E-Farming and digital agriculture

Andre Laperriere
Executive Director
GODAN

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Challenges and opportunities:

- **Demographics**:

  Tripling of the world population

- **Climate change:**

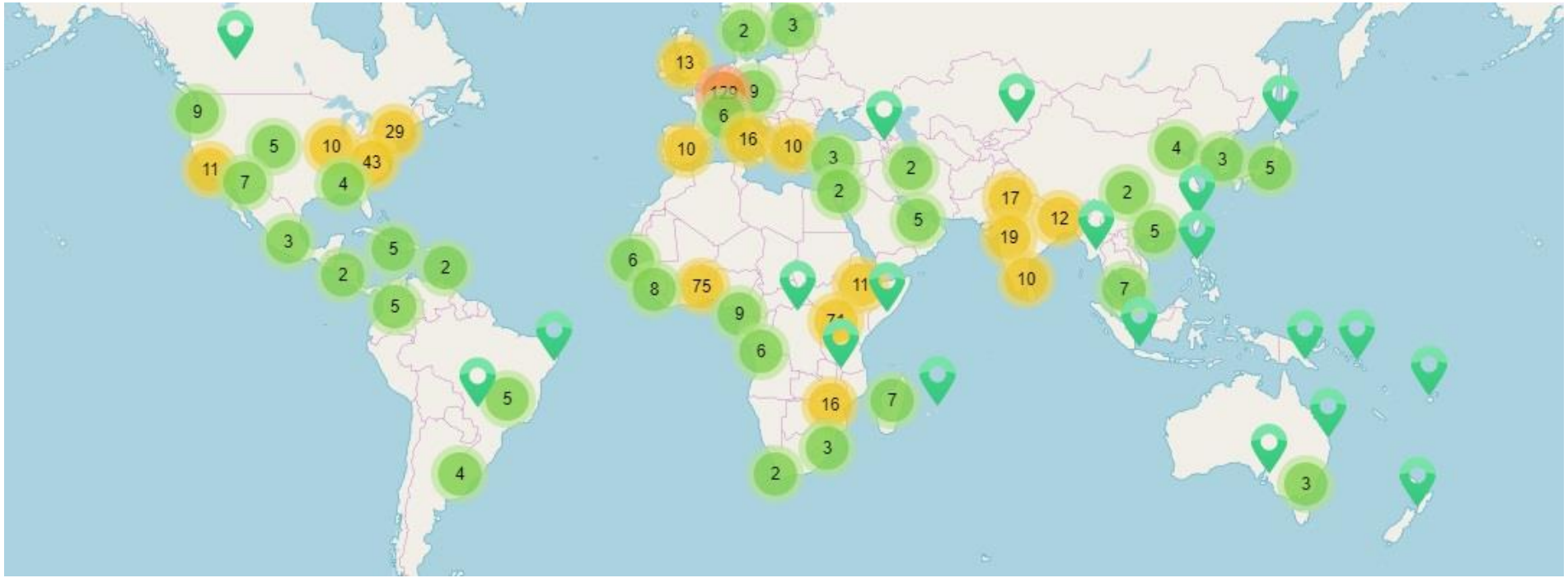
  Warmest years so far, natural catastrophes, agricultural zones changing

➢ **Technology costs** down, **data** availability unprecedented

'Unprecedented times require unprecedented measures'

Building a global momentum (Dec 2014)

GODAN: 800+ partners
(September 2018)



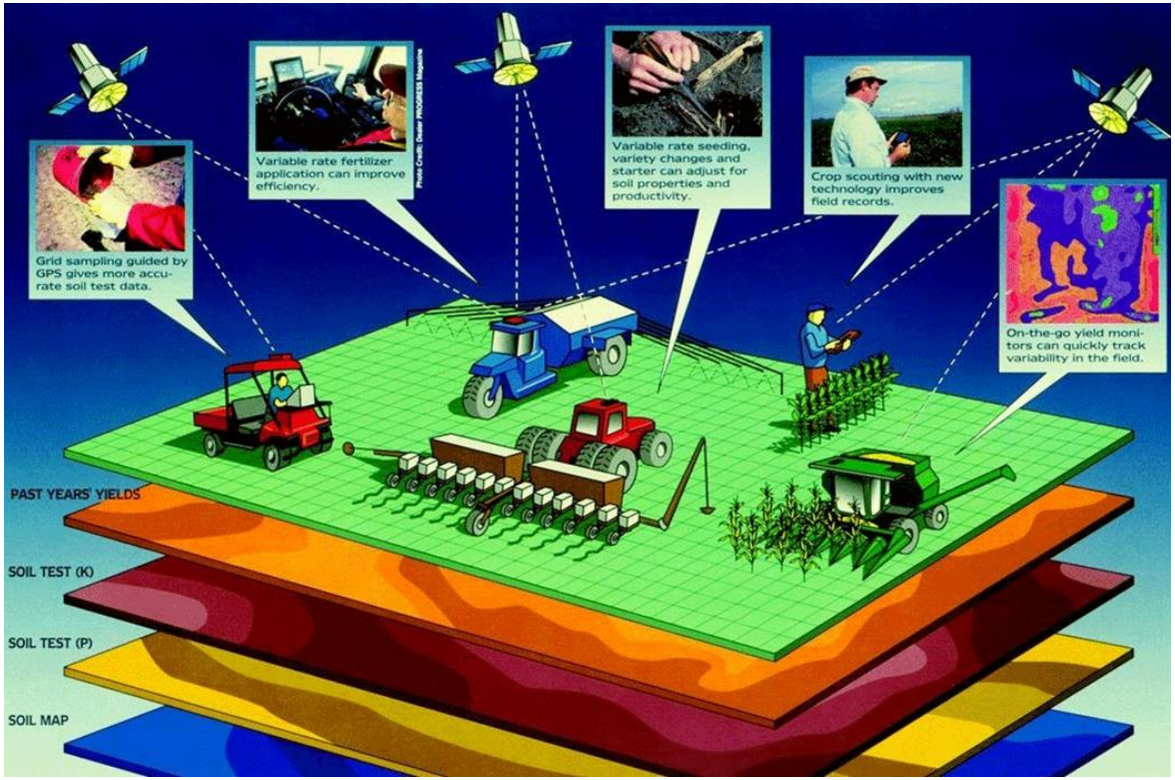
Data exchange= key to impact:

- Geodata
- Weather data
- Market data
- Infestations
- Diseases
- Equipment
- Social data

Impact:

- Ag optimization
- Yields increase
- Costs reduction
- Profit increase
- Nutrition improvement
- Disaster mitigation
- Improved quality of life

Data revolution: New sensors, data integration



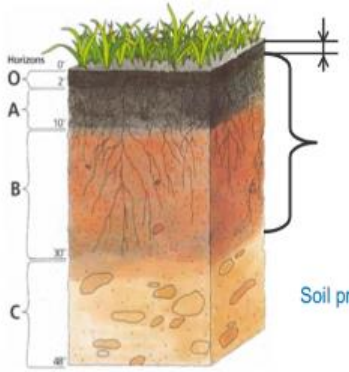
Soil mapping and modelling

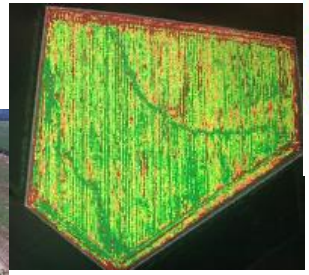
Features:

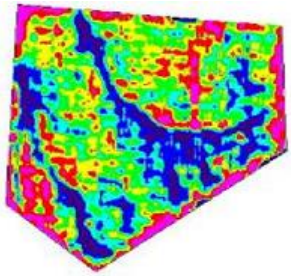
- Field problem areas and yield analysis
- Soil quality indices development (max margin productivity)
- Air and soil temperature forecast
- Drought and flood forecasting
- Nitrogen and pH level determination
- Water erosion modelling

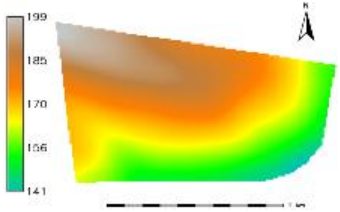
Data types

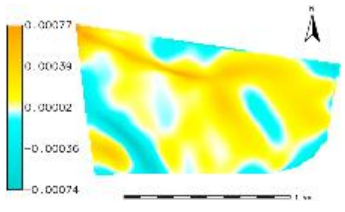
- Sentinel 1 & 2 (10 m resolution)

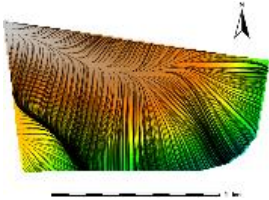






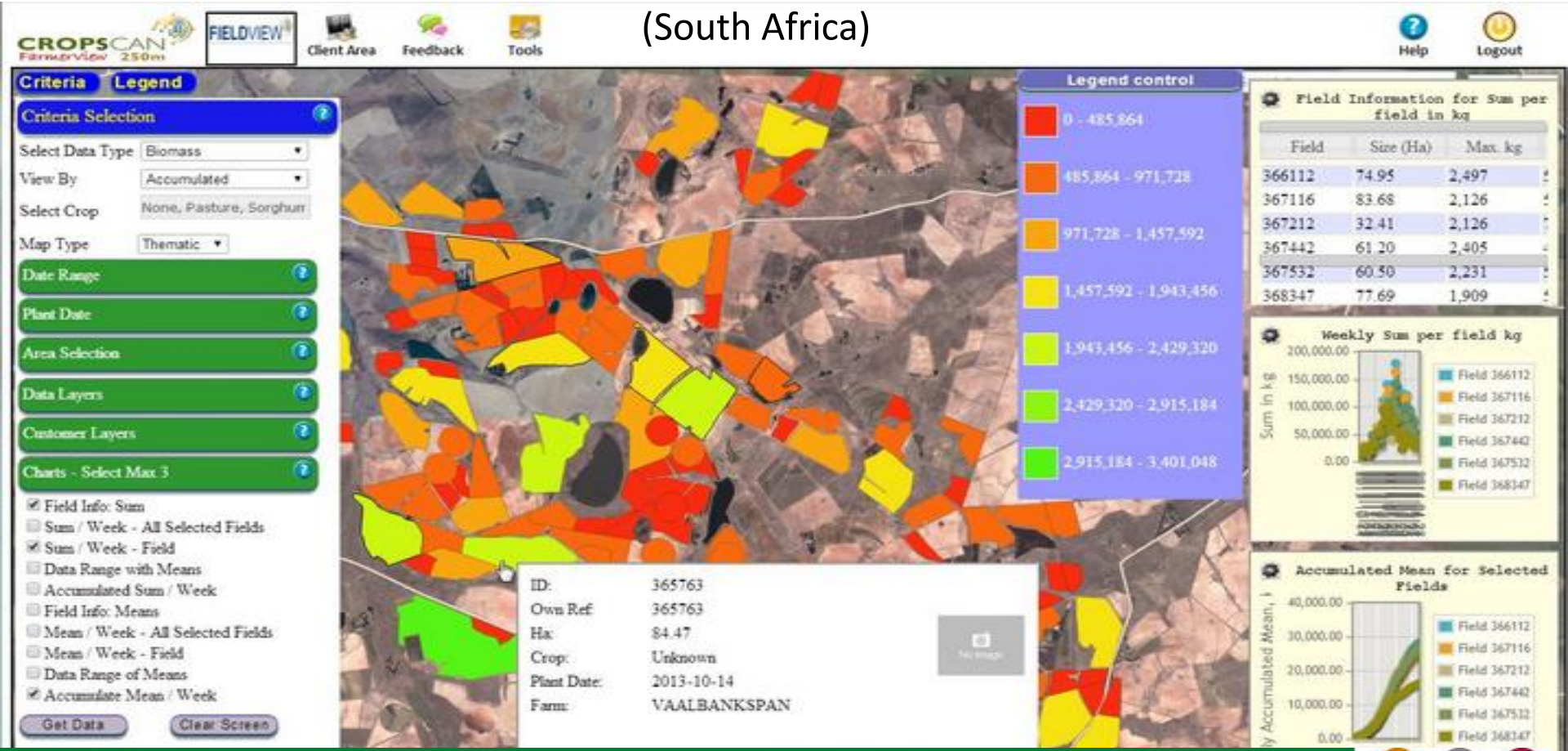






Data for precision irrigation/farming:

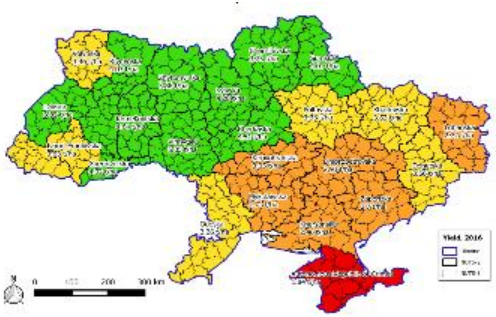
(South Africa)

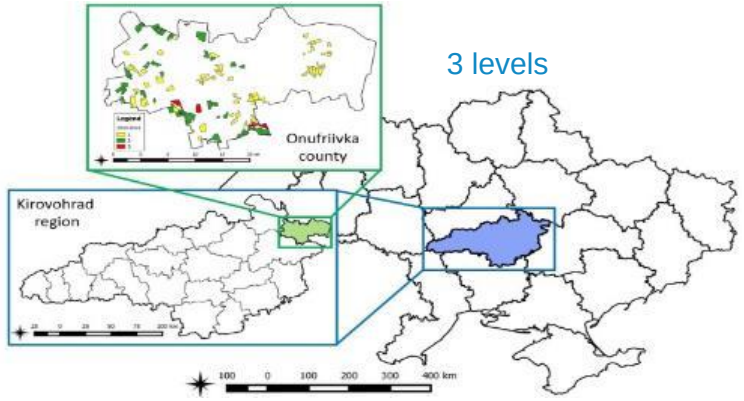


Crop Yield Forecasting

From 2011 with following data:
- MODIS MOD13Q1 NDVI;
- Yield statistics (Government Statistics Agency of Ukraine);
- 2 months in advance of harvest

3 levels
- Regions;
- Counties (Onufrivka county);
- Household (in Onufrivka county)

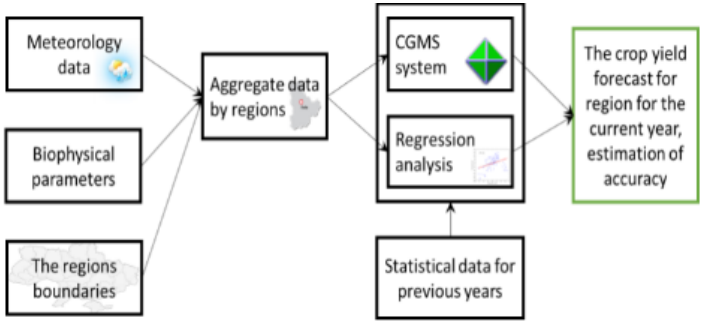




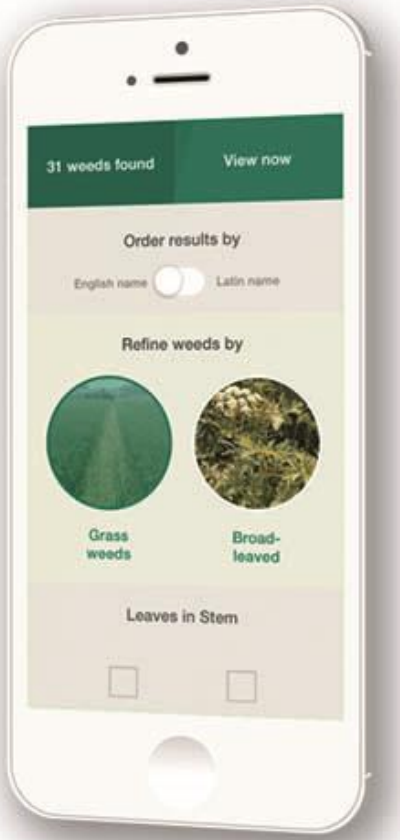
Algorithm is based on:
- Historical data
- Soil moisture
- Precipitation (GPM)
- Weather conditions
- Analysis of spectral indices (NDVI, ReCl, EVI)
- Biophysical parameters (LAI, FAPAR)
- Satellite imagery (Sentinel 2, Sentinel 1, Landsat 8, MODIS Mod13q1, commercial data e.g. RapidEye)

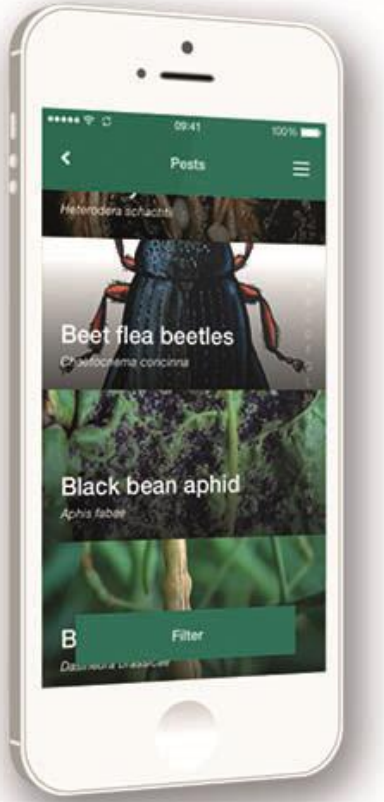
Crop yield forecasting accuracy estimation for previous seasons:

Crop yield forecast accuracy two months before harvest - 70 %
Crop yield forecast accuracy two weeks before harvest - 90 %



- Big Data at your fingertips:





Low tech: ESOKO Model:

Big data that users can understand:
Ethiopia: Data – driven Agriculture

HOTLINE 8282

Ethiopian ATA
Agricultural Transformation Agency
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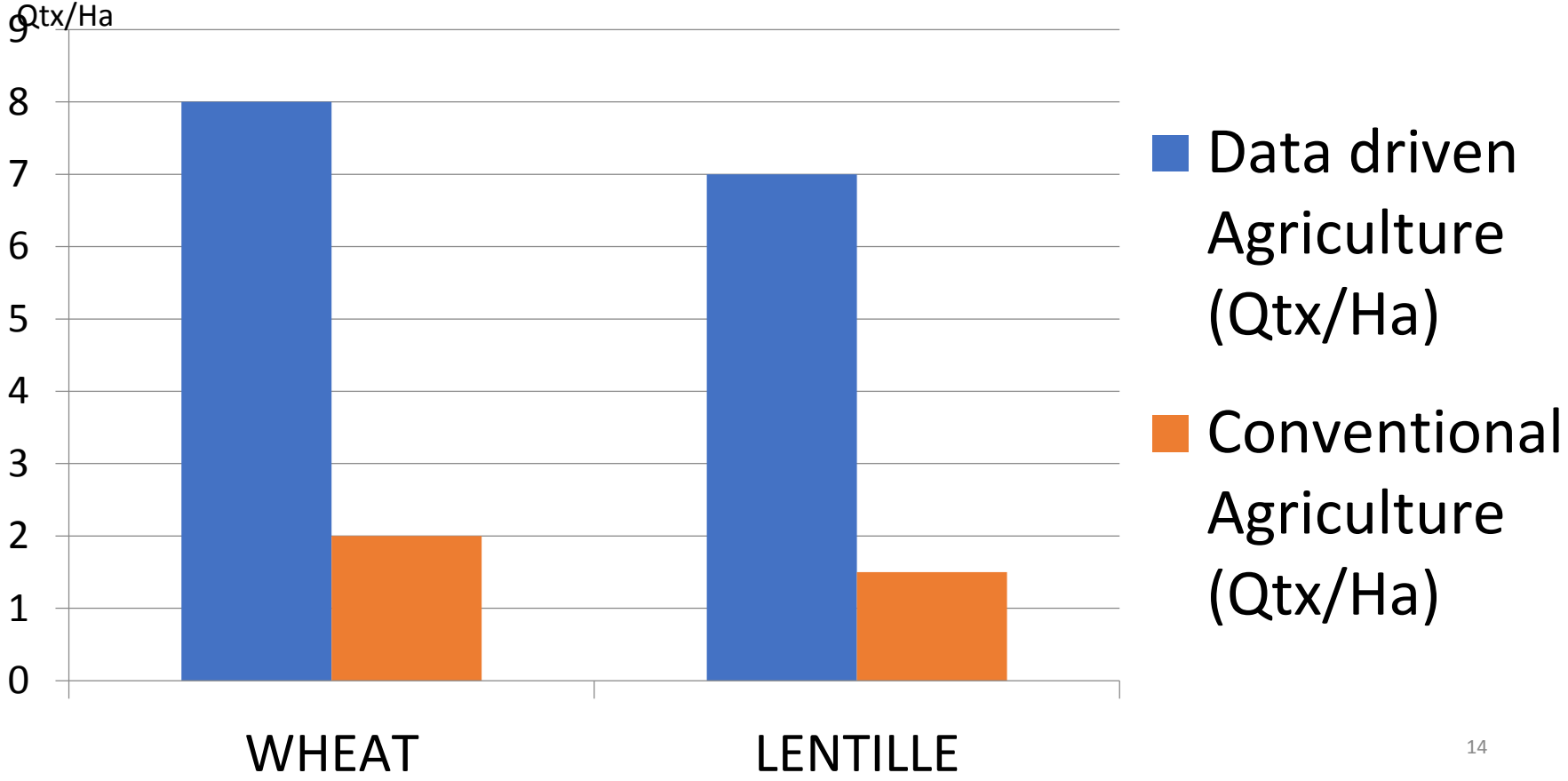
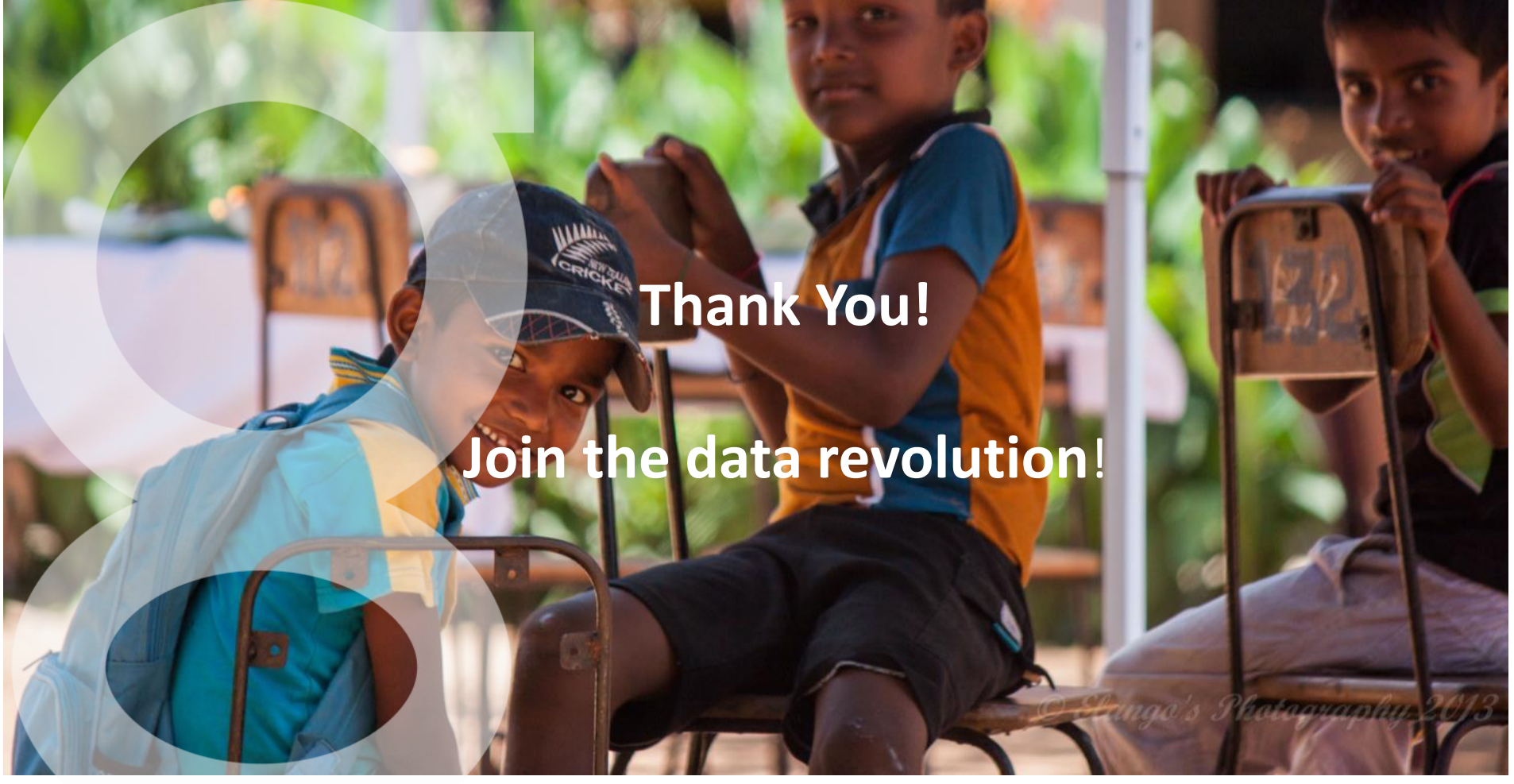
Data driven soil management:

Yield Comparaison – Harvest 2007

(220 mm Rainfall poorly distributed)




Thank You!
Join the data revolution!