

Spectral responses of sulfur deficiency in oilseed rape - first results of a field experiment

Holger Lilienthal, Heike Gerighausen, J. Krieger and Ewald Schnug

Institute for Crop and Soil Science, Julius Kühn-Institut (JKI), Braunschweig, Germany (E-mail: holger.lilienthal@julius-kuehn.de)

Sulfur deficiency in oilseed rape is clearly visible during flowering due to distinct color differences. Whilst sulfur deficiency is characterized by lightened white flowers, plants with good sulfur supply have strong yellow flowers. Remote sensing can be a tool to detect sulfur deficiency at flowering, especially with the advent of the *European Copernicus Programme* and its Sentinel-2 high resolution satellites. The imagery repeat frequency is five days at equator and even 2-3 days at higher latitudes, like in Germany. Remote sensing of oilseed rape at flowering must take place at the full bloom of the plants, since early or late flowering phases can falsify the result. Since this time span cannot always be covered by satellite remote sensing at regional scale, the spectral response of the plants under sulfur deficiency at other phenological stages needs to be investigated. A field trial has been performed to identify the spectral behavior of oilseed rape under different fertilizing conditions und phenological stages. Ten different genotypes and two different nitrogen (200 and 100 kg/ha), as well as two sulfur levels (40 and 10 kg/ha) have been applied. The plots were spectrally measured during the vegetation period to determine possible spectral indications for the detection of sulfur deficiency in oilseed rape next to the time of flowering.