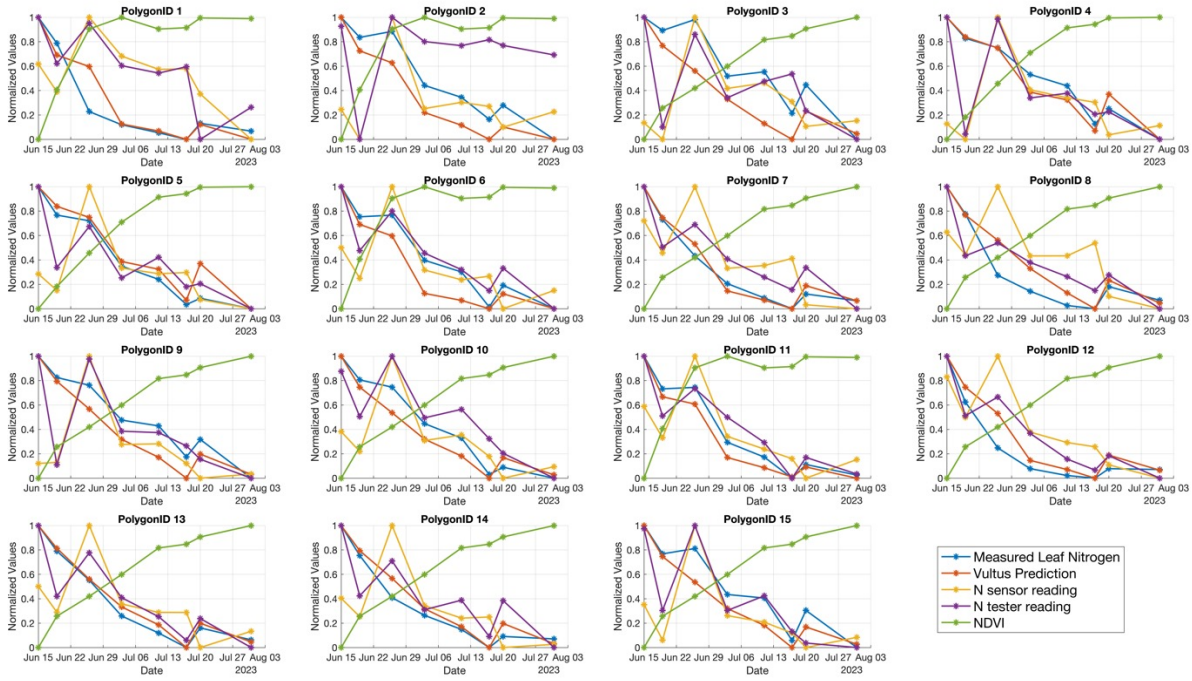
VULTUS

# Potato Leaf Nitrogen model

**Vultus potato leaf nitrogen model was developed using a dataset collected over three years by Lyckeby Sweden. This dataset includes measurements of leaf nitrogen content expressed in parts per million (ppm). Sentinel-2 satellite-derived indices, which represent fractions of absorbed photosynthetically active radiation, leaf area, and leaf chlorophyll content, were employed as input parameters for the model.**




The figure illustrates the normalized values of measured leaf nitrogen (depicted by the blue dotted line), Vultus model predictions of leaf nitrogen (represented by the orange dotted line), YARA sensor readings (indicated by the yellow dotted line), YARA tester readings, and the Normalized Difference Vegetation Index (NDVI) derived from Sentinel-2 data (shown by the green dotted line) for 15 different trial plots.

The NDVI values increased from June 15th to the end of July, corresponding with the development of canopy density in the crops. Conversely, leaf nitrogen content decreased over time, as fertilizer was applied prior to planting, a trend clearly depicted by the measured leaf nitrogen content. The Vultus model predictions closely followed the trend of measured leaf nitrogen, particularly in plots with nitrogen application rates ranging from 50 to 150 kg/ha. In contrast, the N sensor and N tester exhibited higher fluctuations, particularly during the second and third measurement intervals.

In conclusion, the Vultus leaf nitrogen model demonstrated superior predictive accuracy compared to the N sensor and N tester readings in this study. Despite the limitations imposed by the spatial resolution of satellite imagery, the findings indicate significant potential for utilizing satellite images to predict leaf nitrogen content at both plot and field scales.

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