A unique distribution channel for nutrient balances

Gemma Heemskerk, Hayden Lewis, **Andrew McAllister**, Cameron Gourley and Muhammad Islam

Victorian agriculture faces significant challenges to meet the demands of growing markets and continue to deliver production gains, while also demonstrating responsible management of resources. Nutrient resources are a key management consideration for Victorian agriculture. Translation of our science into practical, everyday decision support is achieved with FarmBuild (Figure 1).


FarmBuild delivers algorithms, calculators, and key agricultural datasets as freely available online functions through GitHub - http://farmbuild.github.io/farmbuild. Agriculture industry service providers and software developers can utilise FarmBuild web services, Application Programming Interfaces (APIs), integrated data sources and open source JavaScript API sample code, to build their own digital tools.

Figure 1. Infographic showing translation of Agriculture Victorian's science through digital innovation (i.e. FarmBuild) to deliver productive farms.

Whole farm nutrient balances

A commonly used approach to nutrient balances on farm is the whole farm nutrient mass balance (WFNB). Total nutrients imported and total nutrients exported (Figure 2), for nitrogen, phosphorus, potassium and sulphur, are calculated at farm-scale to determine net farm nutrient status, and nutrient use efficiency (Oborn et al. 2003, Gourley et al. 2007). The WFNB calculator used in FarmBuild was developed through the national 'Accounting 4 Nutrients' program (Gourley et al. 2012) and was a spreadsheet. To deliver this calculator through the FarmBuild open source GitHub repository, the calculator was translated into JavaScript code.

Benchmarking whisker charts (Figure 3) have also been added to the WFNB functions on FarmBuild, estimated from 60 sets of Victorian farm data and hard coded into the version available on GitHub.
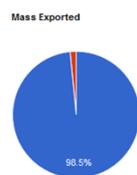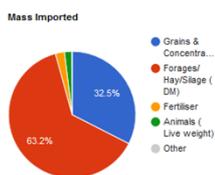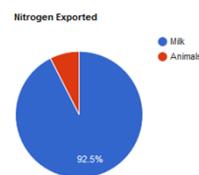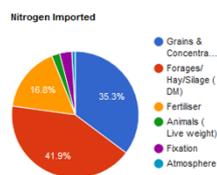

Figure 2. Sources of nutrient import/export in total volume (mass) and in elemental N form as displayed through FarmBuild WFNB calculator. Details results for P, K and S not displayed here due to space restrictions.
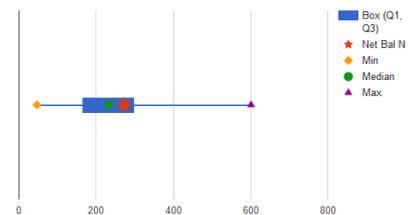
Figure 3. Whisker plot for N as part of WFNB through FarmBuild.

FarmBuild features

FarmBuild also includes farm mapping API and code, a soil area calculation web service, soil import API and code and spatial layers of rural parcels and soil types in addition to the WFNB functions. Clear identification of farm and paddock boundaries, generation of on-farm management zones by paddock labelling, and access to layers of information such as aerial photography and soils, can all inform a WFNB and provide land managers with a greater range of information to support their on-farm decision-making.

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Oborn I., Edwards A.C., Witter E., Oenema O., Ivarsson K., Withers P.J.A., Nilsson S.I., Richert Stinzing A. (2003) Eu. J. Agro., 20, 211-225.