

# Meadow orchard detection using deep learning

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19.07.2024

## Introduction

As ecologists using remote sensing, most methods are based on spectral properties. However this method has its limitation in detecting spatial patterns reliably, like meadow orchards. Deep learning could prove to be a vital tool to complement established methods. Presented are the preliminary results, as final adjustments are still open.

F1 | Training area in NRW-DE

## Methods

### Data

DOP & DLM NRW  
VGG16 model

### Data augmentation

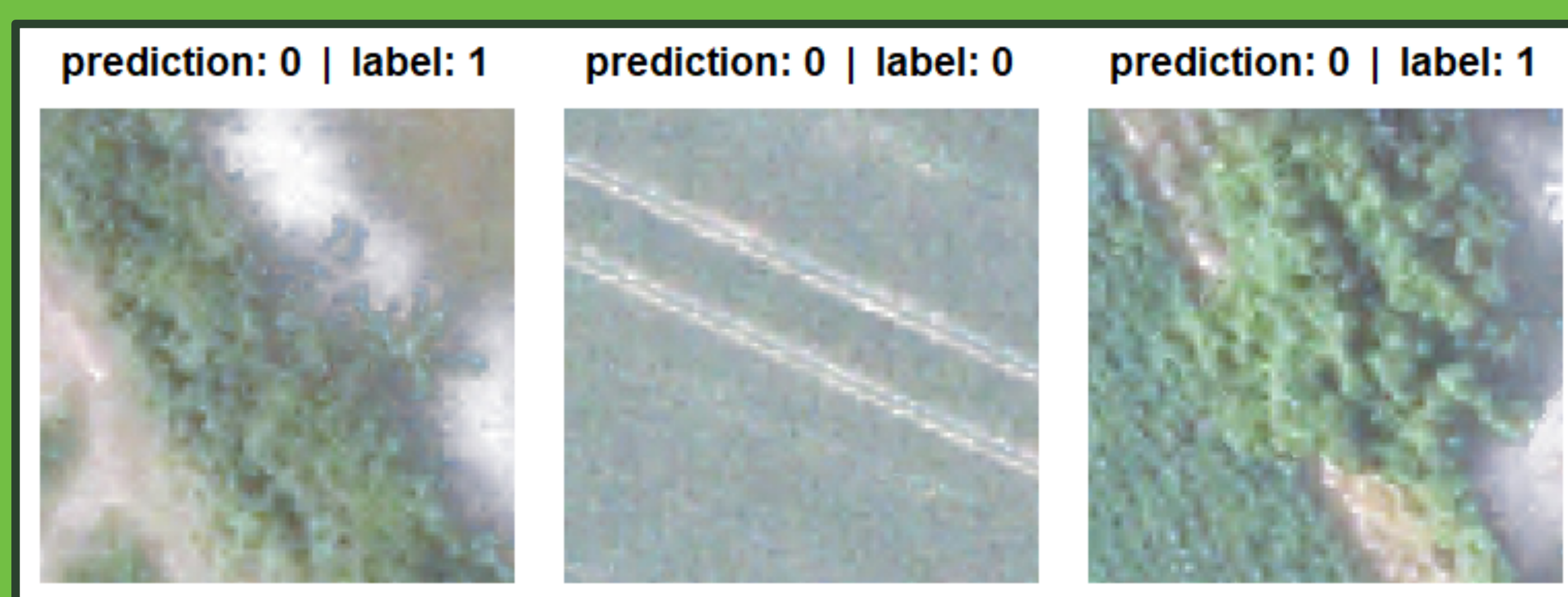
Cut raster into  
128x128 jpegs  
Flip and mirror  
images

### Train model

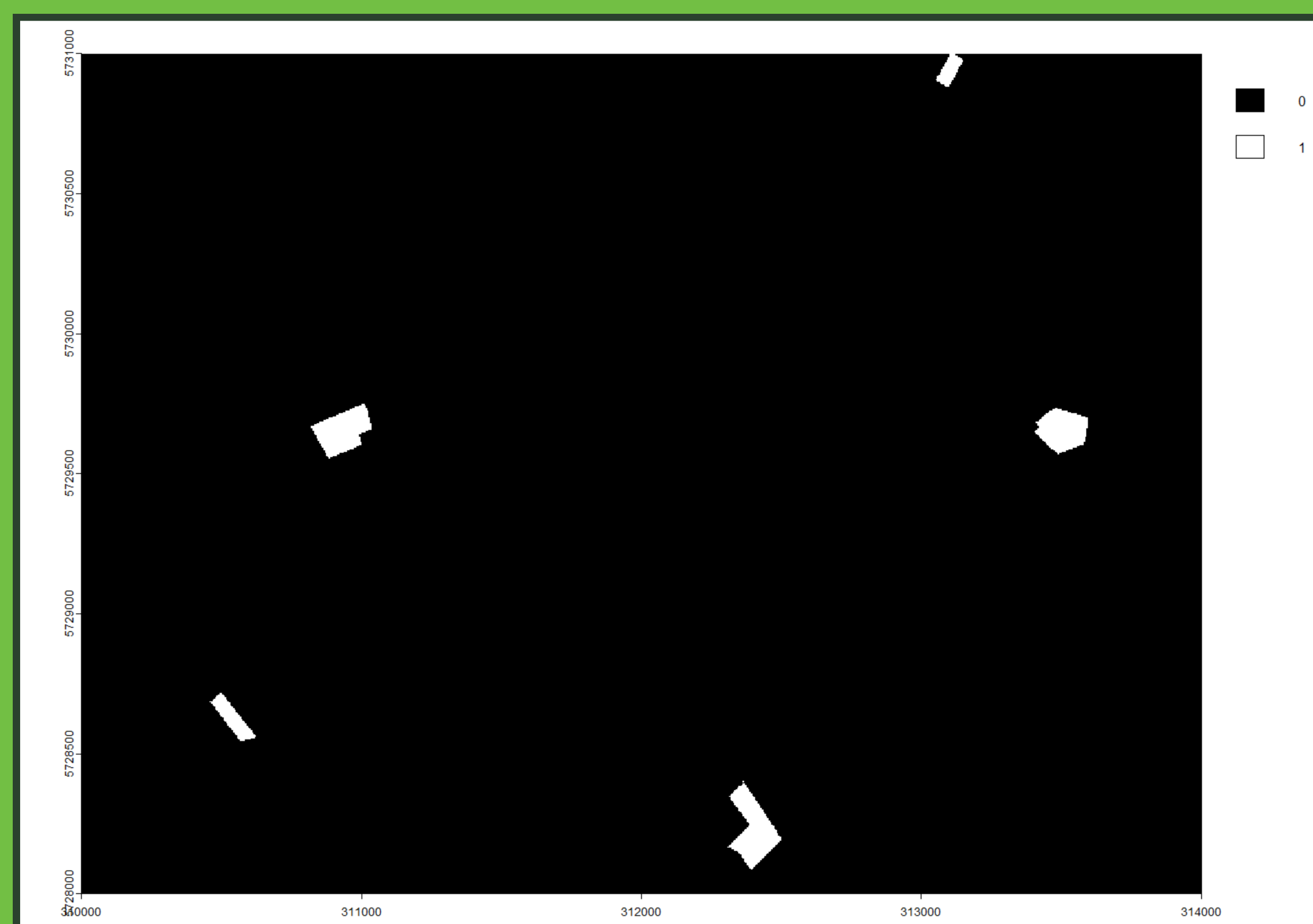
True & Fals data  
Pre trained model  
for edge detection

### Predict & Validate

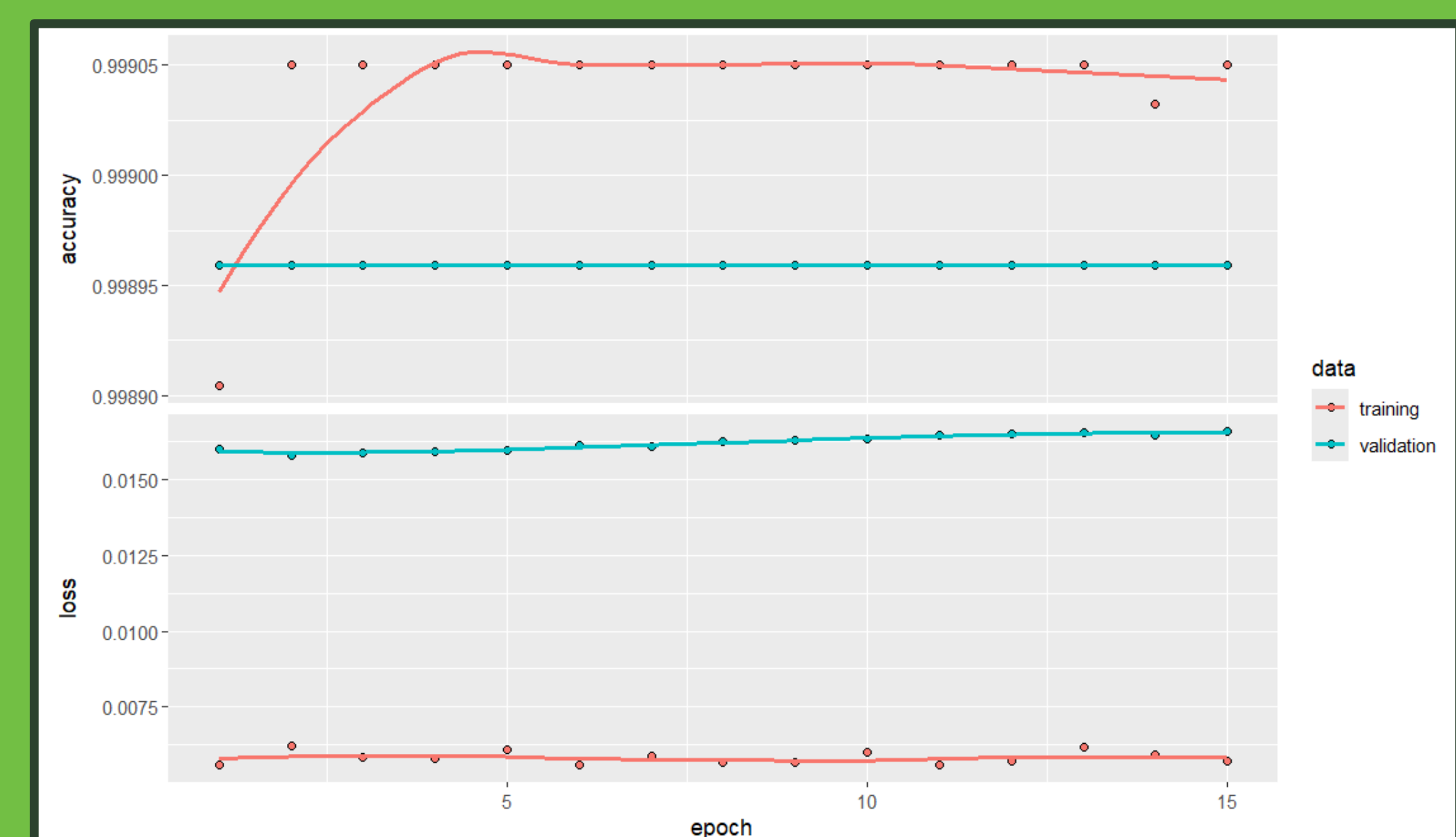
## Results



F2 | Predictions for the individual image tiles and the label assigned by the mask



F3 | Mask as training input for the model showing the meadow orchards. Final prediction will produce a similar output as result.



F4 | Fit of the trained model to the validation data. Close lines indicate a good fit of the model

## Outlook

Next and final steps will be the creation of a prediction map, similar to the mask shown. Finally a validation using the test data will be performed, assessing the quality and applicability of the model.



Final results and all data  
will be available on GitHub

**Sources:**  
[https://dachro.github.io/ogh\\_summer\\_school\\_2020/tutorial\\_DL\\_UAV](https://dachro.github.io/ogh_summer_school_2020/tutorial_DL_UAV)  
Vector shapes by uecteezy.com  
Software: R 4.4.1, Rstudio 2024.04.2, Python 3.12, QGIS 3.28.11-Firenze, Windows 11

Remote sensing based analysis of environmental change | SS 2024

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