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FROM SEED TO PASTA III

A SUSTAINABLE DURUM WHEAT CHAIN
FOR FOOD SECURITY AND HEALTHY LIVES



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A DECISION SUPPORT SYSTEM FOR DURUM WHEAT MANAGEMENT

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To achieve the objectives of the EU Roadmap for moving to a competitive low carbon economy in 2050, all productive sectors, including agriculture, have to find new strategies to reduce greenhouse gas emissions, aiming at a cleaner and more climate-friendly way to produce goods and food. In agriculture, Decision Support Systems (DSSs) are becoming a key component of these new strategies. They are computerized information system that support decision-making activities by means of forecasting models. The DSS called *granoduro.net*[®] was implemented by Horta to help cereal growers and elevators in decision-making for the cultivation of durum wheat (from sowing to harvest), pursuing low carbon emissions and sustainability principles.

The DSS provides information along the crop cultivations, for seeding, weed control, disease management, water balance and phenological development monitoring, and a site-specific nitrogen fertilization plan. The nitrogen tool explain to farmers timing and how much nitrogen fertilizers should be applied during crop season (allocation over time), relying on a balance method including several sub-models as crop and roots growth. Not least the fertilization plan is influenced by weather, data about fertilizers efficiency, varieties needs and fertilizers already applied and recorded in a field book by farmers.

Since 2011 this interactive web-based DSS is consulted by thousands of cereal growers of Barilla supply chain (more than 2500 Italian and 300 Greek farmers in 2017). Farmers confidence with *granoduro.net*[®] increased from year to year thanks to tangible costs decreasing and net income improving, as well as farmers involvement in open days into experimental platforms carried out to validate and calibrate models and advised tools included in the DSS.

Granoduro.net[®] is the milestone of Barilla Sustainable Farming (BSF) approach because improved suppliers net income. From 2012 to 2017 net income raised 22%, 6%, 2%, 27%, 42%, and 81% respectively. In the same time frame direct costs decreased 14%, 18%, 8%, 6%, 10%, and 10%, whereas carbon footprint (tCO₂/hectare) dropped every year, ranging from 8% to 13%. In *granoduro.net*[®] the impacts are calculated of each crop units, demonstrating as site-specific impacts can be calculated in agriculture too. Consequently, establishing carbon credits trading is possible.

Granoduro.net[®] and other DSSs implemented by Horta show that approaching more sustainable crop cultivation is achievable through optimization of crop activities, inputs, as well as more awareness on specific crop issues thanks to precision farming and predicting weather, soil, plant, pathogen models.

ABSTRACT