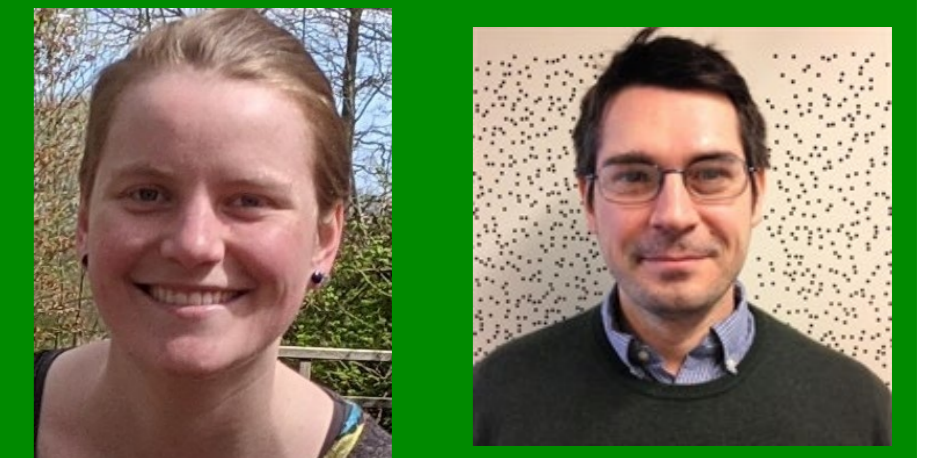


EcoBin: An app to predict N mineralization from organic fertilizer based on the SNOMIN model

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Introduction

We developed EcoBin, an app publicly accessible through Farmmaps, an online platform for precision agriculture. EcoBin was developed from SNOMIN (Berghuijs et al., 2024), a dynamic soil organic matter model that simulates C and N dynamics (mineralization, immobilization, leaching, nitrification) based on the concept of a soil amendment's initial age (Janssen, 1984). Initial age and amendment properties were derived from 'Handboek bodem & bemesting'. The app allows users to assess the potential of common mineral and organic amendments as well as, (new) organic amendments developed by partners from the ECONUTRI project and organic products available from BIN2BEAN living lab project partners, as N sources. Thus, giving some insights into potential of the organic amendments as resources to adjust mineral side- or top- N dressing while subsequently still increasing N use efficiency. The app predicts N mineralization and leaching in bare soil (no plant N uptake is yet included in the app). SNOMIN has also been coupled to crop model WOFOST but is not yet available on Farmmaps.

Methodology

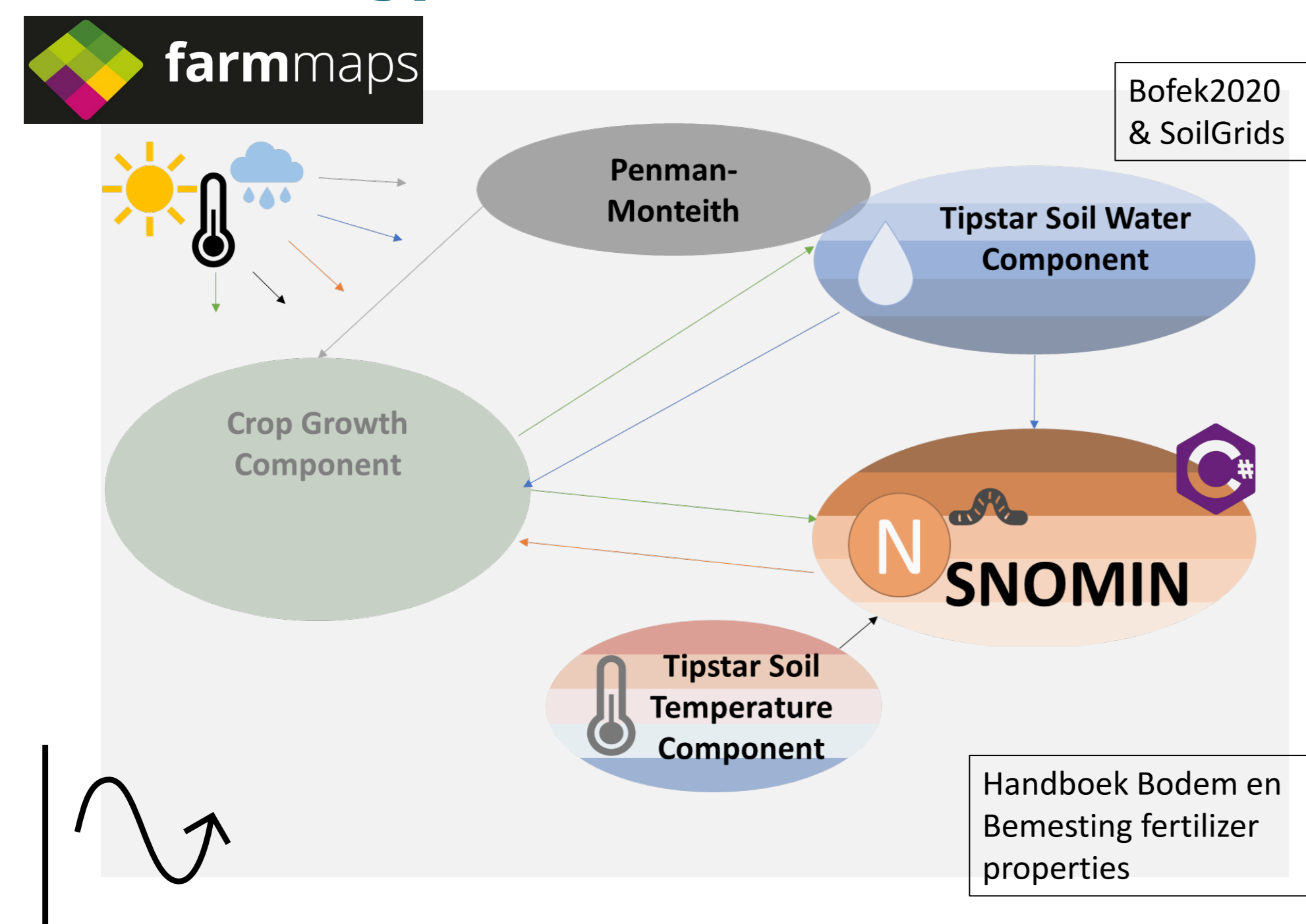


Figure 1. Graphics of methodology and EcoBin app data flows.

Results

Crop Recording

Operations **Soil observations** New

Description Choose operations ▼

Type	Date	Name	Method	Product	Quantity	Unit	
Fertilizing	1-8-2025 13:45	Fertilizing	Side band application	Kalkammonsalpeter (KAS 27%)	40	kg/ha	Delete
Fertilizing	15-7-2025 13:44	Fertilizing	Side band application	Kalkammonsalpeter (KAS 27%)	40	kg/ha	Delete
Fertilizing	1-7-2025 13:43	Fertilizing	Side band application	Kalkammonsalpeter (KAS 27%)	40	kg/ha	Delete
Fertilizing	22-5-2025 16:07	Fertilizing	Side band application	Runderdrijfmest, samenstelling nr 14	35,000	kg/ha	Delete

« 1 »

Figure 2. Farmmaps input screen.

The EcoBin app has its user interface on farmmaps and will be reachable through farmmaps API by December 2025.

Results

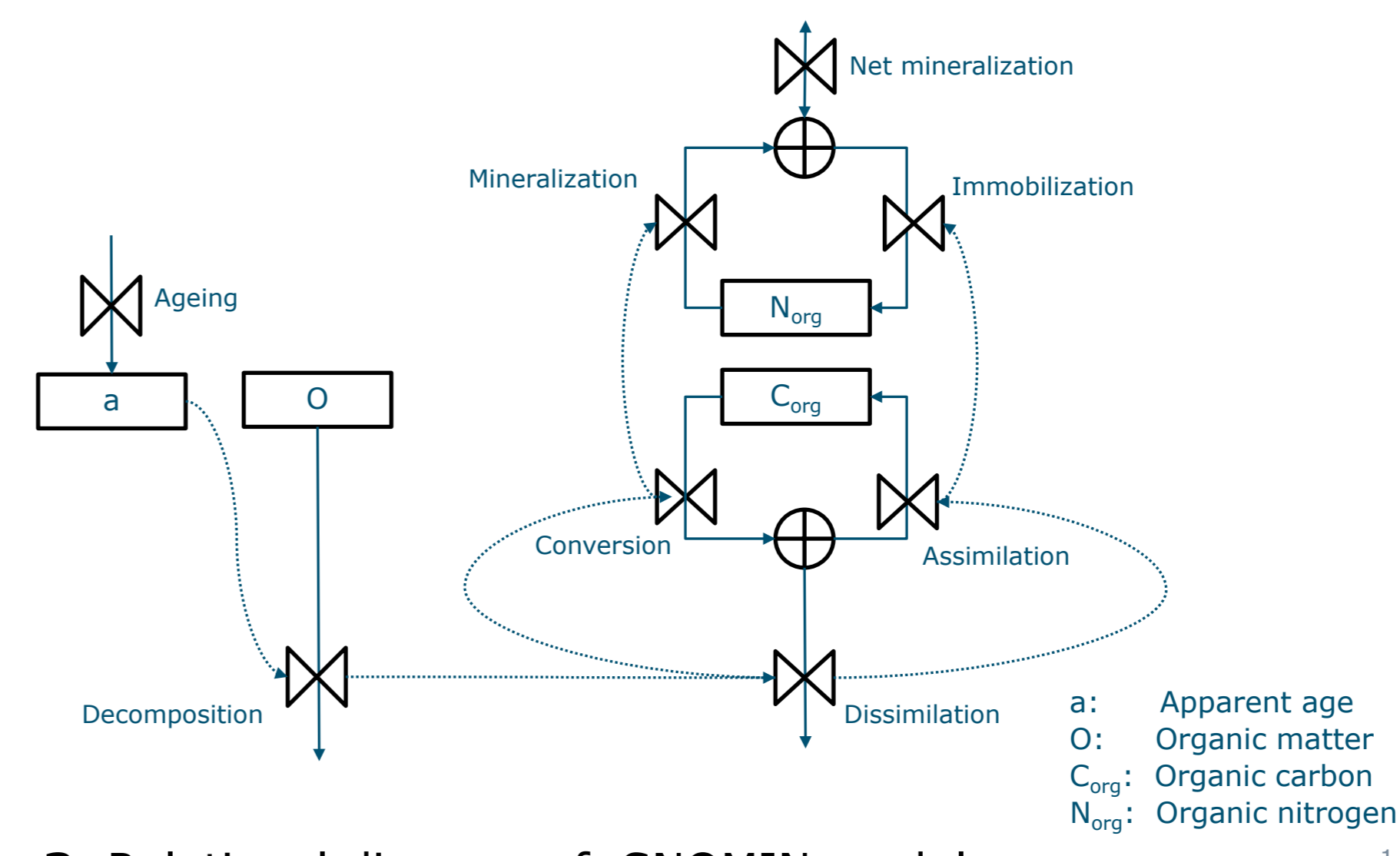


Figure 3. Relational diagram of SNOMIN module.

Results

Available by December 2025 on farmmaps.eu

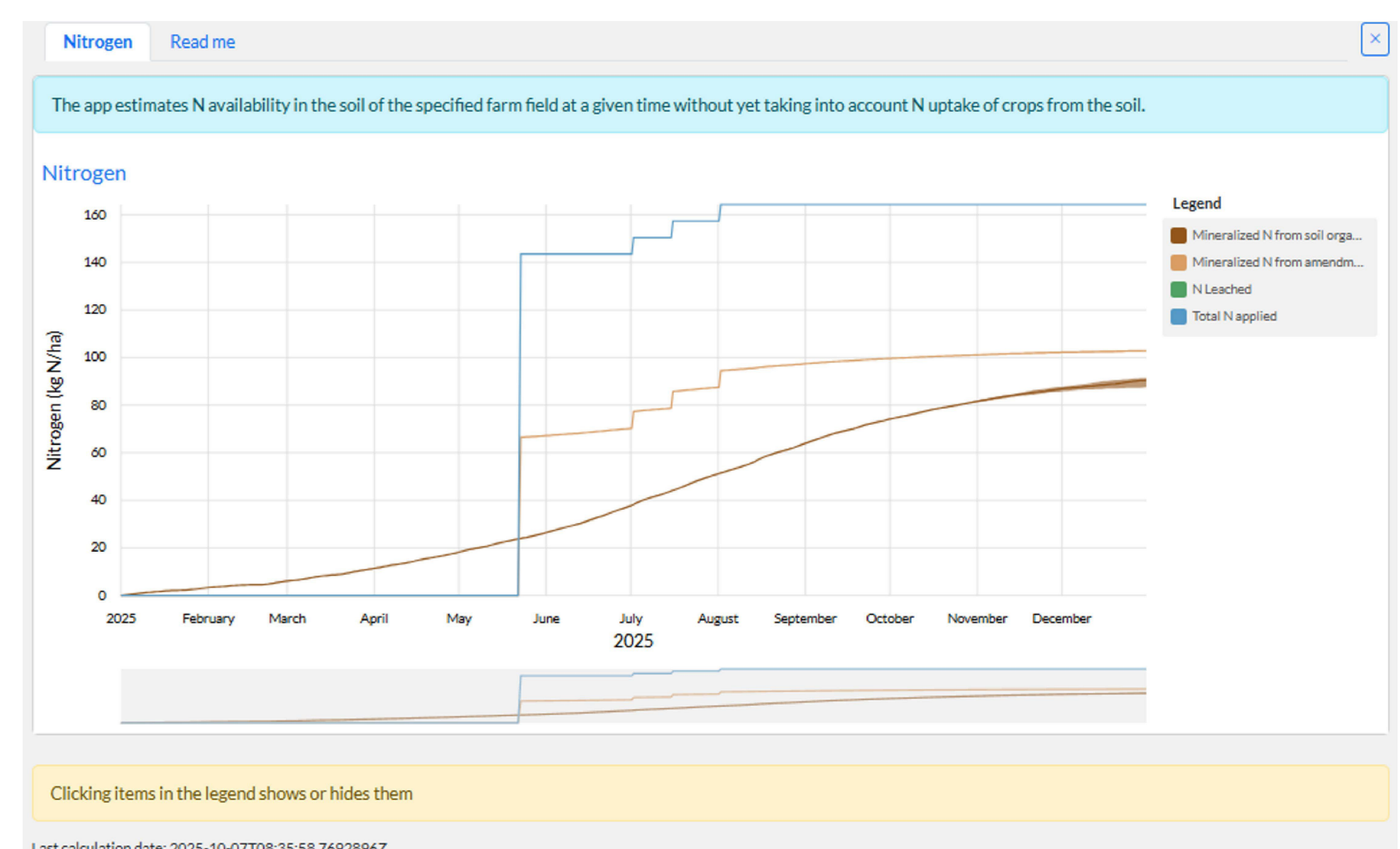


Figure 4. Farmmaps EcoBin app output.

Conclusions

Based on the information from the app, end-users may deduce how the amount of N available to the crop develops over a growing season. This can be used to reduce the total quantity of chemical fertilizer to be applied as top or side dressing. The impact that the added organic amendment has on the total mineralized N is shown in the app. Furthermore, the app estimates mineralized N at future dates, which can also be considered when calculating the quantity of chemical fertilizer as top or side dressing.

Additional to the mineral and organic fertilizers currently in farmmaps, compost and soil amendments produced by the ECONUTRI and BIN2BEAN projects will be added as fertilizer options for the app.

Acknowledgements

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