



Miljø- og
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Satellites reveal nitrogen loss	Ansvarlig	NHKR
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Projekt: [4165, SAT-N]		

Abstract submitted for ECPA 2019 Satellites reveal nitrogen loss

By using new satellite technology this project aims to reveal the amount of nitrogen uptake by catch crops and, thereby, enable a more precise prediction of the nitrogen need for the following crop. The method will be implemented in Denmark through a unique fertilizer planning platform used by almost all Danish farm-ers. Catch crops retain nitrogen during autumn and winter, and release it for the following crop. Therefore, the total need of the following crop will be dependent on the amount of retained nitrogen. For this reason, and since catch crops is a substantial part of the Danish regulation, nitrogen leaching in Denmark could be significantly reduced by predicting the nitrogen uptake in catch crops. In 2018 the claim for mandatory catch crops is about 15 percent of the total agricultural area and will be 25 pct. in 2021. Firstly, the most suitable spectral bands for measuring nitrogen uptake in catch crops will be found. Secondly, the project aims to establish a relationship between the satellite measurements and the amount of nitrogen in catch crops. The method includes selecting 40 fields each year, where nitrogen uptake is measured in the plant material. Satellite data from the same fields enable establishment of a relation between the satellite index and nitrogen uptake. As a supplement, soil samples will be taken in the same fields in the following spring, which will measure N-min (mineral nitrogen). Preliminary results with only 13 data points show a positive relationship between NDVI of catch crops in the autumn and the nitrate content (25-50 cm) in February ($R^2 = 0.40$). Most of the catch crops in Denmark are fodder radish which is destroyed by ploughing or by frost. The hypothesis is that, higher NDVI reflects higher nitrogen uptake, and more nitrogen is available as ni-trate in February. Measurements were also done in oilseed rape fields, and with only 13 data points a negative relationship was found between NDVI in autumn and N-min (0-100 cm) in February ($R^2 = 0.52$). This may reflect that high nitrogen uptakes will reduce nitrogen content in the soil, since oilseed rape is not destroyed by frost. Autumn 2018 is the first year to measure nitrogen in the plant material. The vision is to implement the method to run automatically in the fertilizer planning system in the whole of Denmark without any extra input from the farmer.

Dear Mrs Kristensen,

It is our pleasure to confirm that your abstract entitled "**Satellites reveal nitrogen loss**" with abstract number **30186**, that you submitted for the ECPA 2019 has been accepted by the Scientific Committee as a **Poster** presentation in Topic 07 (Satellite-based applications for Precision Agriculture). Please find below further submission details and congress information.

We invite you to prepare and submit an extended abstract of 2 pages to be included in the book of poster abstracts. The abstracts will be checked and may be returned to authors for revision.

Submitting your extended abstract

Information for extended abstracts submission will soon be available on the website of the conference. When preparing your manuscript please strictly adhere to the authors instructions. The guidelines will be available on the Conference Website (<http://ecpa2019.agrotic.org/>). Abstracts must be written in English (British spelling). Prior to submission please have your abstract checked for correct language by a native English speaker. Abstracts with serious linguistic shortcomings will not be accepted for publication.

The submission deadline is 1 May 2019.