Version 7 May 2019

Introduction to the Soil Navigator Decision Support System (DSS)

INTRODUCTION

The Soil Navigator is an agricultural decision support system (DSS) currently being developed in the Horizon 2020 project LANDMARK (www.landmark2020.eu). Most agricultural DSS are focused on short-term goals for the next growing season, such as increasing plant available nutrients or optimizing crop yield, whereas other important soil functions such as water purification and regulation, carbon sequestration and biodiversity provision are neglected. Making the right management decisions for long-term sustainability is therefore challenging, and farmers and farm advisors would greatly benefit from an evidence-based DSS targeted for assessing and improving the supply of several soil functions simultaneously.

METHODOLOGY

In order to address this need we have designed the Soil Navigator DSS by applying multi criteria decision modelling using Decision EXpert (DEX) integrative methodology. Five teams of scientific experts have developed, calibrated and validated DEX models for five main soil functions: **primary productivity**, **water purification and regulation**, **carbon sequestration and climate regulation**, **nutrient cycling** and **biodiversity and habitat provision**. Subsequently, the five DEX models have been integrated into the Soil Navigator DSS to assess these soil functions simultaneously, and to provide management recommendations for improving the supply of prioritized soil functions.

HOW CAN I MAKE THE MOST OF MY LAND?

 The Soil Navigator DSS may assist farmers and farm advisors who are seeking answers to the overall question "How can I make the most of my land/soil in a sustainable way?" by going through the following three steps:

1. assessing the **initial supply** of the five main soil functions based on data obtained from the LANDMARK database coupled with data entered by the user
2. providing a number of **management recommendations** to improve specific soil functions based on the **demand and importance** entered by the user
3. evaluating the **resulting supply** of soil functions based on user preferences for the suggested management recommendations
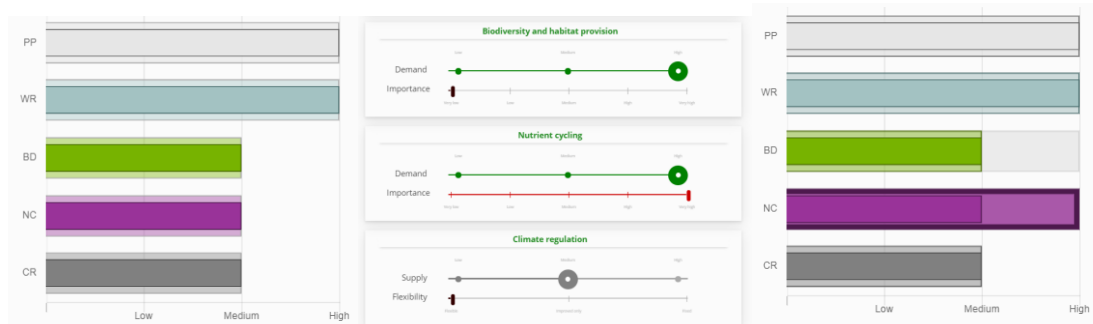
1. Initial soil function supply   2. Soil function demand from user   3. Resulting soil function supply

FUTURE PERSPECTIVES

By including all five main soil functions, the Soil Navigator DSS has a potential to complement the Farm Sustainability Tools for Nutrients included in the Common Agricultural Policy 2021-2027 proposal adopted by the European Commission. Furthermore, the Soil Navigator DSS could be used as an educational tool for farmers, farm advisors and students.

Disclaimer: Please note that the Soil Navigator DSS is currently in a beta version only shared with farm advisors and other users for testing purposes. For a demonstration of the Soil Navigator DSS and information about how to get access to the beta version please contact info@landmark2020.eu.