

## Getting the biomass graph

To arrive at the biomass graph, you must go through the following steps:

1. Add a field
2. Complete the fertilization data under field actions
3. Enter the harvest times under field actions
4. You will then see the graph appear under biomass

## Explanation model

This graph presents predictions of grass yield and crude protein content using trained Random Forest models. Two separate models were developed: one for predicting protein content and another for yield.

The models were trained using output from the Lingra-N-Plus grassland growth model—a process-based crop model that simulates grass growth based on inputs such as soil characteristics, meteorological data, fertilization, irrigation, and timing of grass cuts. More information about the model can be found in Giannitsopoulos et al. 2021.

Meteorological data are extracted from a 5 km resolution KMI grid, while soil data are obtained from the Belgian soil map. All other input data is extracted from the WIG database linked to each field.

The Random Forest models were trained and validated using k-fold cross-validation. The crude protein model was trained on 323 observations from 12 fields collected during 2022–2023. The yield model was trained on 402 observations from 34 fields collected during 2015–2021. All fields are located in Flanders, Belgium.

In the table below the evaluation metrics of the models are given.

	<i>protein random forest [kg/DM]</i>	<i>yield random forest [DM kg /ha-1]</i>
<i>Mean Squared Error (MSE)</i>	0.002	466476.46
<i>Root Mean Squared Error (RMSE)</i>	0.041	682.99
<i>R-squared (R2)</i>	0.22	0.80

## References

Giannitsopoulos, M.L.; Burgess, P.J.; Richter, G.M.; Bell, M.J.; Topp, C.F.E.; Ingram, J.; Takahashi, T. Modelling the Interactions of Soils, Climate, and Management for Grass Production in England and Wales. *Agronomy* 2021, 11, 677. <https://doi.org/10.3390/agronomy11040677>