REMOTE SENSING AND COVER CROPS

Technology enabling increased nitrogen use efficiency in herbaceous crops, specifically by using remote sensing that enables adjustment of the fertiliser (N) dosage and its use efficiency, and the use of cover crops in irrigation systems to be improved.

Contact information

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Technological Offers type

Technological scientific services

Research and innovation areas

- Agriculture, Forestry, Natural Resources, Land Use and Blue Growth
- Digital Technologies, Artificial Intelligence, Cybersecurity, 5G, Robotics
- Space and Earth Observation

ODS

Available from: 2015

Where?

Agricultural Environmental Risk Management Research and Study Centre (CEIGRAM). Joint UPM-ENESA-AGROSEGURO Centre
Agricultural Systems Group (AgSystems)

Keywords: | arable crops | Efficiency in the use of nitrogen | field spectroradiometer | FLIR thermal imaging camera | humidity sensors | hyperspectral sensors | image analysis | multispectral camera | sensorization | water and nutritional stress in crops

Remote sending and cover crops to increase nitrogen use efficiency in herbaceous crops

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Description of the services offered

1. Use of remote sensors to adjust the dosage of nitrogen fertilisers
2. Calculating indices of the crop¿s nutritional status
3. Use of cover crops to decrease nitrate leaching and increase the NUE (nitrogen use efficiency)

Needs requested and applications

The agricultural industry¿s adaptation to the European Green Deal compels improvement to efficiency in the use of resources in agricultural systems over the next decade (2030). At the AgSystems Research Group we do specialist reports and consultancy on the efficient use of resources in crops and we help in designing and reviewing industrial research studies aimed at constructing innovative solutions. We provide facilities, equipment and human resources to carry out product studies and testing, and always seek the best way to protect the research results.

Sector or area of application

Nitrogen and phosphate fertiliser companies, remote sensing

Differential skills

The Agricultural Systems Group (AgSystems) consists of 9 doctorate researchers, 3 trainee researchers and 1 technicians and is led by the Senior Lecturer, Miguel Quemada. The services are carried out by specific staff who are highly qualified, technically and in research, in data processing, the use of hyperspectral and thermal sensors to detect hydric and nutritional stress in crops, geographical information systems (QGIS and ARCGIS) and image analysis, ensuring the high quality of the services offered by the group.

Visit the group's web site: https://ceigram.upm.es/grupos-de-investigacion/grupo-sistemas-agrarios/.

Previous references for provision of services

Over the past 5 years, the group has taken part in 21 projects with companies, foundations and associations in the fertiliser, seed and horticulture industry, associations of producers and agricultural insurance, and directed 4 Spanish projects and 5 international projects (SolACE, Towards INMS, Climate-KIC, MACSUR2, DIVERSify) and taken part in two regional projects (AGRISOST) using the technology set

out in this offer.

Enterprises the group has worked with: Symborg S.L.U¿ Eurochem Agro Iberia S.L.; Syngenta; Agroseguro; Fundación Intermon Oxfam; Unión de Pequeños Agricultores (UPA); Hispánica del Led S.L

Collaborating public research centres: INIA, Environmental Sciences Centre-CSIC, IFAPA Centre (Andalusia Government), CSIC, U. Rey Juan Carlos and CIEMAT

Equipment description

Agricultural Systems Equipment (GI-AgSystems)
to detect hydric and nutritional stress: Set of equipment for measuring physiological parameters in crops, the environment and the soil, of which the following are noteworthy: Field spectroradiometer, 330-1100 nm SVC range, for acquiring spectra in leaves, soil and minerals, FLIR thermographic camera, multi-spectral camera (Tetracam), FDR soil moisture sensor (40) for taking measurements in up to 12 places (including data recorders and solar panels), portable FDR (Diviner) soil moisture sensor for acquiring measurements up to 1m, portable equipment for measuring NDVI (Greenseeker), chlorophyll activity (SPAD), anthocyanins and nitrogen balance index (Dualex), and HOBO field rain gauges.

Request for service

A **request** for service can be made by contacting the science officer **Dr.**

Miguel Quemada Sáenz-Badillos via the e-mail miguel.quemada@upm.es or the CEIGRAM Research and Innovation Management Team, via the e-mail ceigram.etsiaab@upm.es

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