ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Carbon Action - ajankohtaista

Jari Liski

@JariLiski

19.2.2021 **Vettä pellossa – webinaari, Pyhäjärvi-instituutti**

Photo: Sanne Katainen / Maaseudun Tulevaisuus

Carbon Action –ajankohtaista 2/21

- Hiilensidonnan todentamisjärjestelmä
- Pelto-observatorio www.peltoobservatorio.fi
- Uudistavan viljelyn e-opisto www.uudistavaviljely.fi
- Suomen Akatemian Lippulaiva-hanke ACCC The Atmosphere and Climate Competence Center www.acccflagship.fi

HIILENSIDONNAN TODENTAMISJÄRJESTELMÄN KEHITYSTYÖ VAUHDISSA MULTA-HANKKEESSA

27.5.2020

Keskeiset kysymykset

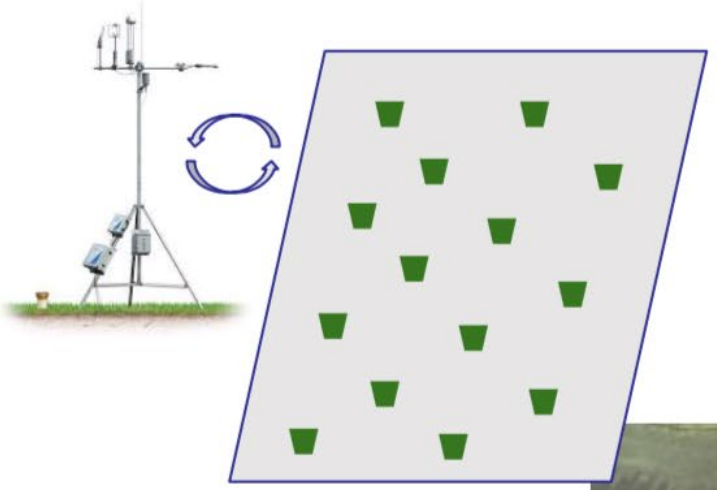
1. Kuinka paljon hiiltä sitoutuu maaperään?
2. Kuinka paljon hiilen sitoutumisesta on lisäistä?
3. Kuinka kauan hiili pysyy maaperässä?

Maanviljelijä ja kuva: Juuso Joona, Tyynelän tila, lokakuu v. 2018

A demonstration from Qvidja, FI

Calibrate here

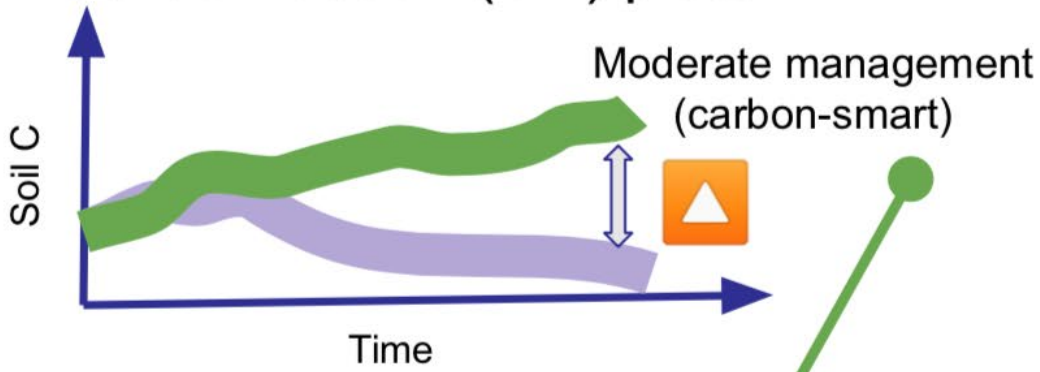
Eddy-Covariance (EC) plot



Model:
Basic Grassland Model
(BASGRA)

Apply (predict) here

Carbon-action (CA) plots



Intensive management
(business-as-usual)

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Verification methodology of soil carbon sequestration

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Measurement technologies
Satellites, drones, in situ

Information technologies
Data

Data, methods, services

Data, methods, services

Data, guidelines, services

Carbon farming
Satellites, drones, weater, climate, soil, agriculture

Calculator

Carbon units
Quantity, permanence, additionality

Scientific advances
Process understanding, Advanced measurements

Calculator development
Calibration, Improved structure

Reliability monitoring
Carbon and GHG fluxes, Soil and plant data

Data, methods

Research infrastructures
ICOS, INAR RI Agriculture

Service development

Operating environment analysis

GHG inventories and scenarios UNFCCC, EU, nation

Climate policy

Suppliers, buyers Marketing Verification

Carbon markets

Life-cycle analyses

Carbon footprints

Environmental goals

Sustainable businesses

Jari Liski 2020.

PELTO-OBSERVATORIO HAVAINNOLLISTAA HIILEN SIDONTAA VILJELYMAIHIN

3.12.2020

HOW MUCH CARBON SOIL ABSORBS?

Agricultural soil holds an enormous potential to mitigate climate change by storing carbon. Carbon Action Field Observatory program improves soil health, increase and verifies soil carbon sequestration – and makes the progress visible.

SEQUESTERED CARBON

A hectare of agricultural land can store 200 - 1000 kg of carbon annually. Soil carbon storage helps to mitigate climate change and ensure food production.

DATA COLLECTING TEST SITES

The data comes straight from 100 carbon farms and intensive test sites. The data is used also to scientifically quantify the changes in the soil carbon storage.

CARBON FARMING PRACTICES

Each farm is different and so is the mix of the practices used. Active monitoring of the impact of the practices helps to develop farming and the research.

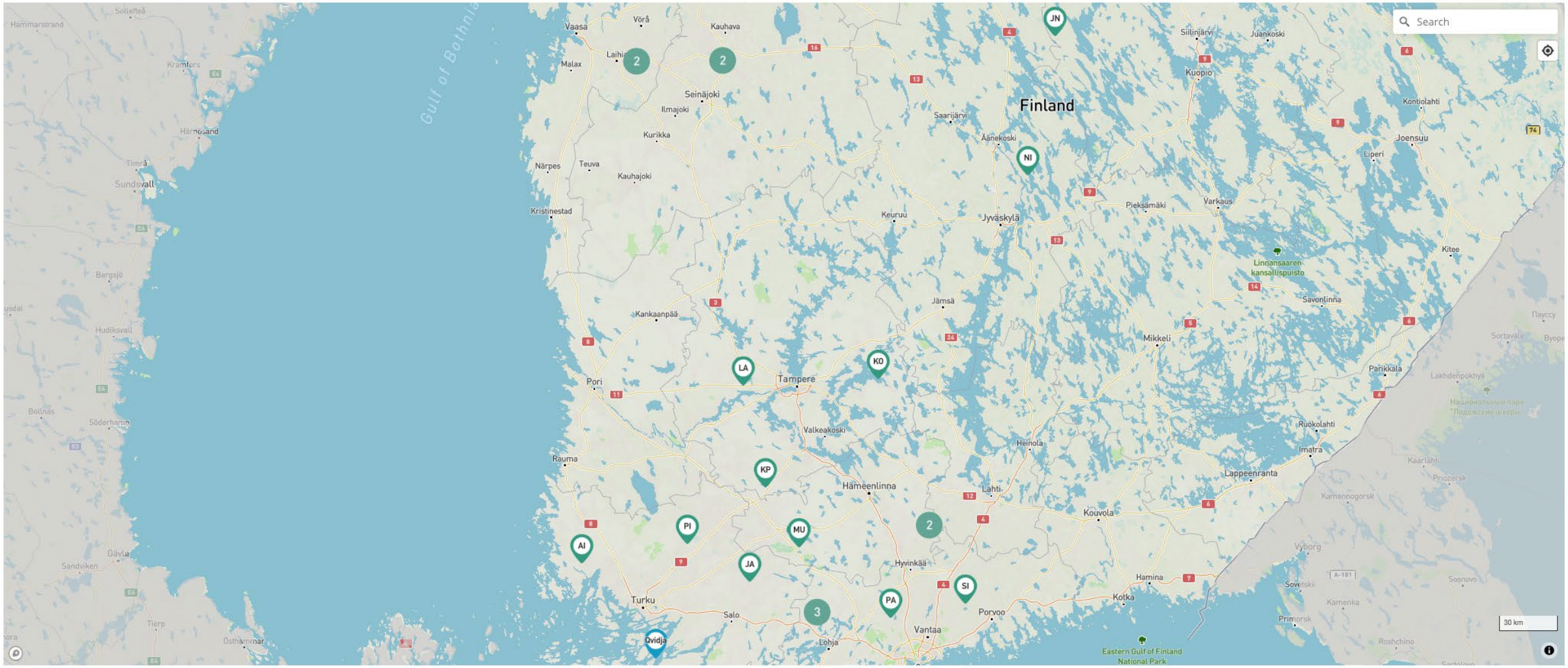
CARBON ACTION -PLATFORM

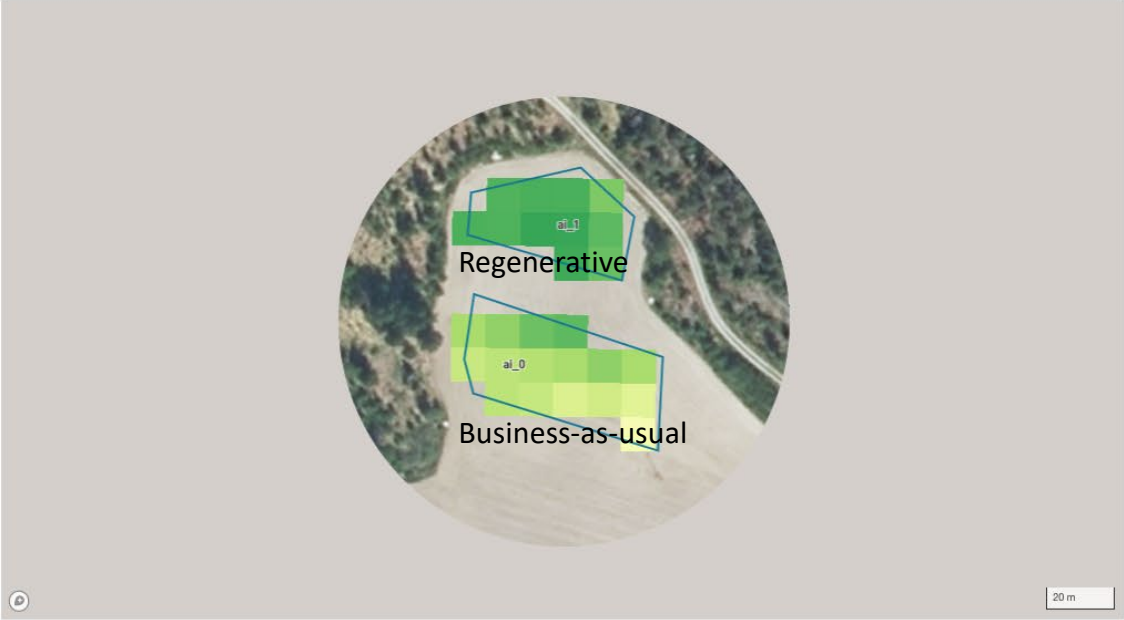
In the Carbon Action platform scientists, farmers and companies work together to enhance carbon storing regenerative agriculture.

DATA STRAIGHT FROM THE FIELD

Over a hundred carbon farmers are currently testing different farming methods on their fields throughout Finland. Soil and microbial analyses, atmospheric measurements and modeling are used to study the fluxes and sequestration of carbon in test fields.

SEARCH BY ADDRESS OR TAP THE MAP POINTS





AI

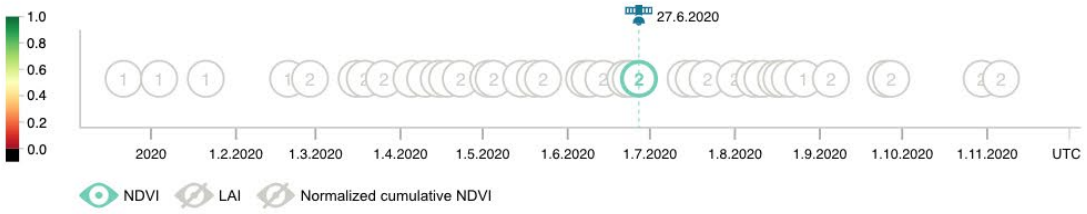
Advanced CarbonAction Site

AI field has a history of vegetable production and is a silty clay. The aim is to improve soil health by a series of ley crops 2019-2021 and return to vegetable production. Control is in grain farming.

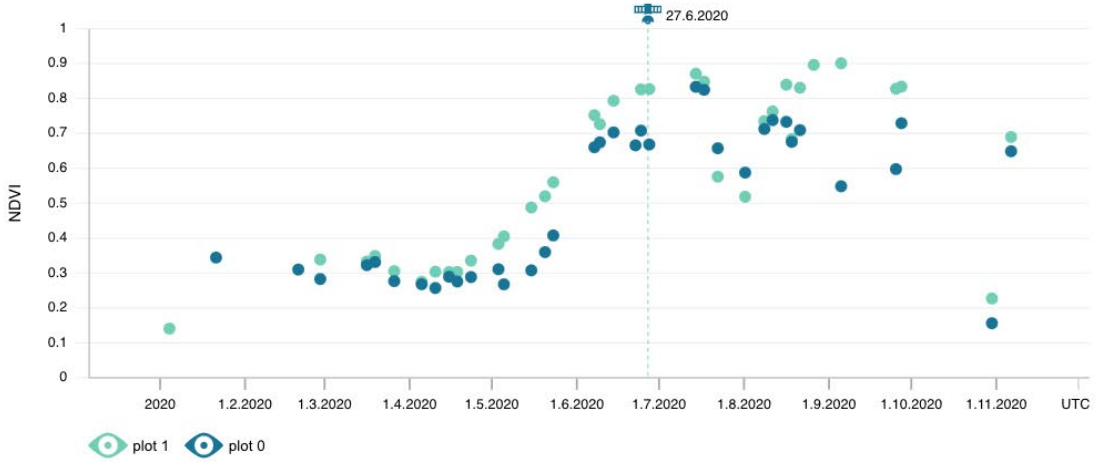
FARMING METHODS

Management: ley farming
Species: multi-species ley
Soil type: silty clay

SATELLITE IMAGES

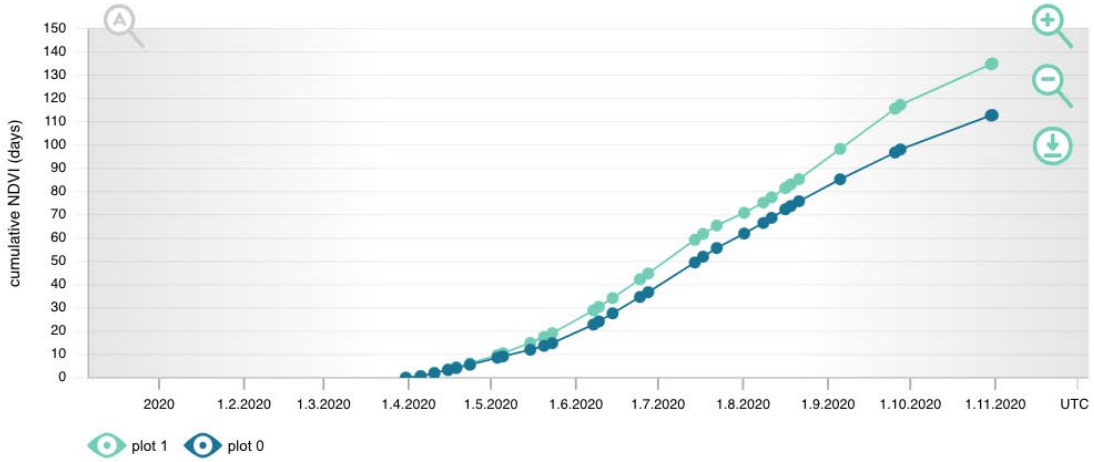


NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI)

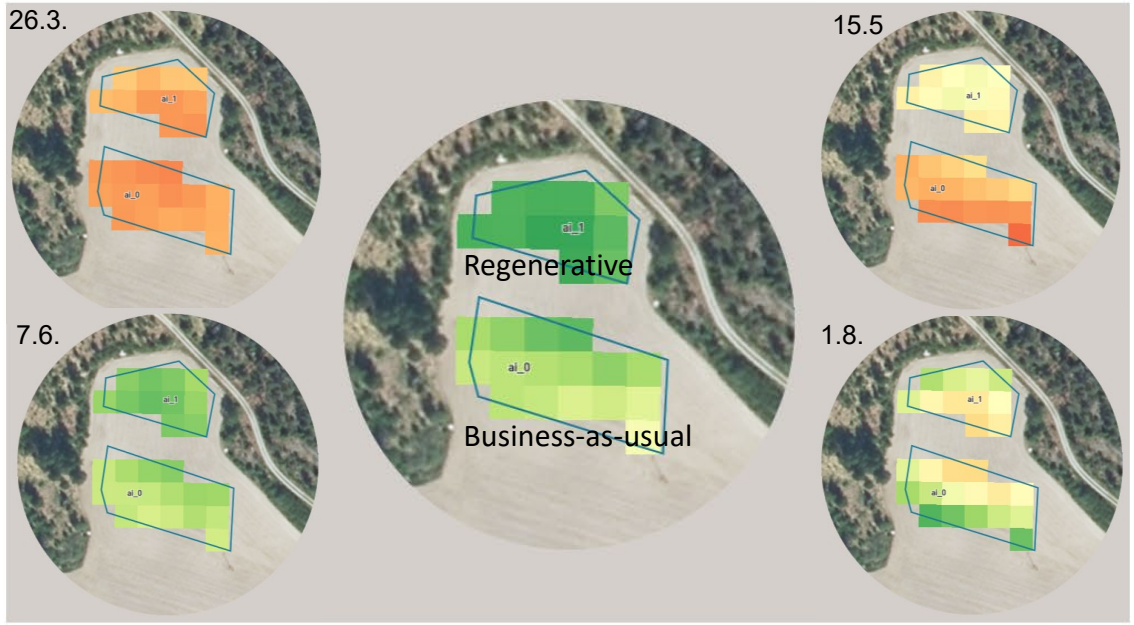


NDVI measures the photosynthetic capacity of the vegetation. It is controlled by the amount of vegetation and the condition of the plants. 0-0.2 very little vegetation, 0.2-0.4 sparse vegetation, 0.4-0.6 moderate vegetation, 0.6-1.0 dense vegetation.

CUMULATIVE MEAN NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI)



Cumulative sum of NDVI for a predefined 244-day growing season 31.3. – 31.10.. Early growing season NDVI sum is a good predictor of yield. For days lacking satellite observations, NDVI was linearly interpolated from the surrounding satellite observations, or extrapolated from the last NDVI observation. The theoretical maximum at season end is 244.



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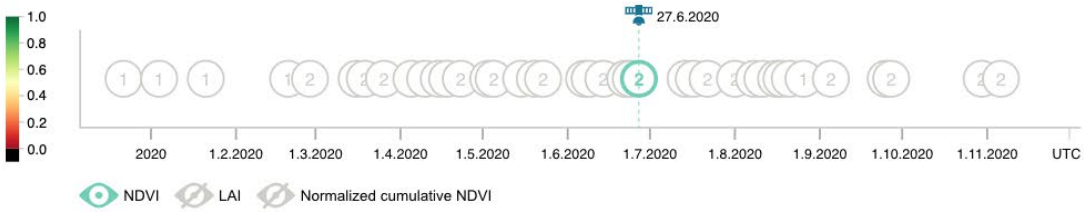

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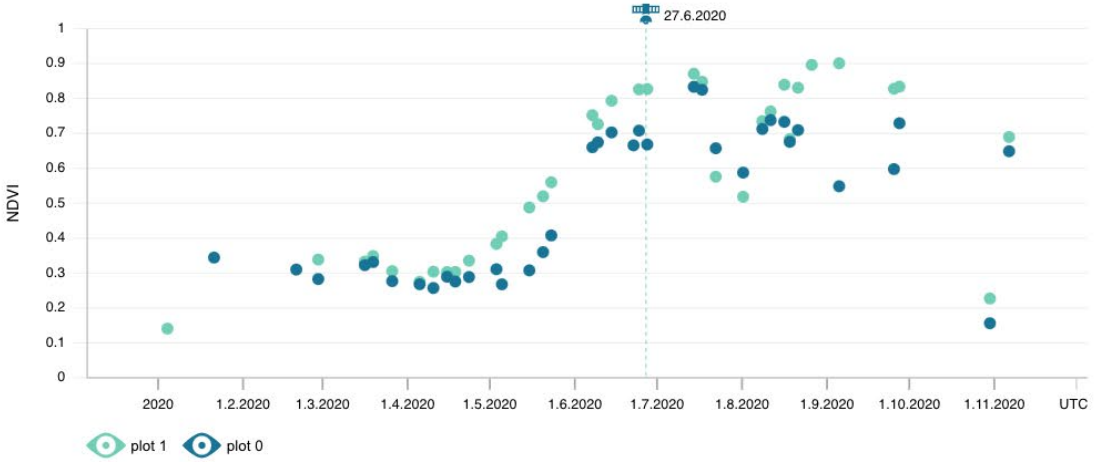

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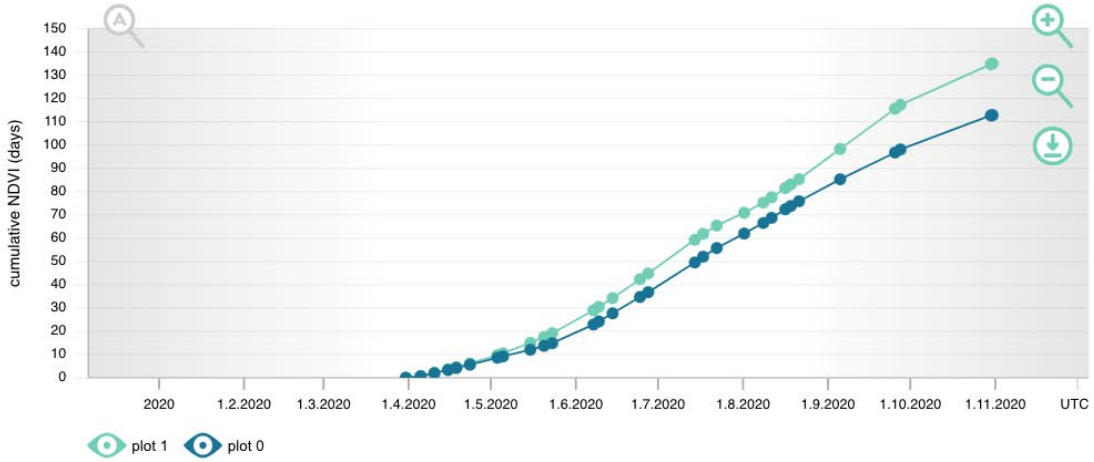

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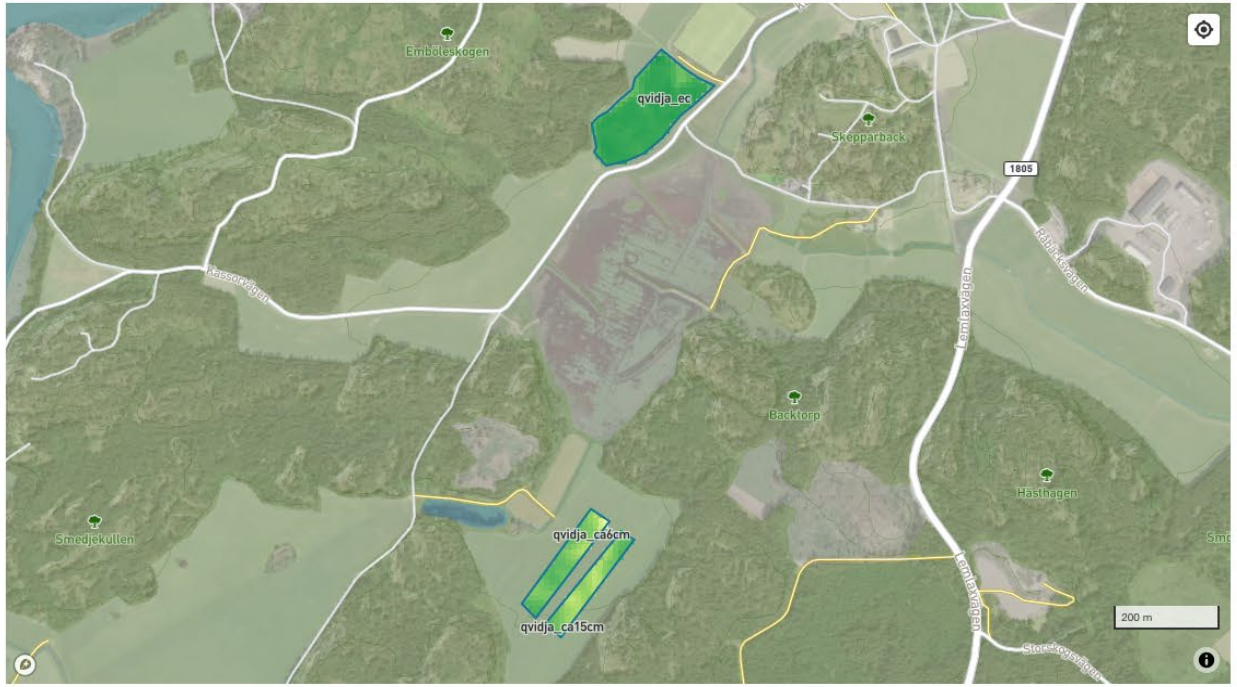


QVIDJA

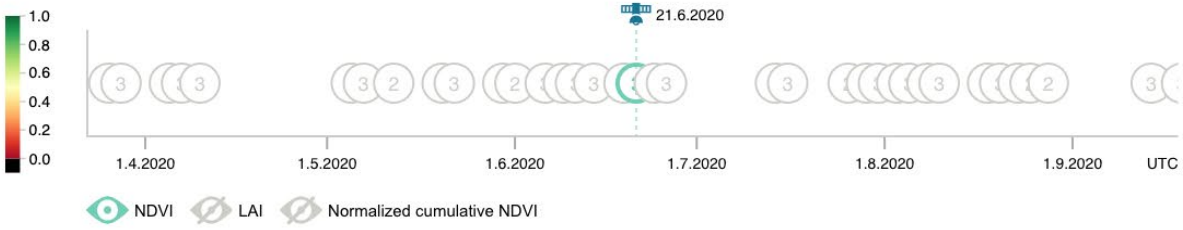
Intensive Site

Qvidja is clay soil for silage grass production. Species diversity is high and the overall aim is to improve soil quality. Qvidja is one of the intensive study sites.

FARMING METHODS

Management: ley farming
Species: silage grass
Soil type: clay loam

SATELLITE IMAGES



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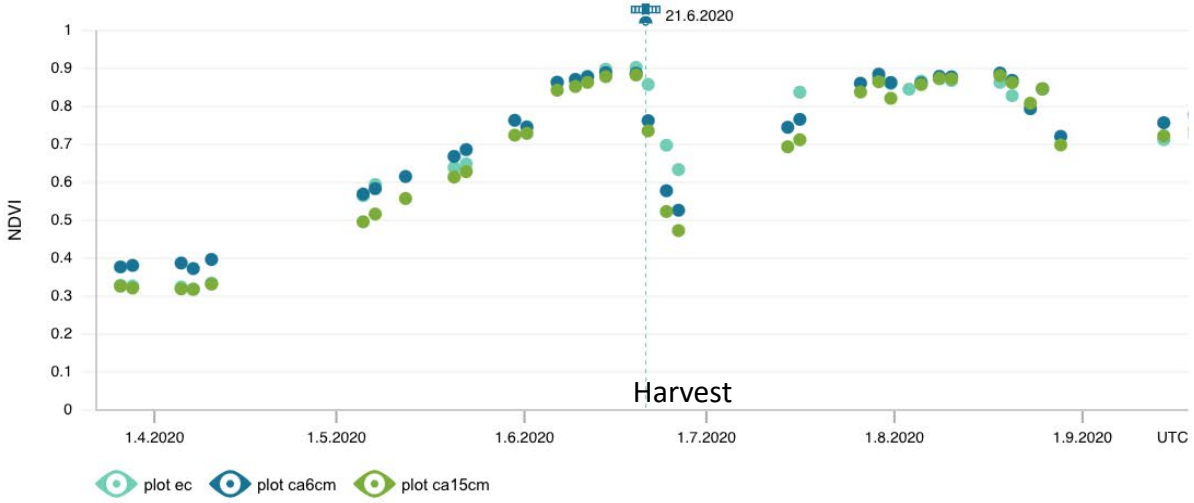
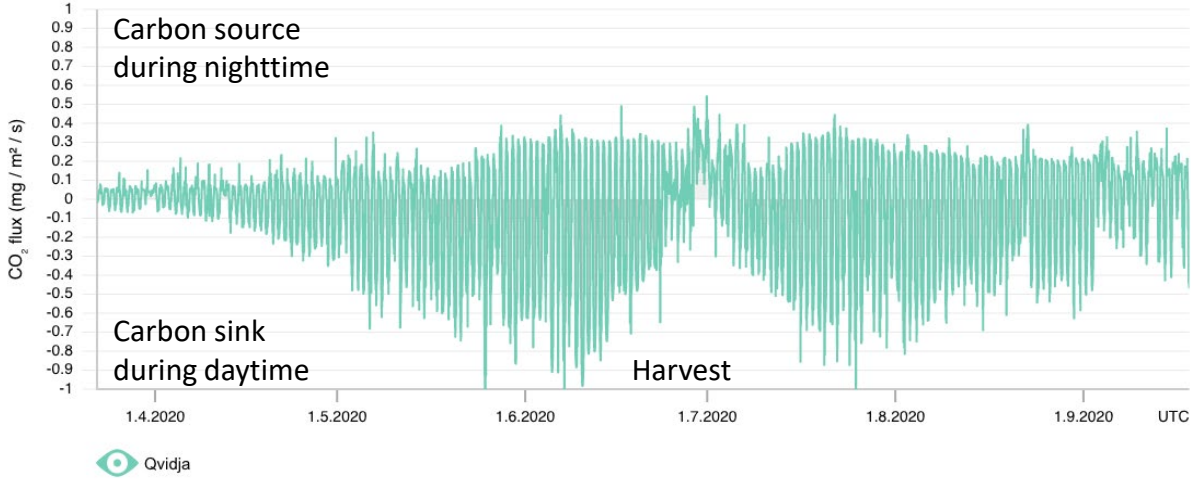
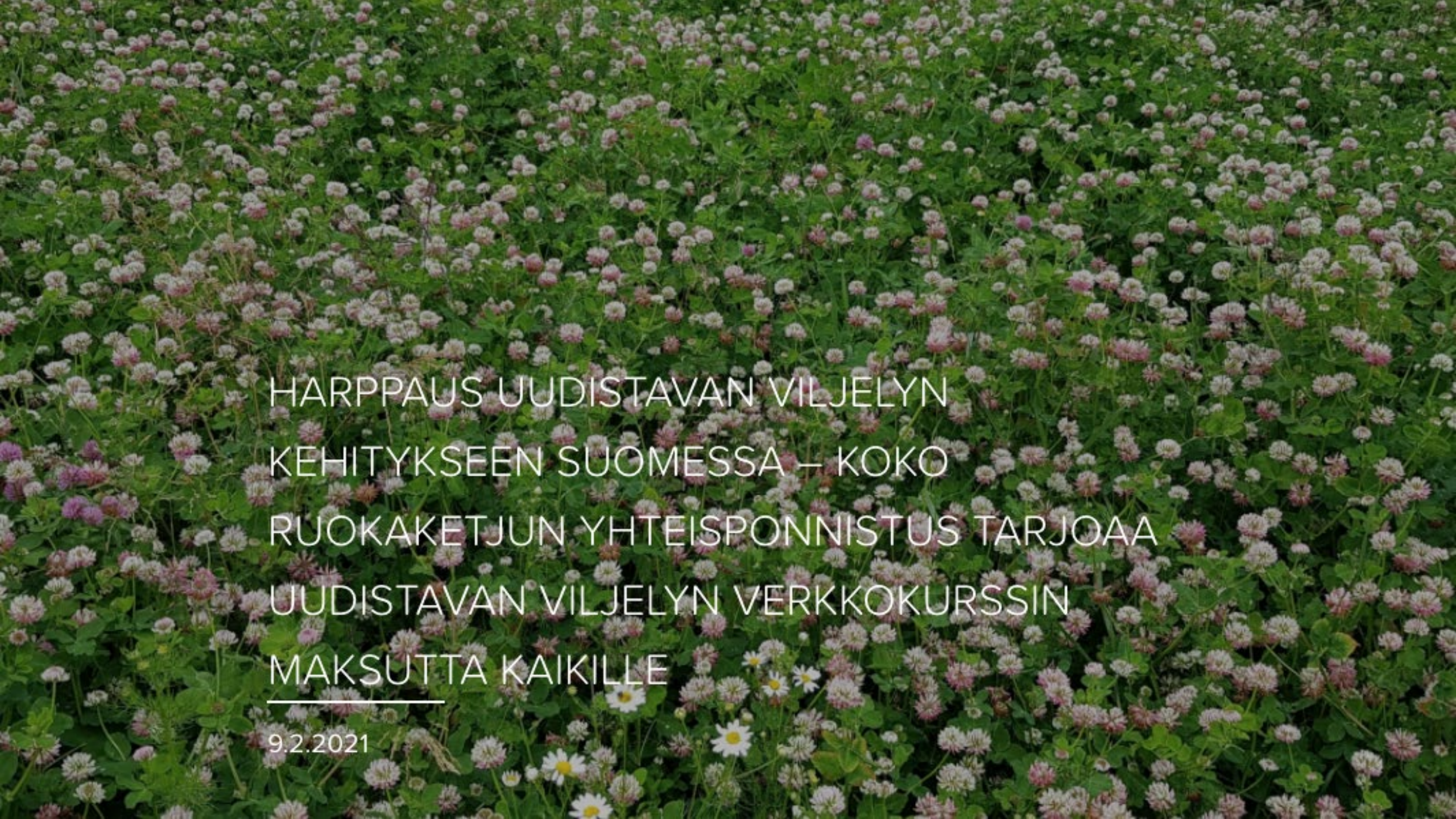


CO_2 FLUX





HARPPAUS UUDISTAVAN VILJELYN KEHITYKSEEN SUOMESSA – KOKO RUOKAKETJUN YHTEISPONNISTUS TARJOAA UUDISTAVAN VILJELYN VERKKOKURSSIN MAKSUTTA KAIKILLE

9.2.2021

CARBON ACTION

Uudistavan viljelyn e-opisto

Siirry e-opistoon

Uudistavan viljelyn e-opisto

Haluatko parantaa maan kasvukuntoa, satoja ja ympäristöä? Uudistavan viljelyn e-opisto sopii kaikille maanviljelyn kehittämisestä kiinnostuneille. Astu sisään!

Kirjaudu Rekisteröidy

Luku 1

Uudistava viljely

Kappale	Tehtävät
I. Maanviljelijä on tulevaisuuden tekijä	0/4
II. Uudistava maatila toimii kokonaisvaltaisesti	0/3

Luku 2

Maaperä

Kappale	Tehtävät
I. Elintärkeä maaperä	0/1
II. Maaperän ominaisuudet	0/4
III. Maan kasvukunto	0/1

Luku 3

Monimuotoisuus

Kappale	Tehtävät
I. Elonkirjo muodostaa moniulotteisen verkon	0/1
II. Monimuotoisuutta voi vahvistaa pienin askelin	0/3

Miten opisto on syntynyt?

Uudistavan viljelyn e-opisto on eri toimijoiden yhteinen voimannäyte, joka tuo tietoa maaperää, satoja ja ympäristön tilaa parantavasta viljelystä jokaisen saataville. Hankkeen alkuunpanijoina ovat strategia-, design- ja teknologiayritys Reaktor sekä Baltic Sea Action Group, BSAG. Opistoa tukee kattava ja monipuolinen kumppaniverkosto.

Lue lisää

Reaktor

BSAG Baltic Sea Action Group

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SITRA

Kumppanit

Mikään toimija yksin ei voi saada aikaan niin suurta vaikutusta kuin koko ruokaketju yhdessä – pellolta jalostuksen ja vähittäiskaupan kautta kuluttajalle saakka. Siksi Uudistavan viljelyn e-opistoa ovat tukemassa suomalaisen ruokaketjun suuret toimijat, jotka ovat sitoutuneet kunnianhimoisiin kestävyystavoitteisiin ja jo aloittaneet työn Carbon Action -hankkeen kautta.

Valio

Pääyhteistyökumppanimme Valion ja muiden kumppaniemme ansiosta Uudistavan viljelyn e-opisto on kaikkien suomalaisten saatavilla, ilmaiseksi. Verkkokurssin sisältö perustuu vertaisarvioituun tutkimukseen, eikä kumppaneilla ole valtaa päättää siitä. Sen sijaan kumppanit jakavat tietoa kurssista omille sidosryhmilleen ja lisäävät kurssin näkyvyyttä oman viestintänsä kautta.

Fazer MTK LAHTI

Atria Agria SLC VIKING MALT

JÄRKI and the Carbon Action farmer collaboration

Baltic Sea Action Group's JÄRKI project has been working actively to promote sustainable agriculture since 2009. In 2019 Louise and Göran Ehrnrooth Foundation and the Sophie von Julinin's Foundation granted the third 5-year funding for JÄRKI and the collaboration with carbon farmers.

Read more

TWINWIN project

The Nessling Foundation finances the Carbon Action project platform's research on how biodiversity impacts the ability of fields to store carbon. In addition to scientific research, the emphasis is on creating impact.

Read more

STN MULTA research consortium

Strategic funding for Carbon Action targets ''stn MULTA: Multi-benefit solutions to climate-smart agriculture''

Read more

SOIL AMENDMENTS project

The project "Effects of organic soil amendments on soil and root microbes" studies how wood derived soil amendments affect microbes in agricultural soil and in oat roots. The project is funded by Maj and Tor Nessling Foundation.

Read more

FluCS Tool project

"Solutions for reliably quantifying carbon sequestration in soil", funded by Maj and Tor Nessling Foundation, develops a tool for reliably measuring soil carbon sequestration.

Read more

Carbon Action Svenskfinland project

Carbon Action Svenskfinland -project expands the Carbon Action platform to the Swedish-speaking region of Finland. The project is funded by SLC, Jordfonden and Svenska Kulturfonden.

Read more

Pollinator-Friendly Farms

The Nessling Foundation funded project aims to develop a pollinator-friendly farms concept and provide farmers with the information they need to improve conditions for pollinators on their farms.

Read more

SOILADVICE project

The project ''SOILADVICE: Sustainable soil management and carbon farming through extensive use of research findings and advisor practices", funded by Maa- ja vesitekniikan tuki, focuses on advancing agricultural advisor practices.

Read more

CARBOCREDIT project

Verification of carbon sequestration in grass fields (CARBOCREDIT) project belongs to CARBO portfolio, funded by Business Finland. The project focuses on verification.

Read more

AGROFORESTRY project

"The potential of trees to mitigate climate change in northern arable lands" studies agroforestry as a tool to mitigate climate change and agroforestry's effects on crop yields.

Read more

INAR RI Agriculture project

The INAR RI Agriculture project, funded by the Academy of Finland and coordinated by the University of Helsinki, investigates the greenhouse gas emissions and carbon sequestration capacity of northern agricultural lands.

Read more

LIFE CarbonFarmingScheme

LIFE CarbonFarmingScheme -project aims to put forth concepts to incentivize climate action and carbon sequestration by farmers and foresters. More specifically, the project outlines the preconditions and opportunities to implement novel incentives which combine EU climate objectives, voluntary carbon markets and agriculture and forestry policies and would accelerate carbon sequestration in European agriculture and forestry. The project receives funding from the European Union LIFE programme.

Pre-study: Knowledge transfer and joint learning

This pre-study is initiated to learn about the conditions especially in malt crop farming in Finland, Lithuania, and Poland, and to establish a basis for further knowledge transfer and training activities, including possible full-scale projects as a follow-up.

Read more

CARBON PATH project

"From Carbon Paths to Carbon Highways", funded by Maj and Tor Nessling Foundation, focused on educating the Carbon Action carbon farmers.

Read more

UUSI LIPPULAIVA VAUHDITTAA MYÖS CARBON ACTION TYÖTÄ

18.11.2020

ACCC

Research Programs

1. Potential of land-based climate change mitigation
2. Air quality-climate interactions
3. Climate change impacts & adaptation

1. CARBON SINK & AGRICULTURE LAND
2. FORESTS STOCKS, SOILS AS CARBON SINK
3. C-NEUTRALITY, COMPENSATIONS FOR COMPANIES
4. CLIMATE NEUTRAL CITIES & HEALTH
5. NOVEL EDDY TECH TO OBSERVE C SINK
6. NOVEL ATMOSPHERIC OBSERVATION TECHNOLOGY
7. SOLVING AIR POLLUTION COCKTAIL
8. CLIMATE ANALYTICS
9. CLIMATE CHANGE & AIR QUALITY FORUM
10. OPERATIONAL PHASE OF PEEX
11. GLOBAL OBSERVATORY
12. SCIENCE DIPLOMACY
13. CLIMATE UNIVERSITY

CARBON ACTION

CLIMATE - SOIL - BALTIC SEA - BIODIVERSITY