

## **Abstract**

**Title: Neuronal networks driving the ‘traffic light system’**

**Authors:** Dr. Sebastian Fritsch, Heiko Fabritius (green spin GmbH, Würzburg, Germany)

In 2017, green spin started a cooperation with the Bavarian State Ministry of Food, Agriculture and Forestry (StMELF) to make the first steps towards the introduction of monitoring for subsidy controls. The goal was to set up a framework to use Copernicus data for crop type detection (e.g., to assess crop diversification) and to gain experience with relevant markers.

Altogether, 170.000 fields (with approximately 530.000 hectares) were analyzed in the process. We elaborated a framework for an automated monitoring with Sentinel 2 and, partially, Sentinel 1 data. An artificial neural network (multilayer perceptron, or MLP) was applied to detect 19 different crop categories (containing 56 different land use types).

The quality of the results was very good overall, with most crop categories having a classification accuracy of more than 95%. We applied a preliminary traffic light system that makes use of these results, to quickly highlight areas that require further action.

We conclude that we established an automated crop classification system with very high accuracies, as a basis for future monitoring tasks. The technological framework is ready to be applied in other European geographies for quality assessment.

About green spin: We are experts in remote sensing analytics and artificial intelligence for the agricultural market. Get in touch with us to shape the future of agricultural monitoring together.