AgroTutor

Promoting sustainable agricultural intensification and crowdsourcing plot information

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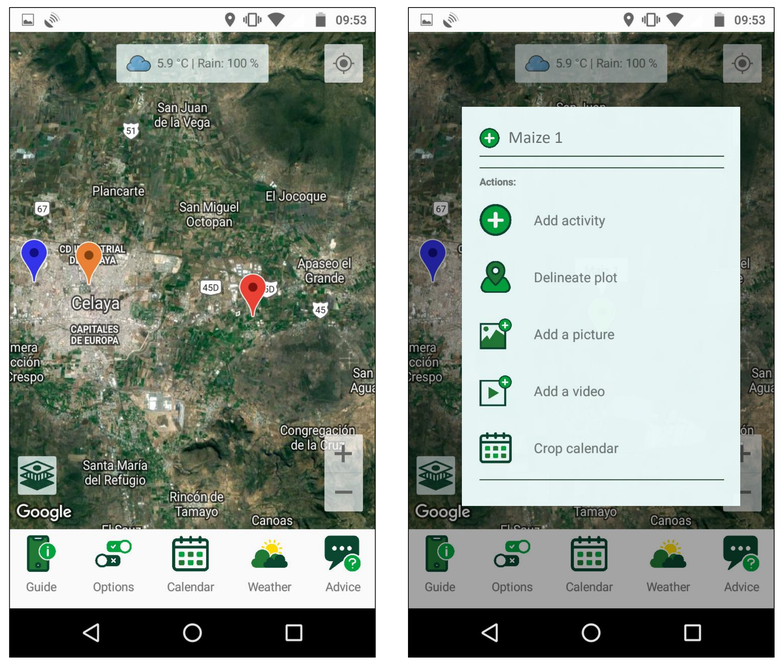
Advice on the spot: Optimal use of resources

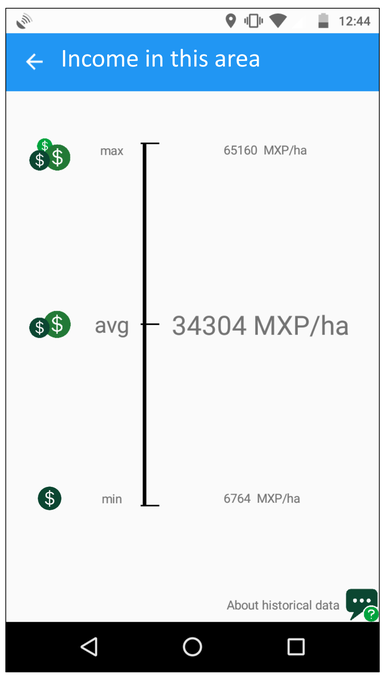
Provision of adequate and timely information to farmers on the ground means optimizing crop production decisions, reducing costs and eliminating adverse effects of overuse of agricultural inputs, e.g. fertilizer.

AgroTutor aims to support farmers across Mexico with benchmarking information, including historical and potential yield on the area where the plot is located, historical costs, income and profit as well as agronomical recommendations specific to the crop and plot location. Location and limits of parcels can be saved, and agronomical activities including costs, pictures and videos can be then added to document the cropping system.



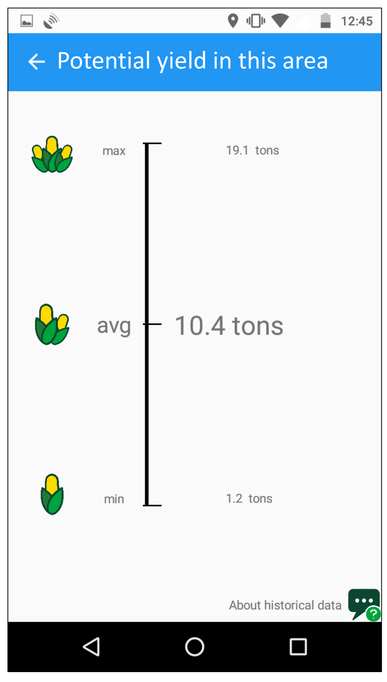
Historical data

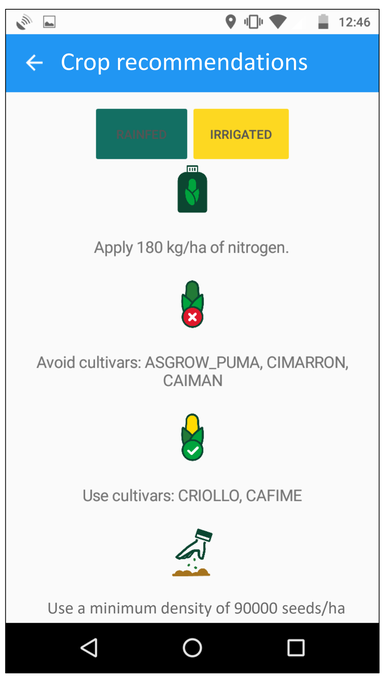
Geo-tagged historical costs, income, profit and yield of almost 200,000 farms is available to AgroTutor users. The data comes from the International Maize and Wheat Improvement Center (CIMMYT) sustainable intensification projects across Mexico. When a farmer asks for advice on a specific location and crop, the data sent back is anonymized and targeted to the specific conditions of the request. The data is meant to be a benchmark so farmers can see what yields and financial estimates have occurred in the area. Part of the data can be consulted publicly at: http://gismaps.cimmyt.org.



Potential yield

Using the geo-location of the plot, as well as irrigation and cultivar characteristics, farmers are provided with historic, non-nutrient and pest limited yield potential estimates, derived from the field-scale model Environmental Policy Integrated Climate (EPIC) (Williams 1995; Gaiser et al., 2010; Folberth et al., 2012), for the period between 1980 and 2010. The data is meant to highlight achievable crop performance in the area where the plot is located. Later, on-site data provided by farmers (stored as plot activities in AgroTutor) would be used to improve model estimates and in turn, sent back to farmers.



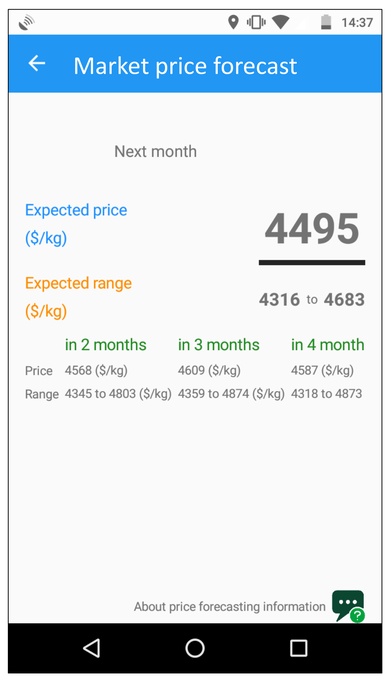


Agronomic suggestions

With the help of machine learning algorithms, the data collected by CIMMYT were analyzed at the International Center for Tropical Agriculture (CIAT-Colombia). The results are agronomic recommendations, shown to farmers in AgroTutor. The methodology used is based on previous studies on rice (Delerce et al., 2016) and perennial crops (Jiménez et al., 2016) where random forest-based algorithms are used to assess the relevance of a set of predictor variables in explaining the output yield variability. Recommendations shown usually highlight best cultivars in the area as well as planting density and nitrogen required.

Market price forecasting

Using a range of multivariate time series models with variables that include climate and financial indicators for the specific crop requested, a 12-month prediction of market prices is shown to farmers in AgroTutor. The models (Crespo Cuaresma, J. Hlouskova and Obersteiner, 2017; Crespo Cuaresma et al., 2018). The models are validated using out-of-sample forecasting compared to historical data as well as performance measures. The price forecasting module is meant to empower further small and medium farmers to obtain better prices for their harvest and help deciding how to proceed with commercialization.



Additional features

In AgroTutor, farmers can also query current, forecasted and historical weather conditions at their current location but also at the location of each plot registered. Farmers can also receive advanced notice for optimal maize fertilization times in the incorporated crop calendar module as well as send feedback and review training materials developed by CIMMYT.

Get AgroTutor!

Available for Android and iOS

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