

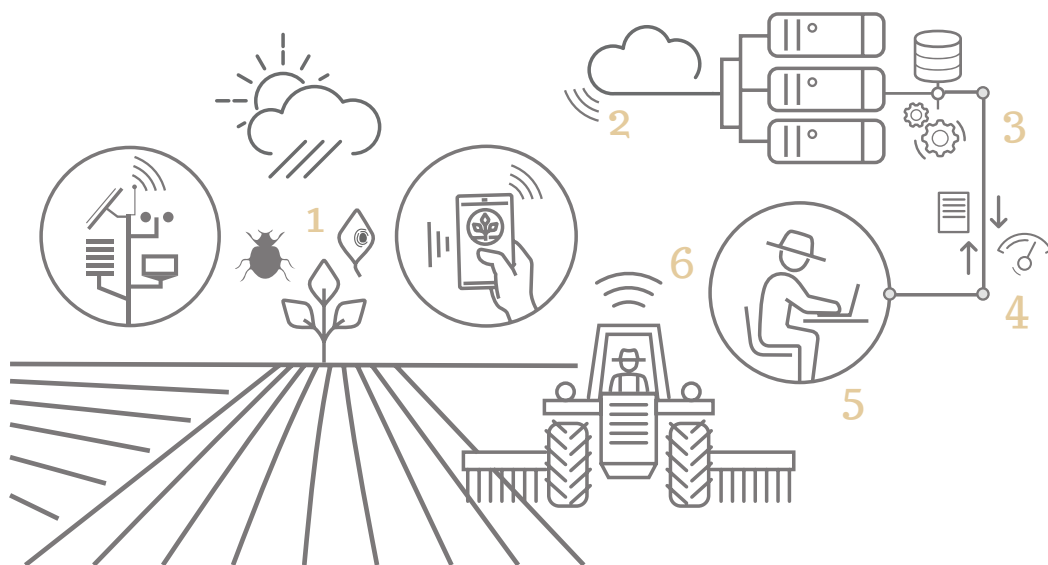
grano.net®

ENHANCE YOUR SOFT AND DURUM WHEAT PRODUCTION

What is grano.net®?

Starting from 2014, Horta has created grano.net for soft and durum wheat®: an interactive web-based tool for high-quality sustainable wheat farming, certified by the [CCPB of Bologna](#). grano.net® is a DSS - an expert Decision Support System.

DSSs are IT platforms that collect crop data in real time, through sensors and scouting tools (1), organize the data in Cloud systems (2), interpret them via advanced modelling and big data techniques (3), and integrate them automatically, generating information, alarms and decision support advice (4). Users resort to these data for precision crop farming management (5). Databases (6) also include farming data, so as to generate a continuous flow of updated information between the crop, the DSS and the user.



SYSTEM ARCHITECTURE

The crop and farming environment data are sent to grano.net® on a continuous basis, through sensors and monitoring activities.



HOLISTIC APPROACH

grano.net® considers all aspects of farming techniques.



WEB APPLICATION

No software PC installation required. The system constantly updates the apps.



EASY AND CLEAR

grano.net® can convert complex climate and farming processes into easy and clear on-field choices.

grano.net® - Background

Horta DSSs are the result of a complex innovation and knowledge transfer process.



Agro-Meteorological Network

Horta manages a network with hundreds of agro-meteorological stations across Italy. Weather data - gathered through a certified quality system ([CCPB of Bologna](#)) - supply key information in real time to the DSSs.



Experimental Platforms

CÀ BOSCO (Ravenna) and LA QUERCIA (Foggia)

On its experimental platforms, Horta creates and tests the innovative techniques used in the DSSs. Platforms can be visited during the season, to assess the quality of the solutions offered first-hand.



Customer Service

Horta offers a complete service. Horta technicians guide users in getting to know and using the portal, and help them take full advantage of all DSS potential. In addition, Horta produces newsletters to provide technical updates at key points during the season, and recommendations on how to use the portal to meet the crop's needs.



R&D

Horta DSSs have highly innovative contents. Innovation is generated through constant and intense research activities, in partnership with the best Italian and foreign universities and research centres.

How does it work?

Horta DSSs are expert systems that integrate different information sources to produce easy and effective advice and alarms. DSSs do not replace agricultural technicians or entrepreneurs: their goal is to provide additional information to improve crop farming decision-making processes.



Geolocation

Every plot of land added to the DSSs is geolocalized, so that the system can keep track of the geographical characteristics of the farming site.



Soil

DSSs take into account the soil physical-chemical characteristics for each crop, in order to better define the water and nutritional needs of the crop.



Product Features

DSSs use updated plant protection and fertilizing products databases, detailing all the technical specifications to select the products that best suit each application, also in relation to anti-resistance strategies.



Variety

DSSs take into account the specific characteristics of each variety, including growth rate, tillering capacity, mineral nutrition needs, production goals, product final use, and disease/disorder resistance.



Weather and Forecast

DSSs acquire weather data and forecasts on an hourly basis, and use them in the mathematical models and decision support tools made available to the users. For this reason, Horta DSSs are an efficient tool to adapt farming techniques to climate change.



Ideal Recipients

Horta DSSs are flexible tools that can benefit many kinds of different users.



Technicians

Technicians who work for public bodies and producer organizations, private consultants, farming equipment network technicians: they can all use Horta DSSs to supply prompt and expert advice based on scientific information to production farmers. They can also organize their work and business visits based on DSS alarms, therefore optimizing their time and work skills.



Farming equipment manufacturers

Farming equipment manufacturers (varieties, fertilizers, plant protection products, biocontrol agents, etc.) can use Horta DSSs as tools to enhance their products, by helping users exploit the genetic potential of different varieties and the distinctive features of each product.



PO/Groups

Producer organizations can use Horta DSSs to address and monitor their partners' production processes, check the fulfilment of specific production goals, organize delivery, and supply homogeneous lots to their partners.



Farmers

Thanks to Horta DSSs, production farmers can increase their product yield, quality and health, and reduce production costs and negative effects on health and on the environment, in line with the modern principles of economic, environmental and social sustainability, integrated production and IPM (Integrated Pest Management). In addition, using the DSSs allows farmer to monitor the entire production process in a knowledgeable manner.



Farming industry

Through Horta DSSs, farming industries can manage their production chain day by day, monitoring their suppliers' crops and farming techniques, and the ecological footprint of raw materials.

Every day by your side

Horta DSSs are the result of a complex innovation and knowledge transfer process.



Soil preparation and potassium-based/phosphoric fertilization

grano.net® provides pre-sowing fertilization advice, developed by accurately balancing the addition and elimination of nutrients.

Optimize fertilization times and the quantity of fertilizer to apply, based on the type of soil, weather, expected yield, crop variety and precession.



Sowing

grano.net® provides an accurate seed application rate based on the chosen variety, type of soil, weather, geographic location of the field and sowing date.

Avoid any seed waste, and, at the same time, optimize seed yield and protein content.



Crop development

grano.net® follows the different phenological phases, from seed sprouting to maturation, and it estimates the biomass production dynamics.

Scheduling interventions based on the plant development.



Weeds control

grano.net® helps you choose the right herbicides to prevent the development of field-specific weeds, and it suggests the best time to apply them.

Control weeds in a targeted and effective manner, using herbicides only when strictly necessary, and preventing phytotoxicity phenomena.



Top nitrogen fertilization

The quantity of nitrogen to be added is based on the balance method, and it is mainly affected by the soil nitrogen content and organic matter, variety, soluble nitrogen content, and weather in Autumn and Winter.

Optimize fertilization times and the quantity of fertilizer to apply, based on the type of soil, weather, expected yield, crop variety and precession.



Pest management

grano.net® provides composite and detailed risk rates to assess whether or when to control wheat diseases (septoria, yellow rust, brown rust, mildew, ear fusarium and mycotoxins).

Control pests effectively, reducing the number of interventions.



Water balance

grano.net® calculates the soil water provision based on its characteristics, rooting depth, crop development and weather conditions.

Avoid crop water stress, scheduling irrigation when needed, and schede the fertilization plan, taking into account the soil water provision.



Traceability

The Farm Operations Register on grano.net® can be used to record all field operations, from soil tillage to grain delivery.

Provides an overview of all farm management operations.



Sustainability

grano.net® allows assessing the environmental impact of any on-field farm and company decision, through aggregate indicators (Health, Soil, Air, Biodiversity, Energy, Water).

Calculate the environmental impact of your crop.

Why use grano.net®?



**REDUCE
PRODUCTION
COSTS**



**REDUCE NEGATIVE
EFFECTS ON
HEALTH AND ON
THE ENVIRONMENT**



**INCREASE SEED
YIELD AND PROTEIN
CONTENT**



**COMPLY WITH
REGULATION**

D.2009/128/EC and with the National Action Plan (Ministerial Decree of 22 January 2014)

To guarantee the quality and reliability of its services, in 2015 Horta has obtained grano.net® certification by [CCPB of Bologna](#)