

CyberGrass I –kick off webinar

Decision support system concept for
grass sward management

Jere Kaivosoja, Luke



Content

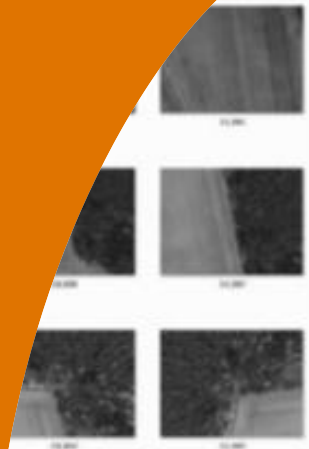
DSS

Remote sensing & DSS

DSS solutions

DSS and drones in the future

TRL of remote sensing solutions



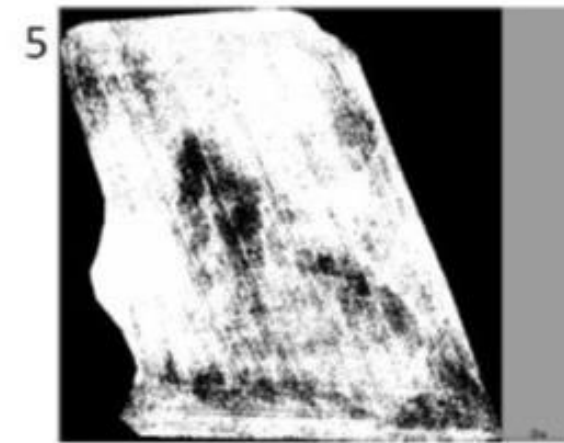
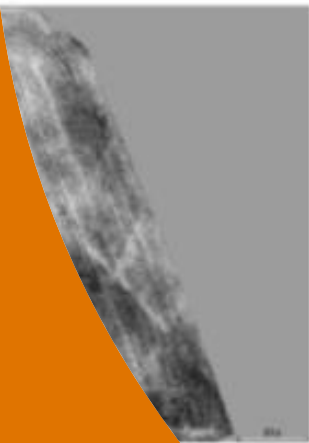
data
images



Orthomosaics
-RGB mosaics
-RGB values & coordinates



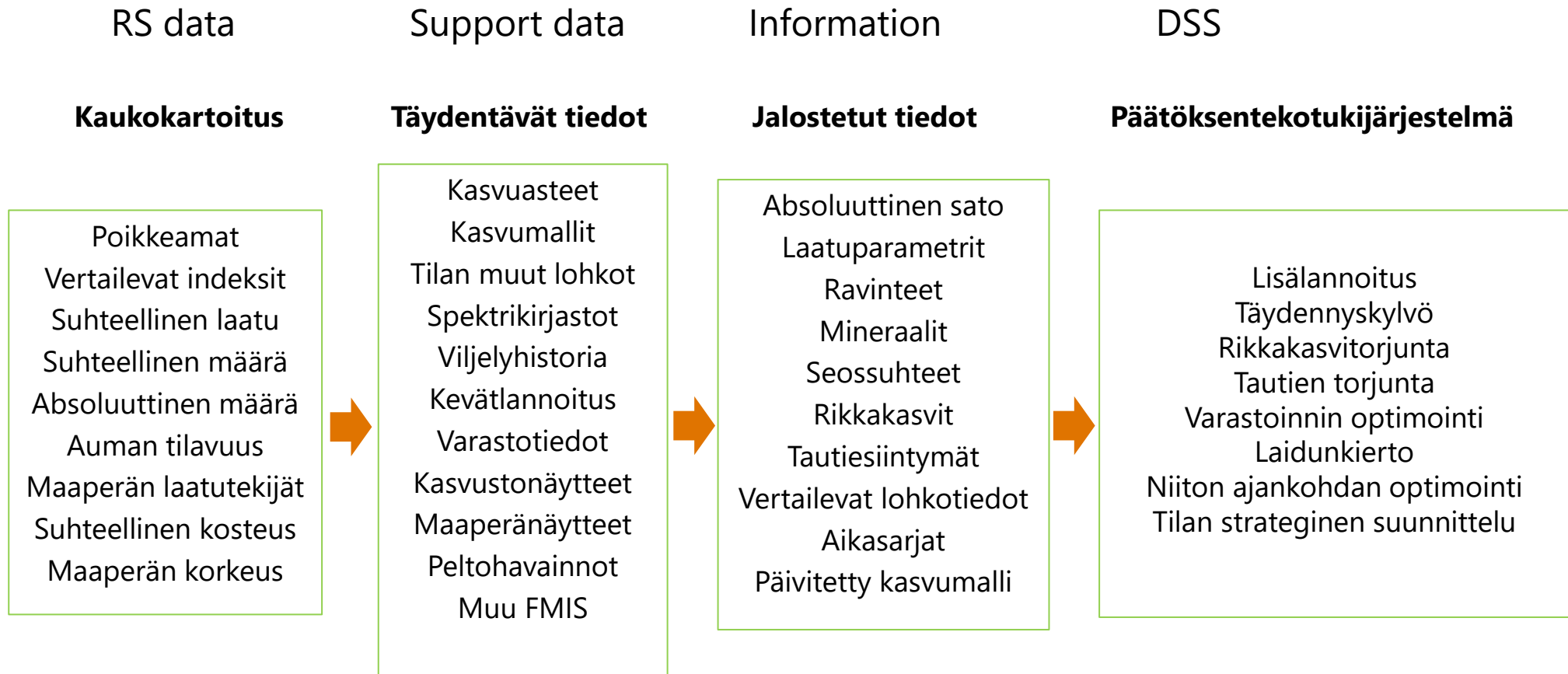
Field map
-RGB-map
-RGB-values &



Classified map
-Threshold
-Binary map: damage/no damage



Task ger
-Seeding
-Contour



DSS tools for silage production from remote sensing data

Fertilization

- Nutrient and mineral maps
- Mixture map

Additional seeding

- Anomaly map
- Disease map

Weed control

- Weed map

Disease control

- Disease map

Storage amount and optimization

- Quality map
- Quantity map
- Mixture map
- Stack volume model

Pasture rotation

- Quantity map (yield map)
- Quantity & quality change
- Mixture map

Harvesting order

- Relative difference indexes

DSS, obstacles, solutions

Fertilization

- Need local data (soil type, grass mixture, growth stage)
- Balancing between quality and efficiency

Additional seeding

- Big machinery and laborous threshold determination (small disperse areas)
- Develop automatic indexing and zoning

Weed control

- Need accurate and local data (weed types and growth stages, grass mixture and growth stages)
- New methods to decrease need for local data

Disease control

- Need accurate and local data, limited control
- Additional seeding

Storage amount and optimization

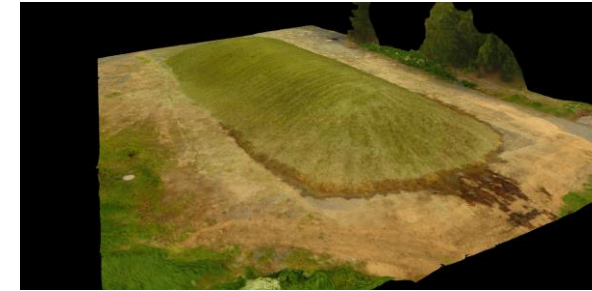
- Getting data fluently to the farm management
- Integrate systems

Pasture rotation

- Need local data, integrate the system
- New methods for local data, develop system integration

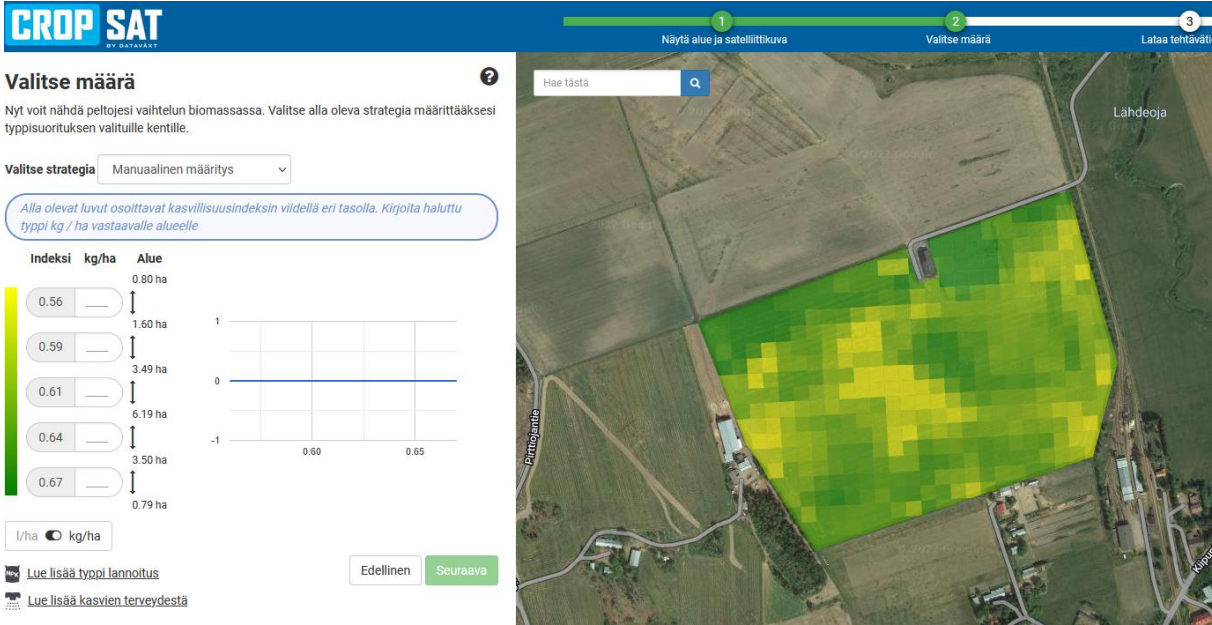
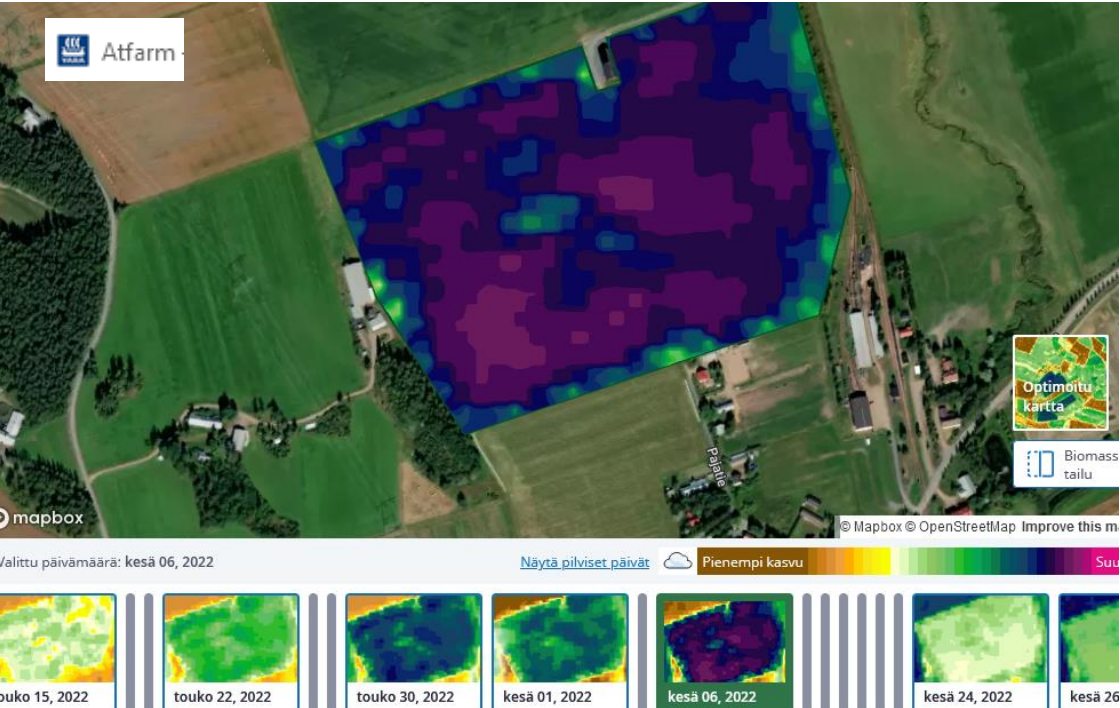
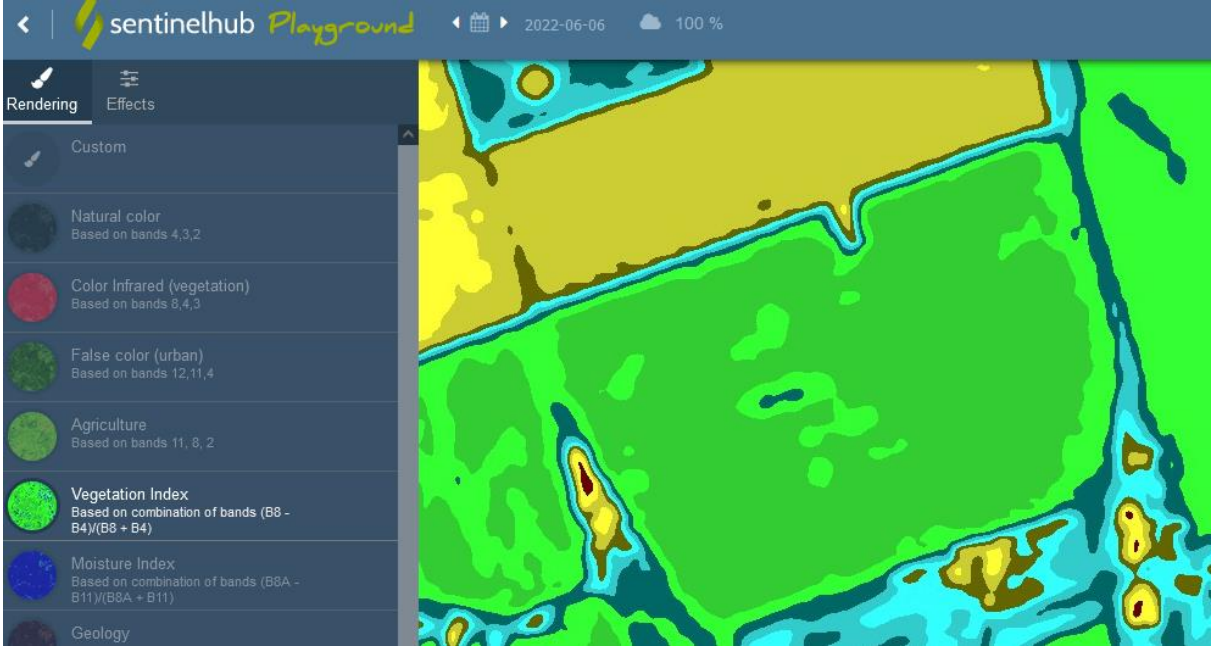
Harvesting order / timing

- Complicated logistics
- Develop systems for logistic optimization



Existing DSS systems

NDVI & Fertilization



The weaker spot





Drone maps, Dronedeploy



CROP SAT

BY DATAVÄY

1

Näytä alue ja satelliittikuva

2

Valitse määrä

Valitse määrä

Nyt voit nähdä peltojesi vaihtelun biomassassa. Valitse alla oleva strategia määrittääksesi typpisuorituksen valituille kentille.

Valitse strategia

Manuaalinen määrittys

Alla olevat luvut osoittavat kasvillisuusindeksin viidellä eri tasolla. Kirjoita haluttu tyyppi kg / ha vastaavalle alueelle

Indeksi

kg/ha

Alue

0.62

—

0.78 ha

0.64

—

1.82 ha

0.65

—

3.94 ha

0.66

—

5.66 ha

0.68

—

3.33 ha

—

—

0.82 ha

1

0

-1

0.62

0.64

0.66

0.68

31.5.2021

Edellinen

Seuraava

Lue lisää tyyppi lannoitus

Lue lisää kasvien terveydestä

Hae tästä

Lähdeoja

Cropsat and Suonentieto

31.5.2021

Sijaintia ei pystytty määrittämään

Antti Suokannas

Luke Maatila

ALOITA KONETYO

Tehtävät

Kartta

Muistiinpanot

Rekisterit

Hallinta

Lähetä palautetta

Kirjaudu ulos

Tekijänoikeudet

NI

TEHTÄVÄT

MUISTIINPANOT

TIEDOT

AJOT

AJOT BETA

5%

11%

4%

80%



Typenoton arvio on dynaaminen ja riippuu kasvuvaiheesta ja pellon typenoton keskiarvosta. Katso lisätietoja [UKK-sivulta](#).

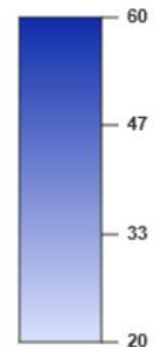
Valittu päivämäärä: kesä 06, 2022

[Näytä pilviset päivät](#)

Pellon keskimääräinen typenotto tänään: 36 Kg/ha

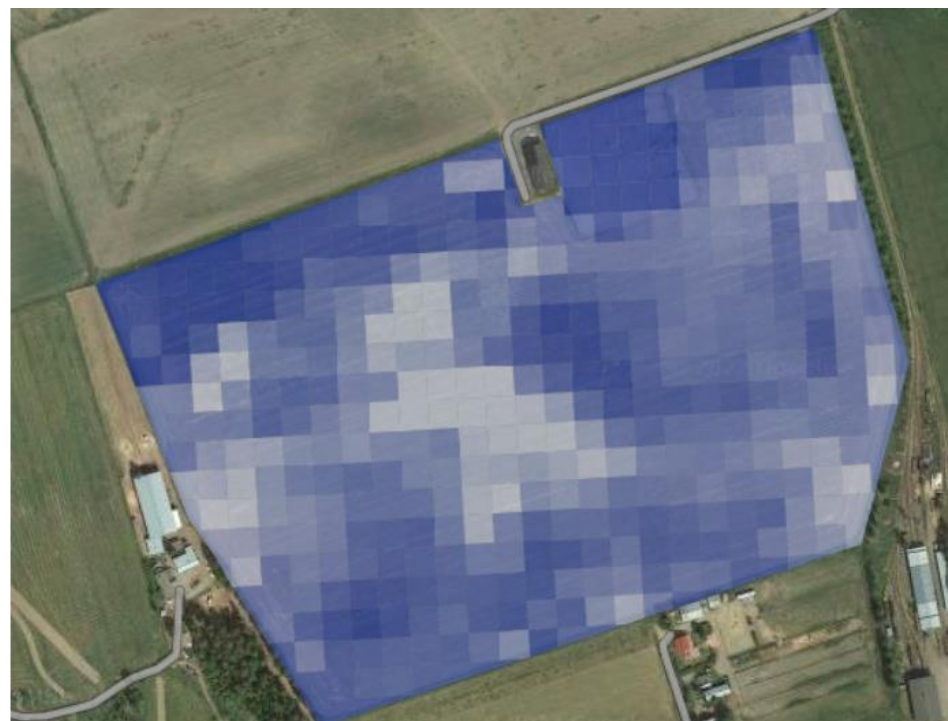
6 16 26 36 46 56 66 /ha

akaa oikea
uu

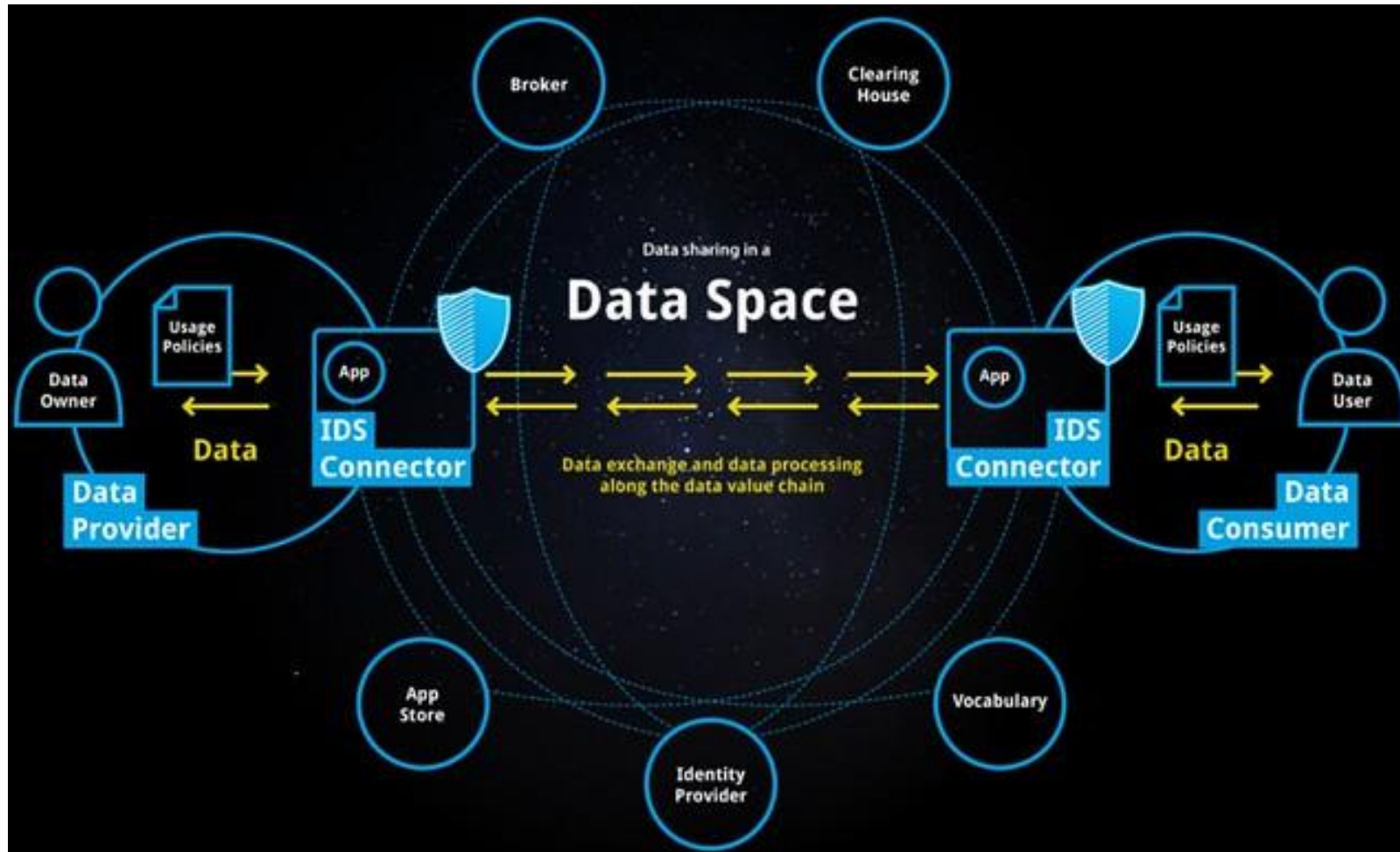


ssessa ja käyttää sitä

DSS and application task, Cropsat and AtFarm



How to enable DSS solutions: International Data Spaces (IDS) model



DSS integration to farm management

Weed control (Flexigrobots, H2020)

<http://flexigrobots.collab-cloud.eu/>

- Mapping of rumex weed locations (drone operation service)
- Application task for weeding operation (machinery prov. service)
- Connection to FMIS (Mtech)
- Mission operation



RS technologies & TRL

- Different RS technologies

- | | | |
|-----------|---|---|
| Satellite | { | • Free satellite: sentinel-2 or sentinel-1 |
| | | • Accurate satellite: commercial, high spectral, temporal or spatial resolution |
| Drone | { | • 3D, photogrammetric or lidar |
| | | • Close range sampling: images, videos, point measurements |
| | | • RGB, typical orthomosaic with regular camera |
| | | • Multispectral |
| | | • Sensor integration: different relevant sensors |
| | | • Hyperspectral |

TRL: Technology readiness level

Quality: Estimated attainable quality level / spatial data quality: (completeness, consistency, positional and temporal accuracy, thematic accuracy)

Economic viability: Costs and benefits

		TRL	Quality	Eco. via.
Nutrient map	Free satellite	# 9	6	9
	Accurate satellite	7	7	6
	3D	4	4	3
	Close range sampling	# 4	9	6
	RGB	8	7	7
	Multispectral	7	8	6
	Sensor integration	# 6	9	6
	Hyperspectral	6	9	5
Anomaly map	Free satellite	# 9	6	9
	Accurate satellite	9	7	6
	3D	6	7	6
	Close range sampling	5	5	2
	RGB	9	6	7
	Multispectral	9	8	4
	Sensor integration	6	8	3
	Hyperspectral	7	8	3
Weed map	Free satellite	7	3	7
	Accurate satellite	7	4	5
	3D	6	7	6
	Close range sampling	6	5	6
	RGB	8	4	5
	Multispectral	6	7	5
	Sensor integration	6	9	5
	Hyperspectral	5	8	2
Disease map	Free satellite	5	2	4
	Accurate satellite	5	3	2
	3D	2	1	1
	Close range sampling	5	8	5
	RGB	7	5	4
	Multispectral	5	6	3
	Sensor integration	4	8	2
	Hyperspectral	4	7	2

Mixture map	Free satellite	5	4	6
	Accurate satellite	4	5	3
	3D	4	3	4
	Close range sampling	# 3	8	7
	RGB	5	4	5
	Sensor integration	5	8	5
	Multispectral	5	6	6
	Hyperspectral	6	8	4
Quality map	Free satellite	7	6	6
	Accurate satellite	7	6	4
	3D	6	4	4
	Close range sampling	7	9	5
	RGB	7	4	4
	Multispectral	7	7	6
	Sensor integration	6	9	5
	Hyperspectral	7	9	4
Quantity map	Free satellite	6	6	6
	Accurate satellite	6	7	5
	3D	# 6	8	7
	Close range sampling	5	8	4
	RGB	8	6	5
	Multispectral	7	7	5
	Sensor integration	# 6	9	6
	Hyperspectral	6	8	4
Stack volume	Free satellite	3	1	2
	Accurate satellite	3	2	2
	3D	# 7	9	7
	Close range sampling	3	4	1
	RGB	3	3	3
	Multispectral	3	3	2
	Sensor integration	5	9	3
	Hyperspectral	3	2	1

Quantity change	Free satellite	7	6	6
	Accurate satellite	7	7	5
	3D	4	9	5
	Close range sampling	3	8	6
	RGB	9	5	5
	Multispectral	7	7	4
	Sensor integration	5	8	2
	Hyperspectral	6	8	3
Quality change	Free satellite	7	6	5
	Accurate satellite	7	7	5
	3D	3	2	2
	Close range sampling	7	8	6
	RGB	5	5	4
	Multispectral	7	7	5
	Sensor integration	5	8	5
	Hyperspectral	6	8	5
Relative index between fields	Free satellite	# 9	8	7
	Accurate satellite	9	9	4
	3D	5	7	4
	Close range sampling	5	8	6
	RGB	7	7	5
	Multispectral	5	8	3
	Sensor integration	5	8	1
	Hyperspectral	5	8	2
Other crop model updates	Free satellite	# 8	8	9
	Accurate satellite	7	8	6
	3D	7	8	3
	Close range sampling	3	3	2
	RGB	7	7	5
	Multispectral	5	6	3
	Sensor integration	5	6	2
	Hyperspectral	5	6	2

Thank you!

