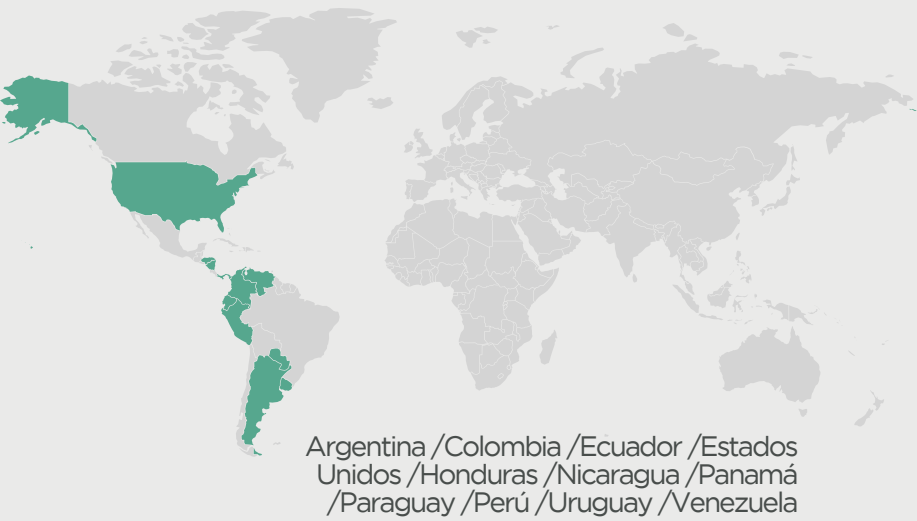
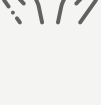




AI to estimate and forecast rainfed yield potential

In the region’s rainfed systems, how much a field can really yield is almost never known. Argentina, Colombia, and Uruguay are building a platform that estimates and forecasts that ceiling, season by season.



-  **150**
Expected number of scientific-technical personnel trained
-  **+3**
Expected gain in TRL levels
-  **6**
Expected number of sites and/or pilots
-  **1**
AI-based predictive platform developed and validated
-  **6**
Open access integrated databases published
-  **5000**
Expected beneficiaries

Three countries, seven crop-and-country combinations, one shared method Initiative

The project brings Argentina, Colombia, and Uruguay together to take yield potential from the experimental site down to the field. Reference sites are first chosen to represent the range of environments for each crop and country, with weather series longer than fifteen years, local soil surveys, and real management practices, and the attainable ceiling is simulated there

season by season. Machine learning algorithms then extend those estimates across the whole cropped area, in high-resolution maps that also report where the prediction is reliable and where conditions stray too far from the reference sites. The scope is maize, wheat, and soybean in Argentina and Uruguay, and maize in Colombia, where yield gaps will be quantified for the first time.

From a static map to a forecast that updates during the season Tech solution

The platform combines two ways of calculating. Crop simulation models reproduce crop growth day by day at the reference sites, using local climate, soil, and management data: they are robust, but they describe only the points where quality data exist. Machine learning algorithms take those estimates and extend them across the entire cropped area using gridded layers of temperature, rainfall, plant-available soil water, and rootable depth, built from national public

information at finer than 10 kilometers resolution for climate and 250 meters for soil. The result is an annual map of the attainable ceiling together with its uncertainty. On that basis, a user compares a field against its own potential before planting and, once the season is under way, enters location, soil type, water table presence, planting date, and accumulated rainfall to obtain an updated forecast, combined with historical climate series to explore scenarios.

MORE INFO



Impacts and Results

The project expects to estimate rainfed yield potential and its year-to-year variability for its seven crop-and-country combinations, over series of at least fifteen seasons per site, and to build national gridded climate and soil databases that reduce the error of the reference global datasets. These will train and validate machine learning models able to map the attainable ceiling across the whole cropped territory, with uncertainty quantified over 100% of the target

area and at least 95% falling within the validated area of applicability. The platform will integrate five critical functionalities, with availability of 95% or better and a usability score of 70 or above, and will take the solution from technology readiness level 4 to 7. Six validation pilots are also planned, along with more than 150 people trained, at least 60 of them women, and reusable open databases.

Organizations

Main Donors

