



# AgAPP-e

## Managing phosphorus efficiency at every level

To address a lack of digital solutions for agricultural resource management, the ITEA project AgAPP-e (Agriculture's digital Analyser of Production, for Phosphorus efficiency) will create tools to automate fertiliser recommendations and resource management thereby improving the phosphorus efficiencies of both farms and nations.

### Addressing the challenge

Phosphorus is a non-renewable fertiliser and an environmental pollutant. Sustainable phosphorus management seeks to reduce its agricultural footprint while sustaining sufficient levels in soil, all against the backdrop of a growing world population. However, repeated fertiliser applications cause distribution issues due to phosphorus partitioning in the soil, as well as a build-up of legacy phosphorus that threatens water bodies. Better management is needed, but remains difficult due to gaps in governance, the difficulty in reaching and motivating farmers, and a lack of practical tools.

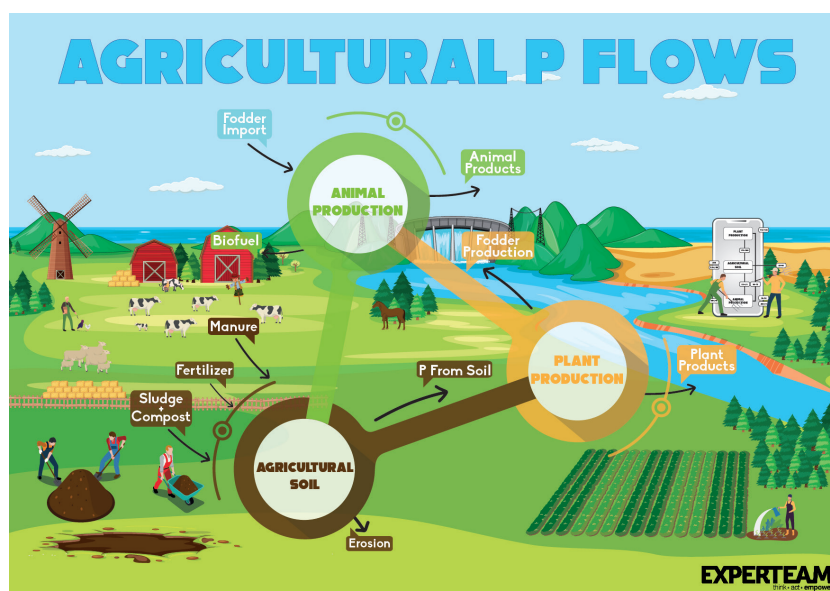
### Proposed solutions

AgAPP-e will be the first step towards an IT-supported phosphorus management system that automates the estimation, predication and simulation of phosphorus flows. To achieve this, the project will create a mobile and a web-based application for data gathering, analysis and evaluation that uses cloud technology for remote access. This will exploit AI techniques, remote sensing data and IoT devices in the field to estimate material flows via efficiency analyses, scenario analyses and resource use or performance indicators, providing a simplified overview with integrated system pictures. A key output will be a digital self-advisory tool to allow farmers to independently calculate optimal phosphorus inputs with their mobile devices. Dormant data is also available at the country level and AI can be used to improve this, such as by estimating

unknown flows for more accurate

national resource budgets. These macro/micro-level elements will be connected by a unified substance flow model for phosphorus, designed for use across borders and thereby allowing the project to make recommendations at both the national and farm levels.

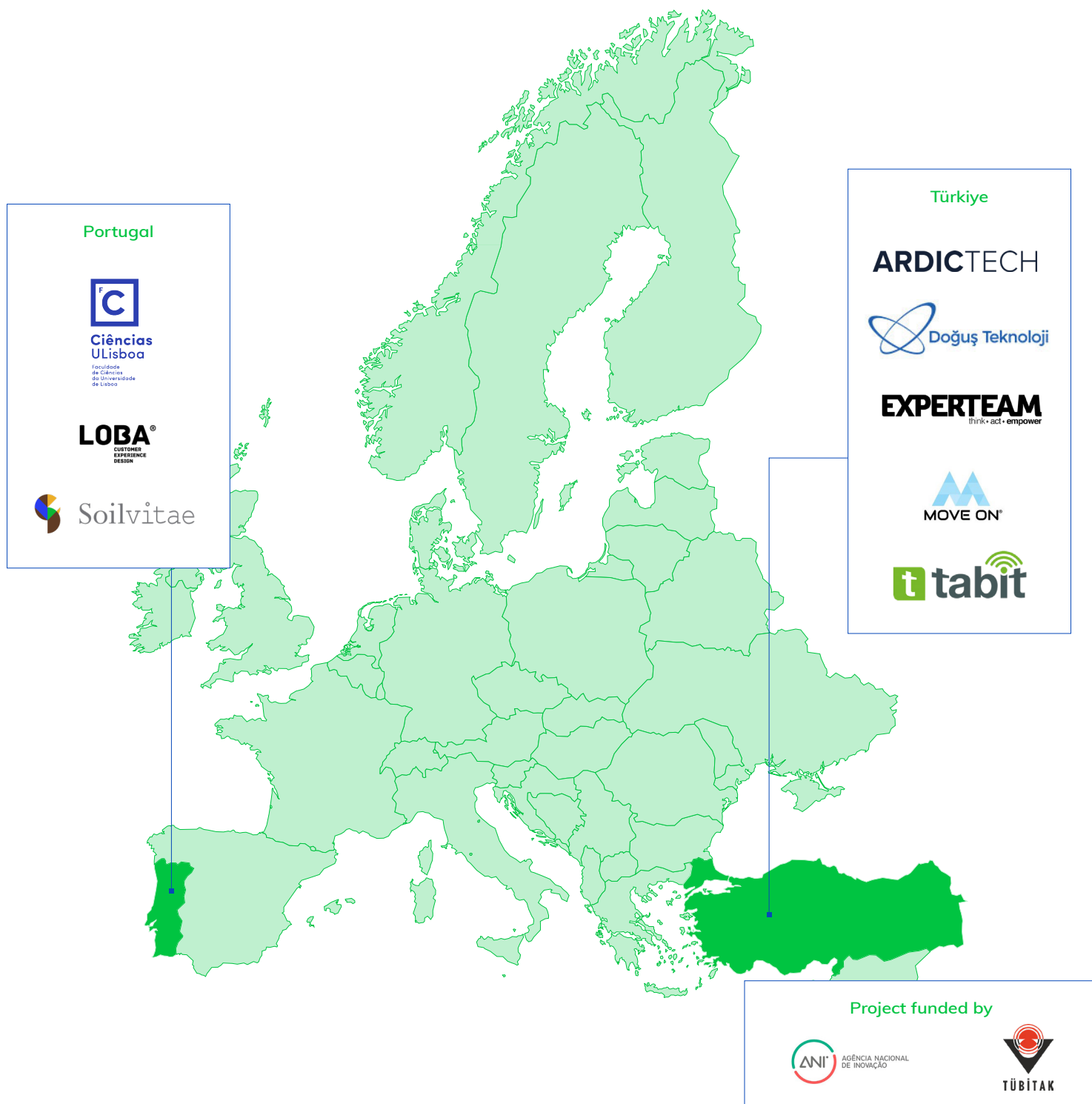
50-75% or even up to 100% for some products. For countries, meanwhile, the project expects to decrease data uncertainty from 25% to 10% and to reduce the time taken per material flow analysis from months or years to a maximum of 10 days. With reduced costs and increased capacities for both farmers and governments, the consortium aims to advance the global economy towards resource efficiency and better environmental performance via less phosphorus waste. In doing so, they will open up opportunities in a phosphate fertiliser market worth USD 61.63 billion worldwide in 2021 and expected to



### Projected results and impact

As no such application currently exists in Europe, AgAPP-e's innovations will be the first to provide easy access to data on spatial and temporal phosphorus use. The corresponding capacity to monitor and optimise this will offer major benefits for farmers: proper fertilisation has been shown to increase crop production by

expand at a compound annual growth rate of 5.7% up to 2040. With an easily expandable model, this is just one agri-food domain to which AgAPP-e's results could eventually apply.



**Project start**  
January 2025

**Project leader**  
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**Project website**  
<https://itea4.org/project/agapp-e.html>

**Project end**  
December 2027

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<https://itea4.org>