



N O R S Ø K

Norwegian Centre for Organic Agriculture



Capture: Fangvekster som klimatilak i norsk kornproduksjon



EJP Soil National Hub på Vitenparken i Ås
06.09.2023

CAPTURE: Mål

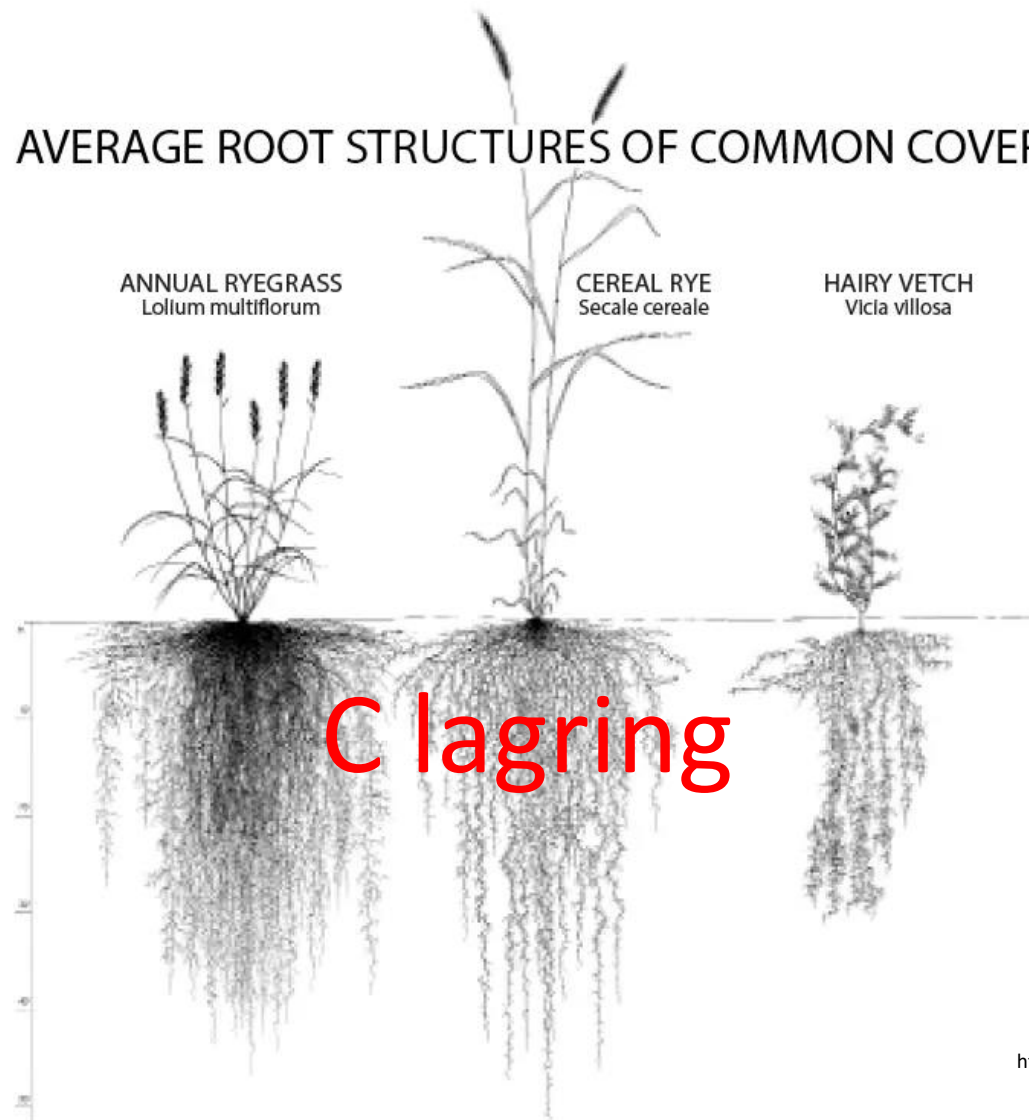
*Dokumentere **klimaeffekten** av fangvekster på kornarealer i Norge, samt å utvikle gode dyrkingsstrategier.*



Foto: Anne Kjersti Bakken

Fangvekster & jordkarbon

AVERAGE ROOT STRUCTURES OF COMMON COVER CROPS



<https://www.deere.com/en/publications/the-furrow/2021/sept-fall-2021/the-root-project/>

WP2 Bidrag av fangvekster til jordkarbon

Task 2.1 Pulsmerking med ^{13}C og tildeling av C under bakken

Hypotese: Fangvekster øker jord C betydelig i norske korndyrkingssystemer på kort sikt.

Design: 4 fangvekster (4 replikater hver) ble sådd i april som monokulturer:

- Italiensk raigras (høy CN)
- Oljefrø raddish (pælerot)
- Sommervikke (belgfrukt, lav CN)
- Phaselia

Prosedyre for pulsmerking:

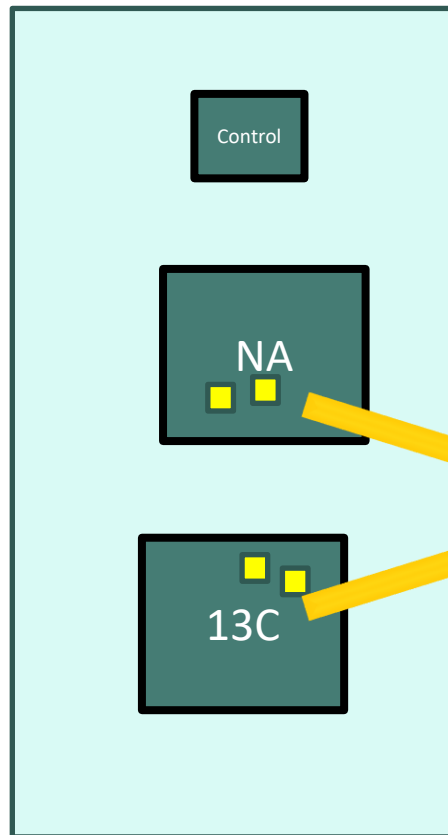
Merket $^{13}\text{CO}_2$ produsert fra merket natriumkarbonat (99 ATOM % ^{13}C) reagerer med 4N HCl i 1 m³ transparente kammer

- Opptak ble fulgt av en Li-Cor CO₂-meter
 - Italiensk raigras – 6 pulser
 - Oljefrø raddish, Sommervikke, Phaselia – 5 pulser



PRØVETAKING OG ANALYSER

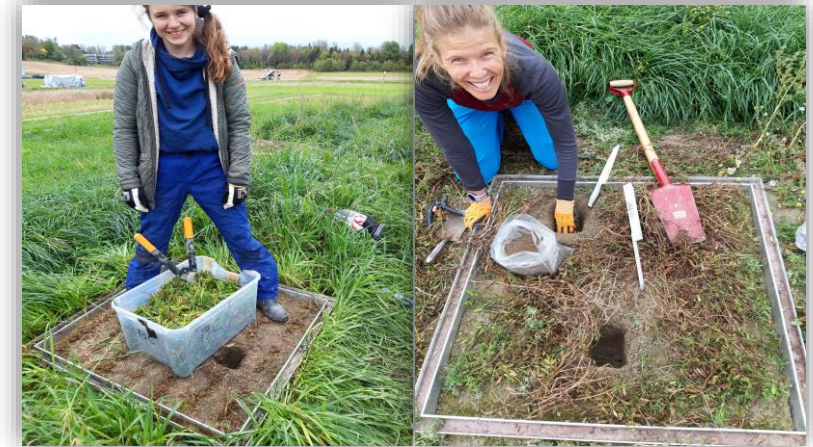
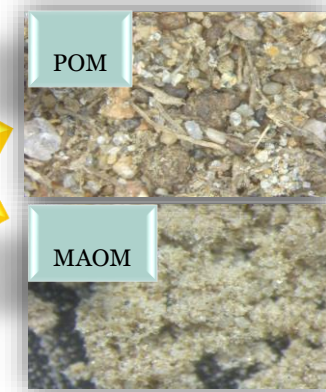
Prøvetaking: Utført i løpet av august/september for alle arter for både naturlig overflod og ^{13}C merkede tomter



^{13}C -analyse for C-allokering:

- Over bakken biomasse
- Stående rotbiomasse
- Massejord (<2 mm)

Fraksjonering (NORSØK)



KARBONPERSISTENS – GJENSIDIG STUDIE

- Etter innhøsting i 2021 ble overjordisk biomasse (ABG) av de pulsmerkede parsellene og kontroll-, naturlig overflodsarealer byttet ut og innlemmet i det øverste laget av jorda.



Prøvetaking høsten 2022 og 2023

- følge nedbrytningen og C-persistensen til skuddet og rotavledet C i de senere årene



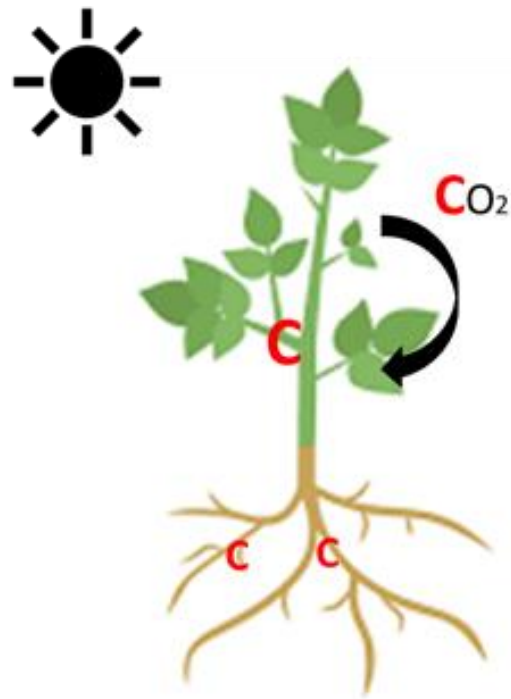
Merkede røtter + umerkede skudd (LR – labeled roots)

Merkede skudd + umerkede røtter (LS – labeled shoots)

Kontroll for naturlig overflod (NA – natural abundance)

Hva skal vi snakke i dag

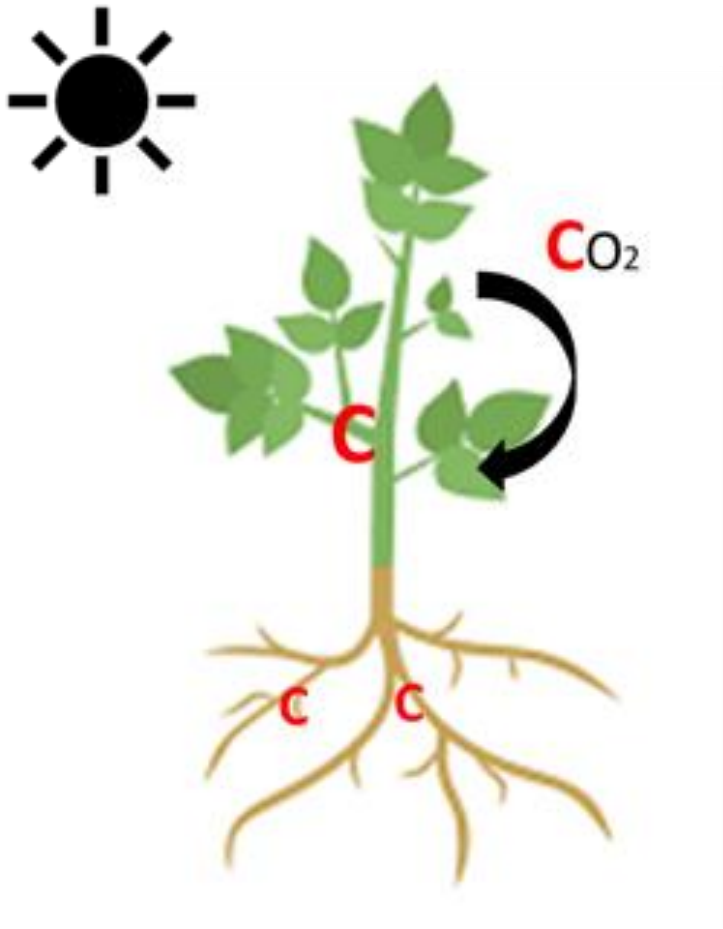
2021: C allocation



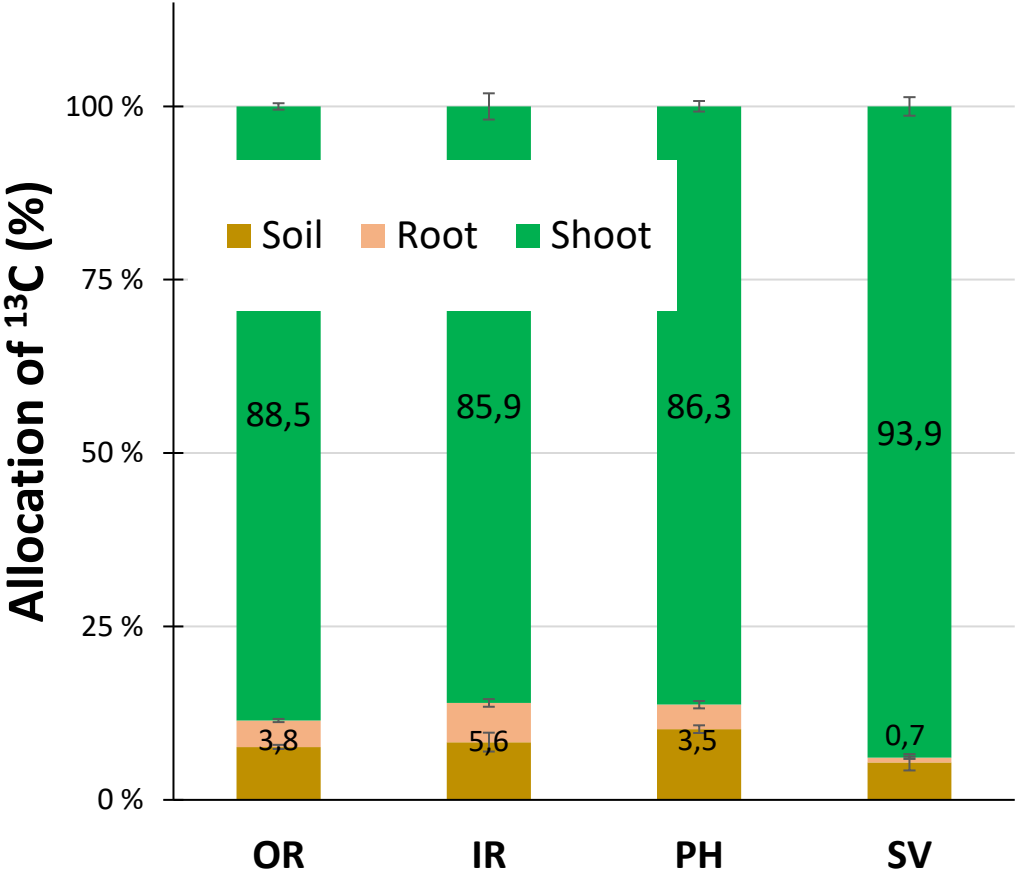
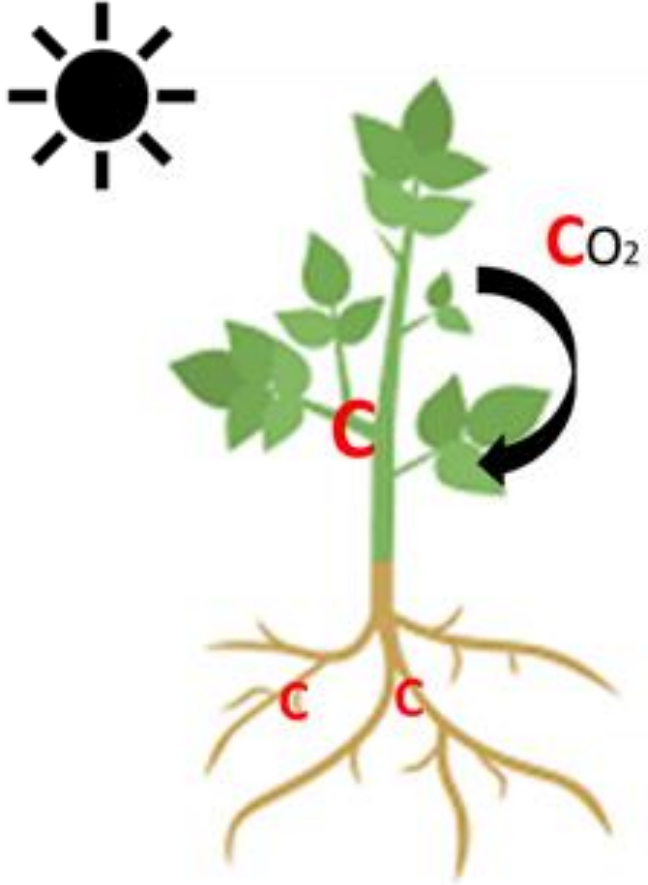
2022, 2023: C persistence



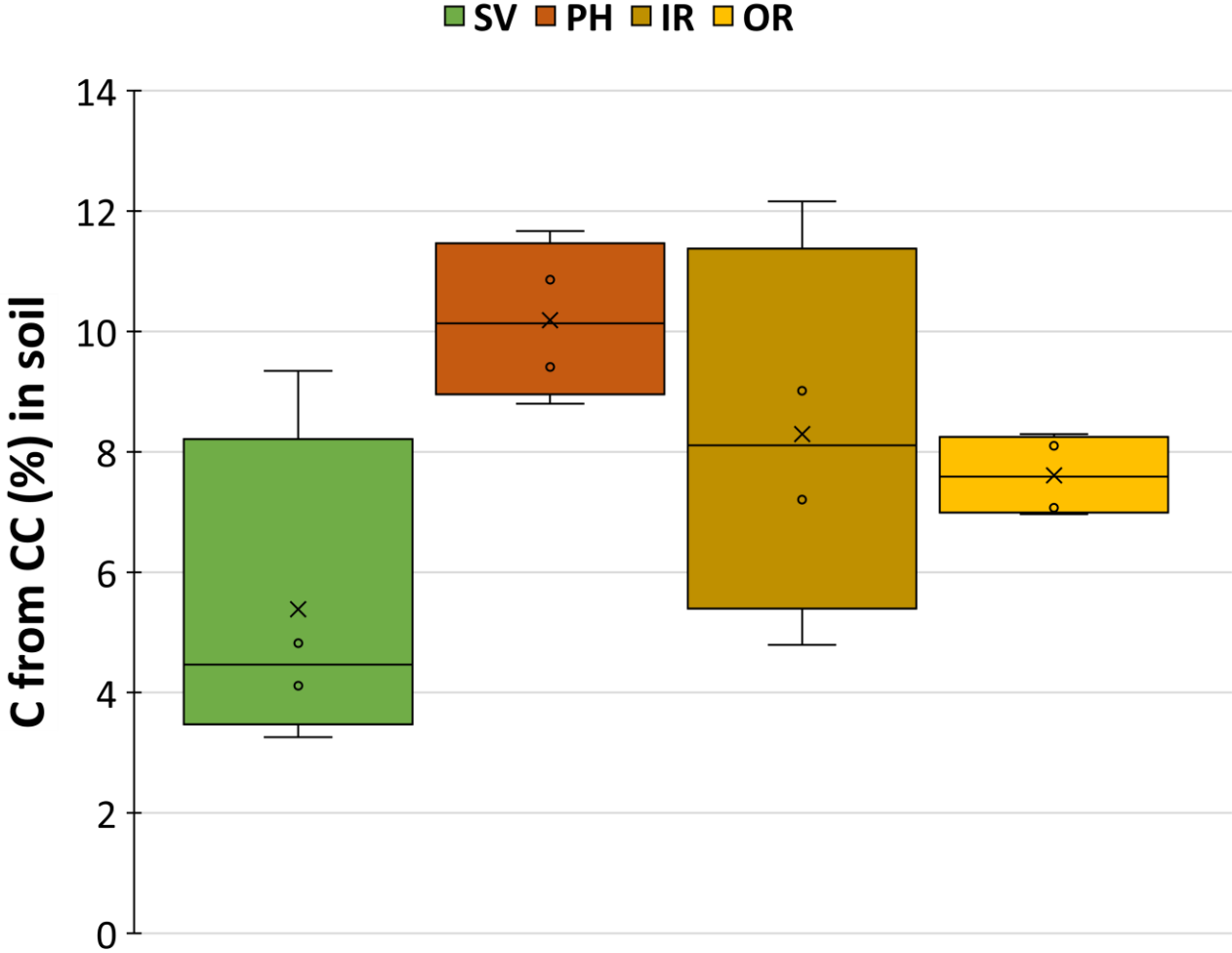
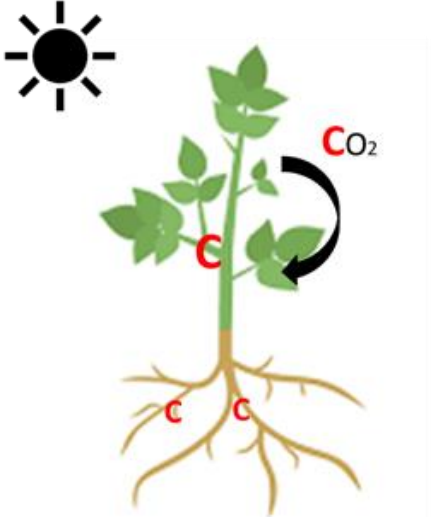
C allocation: fangvekster til jordkarbon i 2021



C allocation: fangvekster til jordkarbon i 2021



C allocation i jord

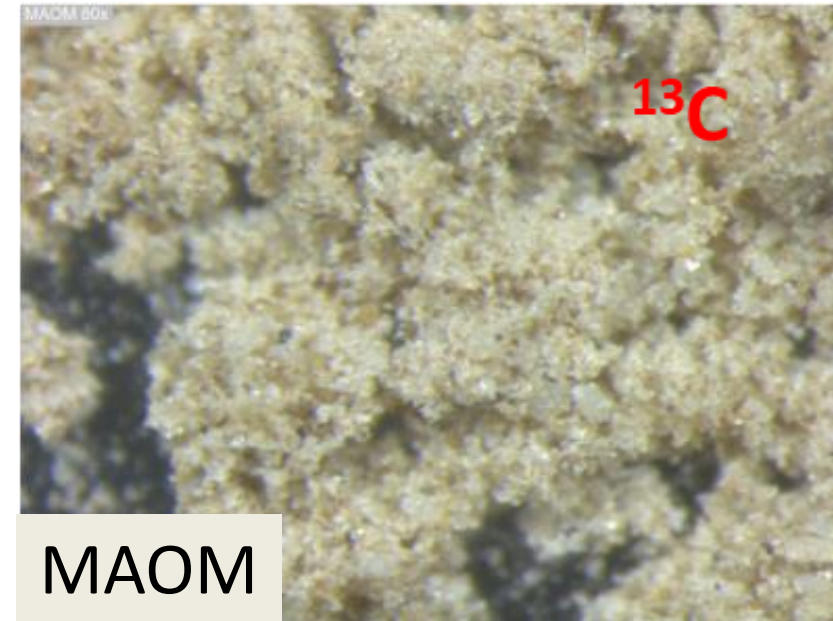


C allocation i jordfraksjoner

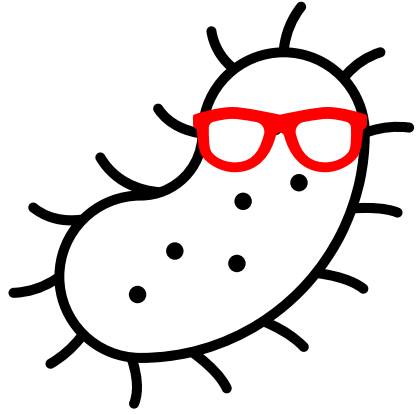
**POM: Particulate
Organic Matter**



**MAOM: Mineral-Associated
Organic Matter**

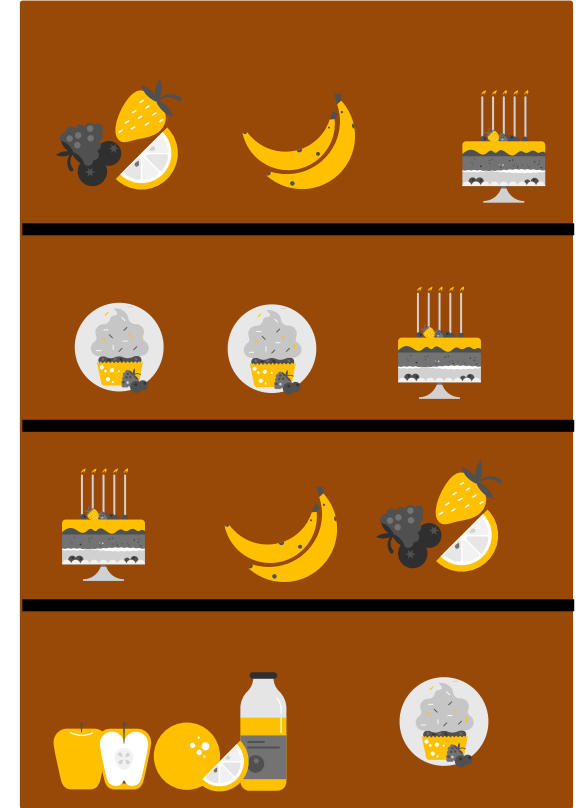
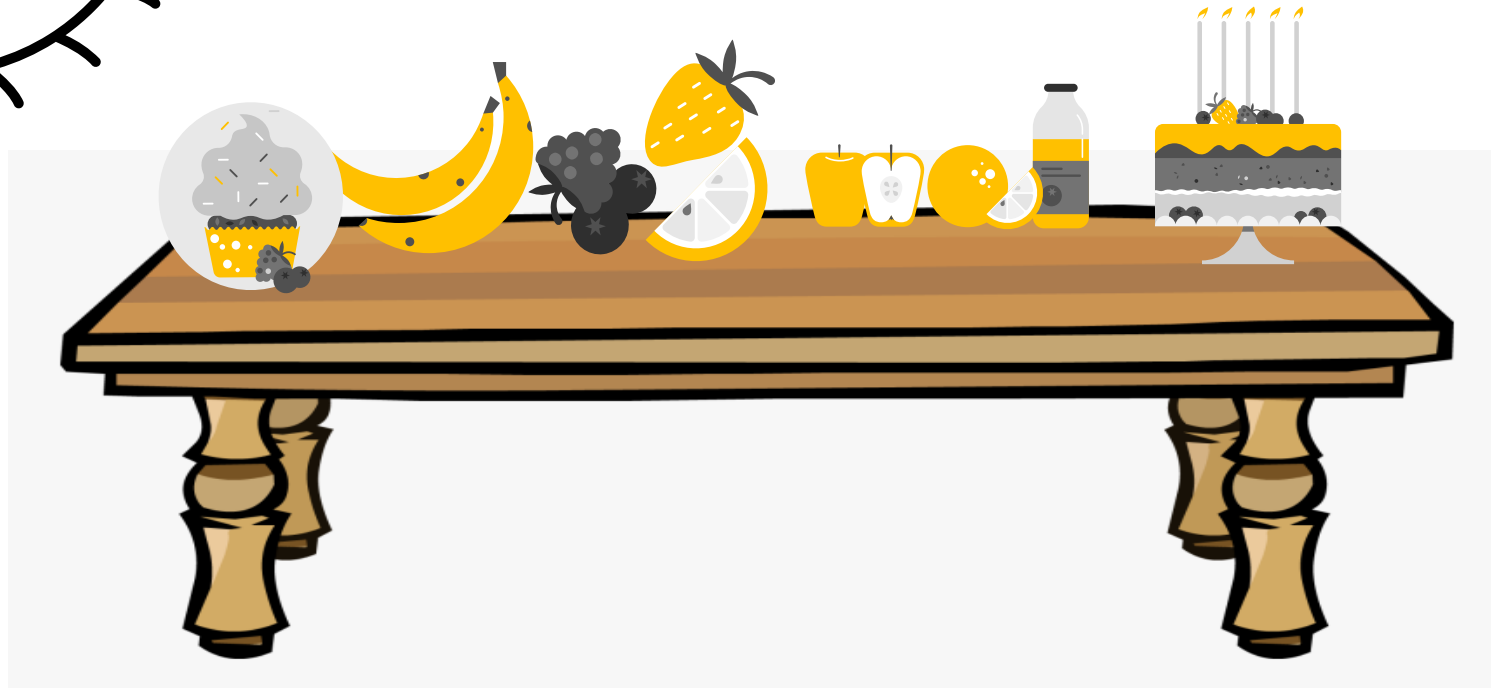
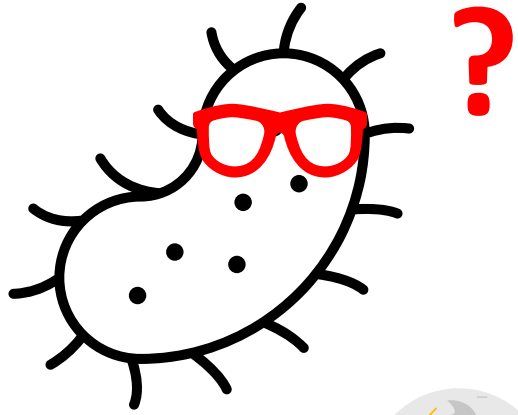


Jordfraksjoner

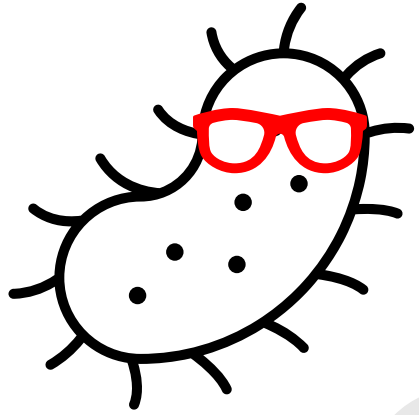


Jord mikrobe

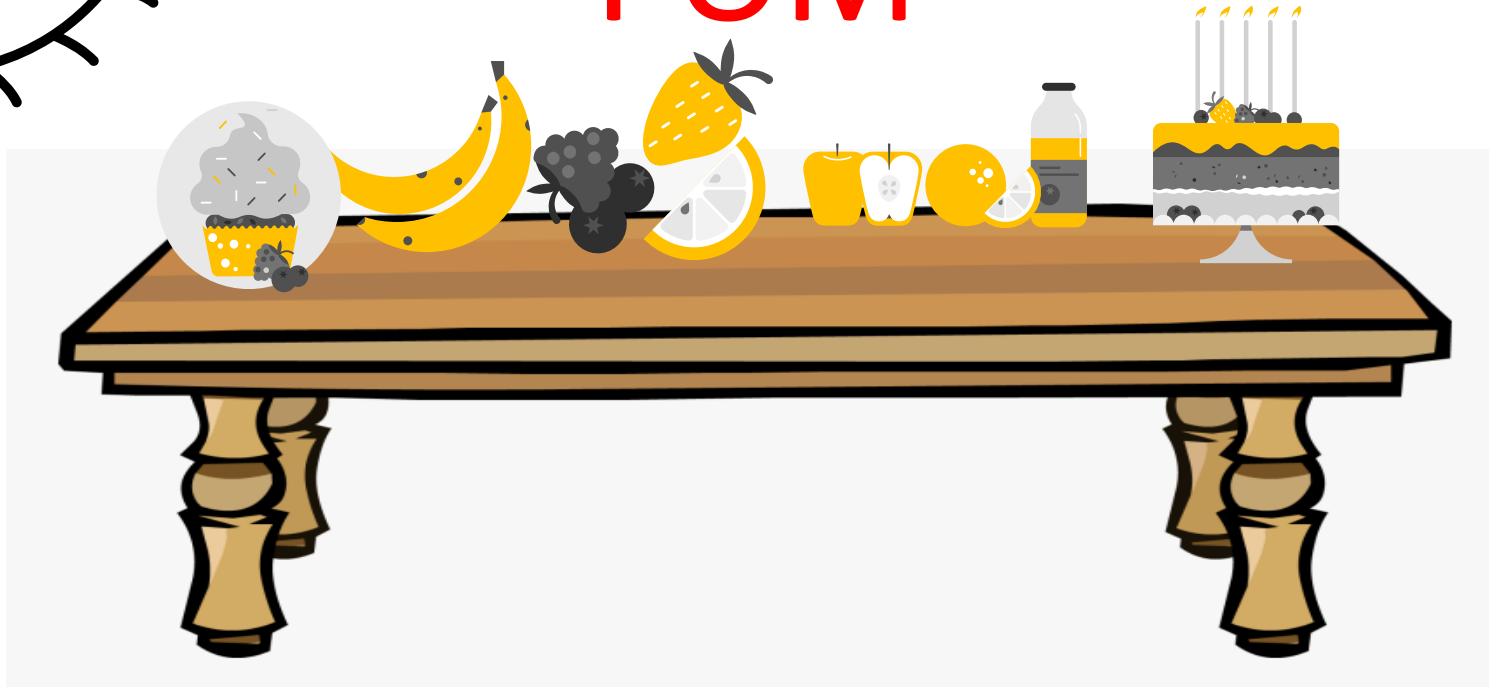
Jordfraksjoner



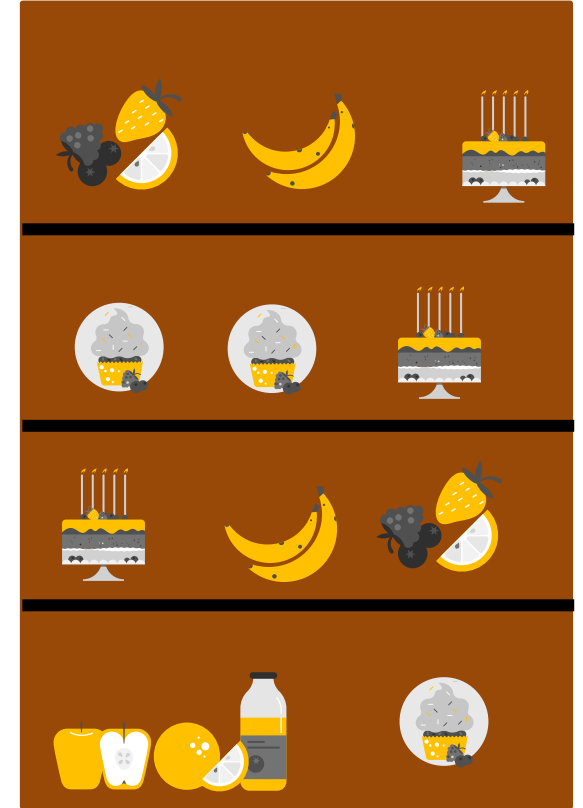
Jordfraksjoner



POM

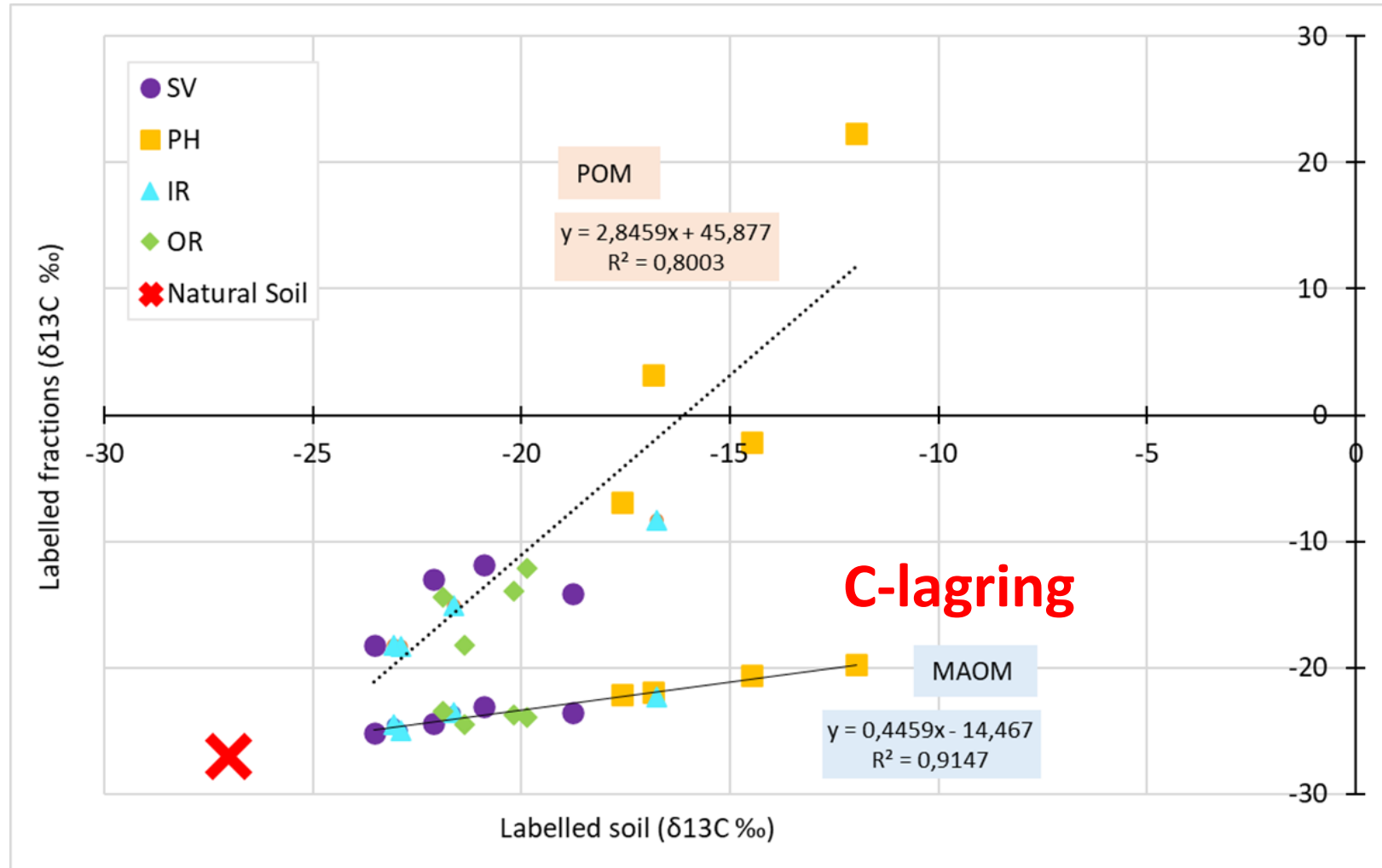
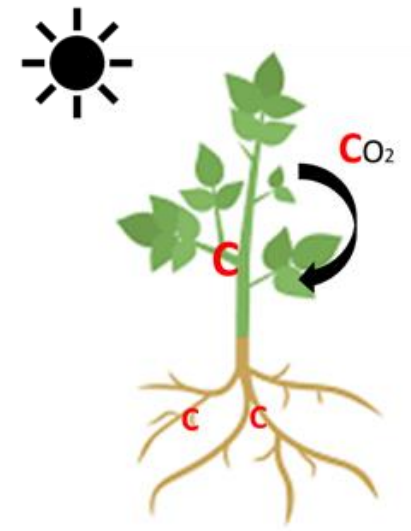


MAOM



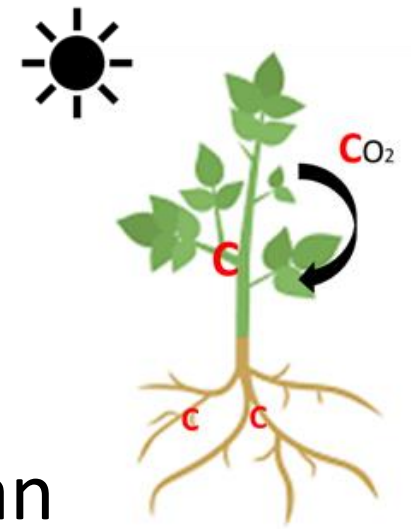
C-lagring

Jordfraksjoner: ^{13}C i 2021



Hva vi har lært til nå

- More C was allocated to the above ground biomass than the below ground biomass during the growing season
- About 4-12% of the total C sequestered by the CC was transferred to the soil during the growing season
- Phaselicia transferred the largest amount of C to the MAOM fraction, during the growing season



Hva skal vi gjorde nå?

2022, 2023: C persistence

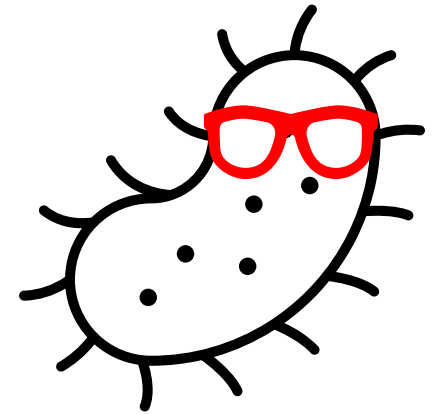


C-arouND

C-arouNd



Takk for meg



Capture:

<https://www.nibio.no/prosjekter/fangvekster-som-klimatiltak-i-norsk-kornproduksjon>

CarouNd:

<https://www.norsok.no/prosjekter/2023/refining-soil-conservation-and-regenerative-practices-to-enhance-carbon-sequestration-and-reduce-greenhouse-gas-emissions>