The following is intended to outline our general product direction.
It is intended for information purposes only, and may not be incorporated into any contract.

Agro – Forest – Environment - ICT for entire countries – COOPERATION between public, private, NGOs and intergovernmental organizations needed

AGRICULTURE SOLUTIONS FORUM 2016
Organized by FAO and ITU
Bangkok / Thailand, 29.-31.8.2016

Global Nutrition Challenge Political

- 2050: 9,5 billion people & no hunger = 100% nutrition increase

- Global Warming & Climate Change (negative externalities)

- Urbanization and Health (smart cities & smart rural areas integration)

- Biodiversity (active risk management / diversification like in finance)

- Land degradation and desertification (land becoming a scarce good)

- Water services for Health (water becoming a scarce good)

BOTTOM<u>LINE</u>

- Large-scale and global environmental hazards to human health urge decision makers to move <u>from observation to application</u>

- <u>Prevention is better than Cure</u>

Agenda

- Introduction
  - Need for <u>holistic</u> applications
  - Overview of apps and <u>benefits</u>
- <u>Expert Models</u> and
  - NEW: <u>Circular Flow</u> Management, <u>NDVI</u>, <u>Pattern recognition</u>
- Conclusion
  - <u>Technology integration</u> needs
  - <u>Stakeholder cooperation</u> needs
- <u>PPP models and Commons</u>
- <u>Education and Implementation of pilot-projects</u>

Introduction
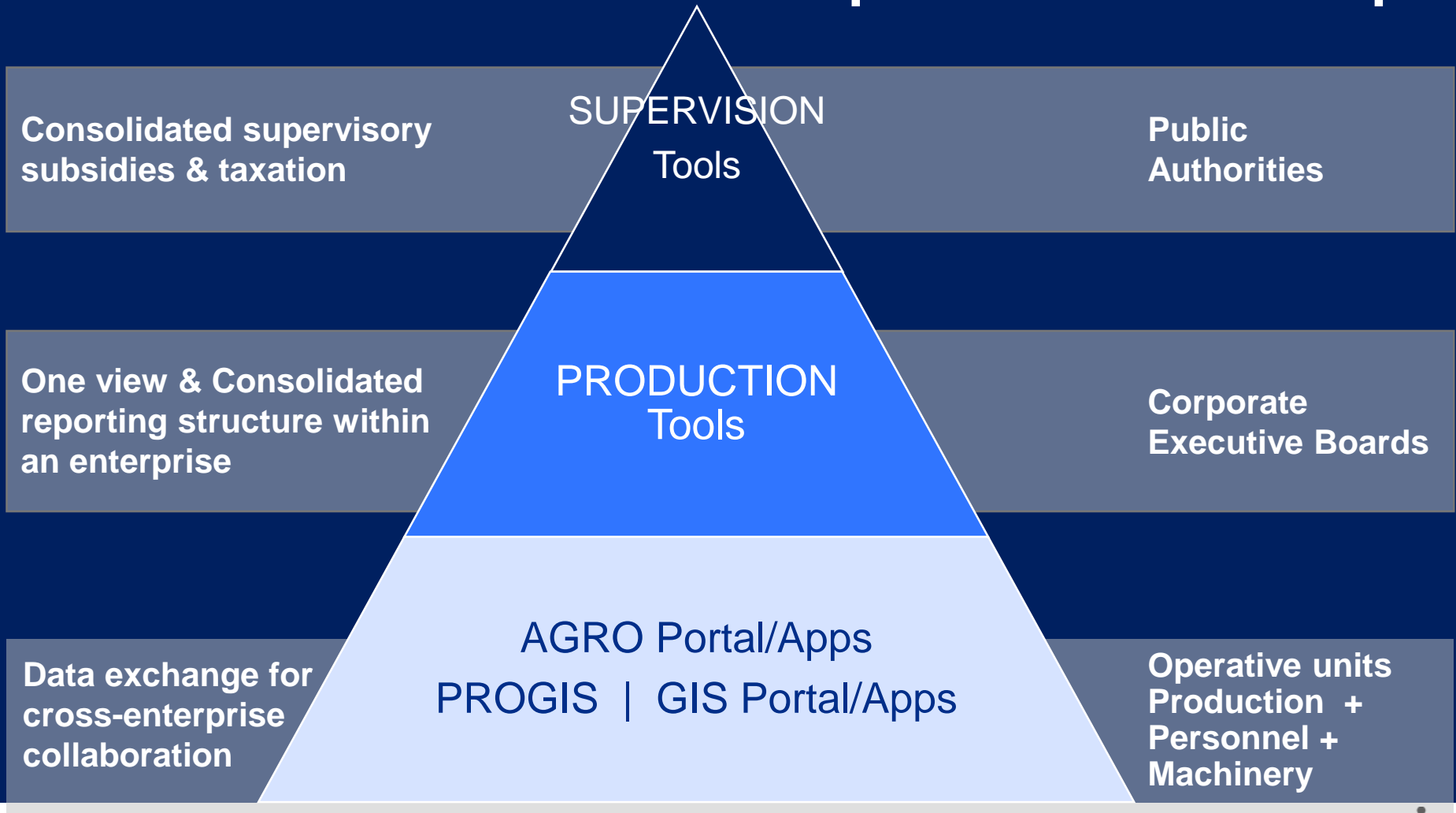
.GIS based AGRO DATA solution for <u>steering</u> and <u>supervision</u> of sustainable growth in

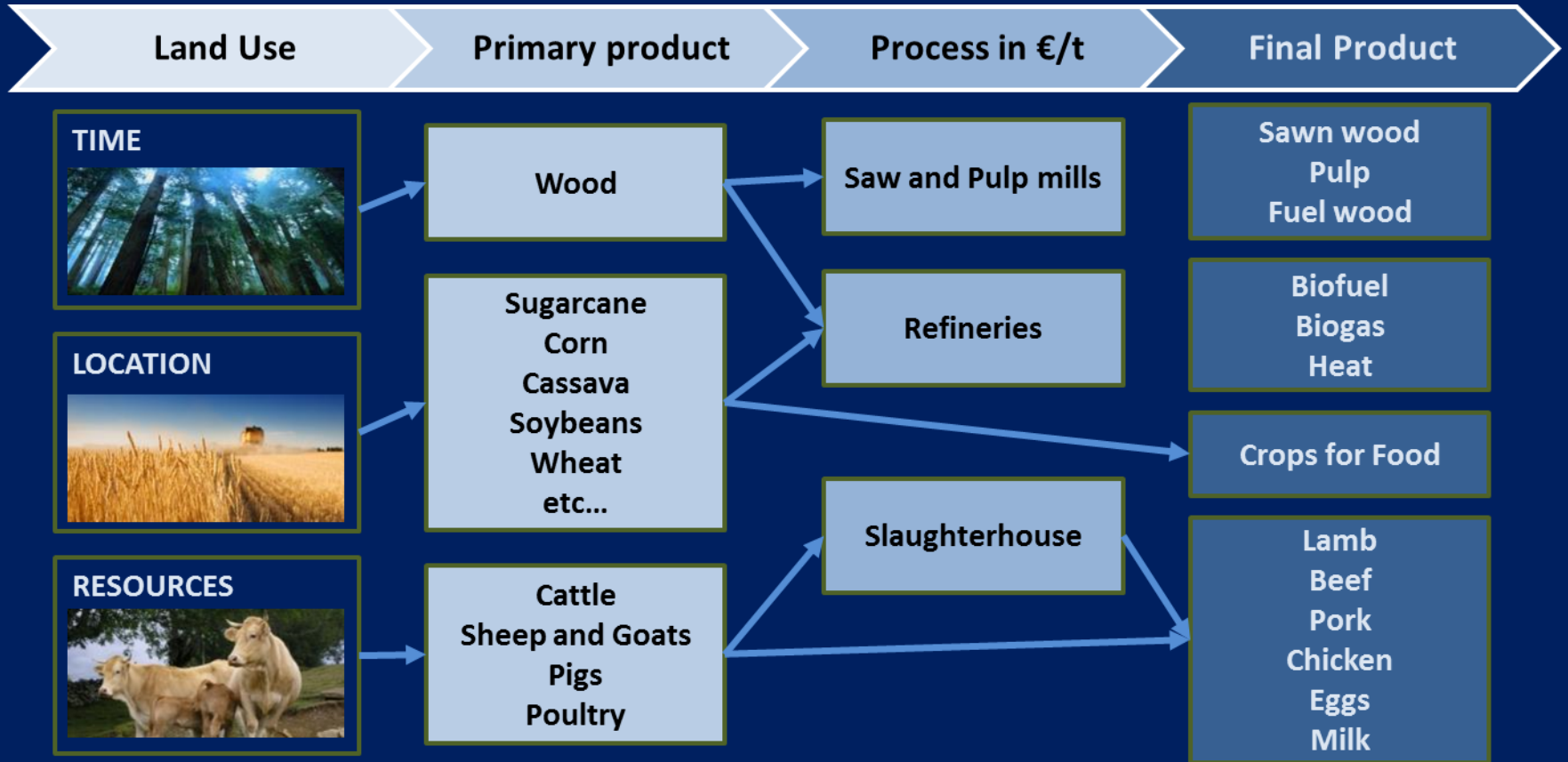- Time   WHEN
- Location   WHERE
- Resources   WHAT

Participants | vertical

top down – bottom up

Consolidated supervisory subsidies & taxation	SUPERVISION Tools	**Public Authorities**
One view & Consolidated reporting structure within an enterprise	PRODUCTION Tools	**Corporate Executive Boards**
Data exchange for cross-enterprise collaboration	AGRO Portal/Apps PROGIS	GIS Portal/Apps	**Operative units Production + Personnel + Machinery**

Participants - horizontal

Land Use	Primary product	Process in €/t	Final Product

TIME

LOCATION

RESOURCES

Wood → Saw and Pulp mills → Sawn wood / Pulp / Fuel wood

Sugarcane / Corn / Cassava / Soybeans / Wheat / etc... → Refineries → Biofuel / Biogas / Heat

→ Crops for Food

Cattle / Sheep and Goats / Pigs / Poultry → Slaughterhouse → Lamb / Beef / Pork / Chicken / Eggs / Milk

- **TRACE & TRACK DB**

Steering & Supervision

NATURAL RESOURCES
FINANCIAL RESOURCES
KNOW HOW RESOURCES

- Human Resources
  - Proactive Education politics
  - Development tracking

- Environment & ICT
  - Optimization of usage
  - Dynamic models & tracking

- FINANCE | SUBVENTIONS | TAX
  - Real time production data & historical data matching
  - Active risk management (all levels!! incl. environment)

Features for Steering & Supervision (PUBLIC & PRIVATE)

- LOCATION DB [MAPS]
  - Digitalization integrated "Add-in" for cadastral data
- TIME DB [PLANNING]
  - Data storage for tracing development and movements
- RESOURCES [ASSETS]
  - HR [human resources i.e. farmers, consultants, etc.]
  - FIN [financial recourses i.e. equity, debt]
  - MACHINERY [equipment, hardware, software]
  - PRODUCTION [input, output, quality, quantity]

ICT PRODUCTS & PROCESSES

TASKS
TOOLS
PREPARATION
MILESTONES

✓ Land consolidation, enviro-, risk-mgmt: tools, apps

✓ Precision Farming: PF-tools, machinery, EC-Sentinel

Individual projects

Standardized

✓ Logistic: Logistic-HQ & mobGIS & communication

✓ Farm- & Forest-management: DokuPlant & ForestOffice & Experts

✓ Geoinfo – maps: LPIS – WinGIS - orthoimages

3-4 y

APPLICATIONS AVAILABLE TODAY

- WINGIS – Geografical Info System

- DokuPlant – Farm-management

- ForestOffice - Forest inventory

- Technology Integration

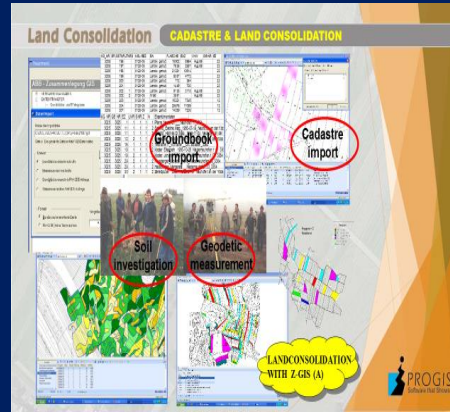**- Logistics and mobGIS**

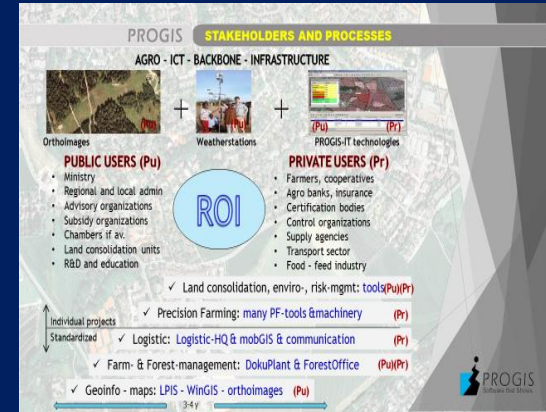**- Precision Farming Tools**

- Mobile technologies   **- Land consolidation apps**   **- Stakeholder Cooperation – know how**

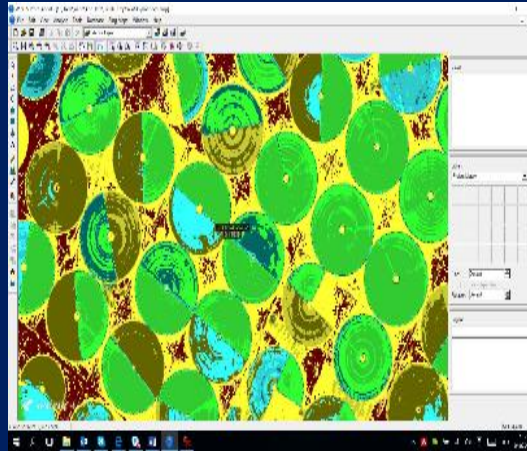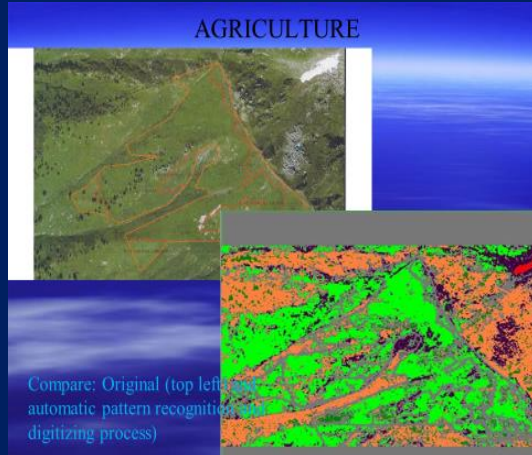- **Environment and natural risks**
- **Apps and know how**

- Circular Flow Managemnt
- + lab with NIRS technology

- Better marketing - Farmer food chains

NEW apps

AGRICULTURE

Compare: Original (top left) and automatic pattern recognition after digitizing process)

- NEW – aut. pattern rec. + digitizing

- NEW: EC Sentinel II - growth-index

- Franchise based food chain – Foodie farmer´s gourmet + inet + logistics

- **Technology & organizational consultancy – entire countries or on demand**

- **Education models - postgraduate education: farmers, advisors, Universities**

40 years ICT in agriculture – forestry – environment – natural risk management
500 man-years of experience

TOOLS | LOCATON & TIME
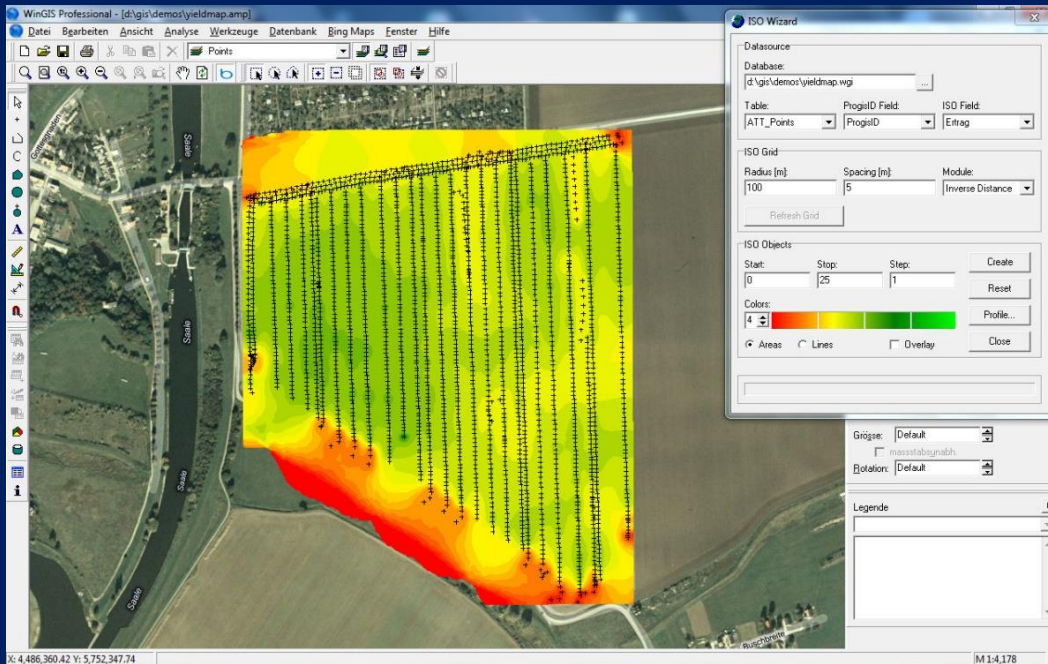
Location related data

- Ortho image
- Cadastral image
- Planning image
- Production image
- Harvesting image
- Financing data

Time related data – plan/done

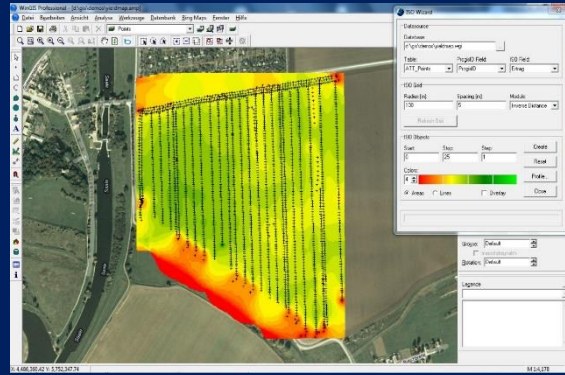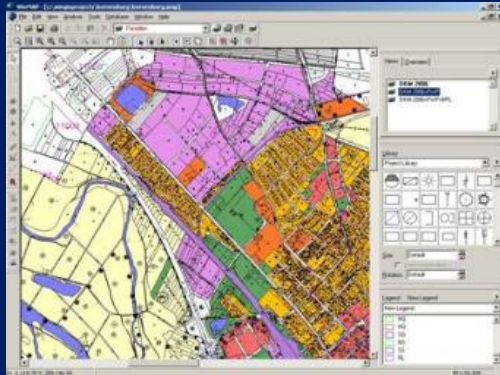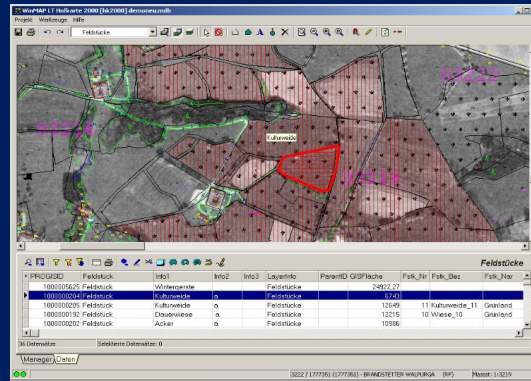| 1.3.2016			5.5.2016		30.9.2016
Tractor plough	Tractor Seeding machine NPK fertilizer		Tractor Sprayer Pesticide		Harvester

TOOLS | LOCATON & TIME

DATABASES

- Ortho image
- Cadastral image
- Planning image
- Production image
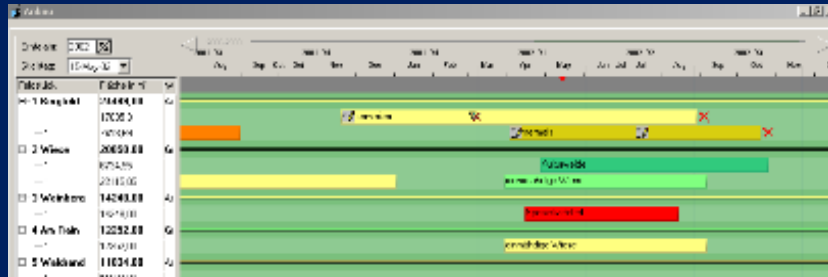- Harvesting image
- Financing data

Input & Output visualised in:
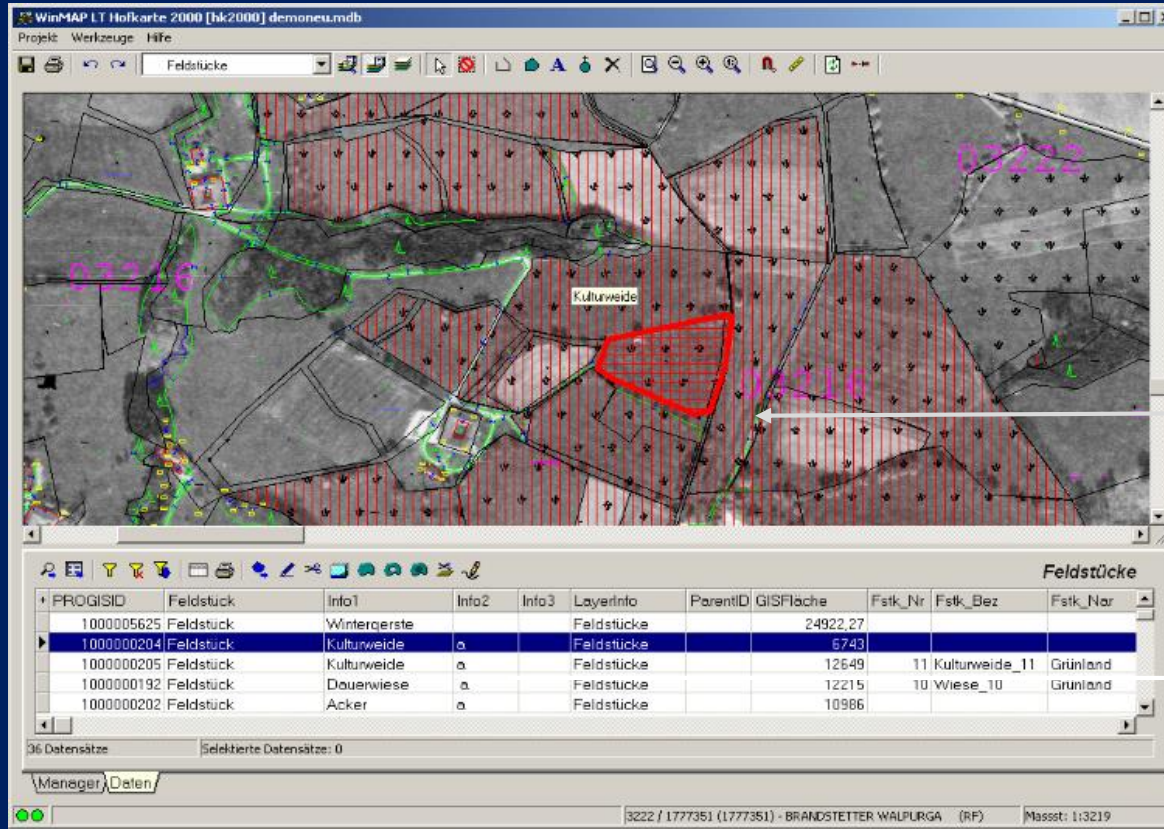time & location & € data

1.3.2016 ✖ ✖ ✖ **5.5.2016** ✖ ✖ ✖ **30.9.2016** ✖

Tractor
plough

Tractor
Seeding machine
NPK fertilizer

Tractor
Sprayer
Pesticide

Harvester
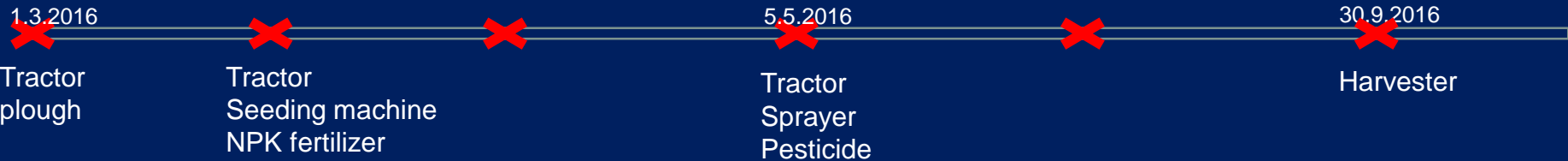
ICT TOOLS:

- location
- time
- expertise

FARM-
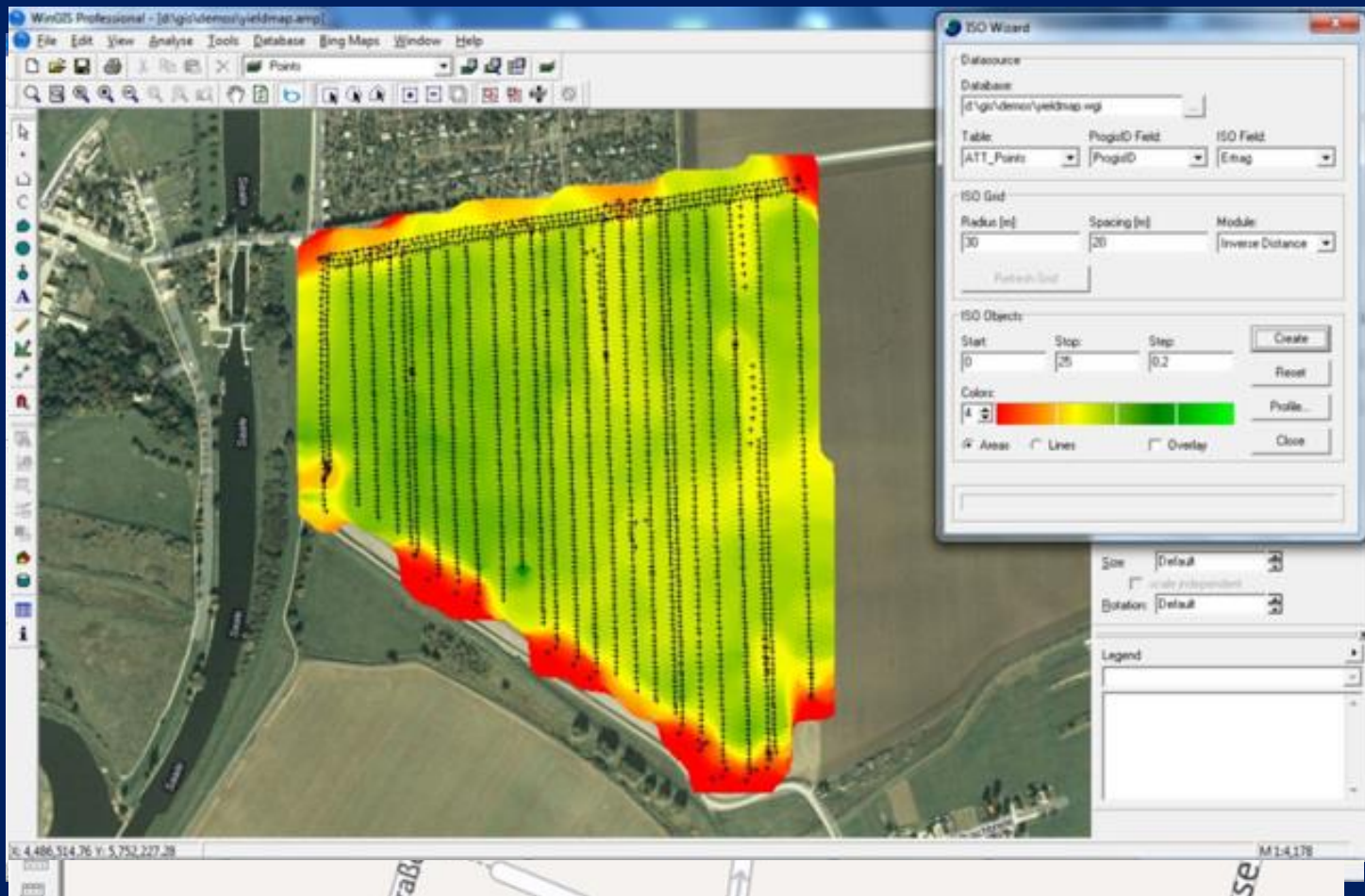
FORESTRY-

ADVISORY-

MANAGEMENT

Expert data

when what

where

ICT TOOLS

WinGIS
for
Vector &
Raster
data

I. orthoimage + cadastre and houses

II. orthoimage + BING road map

III. roadmap + WinGIS location search

IV. thematic map done with Intl DB

V. LPIS dataset

VI. GPS tracking result

VII. laser scan dataset

VIII. harvest map + machine tracking

location

ICT TOOLS

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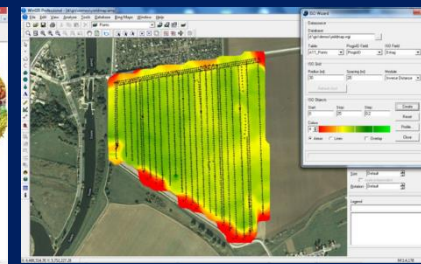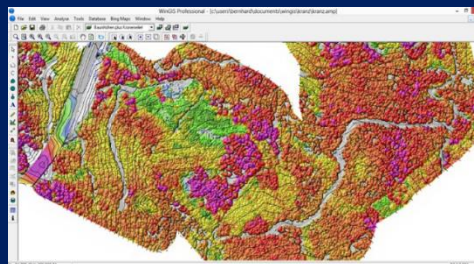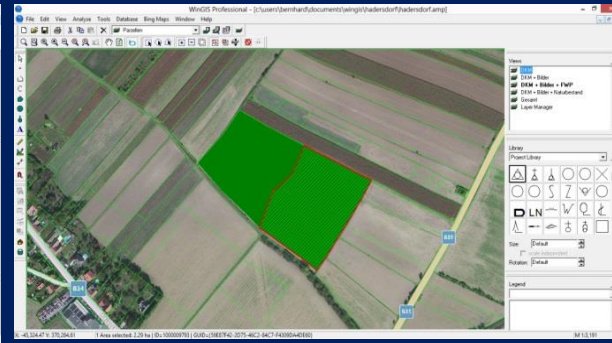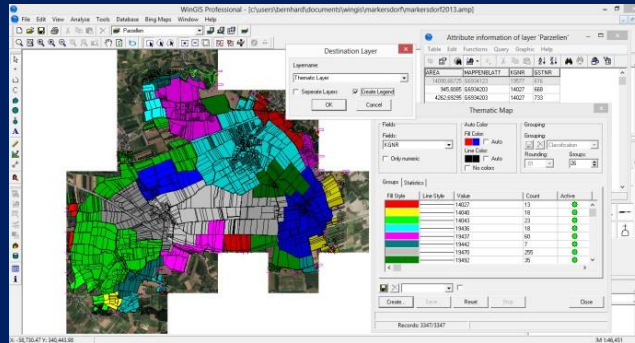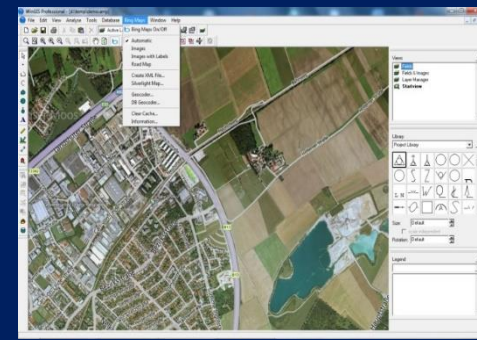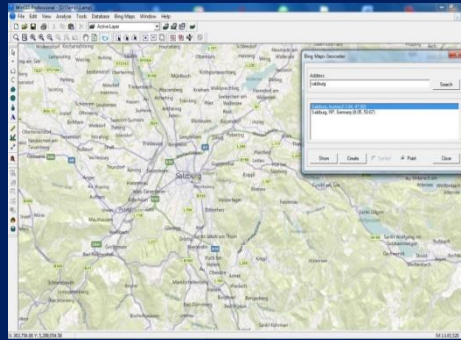
VI. GPS tracking result

VII. laser scan dataset

VIII. harvest map + machine tracking

location

ICT TOOLS

LOGISTICS

just in time

location

ICT TOOLS & THEIR INTEGRATION
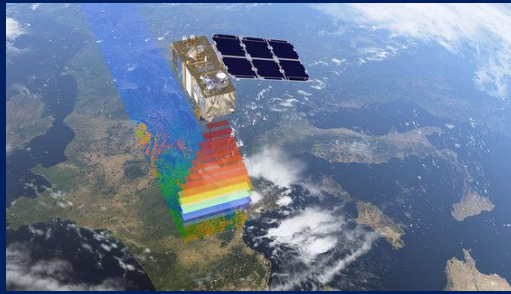
INTEGRATED
NATIONAL FARM
FORESTY
ADVISORY
MANAGEMENT

for

PRECISION FARMING
&
INTERNATIONAL
COMPETITIVENESS

Smart COUNTRY

Competitiveness

Smart CITY

Smart RURAL Area

Migration control

Smart FARMS

Independence

V. PRECISION PREDIC

VI. PRECISION STEERING

III. PRECISION CONTROL

II. PRECISION URBANISATION

I. PRECISION FARMING

ICT TOOLS Stakeholders

INTEGRATED
FARM
FORESTY
ADVISORY
MANAGEMENT

for

LOCAL
REGIONAL
NATIONAL
PRECISION FARMING

international

national

regional

local

IV. SUPRA- and INTERNATIONAL
- Cooperation - INTERNATIONAL ORGANIZATIONS
- and INTERNATIONAL SCIENCE AND NGOS

III. NATIONAL
- USE BOTTOM UP & TOP DOWN:
- OPEN DATA for all users
- TRUST CENTERS – a MUST
- for public and private use
- integrate labs, satellite images, coop..
- with ICT, agro, telecoms (last mile), ...

II. REGIONAL
- INTEGRATE VERTICAL/HORIZONTAL:
- Logistics + mobGIS, integrate industry
- Virtual Farming, Precision Farming
- Environment-, risk-management
- (Sub-)regional SAFER-centers
- GlobalGAP, FSC, PEFC, TC, ...

I. LOCAL
- planing, documentation of activities
- energy-, carbon-, nutrient-balance
- cost- profit calculation, inventory
- localized subsidy management
- business plan, insurance data
- thematic maps, …..

STAKEHOLDERS & PROCESSES

ICT BACKBONE
INTERSECTION

for

PUBLIC USERS
PRIVATE USERS

Supra National

- UN
  - FAO
  - WHO
- EU

Public

Private

- Ministries
- Regional and local admin
- Advisory organizations
- Subsidy organizations
- Chambers if av.
- Land consolidation units
- R&D and education

- Farmers, cooperatives
- Agro banks, insurance
- Certification bodies
- Control organizations
- Supply agencies
- Transport sector
- Food – feed industry

Benefits

- Location and Time integrated production data
- Real Time financial data (by production data)
- Risk Management Tools development
- Powerful features for enhanced
    - Productivity
    - Sustainability
    - Market access and marketability of production
- Steering Tool for environmental & climate risk

Circular Flow Management PROGIS-CFM

LABs
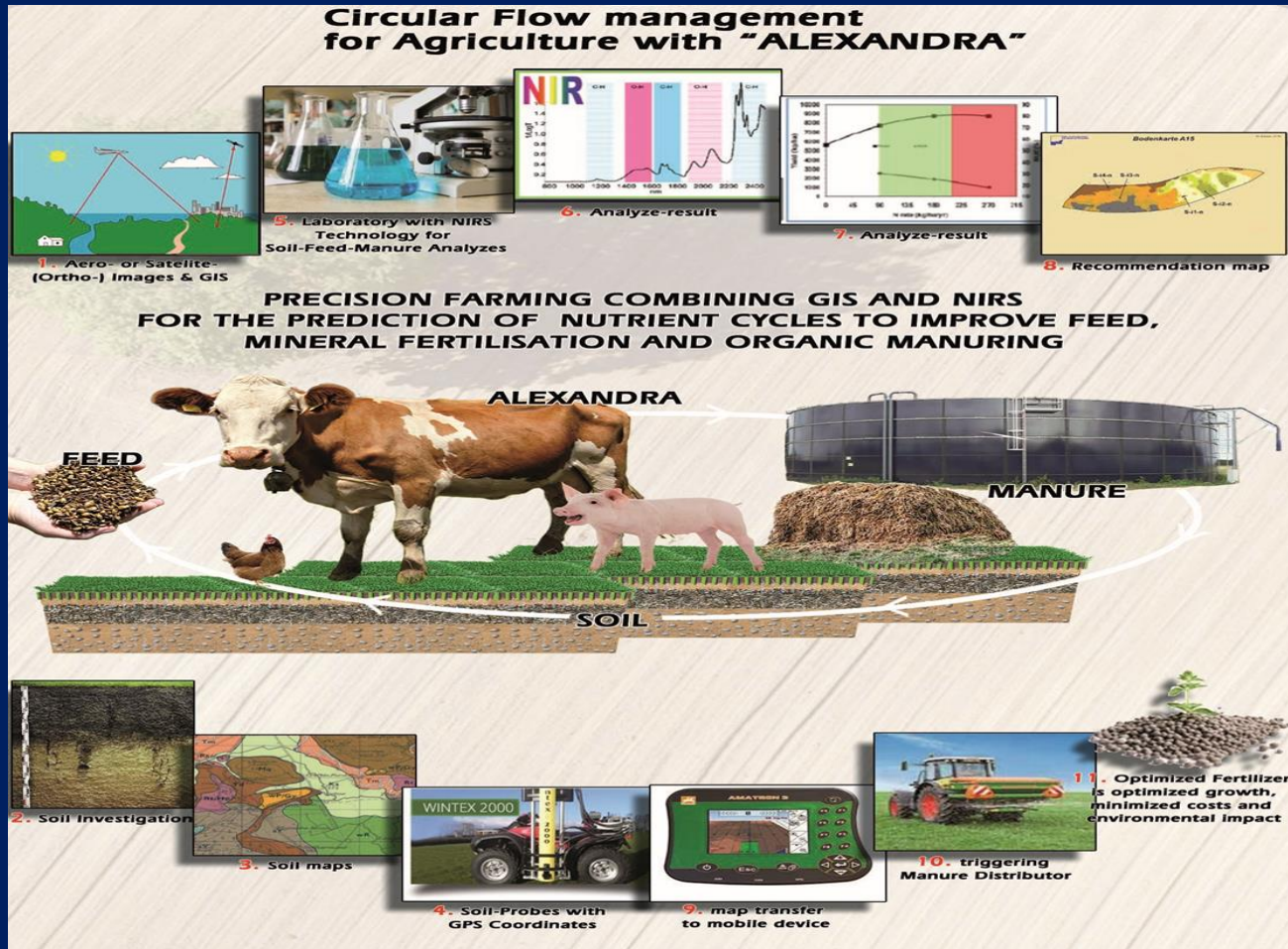
CHALLENGE

The agriculture sector is a strategically unique sector which should ideally be constituted by a network of interacting organizations. In carrying out their activities, such stakeholders have to manage many different and heterogeneous sources of information, such as:

- definition of policies,
- valuation of ecological performances,
- development of sustainable agriculture, crop recollection, and definition of timing and pricing,
- plagues detection.

In this context, future agriculture knowledge management systems not only have to support the direct profitability of agriculture or the environmental protection, but also have to combine and coordinate the efforts and the behaviours of the agri-food industry, consumers, public administrations and wider stakeholders communities.

OSM – rural roads

Atos
www.atos.net

seresco
www.seresco.es

WIRELESSINFO
www.wirelessinfo.cz

CTIC
www.fundacionctic.org

PSNC
www.man.poznan.pl

netcad
www.netcad.com

BODEGAS TERRAS GAUDA
www.terrasgauda.com

MJM Litovel a.s.
www.mjm.cz

PROGIS
www.progis.com

www.tdf.lv

enco engineering & consulting
www.enco-consulting.it

BIM piave comunità
www.consorziobimpiave.bl.it

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www.foodie-project.eu

Farm
Oriented
Open
Data
In
Europe

FOODIE
FARM-ORIENTED OPEN DATA IN EUROPE

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CIP-ICT-PSP-2013-7 Pilot Type B

WinGIS – LUMEN
Sentinel II + NDVI Index

LUMEN REAL
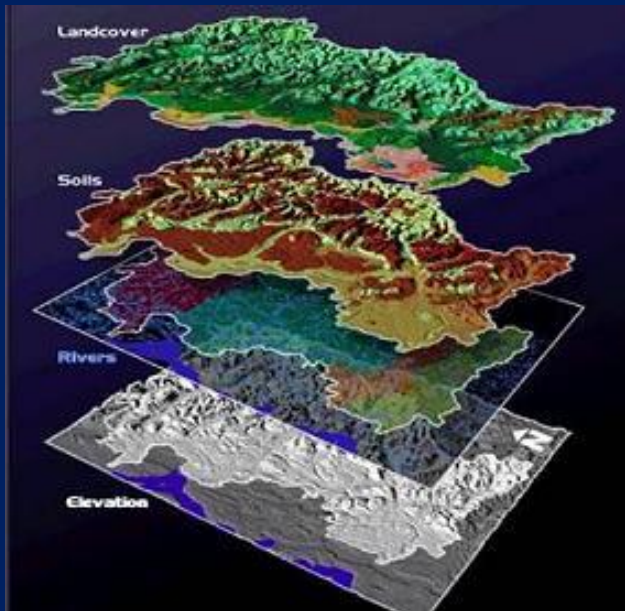
General Information

WinGIS ➡ Shows the borderlines, digitized or LPIS of all your fields

LUMEN Real ➡ Updates real pictures of all the fields (5-10 days update)

GIS Layers

LUMEN Pics

Farm-Oriented Open Data In Europe

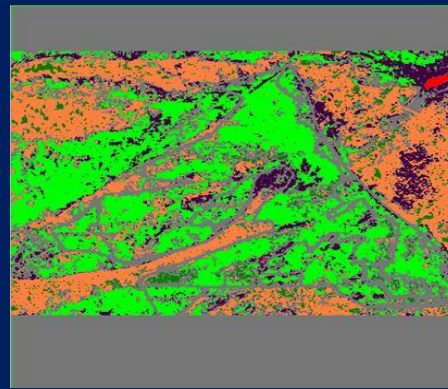| Images	➡	a multispectral imager with a swath of 290 km,
Bands	➡	set of 13 spectral bands - visible to near IR to shortwave IR
Features	➡	4 spectral bands 10 m, six bands 20m, 3 bands 60 m
Agriculture	➡	provides outstanding 10 to 20m spatial resolution with a 5 (North - South) and 10 (Equator) days revisit frequency

multispectral

Infrared

b/w

NDVI-Index

NEW - automatic:
- pattern recognition
- layering
- digitizing
- store, verify, video

Win GIS location

|	
Vector & Raster Data	Transformation |Integrated database | Link to any AX DB [SQL, Oracle, Access, …] | Multiuser features
Thematic maps & GPS ➡	SHP, DXF, CSV, KML| ISO module, overlay | Enhanced printing | BING-, Google-, Yandex-map-integration
Sensor | Telemetry integration ➡	Geocoder, WMS services | Developer tools (SDK) | COM / ActiveX interface | simple access integration | database Connection
Integrated GIS control ➡	Extensive function library, direct access to menu and user interface, customizable GUI and languages | CANVAS mode
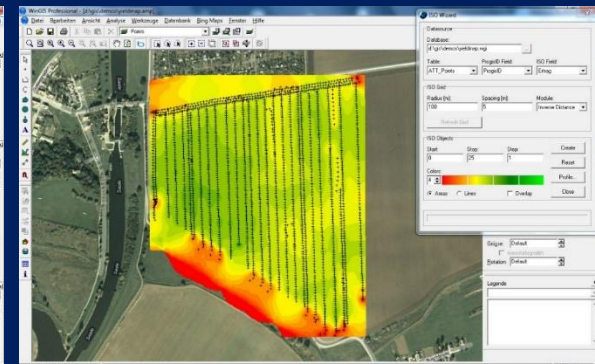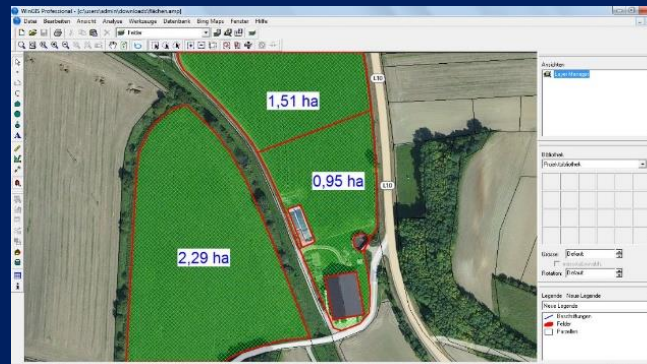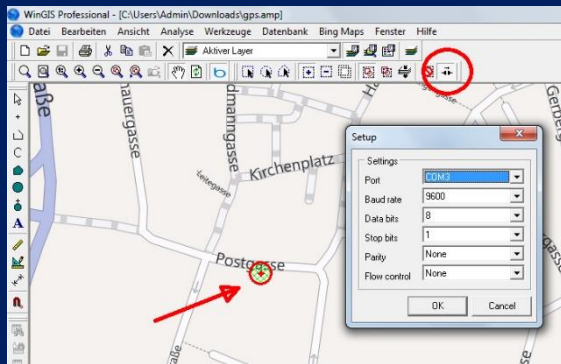
TRACEABILITY for SUSTAINABILITY
EFFECTIVITY vs. EFFICIENCY
TECHNOLOGY INTEGRATION
and
STAKEHOLDER COOPERATION
and
EDUCATION

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