

EU INTERREG FAB FARMERS

DECISION SUPPORT TOOLKIT

WP1 D1.3.2 (UKCEH)

Funded by:



The DST Toolkit

A toolkit of freely available applications to help remove barriers and support further uptake of FAB measure implementation.

Includes DSTs for the provision of:

- Soil Quality and Conservation
- Water Quality and Conservation
- Pest and disease control
- Pollination



Soil Quality and Conservation

Soil quality and conservation assesses the soil structure, compaction, organic matter content, nutrient regulation and erosion control of a soil profile.

Accurately monitoring and undertaking measures to improve these functions will aid the future sustainability of farming practice and environmental impact.



Cool Farm Tool

ONLINE - FARM SCALE - COOLFARMTOOL.ORG

The Cool Farm Tool quantifies on-farm greenhouse gas emissions and soil carbon sequestration.

The online tool helps farmers manage for cost, productivity and soil health showing how management decisions can sequester carbon or reduce greenhouse gas emissions – an issue customers care about.

Taking just 10-15 minutes to get a rough estimate, the tool will stimulate thinking by showing hotspots and helping to develop action plans.

The Cool Farm Tool has been tested and adopted by a range of multinational companies who are working with their suppliers to measure, manage, and reduce greenhouse gas emissions in the effort to mitigate global climate change.

The Farm Crap App

APP - FIELD SCALE - [SWARMHUB.CO.UK/THE-FARM-CRAP-APP-PRO](https://swarmhub.co.uk/the-farm-crap-app-pro)

The app, developed by the SWARM Knowledge Hub in collaboration with Rothamsted Research North Wyke allows the farming community to appreciate the nutritive and economic value of livestock manures.

Farmers are able to visually assess manures and slurry application rates and calculate what is being provided in terms of available nutrients as well as giving an estimate of potential savings in artificial fertilisers.

The data is based on Defra's RB209 Fertiliser Manual values for crop available nutrients along with the industry produced publication *Think Manures* and allows you to select different seasons, types of manures and crops growing to see what the manure will provide in terms of fertiliser value.

mySoil

APP - FARM SCALE - BGS.AC.UK/MYSOIL/#AD-IMAGE-AD-IMAGE-0

mySoil gives you access to a comprehensive European soil properties map within a single app.

Discover what lies beneath your feet and help us to build a community dataset by submitting your own soil information.

Soilapp

APP - FIELD SCALE - ON THE GOOGLE PLAY STORE

SOILapp allows you to collect, visualize and share observations of soil quality using spade-test method. The spade-test is a widely used, qualitative method for performing the observation of soil conditions. It gives the observer information on soil fertility and on mechanical operations effects on its structure. By using the application for recording for soil observations, you are able to share your findings, learn from other users and seek further advice to the users' community.

SOILapp guides you through an easy touch-enabled interface to define features for different layers in a soil sample. At the end, summary features of the observation are given and shared, eventually adding comments and a short description of farm practices.

Count & record Earthworms

PDF - FIELD SCALE - IN THE [AHDB.ORG/KNOWLEDGE-LIBRARY](https://www.ahdb.org/knowledge-library)

There are up to 10 common earthworm species in agricultural soils and these can be grouped into three ecological groups – epigeic, endogeic and anecic.

This publication explain how each group has a unique and important function and give top tips on how identify and count each type of earthworm.

Vess soil structure

**PDF - FIELD SCALE -
[SRUC.AC.UK/INFO/120625/VISUAL_EVALUATION_OF_SOIL_STRUCTURE](https://sruc.ac.uk/info/120625/VISUAL_EVALUATION_OF_SOIL_STRUCTURE)**

This straightforward, quick soil test describes how to assess topsoil in three simple steps. Each assessment should not take more than 20 minutes.

The steps are soil removal, soil assessment and soil scoring. A quality score is given which shows if the soil structure needs to be improved to maintain soil health.

Scoring and assessment require comparison with a 2-page colour chart of differing soil structure and associated soil descriptions.

Other resources

In searching for soil quality resources and tools the AHDB 'GREAT soils' initiative was found to be very informative for a range of topics – see:

<https://ahdb.org.uk/greatsoils>.

The website provides key publications in soil management, field drainage, soil assessment, soil biology, earthworm assessments and recording, soil health, organic matter, pH, and soil structure, among other guides and publications.

Another helpful resource is the Championing the Farmed Environment 'Soil management for your farm business' – see:

<http://www.cfeonline.org.uk/cfe/resources/soil-management-for-your-farm-business>.

This is a well-produced short introduction to the importance of soil structure and soil management.

Water Quality and Conservation

Water quality and conservation assesses the nutrient and chemical composition of water, with the major influence being that which comes from the land.

Monitoring and taking measures to reduce the impact of farming practice on water quality is of great benefit for water supply security and down-stream ecological health



HydroColor: Water Quality

APP - FIELD SCALE - ON THE GOOGLE PLAY STORE

HydroColor is a water quality application that uses a smartphone's digital camera to determine the reflectance of natural water bodies.

Using this information, HydroColor can estimate water turbidity (0-80 NTU), concentration of suspended particulate matter (SPM) (g/m^3) and the backscattering coefficient in the red ($1/\text{m}$).

WaterAware

APP - FARM SCALE - ON THE GOOGLE PLAY STORE

The app forecasts risk of movement of selected active ingredients from soil to water courses based on prevailing and predicted weather conditions, soil moisture deficit and soil type.

It is designed to act as a decision support tool for those applying active ingredients associated with water pollution.

The new feature of #SlugAware is designed to protect the longevity of metaldehyde-based slug pellets. It considers factors such as weather conditions, soil moisture deficit, soil type and previous crops to provide an early warning system to combat slug activity

Cool Farm Tool

ONLINE - FARM SCALE - COOLFARMTOOL.ORG

The Cool Farm Tool Water metrics provide crop irrigation requirements and blue and green water footprints.

With 70 percent of fresh water globally consumed by agriculture, farmers and supply chains are often called on to provide assessments of water used for crop production and ensure efficiency.

Water footprints can be cumbersome and data intensive. But the Cool Farm Tool water metrics enable farmers to quickly and easily account for their crops' water needs and gain insight into better practice.

Behind the scenes, the tool combines just a few additional user inputs with global data sets for crop, soil and climate data, to provide crop water estimates.

Find out if you over or under irrigated. Compare water applied with estimated requirements based on global datasets. Optimal water can mean optimal yields, meaning all resources – both natural and financial – are used most efficiently.

Try out management options like irrigation type and increasing soil organic matter to see how to improve water retention and make the most of each drop of water applied

Other resources

In searching for water quality resources and tools the Environment Agency document 'Water management: Key actions for farmers' was found to be informative with a number of links to relevant resources - see:

http://www.cfeonline.org.uk/cfe/publications/key-actions-for-farmers_core_doc_2016-final-2.

Furthermore, the AHDB 'GREAT soils' initiative, although focused on soil, was also an excellent resource for water quality - see:

<https://ahdb.org.uk/greatsoils>.

Pest and disease control

Pest and disease control assesses the impact on yield and crop or livestock health. Traditionally, these were remedied by increased use of chemical pesticides or medicines help control issues. However, the reliance on these resources has been highlighted as needing to be reduced to limit the resistance of some pests and diseases to chemical interventions, to become more economically and environmentally sustainable with less external inputs use.



Check it out tool

**ONLINE - FARM SCALE -
CHECKITOUT.VOLUNTARYINITIATIVE.ORG.UK/TOOL**

The tool has been designed to help farmers and sprayer operators review and improve spraying practices and so reduce the risk of pesticides reaching water.

There are 22 questions across four sections, and it should take no more than 20 minutes to complete.

Integrated pest management plan

**ONLINE - FARM SCALE -
VOLUNTARYINITIATIVE.ORG.UK/SCHEMES/INTEGRATED-PEST-
MANAGEMENT**

The tool helps growers develop an integrated pest management plan for decision support to identify and improve activity, demonstrate good practice and improve stewardship in retaining crop protection products.

Plantix

APP - PLANT SCALE - ON THE GOOGLE PLAY STORE

The app is an automated disease and pest identification software.

Requiring a picture from a smartphone the app will attempt to diagnose the problem in seconds.

Every disease, pest and deficiency leaves behind a specific pattern.

Plantix recognizes these patterns.

One photo is enough and you know what your plant is missing.

In our social network you can exchange experiences and information with like-minded people in the immediate area as well as with international experts.

This way you will quickly get helpful answers and practical solutions for diseases, pests and deficiency symptoms.

OneSoil Scouting

APP - FARM SCALE - ON THE GOOGLE PLAY STORE

A free app that enables satellite farm monitoring and geo-located information tagging to support the tracking and management of crop condition and potential problem areas.

Other resources

In searching for pest and disease protection resources and tools The Voluntary Initiative website was found to be very informative for promoting responsible pesticide use, with lots of information sheets and links on a range of related topics. The website provides key information for crop protection use related to water, biodiversity, SUD and stewardship. See:

voluntaryinitiative.org.uk.

Another helpful resource is the Championing the Farmed Environment 'Crop protection for arable and livestock farms'. It is a well-produced short introduction to best practice in crop protection. See:

<http://www.cfeonline.org.uk/cfe/resources/crop-protection-for-arable-and-livestock-farms>.

Pollination

Pollination assesses the capacity of an areas biodiversity and ecological health. Increases in pollinators can lead to a greater crop yield. Monitoring biodiversity and numbers of pollinators gives an important indication of ecosystem health and balance.



Cool Farm Tool

ONLINE - FARM SCALE - COOLFARMTOOL.ORG

The Cool Farm Biodiversity metric quantifies how well farm management supports biodiversity allowing farmers to score points to demonstrate the good they are doing.

Scores build as you go – the more positive actions, the higher the score. Biodiversity assessments provide scores along four dimensions and eleven species groups. Farmers can see which species groups are benefiting from their practices and how they might increase and expand these benefits.

For example: field margins sown with perennial flowering seed mixes, gives you three points for helping beneficial insects and three points overall but no points for species that aren't known to benefit like woodland or wetland flora.

Bird nesting boxes, set asides of hedges or trees, leaving un-mown strips or using selective crop protection products to spare beneficial insects are examples from the wide range of practices that score points.

By using the tool, farmers and buyers in the supply chain can quantify baseline impacts on biodiversity, and measure and track improvements over time.

The tool boils complexity into series of multiple choice questions, scored according to latest research and expert judgement.

POLLINATION

iNaturalist

APP - FARM SCALE - ON THE GOOGLE PLAY STORE

Help to identify insects, plants and animals around you to record and share with a global network.

Use geo-located sightings and notes of pollinators, pests and animals.

The app was developed by California Academy of Sciences and the National Geographic Society.

PlantNet: Plant identification

APP - FIELD SCALE - ON THE GOOGLE PLAY STORE

An application that allows you to identify plants simply by photographing them with your smartphone.

Very useful when you don't have a botanist on hand!

Originally designed as a citizen science project: all the plants photographed are collected and analysed by scientists around the world to better understand the evolution of plant biodiversity and to better preserve it.

PlantNet allows you to identify and better understand all kinds of plants living in nature: flowering plants, trees, grasses, conifers, ferns, vines, wild salads or cacti

Flora Incognita

APP - FIELD SCALE - FLORAINCOGNITA.COM

The Flora Incognita App enables you to identify the plants of Europe automatically quickly, easily and accurately.

The identification process is intuitive: take a picture of the flower and the leaf with camera of your smartphone.

The unknown plant is then identified automatically within seconds. In addition to the specific plant species name, a species profile page presents further information such as characteristics, distribution or protection status of the species.

You can also save, export or share your plant observations on different social media channels

Fieldmargin: Simple farm management

APP & ONLINE - FARM SCALE - [FIELDMARGIN.COM](https://www.fieldmargin.com)

A modern, easy to use farming app that lets you keep track of everything that happens on your farm in one place.

Map fields, plan work and record observations. All shared with your team so everyone stays up to date.

Spend less time dealing with paperwork and more getting farm work done.

Data is synced to the cloud so it stays safe and is accessible from your phone, tablet or laptop.

An excellent way to record observations and assess site history to track trajectory of change.

Pollination Mapper

ONLINE - FARM SCALE - POLLINATIONMAPPER.ORG

This web-based decision-support tool for crop planning allows farmers to visualize the impacts of improved pollination measures.

Pollination Mapper enables farmers and advisors to assess the costs and benefits of bee pollination enhancements on farm operations.

This intuitive tool applies scientific models to the real landscape, enabling farmers to draw a field or other area of interest on satellite imagery.

Then, the app evaluates the quality of wild bee habitat near the area of interest based on several data sets.

The tool uses that information to develop an index of visitation to the target crop field.

Bee-Steward

APP (BETA) - FARM SCALE - BEEHAVE-MODEL.NET

BEE-STEWARD is a computer program of virtual bees in digital landscapes developed by researchers at the Environment and Sustainability Institute at the University of Exeter that can be used to predict the effects of different land management on pollinator survival and pollination rates.

Joining forces with forward thinking farmers, land managers and land advisors, working together to make sure BEE-STEWARD benefits bees and business on the ground.

BEE-STEWARD Beta provides a user-friendly interface to the bee behaviour models Bumble-BEEHAVE and BEESCOUT

Other resources

There is a wealth of information published for how to improve and monitor pollinator activity.

The Championing the Farmed Environment 'Pollinator Management' document is an informative introductory guide.

See:

<http://www.cfeonline.org.uk/cfe/resources/pollinator-management-for-your-farm-business>

Hedgerows are important pollinator areas, with the Hedgeline website providing an excellent resource on all things hedgerow maintenance. The website is UK focussed but is broadly applicable to the rest of NWE. See:

<http://www.hedgeline.org.uk/index.php?page=5>

Bees are key to farm pollination efforts, so the NFU have developed a 'Farming for bees' resource to guide farmers in how to manage land better for pollinators. See:

<https://www.nfuonline.com/bee-leaflet-web-version>

Questions?

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