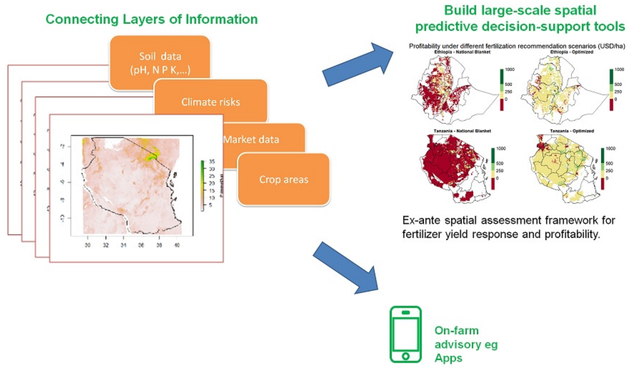
How can the data revolution help deliver better agronomy to smallholder farmers in Africa?

Site-specific information for agronomic decision support

Current R&D gives African smallholder farmers blanket recommendations based on limited project-based trial data. The integration of spatially-explicit information on profitability and risk of agronomic investments can help to improve targeting of investments and agronomic advice which can improve farmers' yields and incomes.

We are developing decision-support tools which integrate geospatial datasets of soil, climate, and socio-economic variables to evaluate agronomic and economic returns to fertilizer and other inputs. These tools enable farmers and policymakers and others to make better agronomic decisions at the field, farm and regional levels.



Tailored advice on your phone

Mobile advisory apps can reach millions of farmers with site-specific recommendations directly or via a service provider. The **Maize-Nutrient-Manager,** for instance, advises the farmer on the best fertilizer application for each field and what maize harvest to expect, using GPS-based field area measurement and information about soil fertility status and farmers' resources.

Some example screens of the Maize-Nutrient-Manager app: (A) intro screen; (B) field's position in landscape influences soil fertility status; (C) manure use options; (D) fertilizer purchase advice for measured field area and farmer's level of investment.

Agronomic research and extension are often aspatial and give farmers blanket recommendations with limited impact on yields and incomes.

To generate site-specific agronomic advice at scale, e.g. what best fertilizer application or crop variety for a field, we can use geospatial data and analytics to map and predict crop yields and profitability at different scales.

Research should work with various service providers to develop appropriate mobile applications and large-scale decision support tools that can provide timely, accurate advice on subjects such as crop varieties, fertilizer use and seed spacing. It will maximize the impact of on-farm extension and large-scale agronomic investments.

Research impacts for sustainable intensification

Taking Maize Agronomy to Scale in Africa (TAMASA) has calibrated and tested Nutrient Expert® and other mobile advisories in Nigeria, Tanzania and Ethiopia. Farmers following such mobile advisory increased maize yields from 2 tons to 4 tons per hectare, and farmers' benefits by 60%.

The lime dashboard compiles woreda-specific information on the extent of acid soils, as well as the expected costs and benefits of liming. This decision-support tool can help target areas where liming will be most profitable for farmers and value-chain actors.

Scan to find out more

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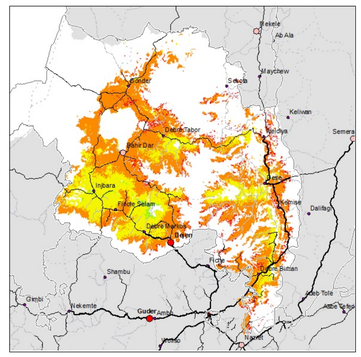
CGIAR

A dashboard for targeting lime investments in Ethiopia

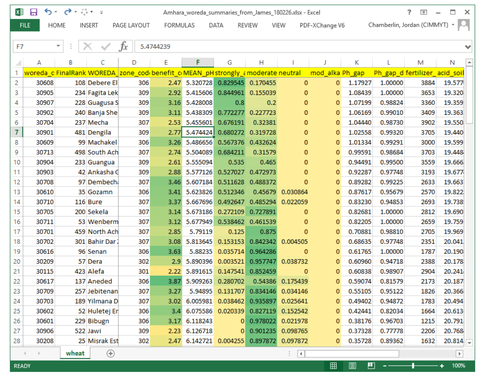
3.6 million people and 43% arable lands are affected by acid soils in Ethiopia. Lime application could help boost crop yields but where is it worth investing in lime operation? Costs-benefits can be mapped using a spatial assessment framework using crop yield response modelling.

How best to package information for decision-making?

Map where benefits outweigh costs: place lime pilots in green areas



Woreda-level spreadsheets could guide acid soil operations



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