2nd Newsletter



Decision Support for Optimized Site-Specific Fertilization based on Multi-Source Data and Standardized Tools

Field experiments

The iFAROS project has successfully finished the second year of experiments involving site-specific fertilization on winter wheat. The experiments took place at four locations, in Germany, Spain, Belgium, and Switzerland.





Specific fertilization strategies for each field were developed by

As the fertilizer is being applied, the Task Controller also records the actual applied dose rates. The "as-applied" map is produced using the distribution data from the spreader. By having this information the application error can be defined by comparing the prescribed rates from the applied ones.



Agroplanning (Spain).

A drone was used as UAV to carry a multispectral camera over a specified field to collect airborne data. The multispectral camera combined with an irradiance sensor was used to capture crop reflectance data.

Airborne data, in terms of spectral information of the specified fields, were acquired twice (before and after the application of fertilizer) for each growth stage of the crop plants where the fertilization was carried out.



The acquired data were processed using the Pix4D software to calculate the NDVI (Normalized Difference Vegetation Index) for biomass assessment of the fields.

The obtained multispectral information was used to develop a sitespecific Nitrogen fertilization application map. This year's experiments involve three zones, to examine how the spreader is coping with the changes in the dose rate. The prescription map was uploaded to the tractor Terminal where the Task Controller of ISOBUS is responsible for controlling the

fertilizer spreader as the tractor is driving in the field.

speed and machine dynamics of the spreader are also considered.



- DLG Field days event was planned to take part in Gut Brockhof (Germany). The event will be organized next year (8-10. June). The University of Hohenheim will have its stand there presenting the iFAROS project;
- ISEKI-Food Conference supposed to be organized in Nicosia (Cyprus). The conference is rescheduled to the next year at the same location (23-25. June). The iFAROS partners are planning to visit the conference and present the project;
- ICT 2020 Leading the Digital Age was planned to happen in December, in Cologne (Germany). Unfortunately, this event is canceled. The possibility to bring the event to 2021 will be explored. In case, the event will be organized next year, the iFAROS consortium is planning to have a project's stand.

We will keep monitoring the situation and looking for any raising opportunities to present the project at further events.

HAICTA 2020

Ground-truth validation is an essential aspect of the iFAROS project. This is why crop samples were collected to assess the accuracy of the biomass estimation through the NDVI measurements. Furthermore, targeted manual sampling also took place right before harvesting.



The iFAROS project will be presented at the International Conference on Information and Communication Technologies in Agriculture, Food & Environment (HAITCA 2020). The conference will be held in Thessaloniki (Greece) on the 24-27. September. The event is planned to be organized as a physical meeting. In case, the situation will change, the presentation will be done virtually.

New publication

The project was presented at the 1st Virtual IFAC World Congress. The publication will become available under open access starting from October 2020. The link will be posted on our website: ifarosictagri.com.

Evaluation of Centrifugal Spreader Response to Variable Rate Application by Using Task File Data

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Abstract: In the site-specific fertilization based on a variable rate prescription, the application accuracy and distribution of the spreader are the key points when it comes to applying fertilizer with centrifugal disk spreaders. The application error occurs mainly due to inaccurate position, the delayed response of the spreader to rate changes and application width errors across the management zones. This study aims to evaluate the application error occurring due to rate changes at management zone boundaries across the application width of the spreader. Towards this aim, a variable rate fertilizer application was performed using a centrifugal spreader. The performed task data that included a spatial field application file in ISO XML format was recorded from a dedicated in-cab terminal to generate the "as-applied" point map. A two-dimensional (2D) matrix method based on a 2D triangular distribution was used to generate the asapplied rate to examine if it results in more accuracy to assess the applied amount of fertilizer at intersections of the management zones. The resulted "as-applied" map, as well as the raw data one, were compared with the prescription map to extract absolute errors. Statistics of absolute error resulted from the comparison was assessed to examine the application accuracy. The mean value and standard deviation of the error for the distributed rate were 13.4 and 11 kg ha⁻¹. These figures were equal to 17.5 and 12.7 kg ha⁻¹ for the error of the raw data "as-applied" map. Evaluation of covered area by the error in percentage also indicated a higher value for the raw data "as-applied" map than that for the distributed one.

Stay in contact

We will be happy to see you at our Twitter account: @lfarosP. Should you have any questions or want to share any news with us, please get in contact with the coordination team:

Dr. Dimitrios S. Paraforos

The spread of the coronavirus has strongly influenced the scientific community all over the world. Due to the situation, several events, in which the iFAROS project was planned to be presented, were canceled or rescheduled to the next year:

COVID-19 situation

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