

Optimization of fertilization through sensors and precision agriculture methods

Riferimenti

Tipo di progetto

Gruppo Operativo

Acronimo

Consensi

Tematica

Agricoltura di precisione

Information

Time frame

2019 - 2022

Durata

36 months

Partners (no.)

9

Regione

Lombardia

Comparto

Coltivazioni foraggere

Localizzazione

ITC48 - Pavia

ITC49 - Lodi

ITC4C - Milano

Costo totale

€697.875,09

Fonte di finanziamento principale

Programma di sviluppo rurale

Programma di sviluppo rurale

2014IT06RDRP007: Italy - Rural Development

Programme (Regional) - Lombardia

Parole chiave

Fertilisation and nutrients management

Soil management / functionality

Farming equipment and machinery

Farming practice

Agricultural production system

Sito web

<http://www.consensi.bio>

Project status

completed



Objectives

The ConSensi project is intended to rationalise and optimise nitrogen fertilisation for livestock feed crops with particular reference to maize, through the efficient integration of algorithms for the improvement of the use of data arising from mapping systems (soil, vegetative vigour and production) and devoted to variable rate distribution of liquid or solid wastewater and mineral fertiliser.

Activities

In order to achieve the objectives set, it is expected: the development of a prototype Rover (with automated driving with GNSS-RTK localization system) for electromagnetic soil mapping and equipped with autosampler, the development of NIR predictive models for the estimation of the main parameters of agronomic interest of soil, the use of multi-spectral drone surveys for the detection of vegetation indices and for the development of a company-wide correction system for the data acquired by Sentinel 2 satellites, and finally the integration of data from the different platforms into a decision support system (SSD) able to provide advice for nitrogen fertilization.

Context

The agricultural sector in which the ConSensi project is involved is the production of maize for livestock feeding. The cultivation of maize for fodder use involves about 23% of the UAA for arable crops, coresponding to 52% for temporary grassland and grassland. A large part of the growing area (40% of the UAA in Lombardy, and 60% of the plain) is susceptible to nitrate water pollution because it is used in combination with large volumes of water and nitrogen fertilizers (Bechini and Castoldi, 2009), in addition with

livestock manure (Zavattaro et al, 2012), even outside the optimal cultivation periods. Moreover the nature of the soil of the Lombardy is generally loose and the hydrological system is vulnerable (superficiality of the aquifers and the presence of numerous surface watercourses). For these reasons, in order to preserve the quality of surface water and groundwater, regional legislation regulates the use of mineral fertilisers and livestock manure in Lombardy. Today there are precision agriculture technologies to characterize the soil and monitor crops with high spatial and temporal resolution, and for site-specific nitrogen application (Diacono and Montemurro 2012; Lemaire et al., 2008). Such solutions are interesting to support localised fertilisation plans, in order to further increase the efficiency of nitrogen use, increase the farm's economic margin and reduce the environmental impact of agricultural activity (European Union, 2016; Sartori et al., 2012).

Partenariato

Role	Azienda	Address	Telephone	E-mail
Leader	CREA - ZA - Centro di ricerca Zootecnia e Acquacoltura di Lodi	Viale Piacenza, 29 26900 Lodi LO Italy	0371 40471	za.lodi@crea.gov.it
Partner	Università degli Studi di Milano - Dipartimento di Scienze Agrarie e Ambientali - Produzione, Territorio, Agroenergia	Via Celoria 2 20133 Milano MI Italy	02 50316589	direzione.disaa@unimi.it
Partner	Condifesa Lombardia Nord-Est	via Malta, 12 25124 Brescia BS Italy	030 2548562	segreteria@codifebrescia.it
Partner	Fondazione Conte Gian Giacomo Morando Bolognini	Piazza Morando Bolognini, 2 26866 Sant'Angelo Lodigiano LO Italy	0371-211140	info@fondazionebolognini.it
Partner	Società Agricola Penati Luigi & Co	Piazza Monsignor Rossi, 2 20090 Basiglio MI Italy		

Role	Azienda	Address	Telephone	E-mail
Partner	Azienda Agricola Motti	via Vecchia 25034 Orzinuovi BS Italy		
Partner	Società Agricola Bonetti di Alessandro e Giacomo Bonetti	via Po, 1 20098 San Giuliano Milanese MI Italy		
Partner	Società Eli Alpi Service s.r.l.	Via Francesco Sforza, 43 20122 Milano MI Italy		
Partner	Consorzio Italbiotec	Via Gaudenzio Fantoli, 16/15, c/o Polo Scientifico Multimedita 20100 Milano MI Italy		

Pratiche abstract

Description

Development of a prototype Rover with automatic driving and a GNSS-RTK tracking system for electromagnetic soil mapping. The Rover will be equipped with an autosampler that allows the collection and transport of soil samples for reference analysis and NIR analysis on site.

Description

Development of NIR predictive models for the estimation of total soil organic matter and of the fraction of organic matter that can be easily mineralized. Determination of the total nitrogen content of the soil.

Description

Development of a decision support system (SSD) capable of maintaining soil organic matter levels through site-specific management of livestock manure and nitrogen fertilization. The SSD will be able to interface directly with the input data file formats and the file formats of the operating machines. Electromagnetic soil resistivity mapping data, soil NIR analysis, aerial vegetation surveys and production mapping will be integrated into the system.

Link utili

Ottimizzazione della concimazione mediante la sensoristica e metodi dell'agricoltura di precisione

4/4

<https://www.innovarurale.it/pei-agri/gruppi-operativi/bancadati-go-pei/ottimizzazione-della-concimazione-mediante-la>

Titolo/Descrizione	Url	Tipologia
Sito del progetto	http://www.consensi.bio	Sito web
Community Facebook Agroenergia& Innovazione	https://www.facebook.com/groups/1085840501809657/?ref=group_browse	Materiali utili