

Novel monitoring methods and soil management approaches for climate responsible agriculture



Institute for
Environmental
Solutions

Rūta Abaja

Webinar "A soil deal for Europe – mission possible in the Baltic Sea Region"

29.06.2022



PROJECT IMPLEMENTATION:

01/04/2018 - 30/06/2023

FINANCED BY:



Valsts reģionālās
attīstības aģentūra

CRAFT LIFE

KLIMATA ATBILDĪGA LAUKSAIMNIECĪBA LATVIJĀ

LEAD PARTNER:



PARTNERS:



LATVIJAS LAUKU
KONSULTĀCIJU UN
IZGLĪTĪBAS CENTRS



Institute for
Environmental
Solutions



BIOCHAR



LATVIJAS LAUKU
KONSULTĀCIJU UN
IZGLĪTĪBAS CENTRS

NO-TILL FARMING



**CONTROLLED
DRAINAGE SYSTEM**

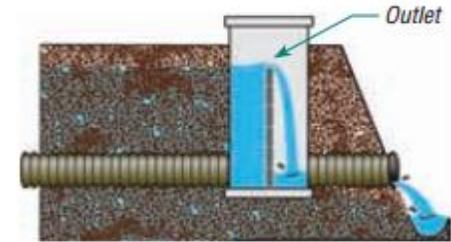


Figure 1. The outlet is raised after harvest to reduce nitrate delivery.

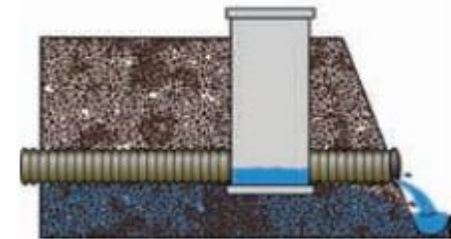


Figure 2. The outlet is lowered a few weeks before planting and harvest to allow the field to drain more fully.

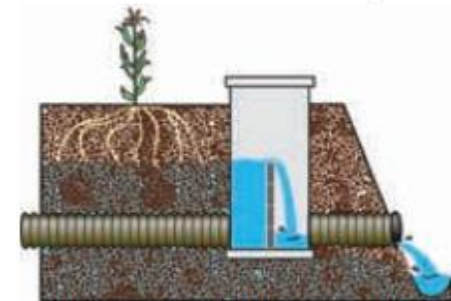


Figure 3. The outlet is raised after planting to potentially store water for crops.

WELLS OF CONTROLLED DRAINAGE SYSTEM



CRAFT LIFE MONITORING METHODS



BIOCHAR

➤ 3 FARMS, TOTAL 1.2 ha

PHYSICAL-CHEMICAL PARAMETERS OF SOIL

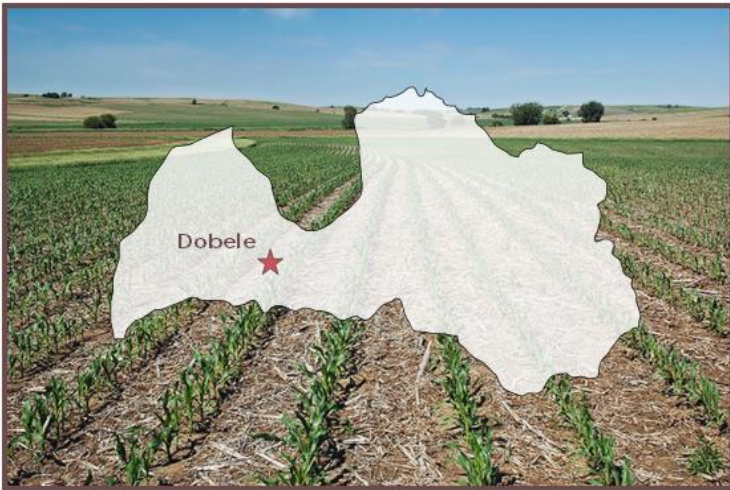
TOT-C, TOT-N, ORG. MATTER, P_2O_5 , K_2O , SO_4 , NO_3 , NH_4 ,
EXCHANGE CATIONS (Mg, Ka),
MICROELEMENTS (Cu, Mn, Zn, B, Fe), pH.

MICROBIAL ACTIVITY IN SOIL

BASAL & SUBSTRATE INDUCED RESPIRATION, AMMONIUM OXIDATION
POTENTIAL, DEHYDROGENASE ACTIVITY, SHANNON SPECIES DIVERSITY INDEX



CRAFT LIFE MONITORING METHODS



NO-TILL FARMING

- 8 FARMS, TOTAL AREA
~175 ha;

PHYSICAL-CHEMICAL PARAMETERS OF SOIL

TOT-C, TOT-N, ORG. MATTER, P_2O_5 , K_2O , SO_4 , NO_3 , NH_4 ,
EXCHANGE CATIONS (Mg, Ka),
MICROELEMENTS (Cu, Mn, Zn, B, Fe), pH.

MICROBIAL ACTIVITY IN SOIL

BASAL & SUBSTRATE INDUCED RESPIRATION, AMMONIUM OXIDATION
POTENTIAL, DEHYDROGENASE ACTIVITY, SHANNON SPECIES DIVERSITY INDEX

WEED AND SOIL INVERTEBRATE DIVERSITY

SPECIES ABUNDANCE, DIVERSITY AND DOMINANCE



CRAFT LIFE MONITORING METHODS



CONTROLLED DRAINAGE SYSTEM

➤ 3 FARMS, TOTAL 80 ha

PHYSICAL-CHEMICAL PARAMETERS OF SOIL

TOT-C, TOT-N, ORG. MATTER, P_2O_5 , K_2O , SO_4 , NO_3 , NH_4 ,
EXCHANGE CATIONS (Mg, Ka),
MICROELEMENTS (Cu, Mn, Zn, B, Fe), pH.

GREENHOUSE EFFECT GAS EMISSIONS OF SOIL

CO_2 , N_2O , CH_4 ; CO_2 budget

PHYSICAL-CHEMICAL PARAMETERS OF DRAINAGE WATER

N, P, C, pH, TEMPERATURE, ELECTROCONDUCTIVITY, LEVEL FLUCTUATION

LOCAL CLIMATE

AIR TEMPERATURE, PRECIPITATION, SOLAR RADIATION, WIND DIRECTION



Airborne Surveillance and Environmental Monitoring System ARSENAL



STA system
with standard colour and thermal vision modes

High resolution
60M pix RGB camera

MWIR sensor
3000-5000 nm
64 bands

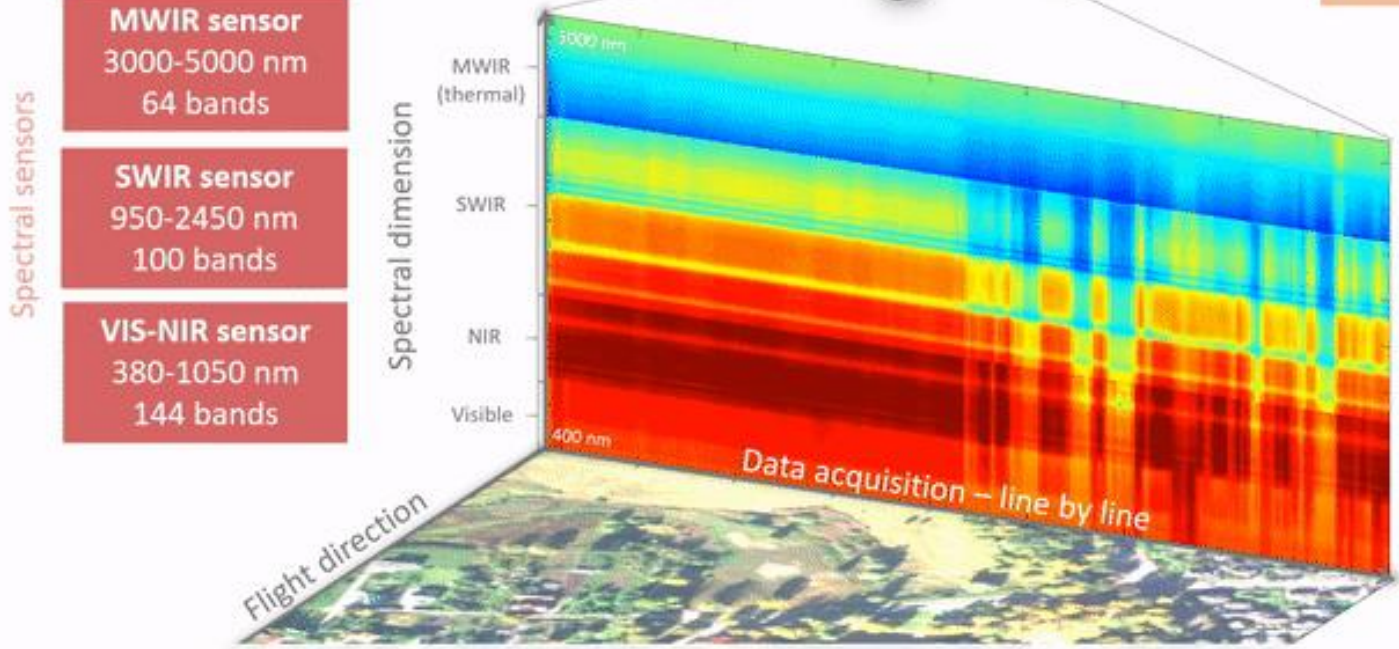
SWIR sensor
950-2450 nm
100 bands

VIS-NIR sensor
380-1050 nm
144 bands

Terrestrial
LIDAR

Thermal
sensor
3800-4800 nm

Ultraviolet
sensor
280-375 nm



AIRBORNE MONITORING OF VEGETATION DROUGHT STRESS



A unique airborne setup not only in the European but also in the world level

Thank you!

Any questions?



**Institute for
Environmental
Solutions**

"Lidlauks", Priekulji parish
Cēsis county, LV-4126, Latvija
T.: 64127951
lidlauks@vri.lv
vri.lv

Our social media:
FB / IG / TW: @videsinstituts
LinkedIn: Institute for Environmental Solutions