 6.5) for optimal soil microbial activity; and
 - adequate trace elements - cobalt, boron, iron, manganese, copper, zinc and molybdenum for plant growth and animal health.
- Ideal soil conditions for pasture growth and health include adequate:
 - nutrient content and availability;
 - aeration enabled by cation balance and in turn biological health eg worm activity;
 - warmth provided by direct sunlight, radiant heat and microbial activity; and
 - moisture – sufficient to enable germination.
- Ideal soil conditions promote microbial activity leading to mineralisation (ie conversion of inorganic mineral substrates into organic forms) and nutrient uptake by plant roots. This is why it is recommended to test soil in spring as there will be optimal microbial activity and soil nutrient levels at this time.
- Conditions which limit microbial activity include:
 - Low temperatures – little activity and hence minimal plant growth below 10 degrees C;
 - Moisture content not at ideal levels (ie field capacity for that particular soil type);
 - Poor soil balance and nutrition eg low calcium and pronounced acidity; and
 - Poor soil structure / chemistry resulting in limited drainage and aeration.
- Soil profile assessment includes:
 - clay content – critical to holding sufficient minerals and moisture in the top soil;
 - evidence of hard pans and compaction – which can limit root development and nutrient uptake;
 - subsoil drainage – may lead to toxic conditions for root development eg salinity; and
 - depth of the water table – may influence moisture access and conditions for root growth.
- Pasture assessment conducted every 2-4 weeks includes:
 - Quantitative determinations ie:
 - feed on offer (kg dry matter per hectare) – desire average pasture height 3–8 cm;
 - ground cover – desire > 70%; and
 - Qualitative characteristics ie:
 - stage of growth – best kept at vegetative stage ie adequate leaf area for active growth;
 - plant species mix – prefer several varieties of highly productive species; and
 - grass to legume ratio. – ideally 70:30 to 50:50
- Information from pasture assessment is matched with livestock assessment at the same time & includes:
 - body condition score of 50 animals at random – aim is mob average CS = 3;
 - stage of growth / pregnancy / lactation and consequent energy / protein needs;
 - intended stocking rate / density – prefer high eg 200 dry sheep equivalents per hectare;
 - duration of intended grazing – prefer short eg 2-7 days; and
 - need for supplementary feeding – ideally minimal.
- The aim of grazing management is to maintain maximum leaf exposure to sunlight to optimise plant energy, protein, fat & hormone production through photosynthesis and allow sufficient time for plants to re-plenish their mineral reserves. This is best achieved by sustained grazing at relatively high stocking density for short periods followed by adequate periods of rest.

Dr Colin Trengove
Director
Pro Ag Consulting & APAL Agricultural Laboratory Pty Ltd