

# Crop sensing and phenotyping for precision agriculture

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## ABSTRACT:

Precision agriculture is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. When applied, it allows an increase of agricultural production with less use of resources. Essential for precision agriculture is access to accurate and timely data on spatial variation within crops, including soil, micro-climate and pest and disease data.

A wide range of technologies is known for capturing the variation. Non-destructive technologies are preferred in terms of costs and large-scale applicability. Only a part of the technology has reached practical use so far. Mostly used technologies in precision agriculture today are spectral sensors. An overview will be presented on advances in crop, soil, weeds, pests and disease sensing using different technologies, and use of spatial data in arable crop management. The focus will be on arable crops and grassland common in North West Europe. Results with precision agriculture in potato show that resource use can be reduced by 15-30% (pesticides and Nitrogen) when crop reflection data are used to optimize crop management at a scale of 10-50 m<sup>2</sup>.