

Transnational workshop 18 October 2019 Landwirtschaftskammer Haus Riswick, Kleve

Precision farming - using new technologies to optimize grassland systems

Research institutes and companies are steadily developing tailor-made solutions to optimise grassland systems. These technologies have still to be implemented into practice. Current precision farming technologies such as GPS-based parallel driving systems are rarely used for grassland management, even though they offer a great potential for improving resource efficiency and monitoring plant development. In the future, tools may be used to acquire data on yield, quality parameters, vegetation structure, species composition, and plant development status. These field-specific data can assist the farmer in the decision-making and grassland management. Reliable precision farming applications can only be developed, if scientists, entrepreneurs, and end users collaborate. The transnational workshop "Precision farming - using new technologies to optimise grassland systems" has been organized to provide a platform for knowledge exchange, networking, and cooperation crossing borders to allow synergistic effects for future developments. Experts from Austria, Belgium, Denmark, Germany, and the Netherlands are invited to present their work.

Welcoming speech of Dr. Franz-Josef Stork (Functional manager, Versuchs- und Bildungszentrum Landwirtschaft Haus Riswick, Kleve). Dr. Franz-Josef Stork introduced the INTERREG project Spectors as a platform where knowledge exchange and networking come together in which this workshop fits very well. He thanks the organizers of this workshop the Landwirtschaftskammer NRW, Wageningen University, Hochschule Rhein Waal and the Nederlands-Vlaamse vereniging voor Weiden Voederbouw (NVWV). Also Conny Bufe (chair of the NVWV) welcomed everybody and gave the word to the moderator of this day Lammert Kooistra.

Peter Lootens from ILVO Belgium gave a good overview of different sensors and carriers which can be beneficial for both farmer and breeder. Plant height - which correlates well with biomass - can be measured with rising plate meters, but High Resolution cameras can show also the variation within plots. Thermal cameras can be used to show differences in drought tolerance.

Idse Hoving of Wageningen Livestock Research showed the work on measuring and predicting the yield and quality of grass with modelling and sensors. With a combination of reflection measurements (WDVIred) and grass height dry matter yield could be predicted well. Like Peter Lootens showed saturation of results occurs at relative high yields.

Lammert Kooistra of Wageningen University & Research showed the work within the Spectors project of the possibilities to collect information with high-resolution remote sensing cameras when to harvest and about the grass quality. The used cameras and models gave quite good results of the separate cuts, but due to variation within a growing season the use of one model throughout the year did not fit.

Soren Skovsen of the Aarhus University presented the research of making maps of grass clover fields with cameras. With an input of a lot of pictures based on deep learning models splitting grass, clover and weeds was possible. Which can be used to apply different N-fertilization levels. Remarkable even white and red clover could be distinguished.

Andreas Klingler of HBLFA Raumberg-Gumpenstein Austria showed the results of monitoring grassland growth dynamics using Leaf Area Index from a satellite (Sentinel-2). With a photo every 5 days resulting in a LAI dry matter yield could be predicted quite well and in the future the results can be used to estimate the mowing date and optimal fertilization and irrigation moments and levels.

After a very good lunch four short pitches were given.

Koen van Boheemen (Wageningen Plant Research) presented the research of precision fertilization on grassland. To make use of differences in organic matter content, collected with Veris soil scan, in two trials several monitoring and measurements are done this year and next coming years.

Prof Georg Bareth of Universitat Koln showed the difference of spectral crop and nonspectral crop traits. Combining RGB images and 3D features were a good predictor for crop height and biomass and can replace the rising plate meter.

David Stablein of the Bayerische Landesanstalt presented the determination of cutting frequencies using the satellite Sentinel-1. Which could be a cost and time efficient method to integrate in grassland yield models to predict crop yields.

Gerber van Vliet from the Luxembourg ministere de L'Agriculture gave another perspective how - as a small country with comparatively a small agriculture importance— promote grazing. Using pilot farms to implement new technics like the rising plate meter and publish the results weekly.

During the day participants could see some sensors and possible uses presented by 5 companies. And afterwards an interesting excursion in the stables of Haus Riswick.