MySoil – dishing the dirt on soil constraints

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Key messages

MySoil helps growers and advisors correctly identify soil types for their region and provide information on the major soil constraints impacting on crop production. MySoil has been updated to provide more localised information about soil types in the Western Australian (WA) Wheatbelt. These changes include:

- Soil specific information for each Ag Soil Zone.
- Rating of topsoil and subsoil limitations for each soil type.
- Links to soil chemical and physical data for representative soil profiles.
- Links to current soil management bulletins.

Aims

To improve grower awareness of differing soil types and their potential constraints and management options at a regional level.

Background and Methods

MySoil was initially launched in 2012 primarily as a tool to identify soil types within the WA soil classification system (Schoknecht and Pathan 2013). MySoil uses the Lucid software to differentiate 15 generic soil types based on their texture, colour and pH. Lucid is a flexible knowledge management tool that helps users make an identification or diagnosis based on observed properties. For example, in this case the key asks the user to select observed soil colour, texture and other properties to help narrow down the specific soil type. To date the MySoil tool receives solid web traffic from WA with a 76% return user rate. Peak times are generally March to June with spikes in November and January.

While MySoil has exceeded its initial expectations, it has a number of limitations. Because the soils are generic across the wheatbelt, localised differences are not taken into account. Hence a highly productive shallow sandy duplex in the south east (i.e Scaddan sand) has the same classification as a comparatively impenetrable shallow sandy duplex in the south west (i.e. Moort soil).

The key revisions to the MySoil tool have been to make the information more specific to location, provide actual data from representative soil profiles, identify and rate constraints and link to current soil management information. To achieve this, the major soils in each Ag Soil Zone were identified using the Department of Agriculture and Food WA's (DAFWA) soil mapping database. The database has soil chemical and physical data for 50 000 sites across WA. Each site has been categorised according to the Australian Soil and Land Survey Field Handbook (The National Committee on Soil Terrain, 2009). We found that the seven most common soil types in each Ag Soil Zone accounted for 90% of the soils across the WA wheatbelt. A template was constructed that included their distribution, key soil features, likely constraints based on representative soil profiles from the DAFWA soils database and links to current management publications. Key references are also given for each soil, including separate soils sheets for each of the major soils in the 11 Ag Soil Zones. These zones are contained within the grain producing areas of WA and have been grouped based on climate, geology, soil formation processes and production systems (Figure 1).

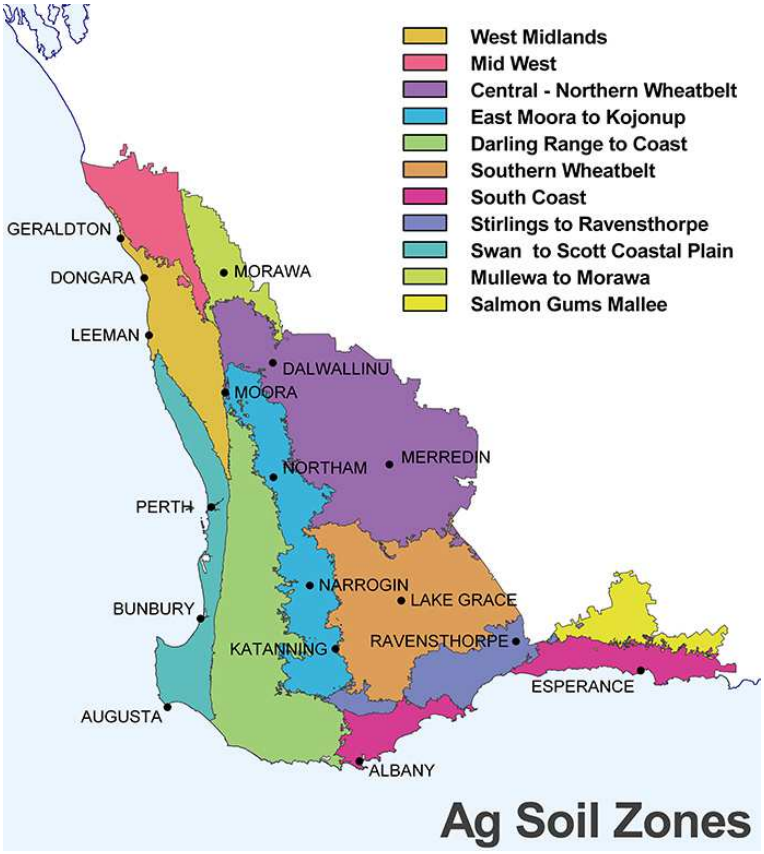

Figure 1: Ag Soil Zones

The updated MySoil tool was generated through the aggregation of WA soil groups and soil site data from the DAFWA soils database. Seventy-three soils where identified and rated for potential constraints across the 11 Ag Soil Zones (Figure 1). The ratings for the constraints are based on published information and are consistent with those presented in the SoilGuide (Moore 1998). The ratings for each constraint (i.e. acidity, salinity, boron etc.) range from 'none' through to 'severe' which is defined as limiting crop growth in all years.

Results

The revised version of MySoil has been expanded with 73 key soils described, classified, and rated in terms of their topsoil and subsoils constraints across the 11 Ag Soil Zones. Using the Lucid key growers and advisors are presented with a list of questions to help identify their soils. Questions include: Ag Soil Zone, soil colour, texture, pH and stones and gravel presence. As the grower answers the questions the list of possible soil types is reduced, eliminating soils that don't match the properties selected. Once the grower has reached a final outcome they are then linked to a comprehensive factsheet on that soil type. This factsheet provides an overall description of the topsoil and subsoil with pictures to help confirm the identification, plus information on properties, constraints and management options. The major soil properties covered include: acidity, salinity, sodicity, boron toxicity, compaction, water repellence, nutrition and alkalinity. In all cases constraints are identified as being topsoil or subsoil.

Conclusion

By correctly identifying your soil type and understanding the degree by which the subsoil constraints are limiting production, farmers are able to make an informed decision to invest in amelioration. Sub-soil constraints cost WA growers more than $600 million per annum in lost production (Herbert 2009). Often the diagnostics are insufficient to enable growers to correctly identify and manage constraints. Confidence in predicting the severity and extent of these constraints is important given that many growers are experiencing reduced margins due to drying climates and increasing costs relative to returns. MySoil provides the first step in soil diagnosis and identifying the subsoil constraints limiting production.

MySoil is available at www.agric.wa.gov.au/mysoil

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Key words

MySoil, subsoil constraints, Western Australian soil types

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