The Joint Research Centre

EUROPEAN COMMISSION

Monitoring Agriculture with Remote-Sensing

MARS

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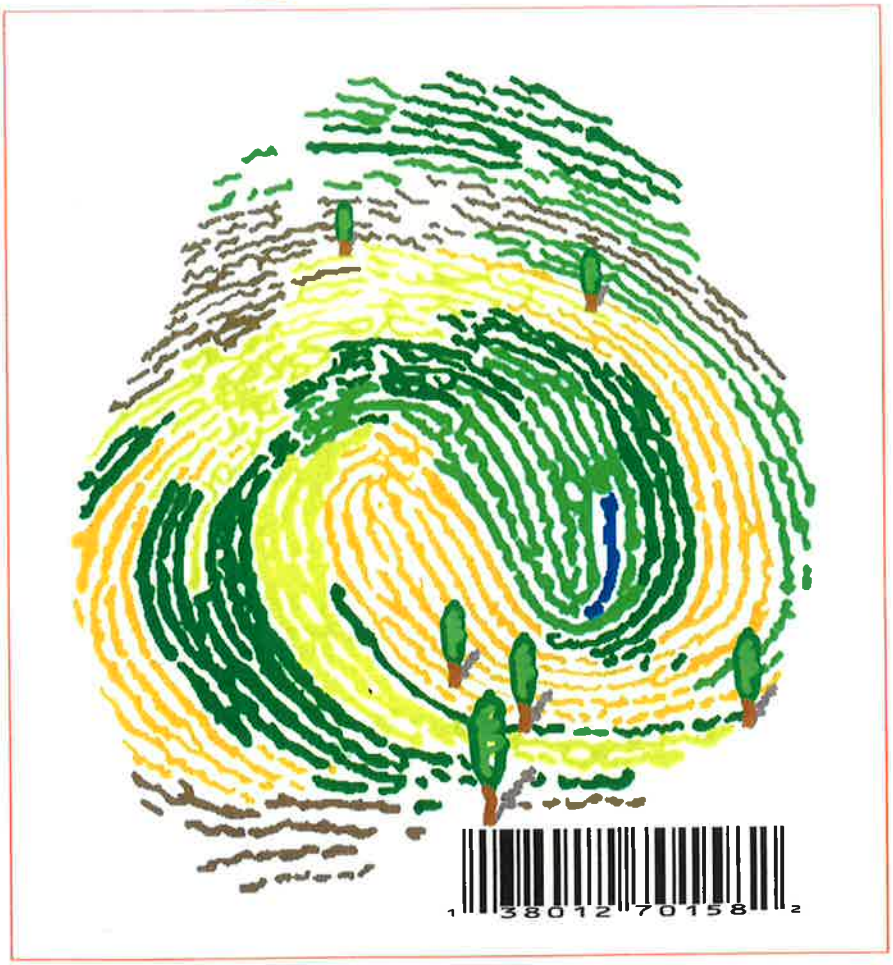
1st workshop on Geotraceability in agriculture



Joint Research Centre – Ispra
Italy
4 and 5 March 2003

Proceedings

Special Publication No. I.03.65

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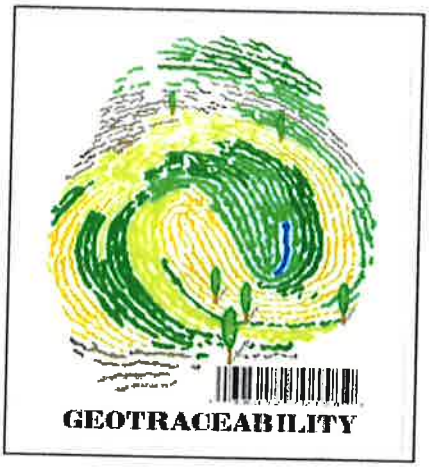

Dear participants,

Here are the proceedings that the MARS Unit decided to edit during the workshop. You will find a little introduction, the agenda, the list of participants, and PowerPoint presentations print out.

We would like to thank you very much for your participation. Thanks to your presentations and contributions this workshop was very successful. This exchange of information between the different participants and the Commission was very fruitful. We would like to thank also the contacted persons, who contributed to the setup of the workshop but who unfortunately could not attend it.

We hope that we will be able to organise again such a kind of workshop. In the meantime, we know that contacts established during the workshop already contributed to joint initiatives in the frame of the Sixth Framework programme.

Yours faithfully,

Philippe Loudjani
MARS Unit, IPSC, JRC Ispra

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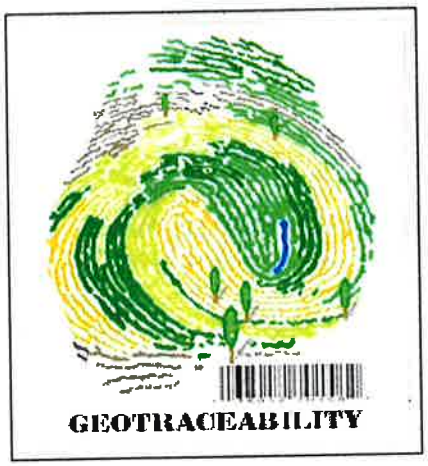

Organisation committee

Marjo Van Loon – Philippe Loudjani – Olivier Leo – Simon Kay

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Approved by:	Olivier Leo Jacques Delincé	***Diffusion:***	Internal JRC, MARS Unit, DG-AGRI, DG SANCO, Participants of the meeting
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Introduction

In the frame of the integrated Administrative and Control Systems, a fully digital Land Parcel identification Systems (LPIS) will be available in January 2005 in present and future EU Member States (Council Reg.1593/00). Such systems are combining a large orthophoto coverage with a map of reference parcels (scale better than 1/10 000, 50 cm -1m pixel) and will be regularly updated.

The MARS Unit is in charge in support to DG AGRI of the technical recommendation and the follow up of the implementation of the LPIS system by the MS and is, de facto, the technical reference point for all the national Administrations and service provider involved in the LPIS development, GIS running, updating.

The main purpose of the LPIS is to support the exchange information with farmers, manage eligibility and cross controls at the parcel level, check and monitor the measures related to environment protection, Rural Development and this various functions are managed by GIS.

LPIS is presently a basis layer common to most of the Common Agricultural Policy (CAP) regulations (arable, forage, Olive Tree, Vineyard...) and present huge opportunities to set-up traceability system(s) at parcel level in order to register or certify farm practices and productions.

Following the mid-term review, the ongoing reform of the CAP will provide a more proactive role to farmers and reinforce the policy to support food quality and respect of the environment: In practice, the reform proposes to introduce a single payment system per farm, but conditions it upon cross-compliance to environmental, animal welfare and food quality criteria.

The objectives of the workshop were:

- To explore for what purpose we can use geotraceability/record keeping at field level:
  - Traceability of agricultural activities at farm level
  - Value adding of farm products on the market
  - Appellation, labelling
  - Certification for retail/contract farming
  - Communication tool to costumers, consumers and government organisations
  - Preparation for future legislation on traceability (General Food Law)
  - Preparation for the outcomes of the CAP mid-term review (control and audit systems)

- To investigate the possibilities of an extended use, especially towards food safety and agri-environment sustainability, of the present fields' registers developed in the context of the Integrated System;

- To state what are the minimum information and activities to trace in order to cover multiple purposes (Farm audit, certification, labelling ...);
- To discuss how to insure and secure information and data transfers;
- To discuss how to optimise the administration of the system (role of National bodies, farmer associations ...);
- To examine what are the time constraints of the system (backup and update of information, yearly and multi annual applications ...);
- To determine what are the potential benefits for farmers;
- To investigate what are the other possible uses of such a system (emergency planning, land use management ...).

Participants

Around 20 persons participated to the workshop including representatives of the European Commission (DG AGRI, DG JRC); national Administrations, solution providers, certification bodies and agro industrial involved in geo-traceability.

The contribution of the different stakeholders allowed giving insight in:

- What are the present developments on tracking and tracing in private companies/at farm level?
- What is possible from the Information & Communication Technologies (ICT) perspective?
- What are the present legislative requirements?
- What are the present systems of certification, qualification?

The results of the workshop will be used to direct and formulated future research and applications of geotraceability in agriculture.

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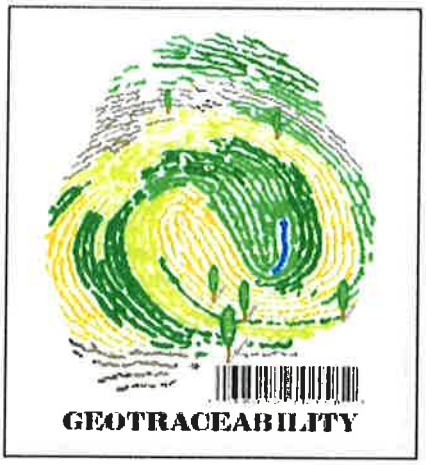

Joint Research Centre, Ispra (Lago Maggiore), Italy

4 – 5 March 2003

Agenda

Tuesday 4 March

10.00-10.30 h — Objectives and agenda of the workshop
J. DELINCE (DG JRC, EC)

10.30-11.00 h — CAP reform, a long-term perspective for sustainable agriculture – Traceability and food quality
G. MALLIARIS (DG Agriculture, EC)

11.00-11.30 h — Concept, legal basis and opportunities for geo-traceability
M. VanLOON (NL)

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11.30-12.00 h Possible contribution of the Common Agricultural Policy
O. LEO (DG JRC, EC)

12.00-12.30 h Tools for geotracing
S. KAY (DG JRC, EC)

12.30-14.00 h Lunch

14.00-14.30 h Geotraceability in agriculture?
P. LOUDJANI (DG JRC, EC)

Technical solutions

14.30-15h00 h Electronic data interchange of geo information
T. VanDerWAL (WiSL, NL)

15h30-16.00 h Farm management systems and GIS
W. MAYER (ProGIS, Austria)

16.00-16.30 h Coffee break

16.30-17.00 h Potential use of SPOT imagery for geo traceability in agriculture
M.C. DELUCQ (SPOT image, FR)

17.00-17.30 h FP6, ERA and Traceability
P. CHURCHILL (DG JRC, EC)

Wednesday 5 March

9.00-9.30 h Geographical traceability of food (GeotrAceAgri Project)
B. TYCHON (FUL, BE) – R. OGER (CRA, BE)

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Certification and Controls

9.30-10.00 h — General approaches and requirements for the implementation and control of "Appellation d'Origine"
G. FLUTET (INAO, FR)

10.00-10.30 h — Certification and control processes at farm level
S. CARDINALI (Det Norske Veritas, IT)

10.30-11.00 h Coffee break

11.00-11h30 h — Traceability and Certification of Farms
G. GUINOISEAU (Maferme Solutions, FR)

Agri-business initiatives

11.30-12.00 h — Creating value with geography when satisfying Traceability requirements, a case study at "Sud Ouest Legumes"
A. KILLMAYER (Geosys, FR) - H. DOUCHE (Coopérative Légumes du Sud ouest)

12.00-12.30 h — Tracking and tracing guidelines – Experiences in The Netherlands
J. KAMP (Q-Point, NL) - A. VanDeKAMP (Productboard Arable Farming, NL)

12.30-14.00 h Lunch

14.00-14.30 h — Precision viticulture - geotraceability
J.N. PAOLI (Centre Agronomique Montpellier, FR)

14.30-15.00 h — The use of nuclear magnetic resonance and of stable isotopes analyser to support European policies for consumer protection
C. GUILLOU (DG JRC, EC)

15h00-15.30h — **Discussions – Conclusions**

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List of participants

CAP REFORM
A LONG-TERM PERSPECTIVE FOR SUSTAINABLE AGRICULTURE

TRACEABILITY
AND
FOOD QUALITY

George Malliaris
Unit B.3. Agricultural product quality policy
DG AGRICULTURE
EUROPEAN COMMISSION

CAP reform
European Model of Agriculture
Objectives

- **more market orientation and increased competitiveness,**
- **food safety and quality,**
- **stabilization of agricultural incomes,**
- **integration of environmental concerns into agricultural policy,**
- **developing the vitality of rural areas,**
- **simplification and strengthened decentralization.**

Key elements of CAP reform- a long-term perspective for sustainable agriculture

- a single farm payment, independent from production ("decoupling"),
- linking those payments to the respect of environmental, food safety, animal welfare health and occupational safety standards, as well as the requirement to keep all farmland in good condition, ("cross-compliance"),
- a stronger rural development policy with more money, new measures to promote quality, animal welfare and to help farmers to meet EU production standards,
- a reduction in direct payments ("degression") for bigger farms to generate additional money for rural development and the savings to finance further reforms,
- revisions to the market policy of the CAP,

Article 24 (Chapter VIa) refers to food quality and includes key elements such as ;

•Support for agricultural production methods designed to improve the quality of agricultural products should provide assurances to consumers on the quality of the product or of the production process used through the participation of farmers in food quality schemes

•Support shall be granted to farmers who participate on a voluntary basis in Community national food quality schemes, which impose specific production requirements on agricultural products (Support shall only cover products intended for human consumption.)

•Support shall be paid as an annual incentive payment up to the maximum eligible amount per holding.(The duration of such support shall not exceed a period of five years).

European Community quality schemes

- Council Regulation (EEC) No 2081/92 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs,
- Council Regulation (EEC) No 2082/92 on certificates of specific character for agricultural products and foodstuffs,
- Council Regulation (EEC) No 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs,
- Title VI on quality wine produced in specified regions of Council Regulation (EC) No 1493/1999 on the common organisation of the market in wine.

National Quality Schemes Criteria

- the specificity of the final product produced under such schemes shall be derived from detailed obligations on farming methods that guarantee specific characteristics, or a quality of the final product that goes significantly beyond the commercial commodity standards as regards public, animal or plant health, animal welfare or environmental protection;
- compliance with specifications and verification by independent inspection bodies;
- the schemes shall be open to all producers;
- transparency and complete traceability assurance;
- the schemes shall respond to current or foreseeable market opportunities.

EU LEGISLATION/QUALITY SCHEMES

- **Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety** *Official Journal L 031 , 01/02/2002 P. 0001 – 0024*
- **Council Regulation (EEC) No 2081/92 of 14 July 1992 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs** *Official Journal L 208 , 24/07/1992 P. 0001 - 0008*
- **Council Regulation (EEC) No 2082/92 of 14 July 1992 on certificates of specific character for agricultural products and foodstuffs** *Official Journal L 208 , 24/07/1992 P. 0009 –*
- **Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs** *Official Journal L 198 , 22/07/1991 P. 0001 - 0015*
- **Council Regulation (EC) No 1493/1999 of 17 May 1999 on the common organisation of the market in wine** *Official Journal L 179 , 14/07/1999 P. 0001 - 0084*

Information on CAP-reform can be found in the following address of DG AGRI:

- **www.europa.eu.int/comm/agriculture/mtr/index_en.htm**

Geotraceability in agriculture

Concept, legal basis and opportunities for geotraceability

March 4 and 5, 2003

Marjo van Loon

Overview

- Basic concepts and approach
- Geotraceability at farm level
- Review of EU regulation and market
- Opportunities for geotraceability
- Points of thought

Major food safety crises in '80's and 90's: dioxin, food and mouth disease, BSE……

…..are the initiators of change in agricultural production and legislation:

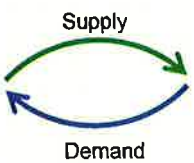
- Discussion on current "way of farming"
- Increased involvement of consumers

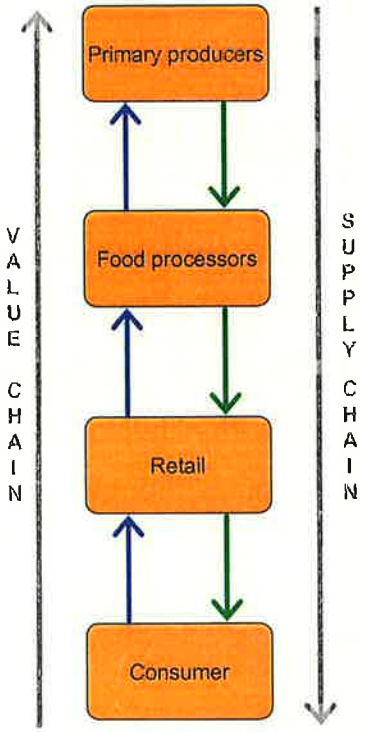
Past:

Agricultural production was production/supply driven

Now:

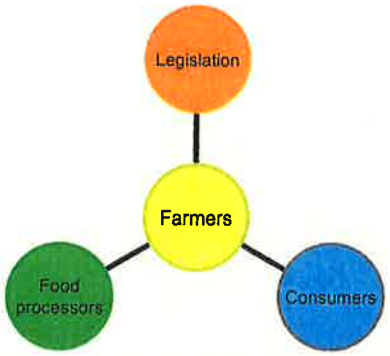
Agricultural production more demand driven. Supply chain is influenced by consumers voice





Stakeholders

Legislation on health, safety, environmental protection and consumer protection. Standards and control.



Food processors need raw materials with high safety and quality standards. They want to produce food products consumer are asking for and minimize business risk

Consumers demands quality food that is safe, nutritious, delicious and produced with respect for the environment and animals.

Traceability: Ability to trace and follow a food, feed, food-producing animal or substance through all stages of production and distribution.

Tracking: Determining the *location* of a certain food… in the food chain at a certain moment

Tracing: Determining the *history* of a food… throughout the food chain.

Upward: from raw material to end product

Downward: from end product to raw materials

Geotraceability at farm level

Collect information on crop location and management

IACS/LPIS for storing information at field level

Share information

Food safety promotion through:

- From fork to farm (curative approach)
- From farm to fork (preventive approach)

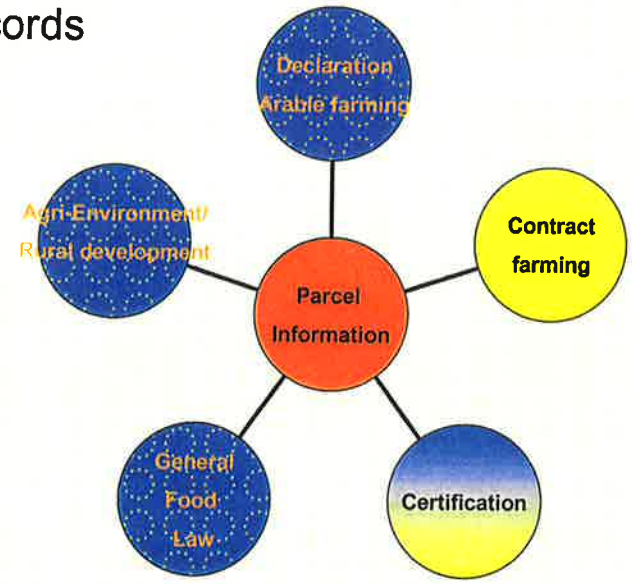
Food quality promotion through:

- Add value to agricultural products
- Distinction of products on the market based on quality and/or origin

Use geotraceability from field level as a support tool

Necessity of keeping field records

- General farm management
- Provide product information to costumers
- Manage information for audits/certification
- Manage the information necessary for EU support



Regulation driven

Market driven

Legal basis

European legislation including traceability:

General food law (2002)	*Regulation 178/2002*
Animal food and feed	*Regulation 1760/2002*
Genetically modified organisms	*Regulation 258/1999 and 49/2000*
Marketing of olive oil	*Regulation 1334/2002*

National legislation including traceability:

- Not identified yet

European legislation with opportunities for (geo)traceability :

Label of quality	*Regulation 2081/1992 and 2082/92*
Organic farming	*Regulation 2092/1991*

Market initiatives with opportunities for (geo)treaceability:

- Contract farming
- Retail certification

Label of origin/quality

Used for regional products that are:

- Produced under specific natural conditions
- Produced with unique handicraft

Other labels: AOC and DOC(G), Little red tractor

Strategy for small and middle sized companies

Food quality strategies - certification

Organic farming label:

Used for products that are produced under the principles of organic farming

Viable and sustainable alternative to the common methods of agricultural production

Other food quality strategies

Contract farming

Contract with mutual benefits for farmers and processing companies:

- Minimizes business risks through building in guarantees (sales, quantity, quality)
- Better able to respond to costumer demand

Certification by retailer

Standards for production

- EUREPGAP
- Codex Alimentarius
- Qualität und Sicherheit
- British Retail Consortium
- Global Food Safety Initiative

License to supply

Record keeping for food quality promotion?

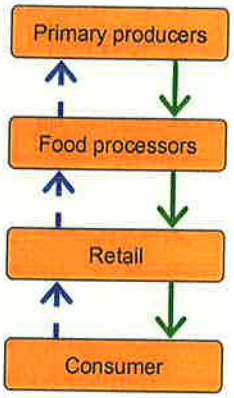
1. Create provenance for label of origin
2. Give insight into crop management for:
   - Organic farming schemes
   - Contract farming
   - Retail certification

Level of geographical detail in record keeping

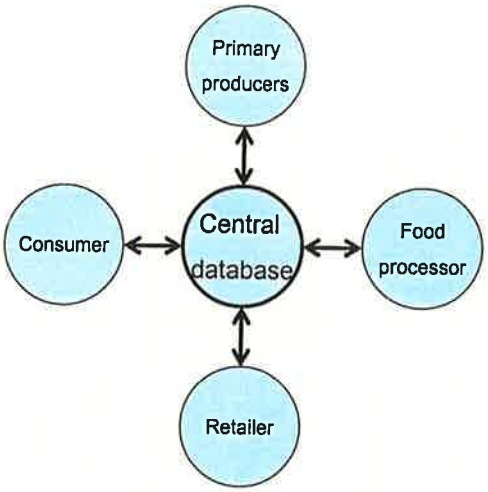
	Field level	Farm level	Regional level
Declaration arable farming	X		
Agri-environment measures	X		
General Food Law		X?	
Certification: Label of origin			X
Certification: Organic farming	X		
Retail certification (EUREPGAP)	X		
Contract farming	X	X	

Organisation of traceability:

One up - one down



Centralized database



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Geotraceability
ipsc

Some issues to consider for future discussion:

- Geotraceability is a chain approach (integration and coordination)
- The chain is as strong as the weakest link
- Quality of the data determines the quality of the information flows
- Should be integrated with other record keeping and reporting actions

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Workshop
"Geotraceability in Agriculture"
Ispra, 4-5 March 2003

Possible contribution of the Common Agricultural Policy

Olivier LEO
IPSC - MARS Unit – DG CCR, Ispra

Email: olivier.léo@jrc.it
Web site: http://mars.jrc.it

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Possible contribution of the CAP

✓ **Common Agricultural Policy**
- Provides some regulatory frame for the identification of Agricultural parcels
- Main purpose is the management and control of Area based Subsidies
- But basic information, exchange of information with Farmers may provide elements or opportunities to support Traceability at the parcel level.

✓ **4 main fields and groups of Regulation**
- IACS — Counc. 3508/92, 1593/00; Com. 2419/01
- Permanent crops: OLI GIS — Counc. 2366/98
  VITI GIS — Counc. 2396/86 + Com. 649/87 + market Reg Counc. 1493/99
- Rural Development — Council 1257/99 ; Commission 445/02
- The ongoing Reform of the CAP (cf Mid term review) proposal of Council Reg Com (2003) 23 – 21/01/03

Possible contribution of the CAP

Volumes and expenses controlled by the different Systems

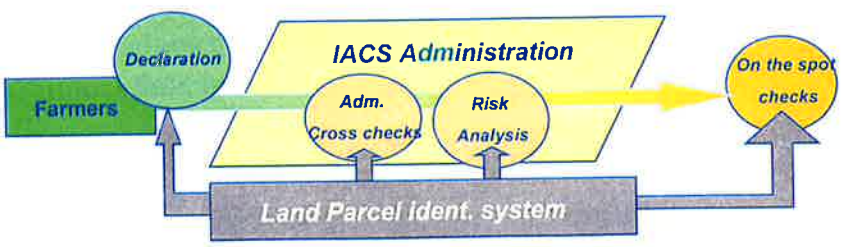
	Regulations	Indicative Yearly Budgets (subsidies)	Farmers	Volumes
IACS (arable, forage)	3508/92 1593/00	25 Bio €	3.2 Mio EU15 (+ 13)	50 Mio parcels 100 Mio ha
Rural Development	1257/99 445/2002	5 Bio €	1 Mio. EU15 (+13)	20 Mio ha
Olive Trees	2366/98 (GIS)	2 Bio €	3 Mio. EU15 (+ 4)	800 Mio O.Trees 11 Mio parcels
Vineyard	2392/86 2729/2000	0.2 Bio €	1.6 Mio EU15 (+ 9)	10 Mio parcels 3.6 Mio ha

Since 15 years, huge investments have been made to implement geographic information systems to monitor, manage and control these Schemes

Land parcel identification systems

Integrated Administration & control systems

- ✓ **Covers Arable and forage land**
  - ➢ IACS Counc. 3508/92, 1593/00; Com. 2419/01
- **The Land parcel identification systems (LPIS) are a key element of the IACS**
  - Directly involved in the different procedure of IACS
    - Yearly application by Farmers
    - Administrative checks (100%)
    - Risk analysis
    - On the spot checks (5% minimum)



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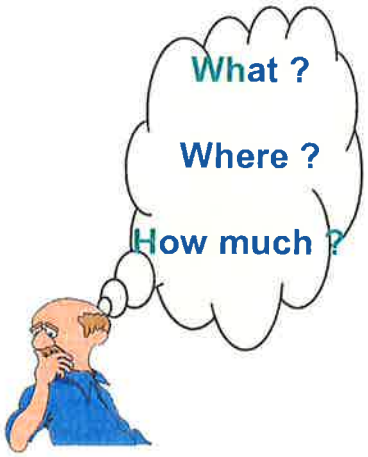
Integrated Administration & control systems

- ✓ **Main purposes of LPIS are to provide**
  - an unique parcel identification number
  - A geographic location
  - An area for any agricultural parcel.
- ➢ **But the Reg. Foresees the possible use of other types of parcels (Cadastre, production blocks or ilots)**



In practice : The LPIS provides a reference parcel, allowing the identification and the cross checks of all the parcels declared in a given campaign.

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Which Reference parcels are possible ?

- The agricultural parcel
  - Declared by the farmer and validated during the campaign? Declared and validated during the preceding campaign?
- The production block (farmer block, « ilot ») with more stable limits
- The physical block with rather perennial boundaries

Definition of the Agric. Parcel ? ***(§1.4, Reg. 3508/92) :***	***Continuous Piece of land...***	***...cultivated by one farmer...***	***... with only one crop .***
Agricultural Parcels	X	X	X
Production block	X	X	
Physical Blocks	X		

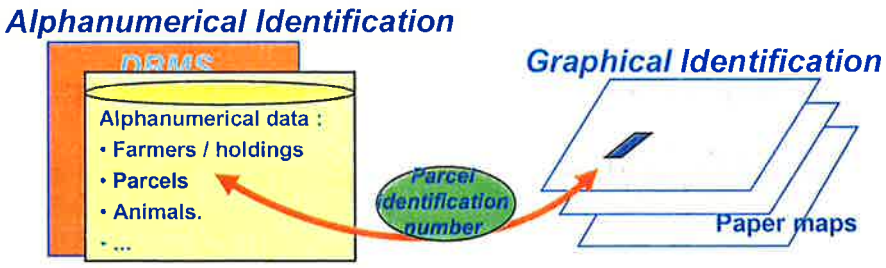
Land parcel identification systems

Reference parcels...

3 basis concepts	IACS (LPIS)	SIGC (SIPA)	InVeKoS (FIS)
1 piece of Land, 1 farmer, 1 crop	Agricultural parcel	Parcelle Agricole	Schlag
1 piece of Land 1 farmer (1-n crops)	Farmer (production) Block (Ilot)	îlot de culture	Feldstück
1 piece of Land (1-n farmers, 1-m crops)	(Physical) Block	Bloc (physique)	Feld-Block
Real Estate	Cadastral parcel	Parcelle Cadastrale	Flurstück

Land parcel identification systems

- **in 92, IACS was defined as a computerized system**
  - with alphanumerical databases
  - Without obligation for (geo)graphical data



In practice, IACS could be hybrid GIS combining databases with paper maps...

Land parcel identification systems

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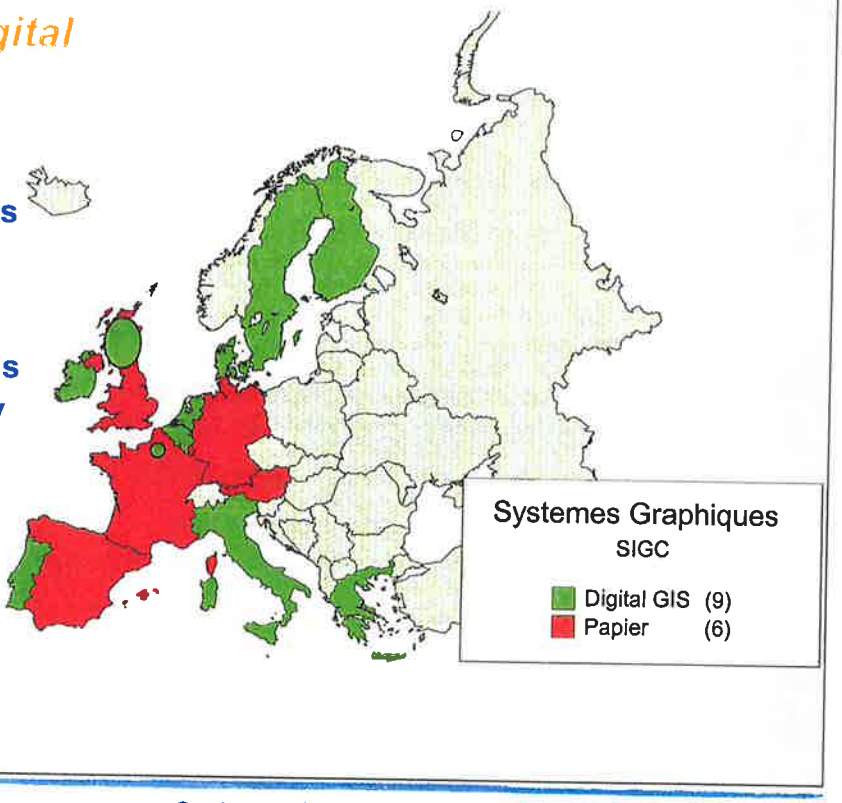
Availability of Digital LPIS in 2000 ?

- Digital LPIS was available in 9 M-States + 2 regions and +/- managed by GIS
- Other cases depends upon local availability of digital cadastre

70% of the EU. M-States, but 50% of the farmers 1.65 Mio / 3.27 Mio



Land parcel identification systems

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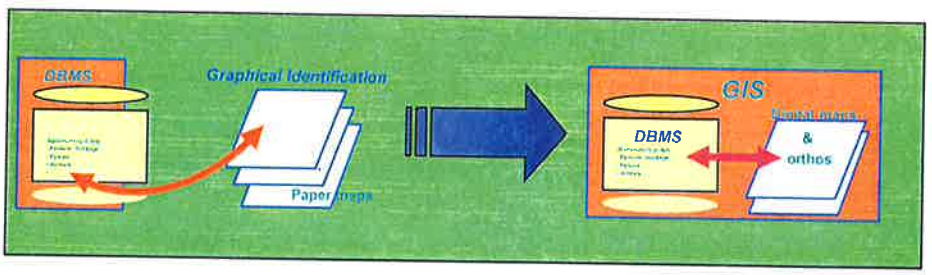
- In 2000, Reg 1593/00 make compulsorily digital LPIS and GIS
  - Digital maps minimum standards 1/10 000
  - Optional use of Ortho-photos (minimum 1m pixel, RMSE < 2,5m)
  - Exchange of graphical information with farmers (preprinted forms)
- LPIS/ GIS fully implemented in January 2005. Will increase homogeneity & quality standards of EU LPIS



In practice, the LPIS have to migrate from an hybrid GIS to a real GIS. The purpose is not to modernize paper map updating but to develop GIS applications accessible to Administration and Farmers

Land parcel identification systems

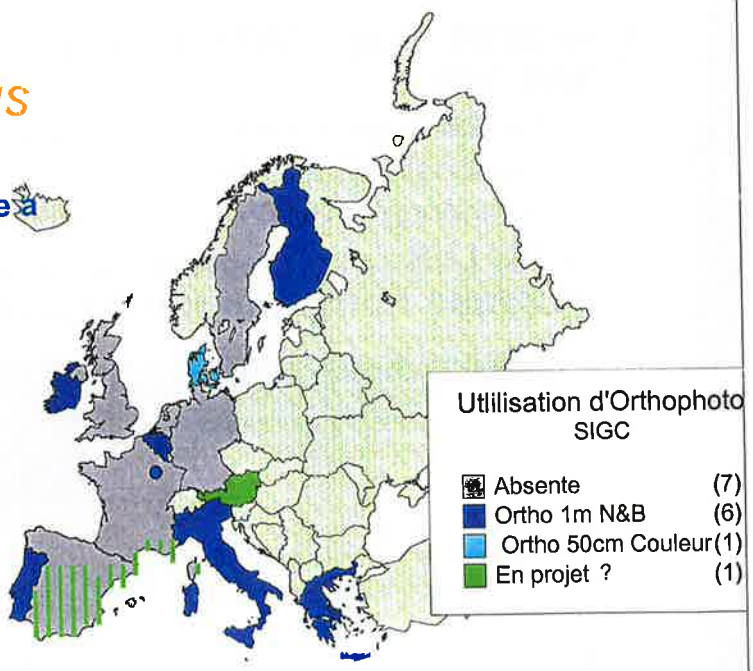
- **Total investments for the implementation of LPIS/GIS are in the range of 200 Mio EUR for EU 15**
  - i.e between 75- 125 Eur / km2
- **Main challenge are for large MS without Digital maps**
  - UK: Digitization of Land survey maps and use of orthophotos
  - SP, OST: Digitization of Cadastre and combination with orthophotos
  - FR: Complete migration from Cadastre to Ilots defined /orthophotos
  - DE: Partly use of digital cadastre combined with orthophoto. W/N: Migration from cadastre to Physical blocks
- **Some other MS will improve present systems**
  - NL: integration of orthophotos
  - IRL, ITA… development of Internet applications

In January 2005, digital maps and orthophotos will be available in almost all MS (and candidate countries)

Land parcel identification systems

Availability of Orthophotos in LPIS in 2000?

- **7 Member-States have a whole coverage of orthophotos in LPIS**
- **+ SPAIN, FRANCE (part, OLISIG)**



47% of M-States

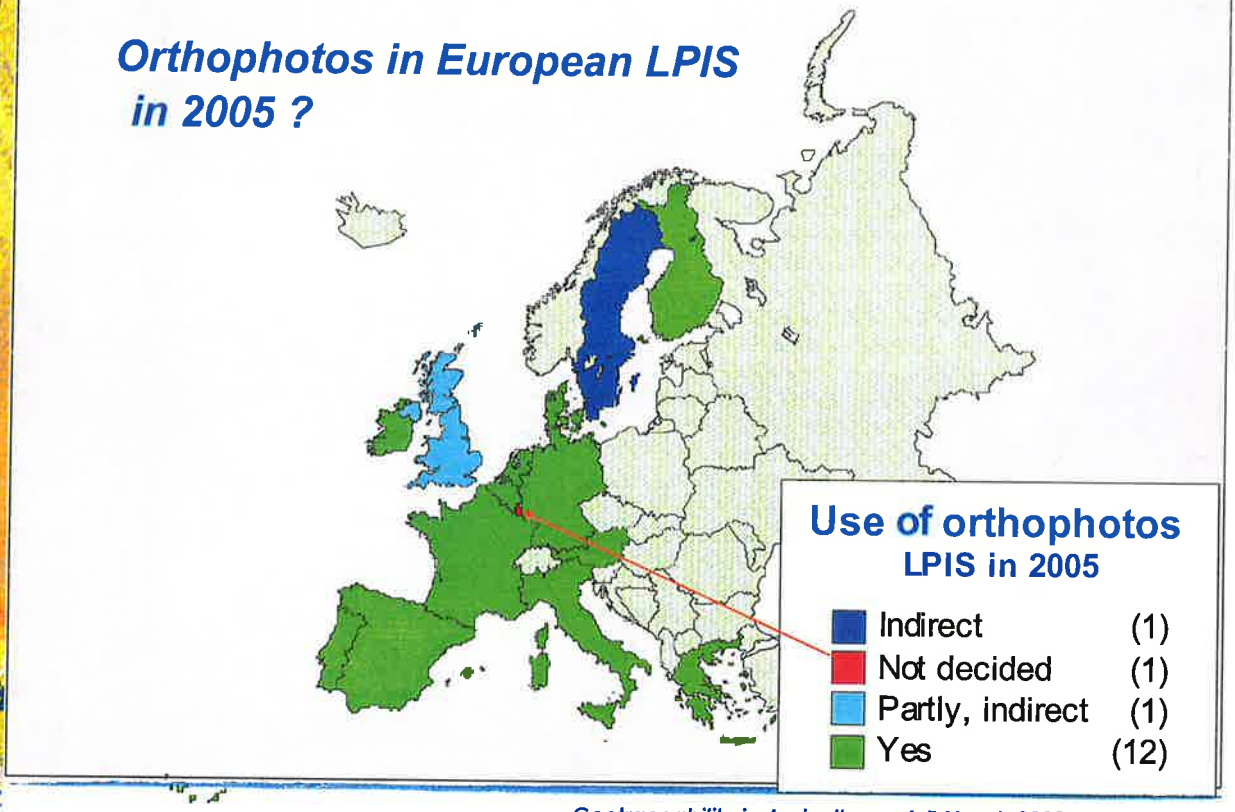
and 47% of farmers
1.54 Mio / 3.27 Millions….

But potentially > 60%

Land parcel identification systems

The Joint Research Centre

Orthophotos in European LPIS in 2005 ?



Land parcel identification systems

The Joint Research Centre

- An efficient and pragmatic block system based on Colour 50cm orthophotos… (3rd updating) -A web interface for farmers and wide public

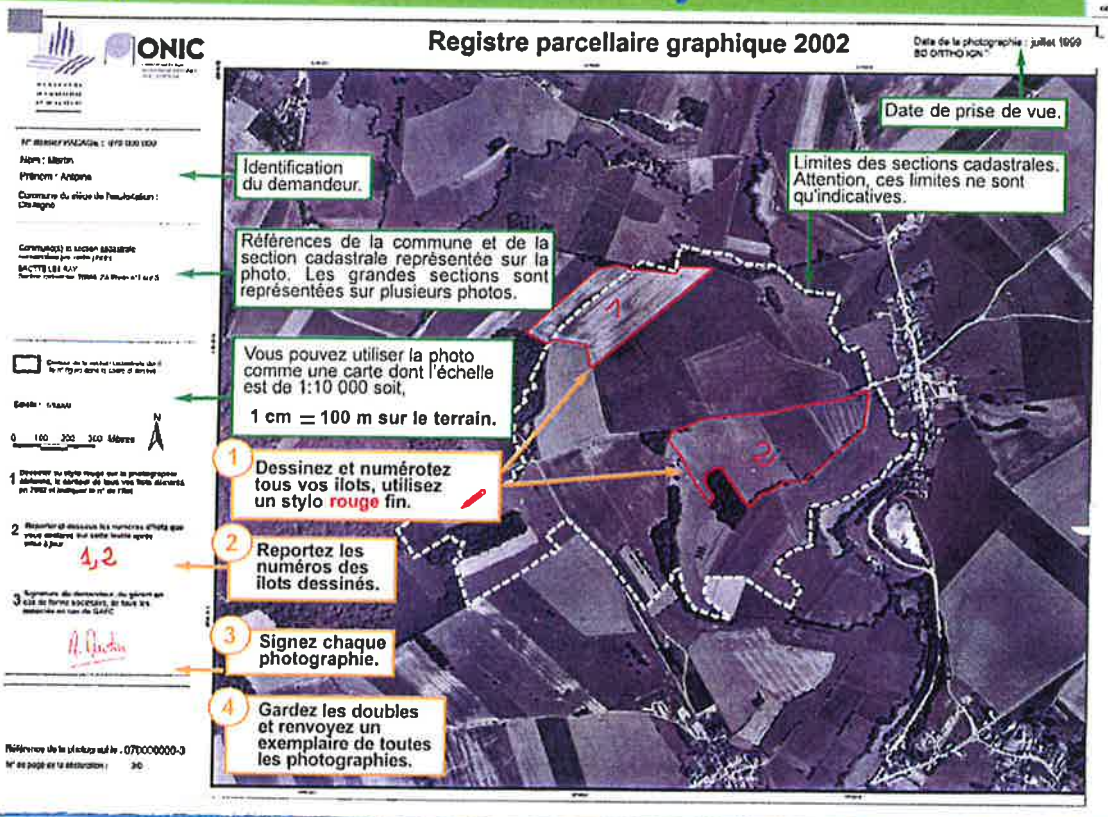
Land parcel identification systems

A block system with single Agriculture Parcels for arable lands

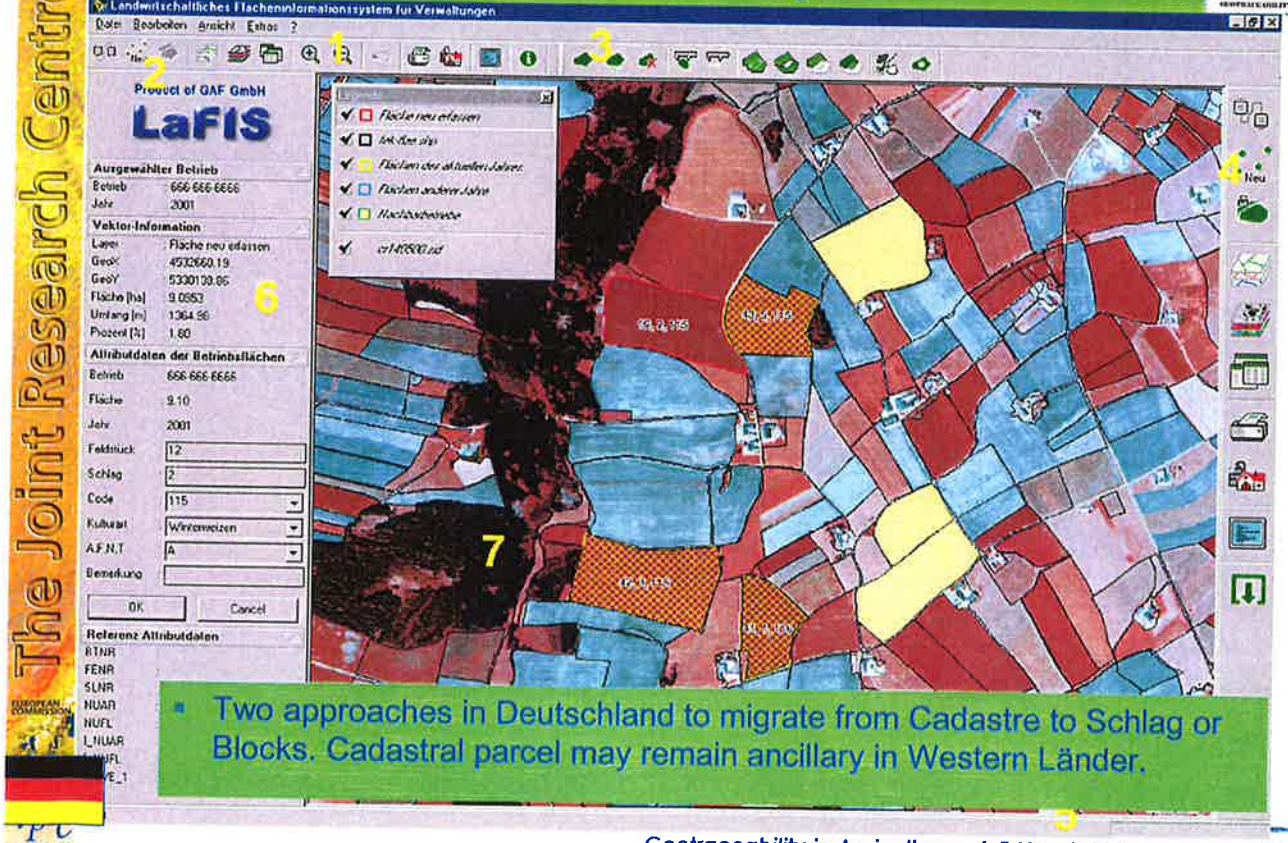
Land parcel identification systems

PO managed both blocks and parcels (Synergy with Olive tree Registers)

Land parcel identification systems



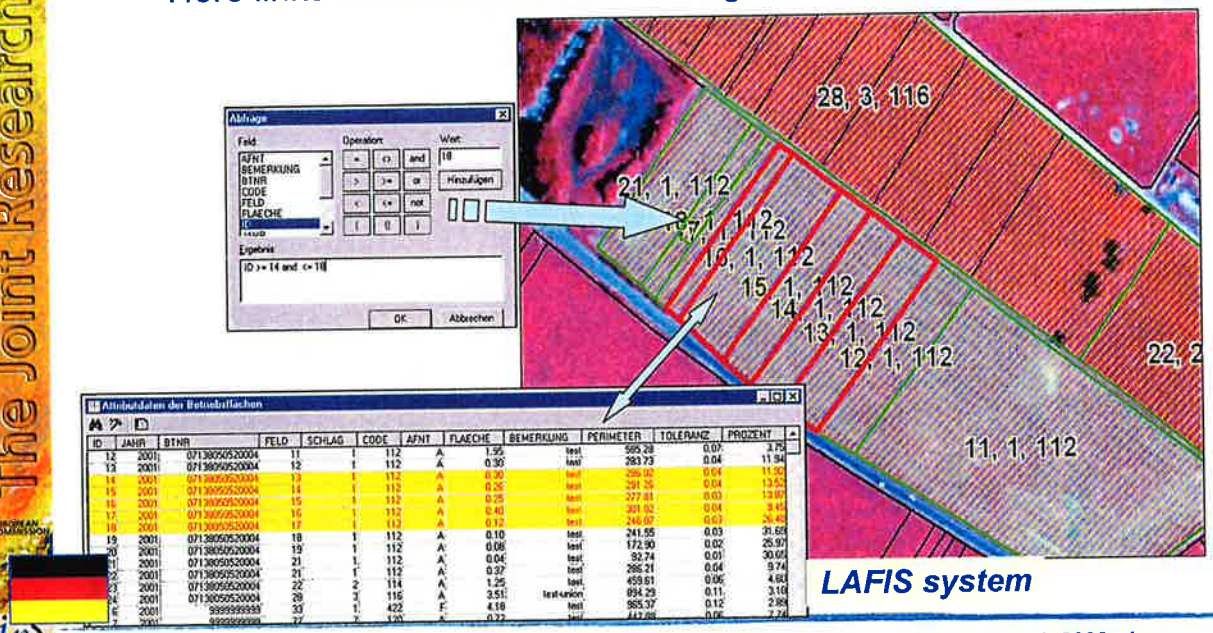
Land parcel identification systems



- Two approaches in Deutschland to migrate from Cadastre to Schlag or Blocks. Cadastral parcel may remain ancillary in Western Länder.

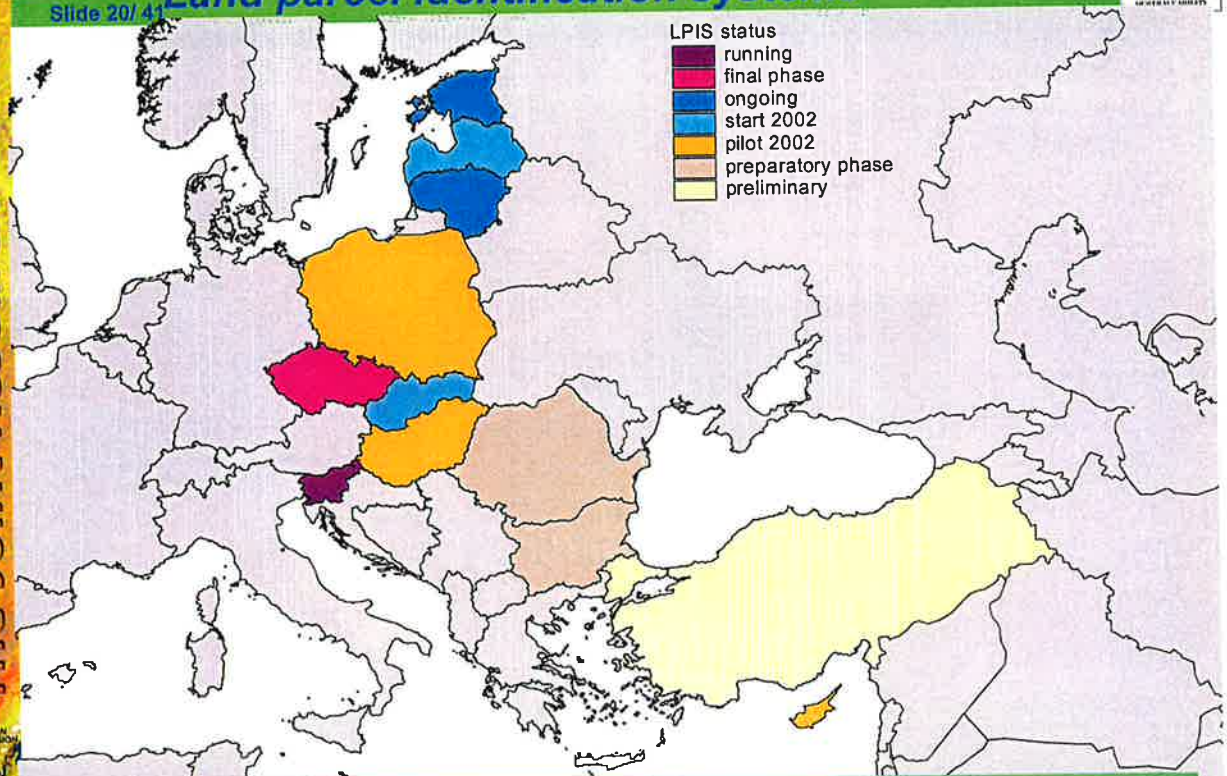
Land parcel identification systems

- **Specific GIS functionalities have to be implemented**
  - To manage the agricultural parcel and the reference parcels
  - Following control and updating processes
  - Here links between Cadastre and agricultural parcels in Germany



LAFIS system

Land parcel identification systems

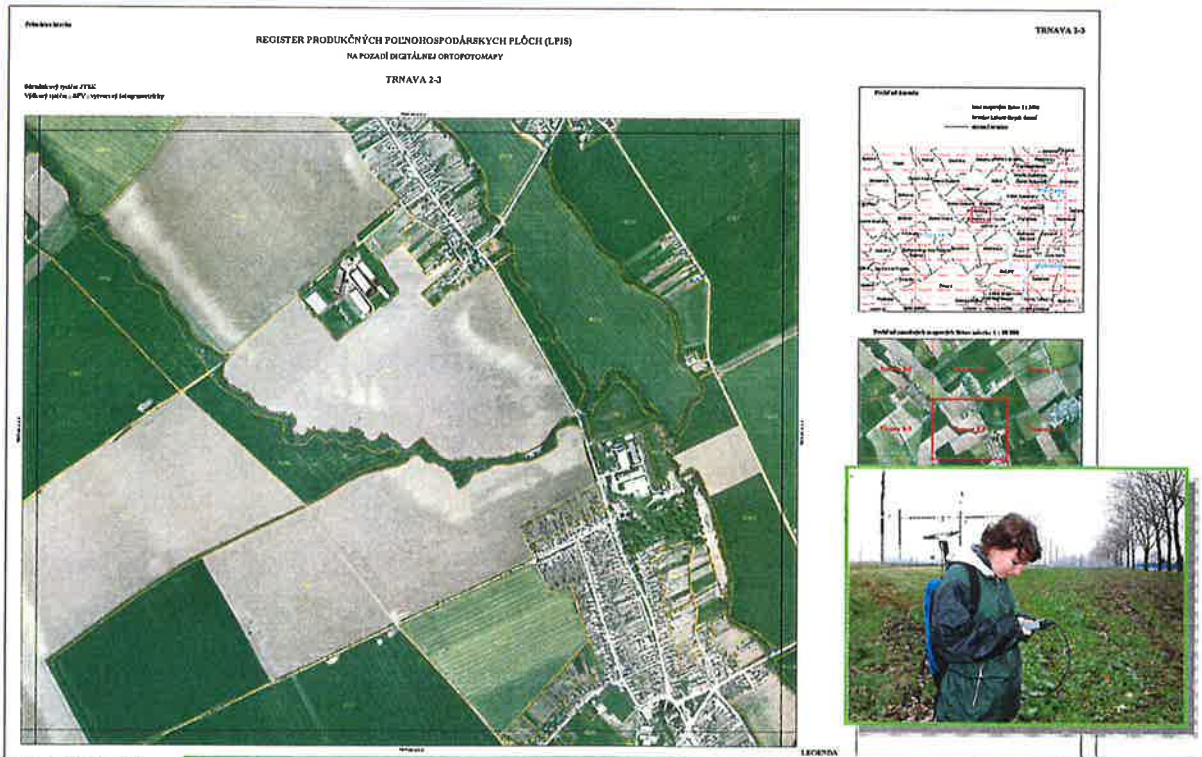


Status of IACS implementation in Candidate countries- September 2002

Land parcel identification systems

Hungary - A block coverage built on orthophotos

Land parcel identification systems



Slovak Rep - A block system/ortho -GPS use to link parcel to holdings

Land parcel identification systems

Poland : Color 1:5000 Ortho overlaid with scanned cadastre

Land parcel identification systems

Exchange of information with Farmer

- IACS foresee the use of pre printed forms to reduce the anomalies generated by wrong declaration or data entry.
- Same evolution for LPIS /GIS: Provision of maps to the farmer will be generalized in EU in 2005
- Clear definition of parcels cultivated and the indication of reference areas reduces
  - the errors in declaration
  - the discrepancies due to measurement accuracy
- Farmers obtain an reliable information of their parcels
  - Play an active role in the updating of the system

This exchange of information is crucial for the sustainable management of IACS and represent a first step of certification

Land parcel identification systems

The Joint Research Centre

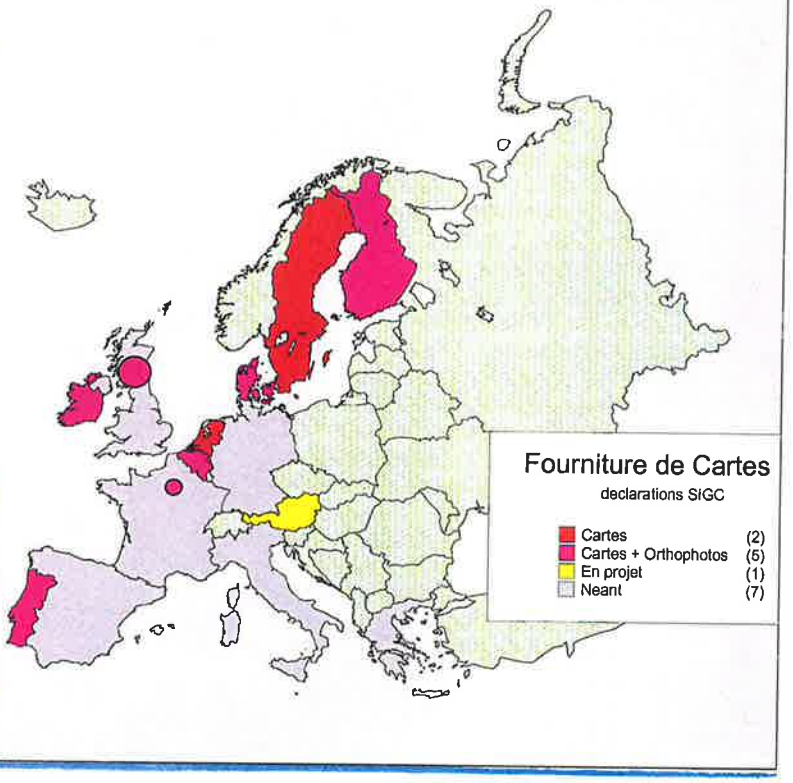
Providing Maps to Farmers in 2000

- 7 MS + 2 reg. are providing map extracts to farmers …

47 % of M-States

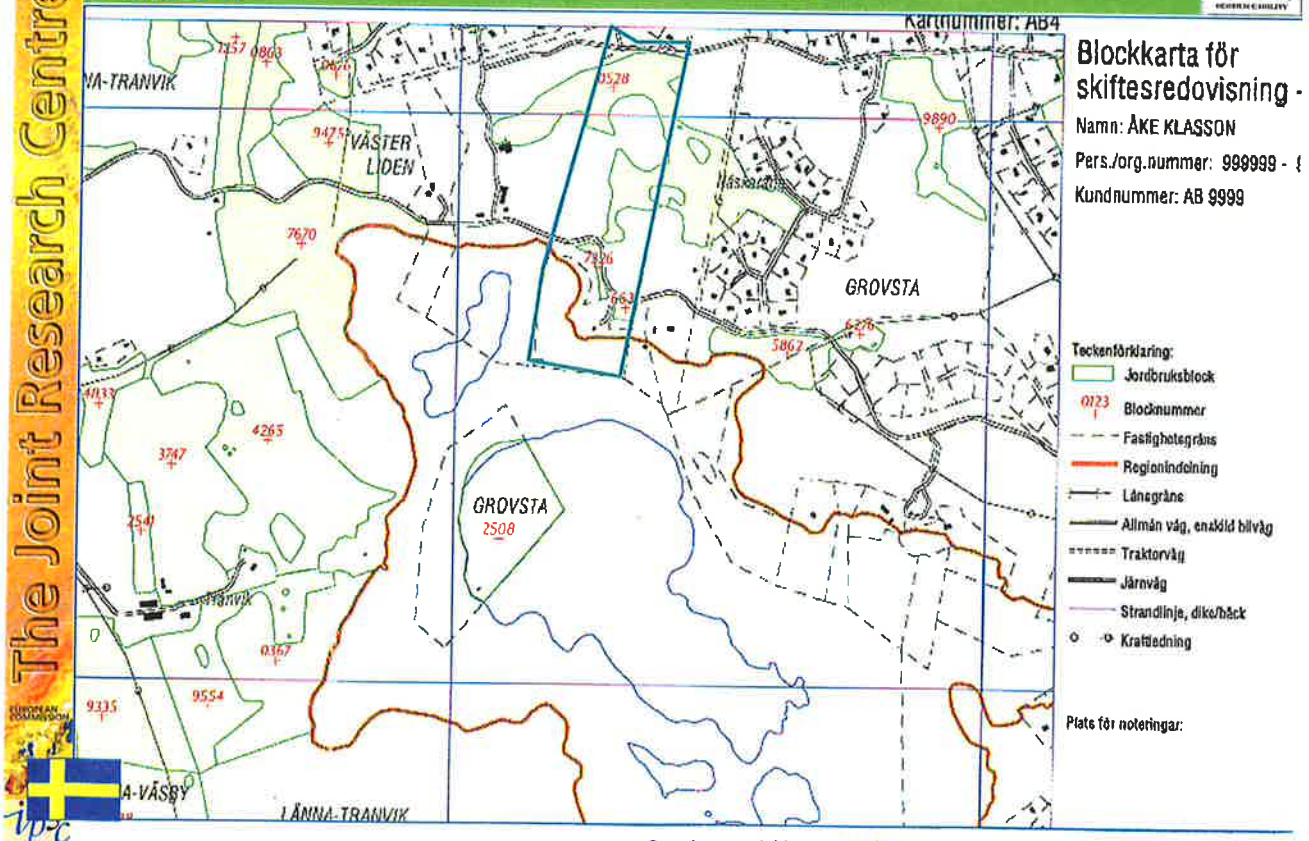
but less than 20% of the farmers

0,6 / 3,27 Millions…



Land parcel identification systems

The Joint Research Centre



Land parcel identification systems

Olive Trees, Vineyard and other permanent crops

Permanent crops Registers and GIS

Olive Tree "Registers"

- Historically the first regulation to implicate use of aerial photography and graphical register
- Functionality to cense and control
  - Olive tree parcels
  - Number of olive trees

✓ **Regulation 2366/98 OLI-GIS**

- Makes compulsorily the implementation of GIS
- and the use of orthophotos
- Systems almost completed (P, S, F, I) or still in progress (Gr)

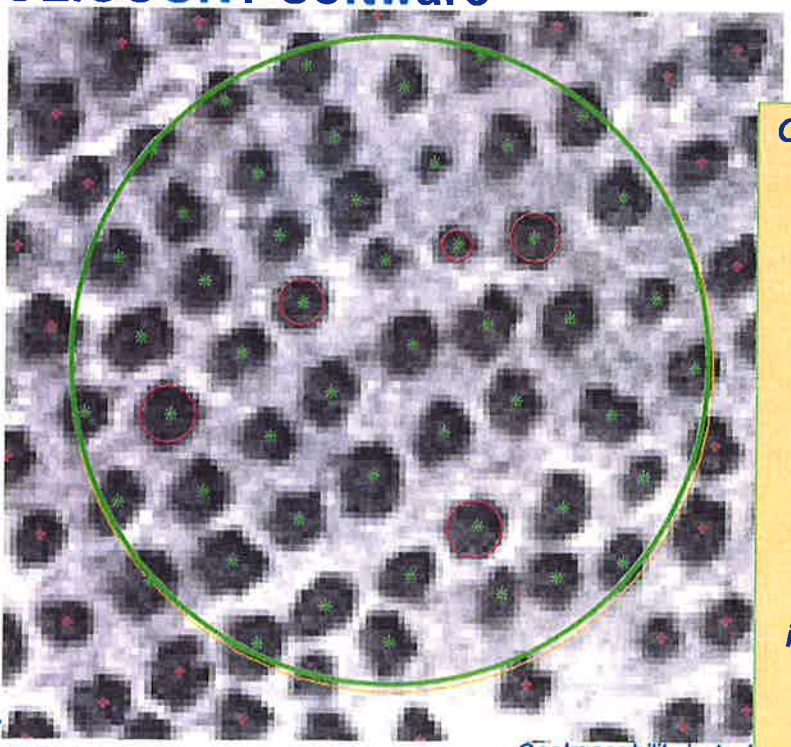
Orthophotos are indispensable tool to count and locate efficiently olive Trees. GIS applications were developed to support photo interpretation and to estimate the parcels area

Olive Trees, Vineyard and other permanent crops

JAEN area, Andalucia

Olive Trees, Vineyard and other permanent crops

OLICOUNT Software



OLICOUNT software was developed by MARS in the frame of statistical survey (OLISTAT).

It is presently used by MS for the implementation of OLI GIS.

In practice, automatic count supports CAPI and will be edited following field inspections on around 30 % of parcels...

OLI GIS application

manages the links between graphical information and the various databases

NIF	ACÇÃO	número SIP	Área (ha)	Oliveiras	Ocupação
100200111	V	1234567890001	0.34	21	CA
100200222	V	1234567890002	0.51	23	CA
100200333	V	1234567890003	0.45	46	OL
100200444	N	1234567890700	0.55	37	OL
100200555	N				

SIP

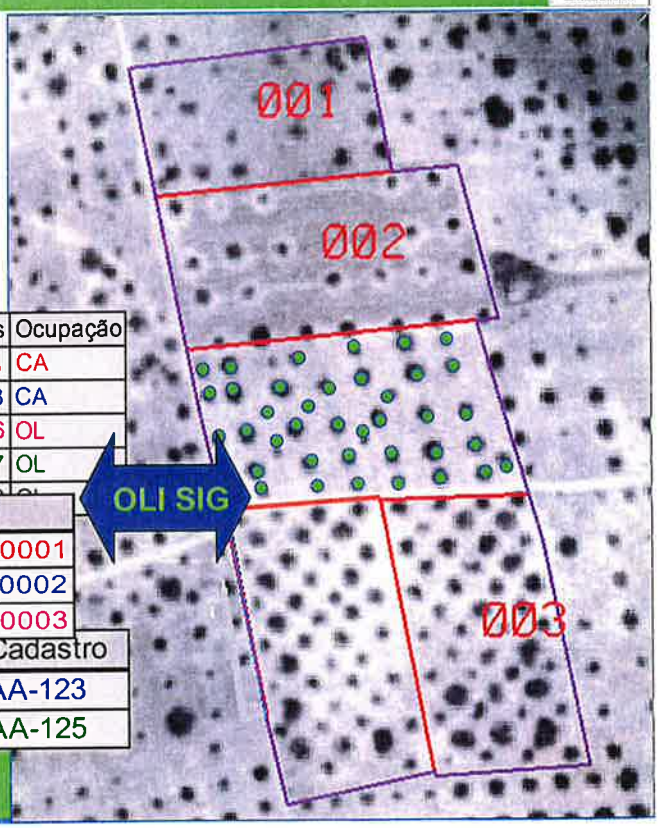
Azeite

NIF	número SIP
100200111	1234567890001
100200222	1234567890002
100200333	1234567890003

Requerente Novo

NIF	Cadastro
100200222	AA-123
100200444	AA-125

OLI SIG



Extracts of OLISIG PORTUGAL (INGA)

Permanent crops Registers and GIS

- ✓ **Vineyard "Registers"**
  - Rather complex databases describing vineyard parcels, generally based on cadastre
  - Specific functionalities: Management of planting rights, Controls of grabbing up etc (subsidies are marginal <<5 %)
  - Difficulties of maintenance / update exhaustive census
  - In some regions, very small parcels impose very detail mapping *1: 2500- 1: 5000 instead of 1: 10 000 standard*

- ✓ **Regulation 1593/00 (IACS GIS)**
  - Define compliancy requirement between
  - Cross checks to avoid double claims / IACS eligibility

- ✓ **A common LPIS arable sector / permanent crops GIS is implemented in most Mediterranean countries: ESP, ITA, GR (P)**

- *NB: The future Reform of the CAP will include the Dry Fruit schemes in the IACS / area based payments*

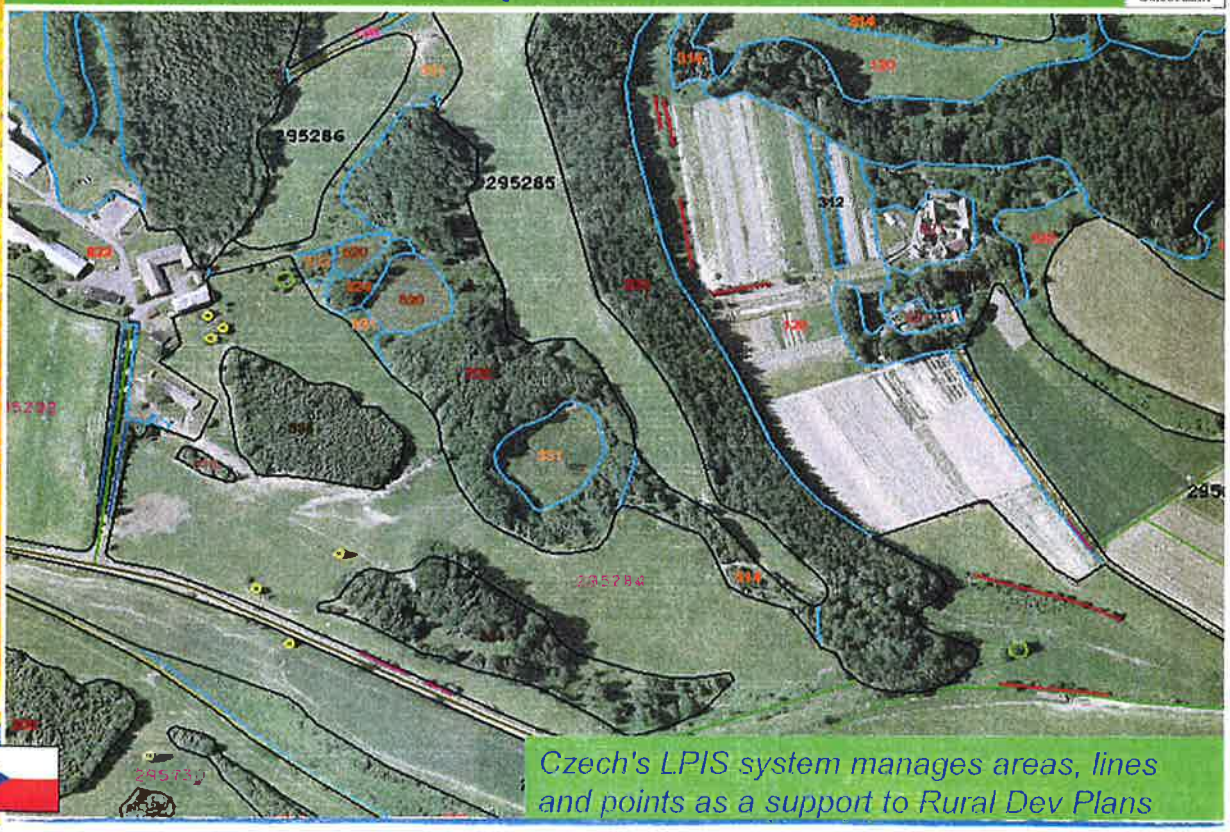
Rural Development

Rural Development

- ✓ **integrate a number of pre existing schemes**
  - ➢ Less favored areas
  - ➢ Agri environmental schemes,
  - ➢ Installation of farmers, conversion, Forestation, etc
- ✓ **Multi annual agreements signed between Farmer and Administration**
- ✓ **A rather complex system**
  - ➢ complete menu " a la carte" for farmers
  - ➢ various types of expenses: EAGGF Guidance (investment) / EAGGF Guarantee
  - ➢ Various level of co-funding by EU
  - ➢ Heterogeneous implementation at regional /national level
  - ➢ Complex controls (good farming practices, etc)
- ➢ **Land parcel identification systems of the IACS has to be used**

Requirement of managing non area features to control (Edges, walls, isolated trees, etc...)
X annual commitment reinforce the role of "agreement maps"

Rural Development



Czech's LPIS system manages areas, lines and points as a support to Rural Dev Plans

Possible contribution of the CAP

The Joint Research Centre

The Reform of the CAP Com (2003) 23 – 21/01/03

- ✓ **Proposal of Council regulation**
- ✓ **Foreseen Schedule**
  - ➢ **Council Reg. ?** *approved June 2003*
  - ➢ **Comission Reg ?** *approved Dec 2003*
  - ➢ **Applicable in** *2004 ?*
- ✓ **Main orientation**
  - ➢ Market orientation *(decoupling, single payment)*
  - ➢ Environment protection
  - ➢ Quality initiative
  - ➢ Food Safety
  - ➢ Rural development *(Advisory system)*

Will repeal IACS Regulation (1st Pillar)
Doesn't replace Rural Dev. (2nd pillar), slightly amended by a new chapter

Possible contribution of the CAP

The Joint Research Centre

The Reform of the CAP Com (2003) 23 – 21/01/03

- ✓**Main features**
  - ➢ *Single Payment Scheme for all based on reference period*
  - ➢ *+ specific premium for D Wheat, Protein crop,Rice, Nuts, Energy crops (Biofuel), Potato starch…*
  - ➢ *Degression, modulation :* Provide mechanisms to transfer budget from 1st to 2nd Pillar

IACS is reinforced and LPIS remain a key element for control and monitoring of the future system

Possible contribution of the CAP

The Reform of the CAP Com (2003) 23 – 21/01/03

- Geographic information remains crucial
  - LPIS / GIS is maintained *(Art 19- 21)*
  - Reference to Remote sensing for LPIS and controls *(WA 24, Art 24)*
- Control functionalities
  - Eligibility / Permanent pasture, Dec 02 *(Art 5)*
  - Cross compliancy *(Art 3, 6, 40 Annex III)*
  - double claims *(Art 36)*
- Fundamental changes for the management of geographic data
  - Definition & management of « **Entitlements** »
  - Intervention of « **Advisory Systems** »

Possible contribution of the CAP

The Reform of the CAP Com (2003) 23 – 21/01/03

The Entitlements

- Payments entitlements attached to a farmer *(Art 38)*
  - Reference Amount
  - Number of eligible hectare
  - Mean amount per hectare
- Definition of the entitlements
  - On a reference period 2000-02 *(Art 39)*
  - For eligible land uses (arable, forage, list of crops, no permanent)
  - Linked to geographic areas *(Art 44)*
- Main questions
  - Level of detail for yearly claim
    - Production block (ilot) sufficient for management and control ?
  - Management and transfer of entitlement *(Art 46 - 48)*
  - strength of link with parcels of the reference period ?

Many issues to be clarified in the Application Regulation in 2nd half of 2003

Possible contribution of the CAP

The Joint Research Centre

The Reform of the CAP Com (2003) 23 – 21/01/03

Advisory systems *(Art 12- 17)*

- a support to farmer for cross-compliance and rural development
  - ***Provide information on eligibility, cross-compliance, good farming practices***
- Compulsorily for farmers receiving above 15000 Eur/ year (or 100000 EUR of Turn over)
  - ***optional for the others***
- Advisory Organization ?
  - Designated authorities, Private bodies,
  - Private org to be approved by a national Supervisory Authority
- Role: Support and not Audit
  - Obligation for farmer to provide correct information to the AS
  - Responsability remains at farmer level
- Similar to some initiatives of certification and traceability

Distribution of geographic information play an important role – Present technologies provide a number of tools and solution

Possible contribution of the CAP

The Joint Research Centre

The Reform of the CAP Com (2003) 23 – 21/01/03

Quality and traceability ?

- Proposal of 2 new chapters in RD Reg 1257/99
- Food quality
  - Incentive payments to farmer for participation to EU or Nat recognized Schemes
    - ***Max 1500 EUR / year and 5 years***
  - Support to producer groups for activity of promotion/ information of consumer
    - ***Maximum 70% of elligible cost***
- Meeting standard *(Article 21)*
  - Support to farmers for introduction of Management standards for cross compliance
    - ***Max 10 000 EUR / year, degressive for max 5 years***
  - Support to farmers to use Advisory Systems
    - ***Maximum 80% of costs, 1 year ceiling of 1500 Eur***

Potential synergies with Geo traceability... Importance of will depend upon Commission regulation and initiative of MS

Possible contribution of the CAP

The Joint Research Centre

Thanks for your attention !

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zzz

zz

z

Tools for geotracing

Simon Kay
MARS Unit

Tools for geotracing

- Geotracing feasibility dependent upon a number of *Geomatics* technologies:
  - Geographic Information System (GIS) tools
    - Mainstream digital mapping
    - Land Parcel Identification System for the CAP
  - Global Navigation Satellite Systems for positioning
    - GPS
    - Galileo (EGNOS)
  - Internet/Wireless communications
    - Freedom to work in the field
  - Very High spatial Resolution (VHR) remotely sensed data
    - Reduced costs, higher availability

Digital map sources: UK OS MasterMap

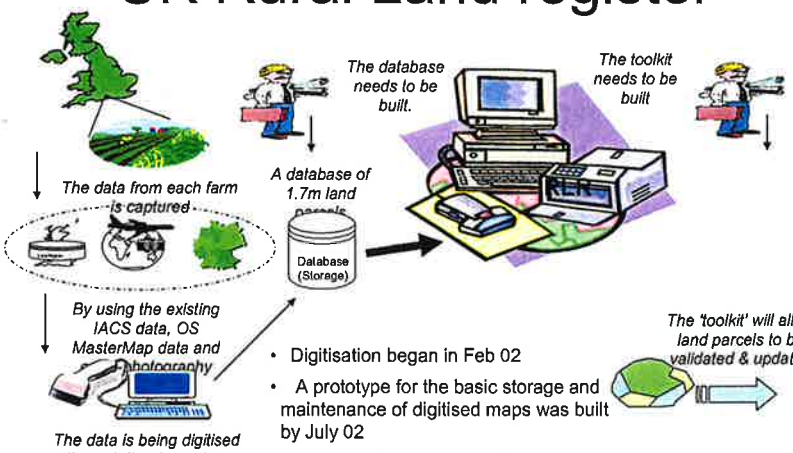
Topo96 Landline

- Restructured data
- Improved quality
- Spatial indexing

OS MasterMap

Database of over 400 million unique topographic objects

UK Rural Land register



- Digitisation began in Feb 02
- A prototype for the basic storage and maintenance of digitised maps was built by July 02
- The limited capability version of the RLR will be functional by Dec 02
- The full RLR with all its data will be available by Jan 04

GNSS

- Satellite navigation is about 40 years old
  - 1959 –TRANSIT programme in response to SPUTNIK
  - 1964 – TRANSIT operational
  - 1996 – TRANSIT retired
- GPS took about 30 years to develop
  - 1964 – US Navy TIMATION project started
  - 1973 – Labour Weekend architecture meeting
  - 1978 – First GPS Block 1 Satellite
  - 27 April 1995 – GPS Full Operational Capability
- EGNOS has been going for nearly 10 years
  - Pre-operational phase Aril 1st 2003?
- First Galileo signals are planned for 2008

GNSS, GPS

- Current accuracy potential:

Horizontal Accuracy (95%,m)	Note
5 -10	GPS stand-alone
1-3	Differential GPS including the future EGNOS
0.02 – 0.05	Real-time kinematic using differential carrier phase up to thousands of kilometers
0.005 – 0.02	Static differential carrier phase up to many hundreds or thousands of kilometers

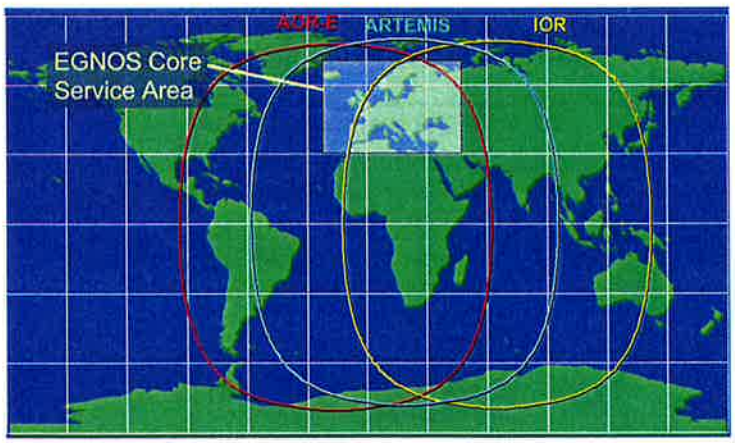
GNSS – GPS performance

Parameter	GPS SPS Specification[1]	FAA GPS SPS Performance Analysis Report[2]
Horizontal Accuracy (95%, m)	≤13 (≤ 36 worst case)	6.389
Vertical Accuracy (95%, m)	≤ 22 (≤ 77 worst case)	7.811
Time Transfer Accuracy (95%, m)	≤ 40	16

1. *GPS SPS Performance Specification*
2. *FAA GPS SPS PAN, October 2002*

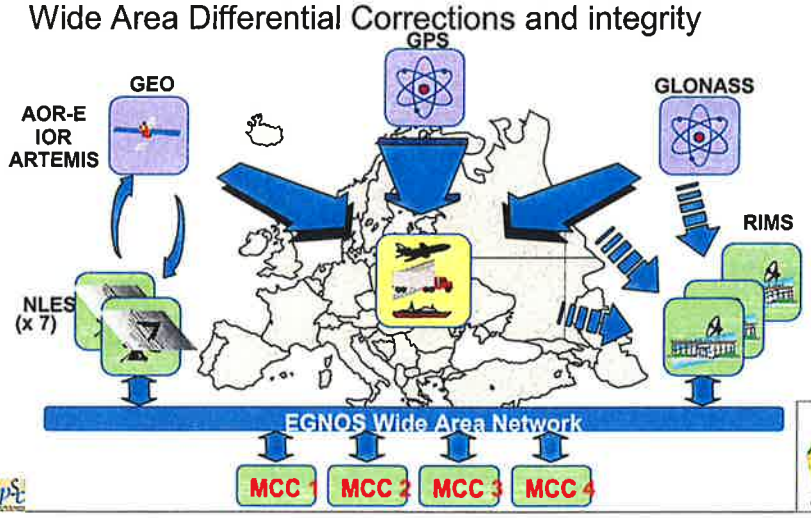
GNSS - EGNOS

- EGNOS is a satellite-based augmentation system that enhances the performance of GPS



GNSS - EGNOS

- The EGNOS ground segment mimics GPS to deliver Wide Area Differential Corrections and integrity

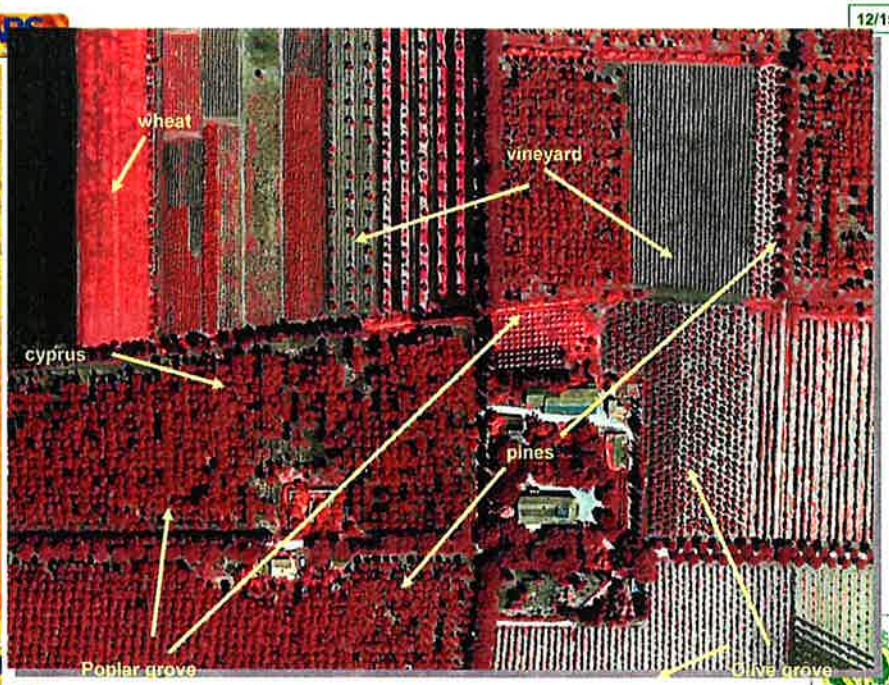


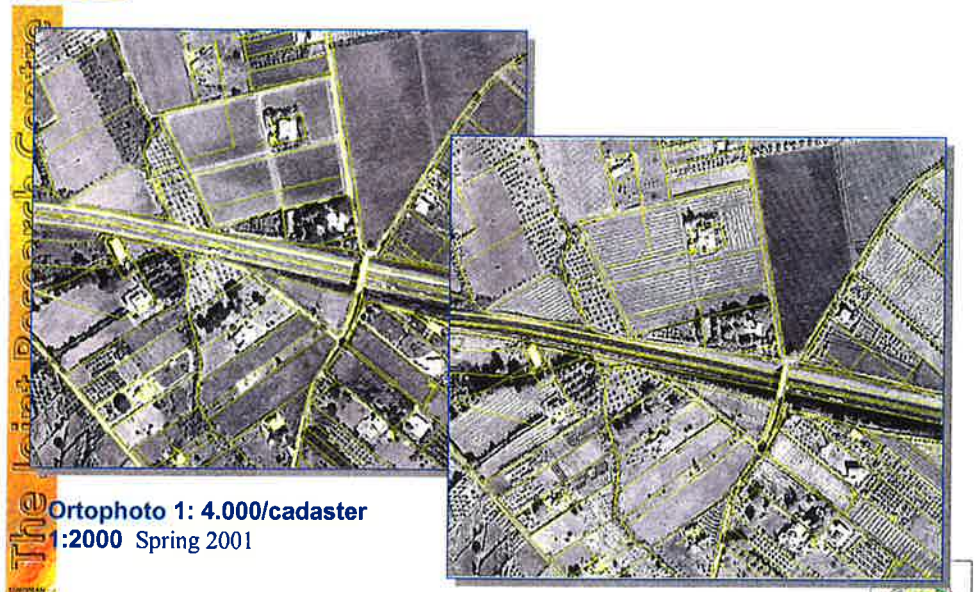
Wireless Internet connections

- Field work enabled
  - PDA systems now powerful enough
  - Data connection broad enough

VHR image data

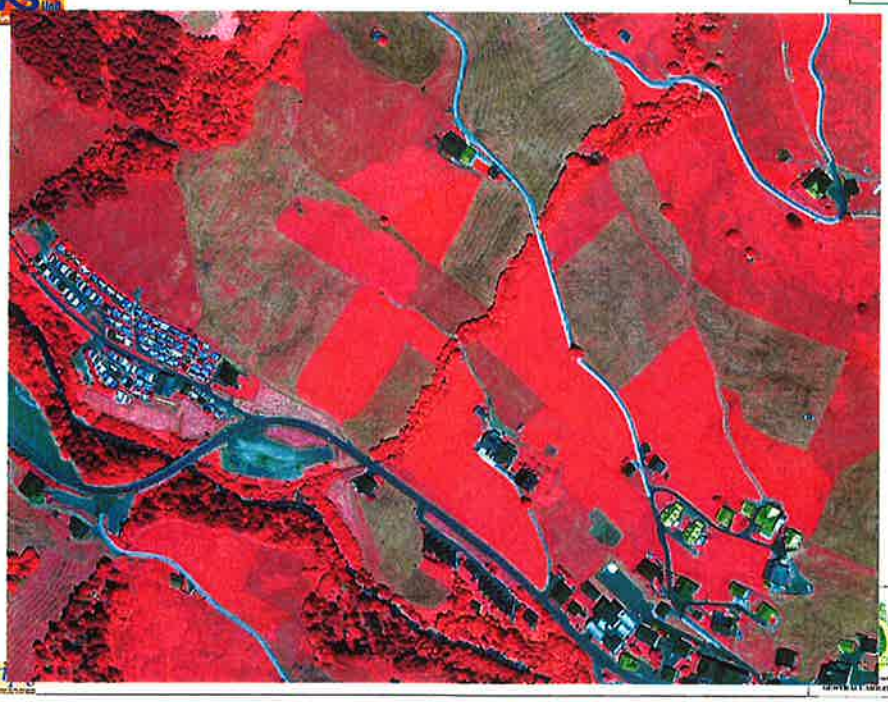
- EU-wide (23 MS) orthophoto coverage by 2005
  - <1m pixel (50cm typical)
  - Often colour (sometimes CIR)
  - 3 to 5 year update typical
- Increased availability of satellite VHR
- Digital airborne systems also competitive
  - e.g. Leica Geosystems ADS40, Zeiss DMC





Ortophoto 1: 4.000/cadaster
1:2000 Spring 2001

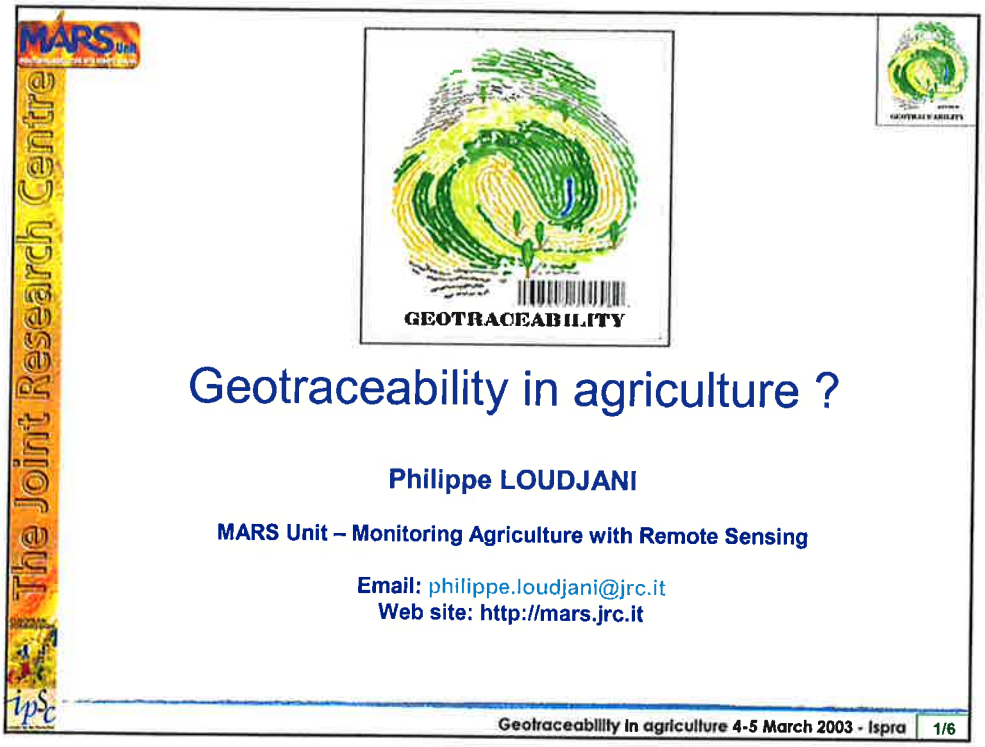
QuickBird 1: 4.000/cadaster
1:2000 March 2002

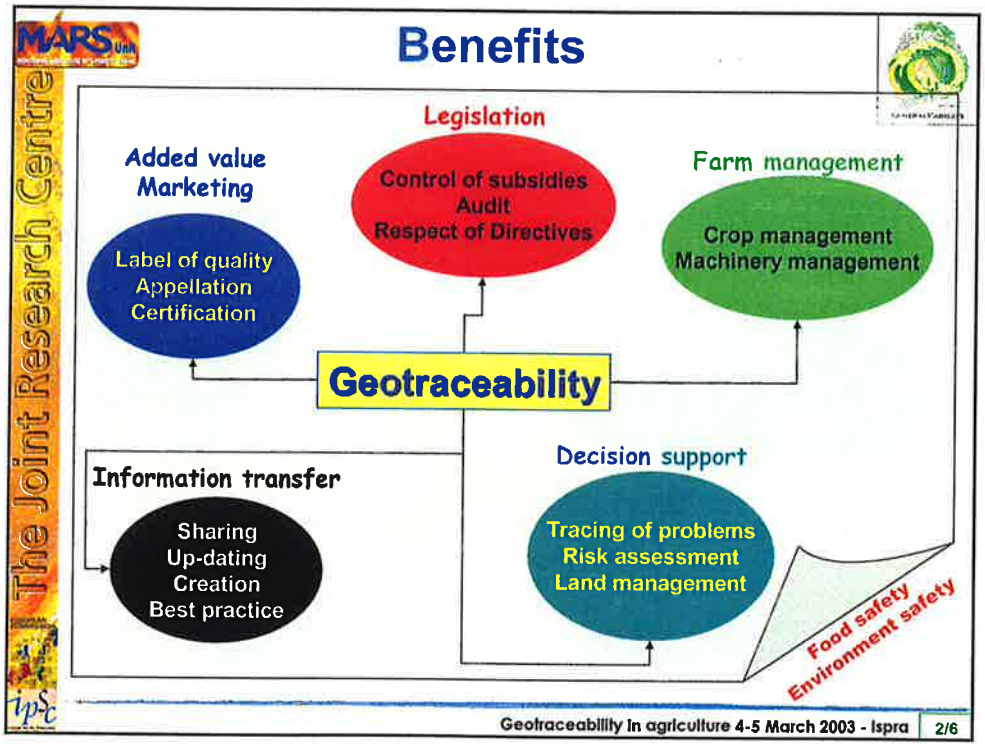


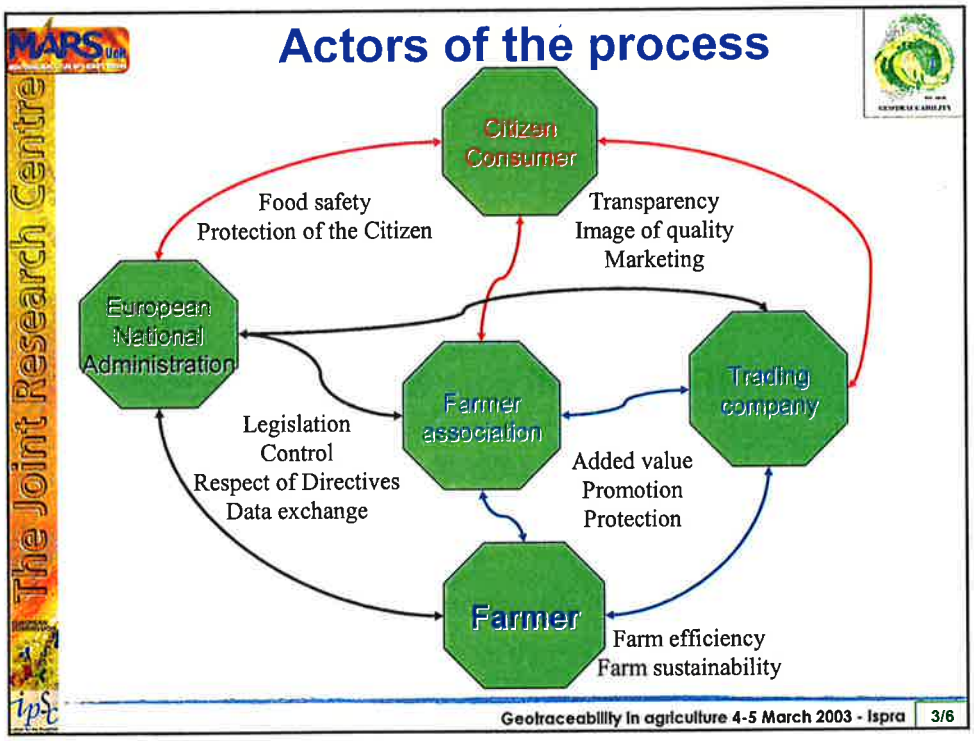
Summary

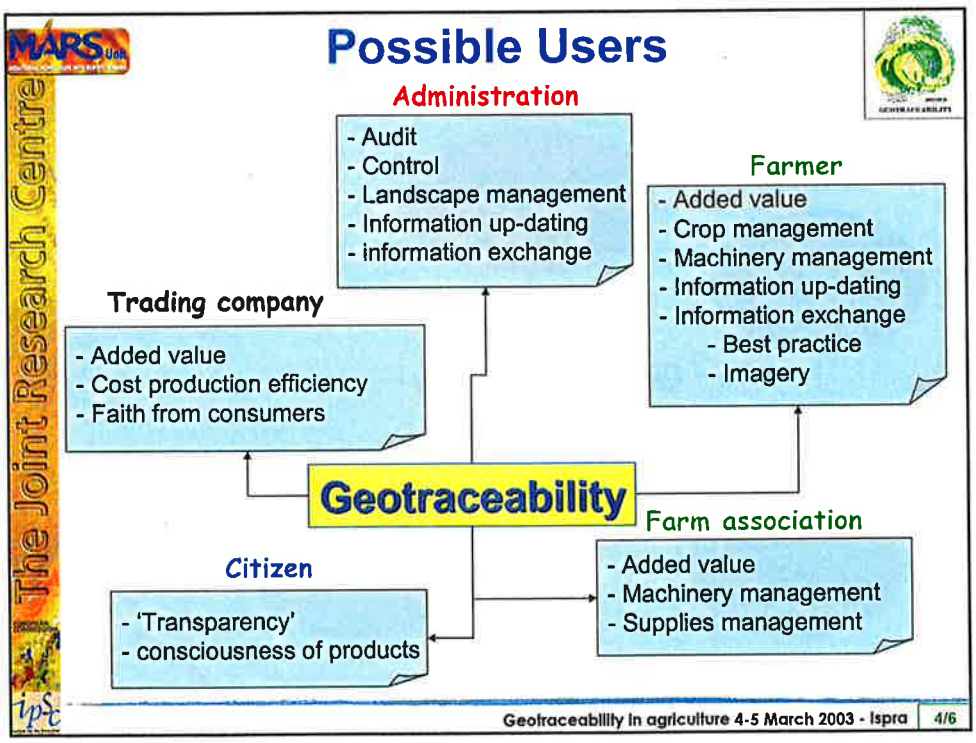
- Various technologies are now here able to support geo-tracing
  - Configuration to be determined based upon
    - user requirements
    - costs
    - Timeliness

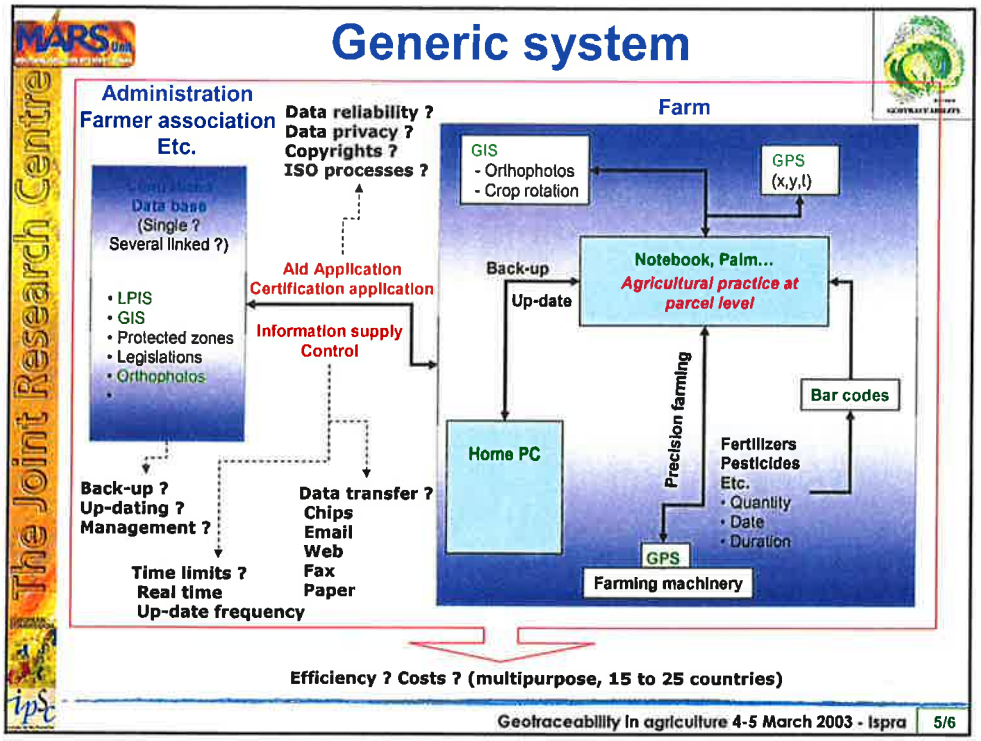
- Acknowledgements for various images and figures:
  - M Probert OS GB
  - Sally Basker, Helios Technology
  - Livio Rossi, EurImage

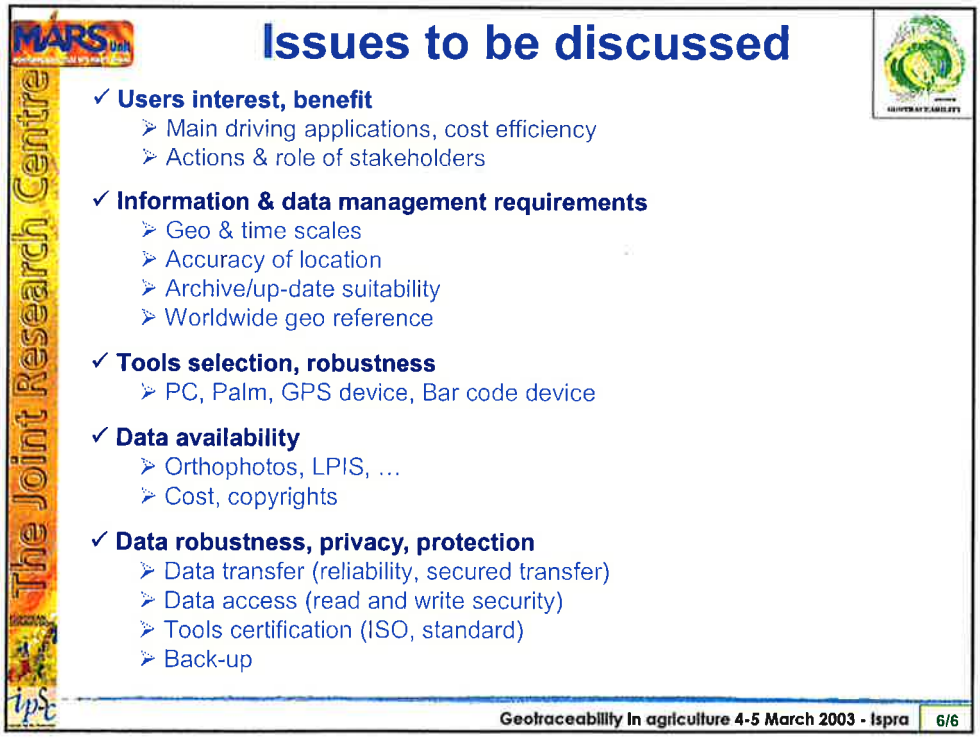

MARS Unit
The Joint Research Centre
GEOTRACEABILITY
Geotraceability in agriculture ?
Philippe LOUDJANI
MARS Unit – Monitoring Agriculture with Remote Sensing
Email: philippe.loudjani@jrc.it
Web site: http://mars.jrc.it
Geotraceability in agriculture 4-5 March 2003 - Ispra
1/6


MARS Unit
The Joint Research Centre
Benefits
Legislation
Control of subsidies
Audit
Respect of Directives
Added value
Marketing
Label of quality
Appellation
Certification
Farm management
Crop management
Machinery management
Geotraceability
Information transfer
Sharing
Up-dating
Creation
Best practice
Decision support
Tracing of problems
Risk assessment
Land management
Food safety
Environment safety
Geotraceability in agriculture 4-5 March 2003 - Ispra
2/6

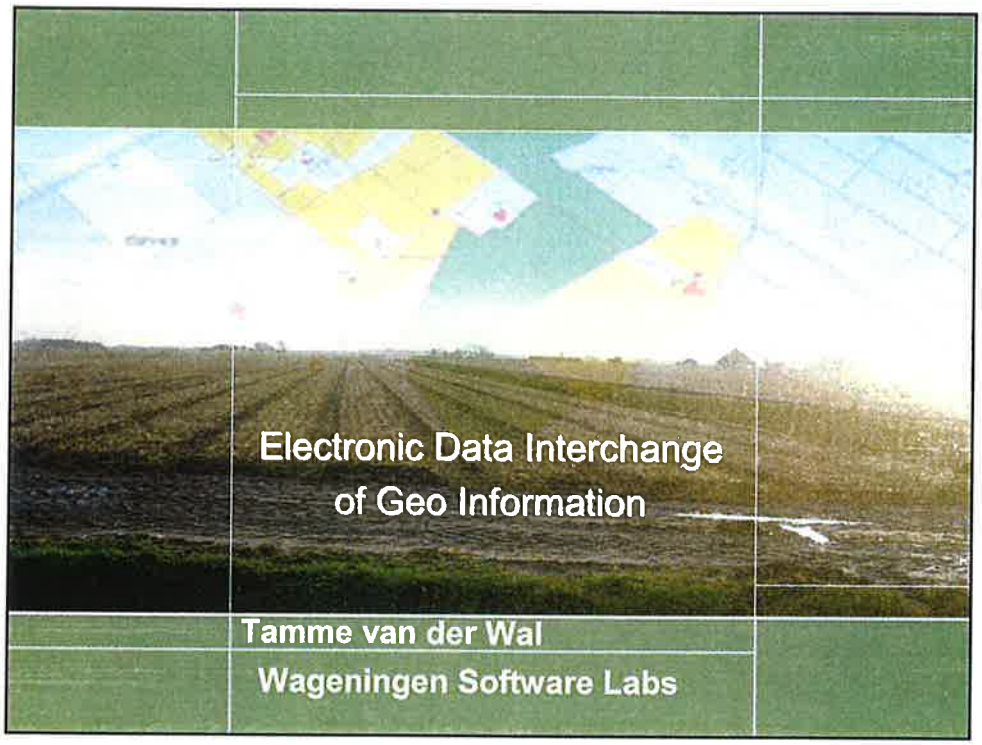

Actors of the process
The Joint Research Centre
Citizen Consumer
Food safety
Protection of the Citizen
Transparency
Image of quality
Marketing
European National Administration
Farmer association
Trading company
Legislation
Control
Respect of Directives
Data exchange
Added value
Promotion
Protection
Farmer
Farm efficiency
Farm sustainability
Geotraceability in agriculture 4-5 March 2003 - Ispra
3/6


Possible Users
The Joint Research Centre
Administration
- Audit
- Control
- Landscape management
- Information up-dating
- information exchange
Farmer
- Added value
- Crop management
- Machinery management
- Information up-dating
- Information exchange
- Best practice
- Imagery
Trading company
- Added value
- Cost production efficiency
- Faith from consumers
Geotraceability
Farm association
- Added value
- Machinery management
- Supplies management
Citizen
- 'Transparency'
- consciousness of products
Geotraceability in agriculture 4-5 March 2003 - Ispra
4/6


Generic system
The Joint Research Centre
Administration
Farmer association
Etc.
Data reliability ?
Data privacy ?
Copyrights ?
ISO processes ?
Farm
Data base
(Single ?
Several linked ?)
• LPIS
• GIS
• Protected zones
• Legislations
• Orthophotos
Aid Application
Certification application
Information supply
Control
GIS
- Orthophotos
- Crop rotation
GPS
(x,y,t)
Back-up
Up-date
Notebook, Palm...
Agricultural practice at parcel level
Bar codes
Home PC
Precision farming
Fertilizers
Pesticides
Etc.
• Quantity
• Date
• Duration
GPS
Farming machinery
Back-up ?
Up-dating ?
Management ?
Time limits ?
Real time
Up-date frequency
Data transfer ?
Chips
Email
Web
Fax
Paper
Efficiency ? Costs ? (multipurpose, 15 to 25 countries)
Geotraceability in agriculture 4-5 March 2003 - Ispra
5/6


Issues to be discussed
The Joint Research Centre
✓ Users interest, benefit
➢ Main driving applications, cost efficiency
➢ Actions & role of stakeholders
✓ Information & data management requirements
➢ Geo & time scales
➢ Accuracy of location
➢ Archive/up-date suitability
➢ Worldwide geo reference
✓ Tools selection, robustness
➢ PC, Palm, GPS device, Bar code device
✓ Data availability
➢ Orthophotos, LPIS, ...
➢ Cost, copyrights
✓ Data robustness, privacy, protection
➢ Data transfer (reliability, secured transfer)
➢ Data access (read and write security)
➢ Tools certification (ISO, standard)
➢ Back-up
Geotraceability in agriculture 4-5 March 2003 - Ispra
6/6

Future: animal traceability…



Electronic Data Interchange of Geo Information

Tamme van der Wal
Wageningen Software Labs

Presentation Programme

- Agricultural Geo-information data collection in NL;
- Internet based application;
- Demo
- Coming improvements

Geo-information use

Farmer :

- Farm planning;
- Land transactions (Cadastre);
- (precision agriculture).

Government :

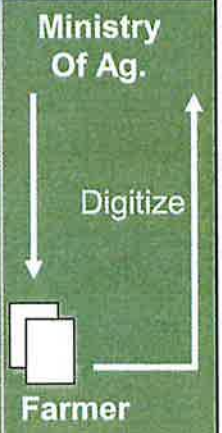
- (support-)measures where maps are required for the declaration, e.g.:
  - CAP;
  - Dutch manure legislation.
- control on declarations;
- Fighting plant/animal diseases.

Current Product

- Initial mailing of custom cut maps;
- Maps cover parcels of last years' application;
- Call centre and internet ordering service for additional maps and forms;
- Printing on demand for maps and forms;

management information to ministry of Agriculture.

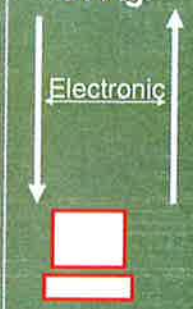
Large paper flow!



Internet declaration

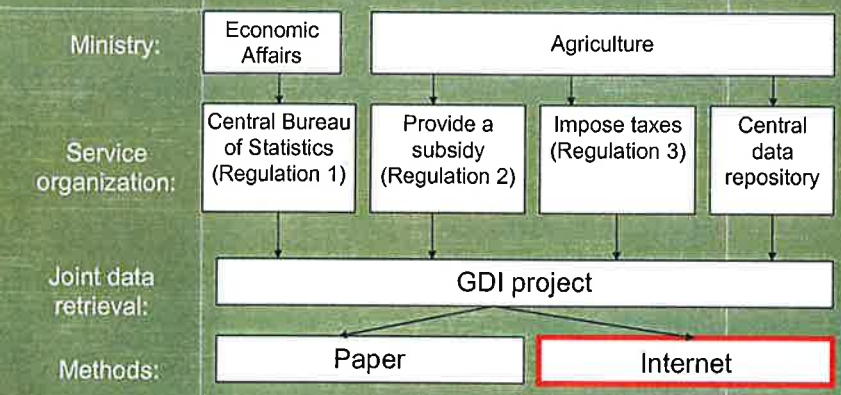
Interactive application
- Last year's parcels
- Select geometry
- Add (draw) new geometry

Higher quality
- Better geometry
- Application is complete
- Application is consistent



From paper to electronic

Joint Data Collection



requirements

government service organization:	provide a subsidy (regulation 2)	impose taxes (regulation 3)	central parcel registration
parcel geometry demands:	low	high	high
parcel check:	area claimed compared to total area of topographic parcel overlap with other parcels of user	parcel area and geometry overlap overlap with neighbour parcels Ownership / rent	parcel area and Geometry overlap overlap with neighbour parcels Ownership / rent

GDI internet story board

website of Ministry of Agriculture

www.Invloket.nl

Single sign on

(redirect to GDI website)

intro | overview | steps | sign

A | B | C | ... | F | ...

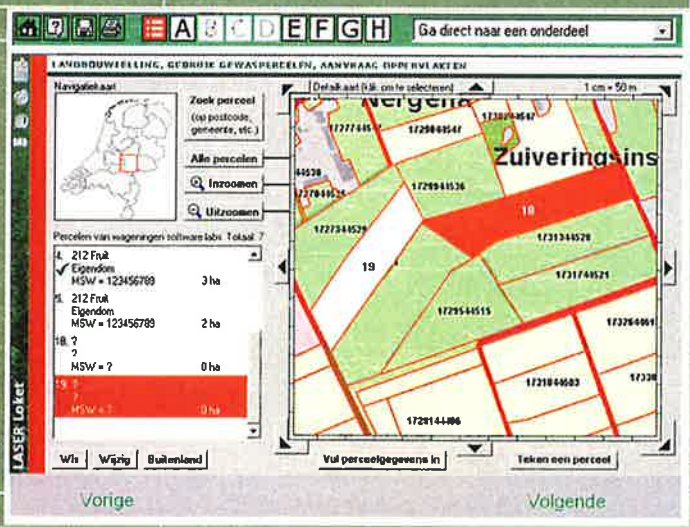
2002 demands

Let non-GIS experts do GIS task
→ usability critical!

Internet application in less time than paper, e.g. by…

- Present previous year's user data for editing
- Integration as component in website of Min. Ag.

Internet declaration



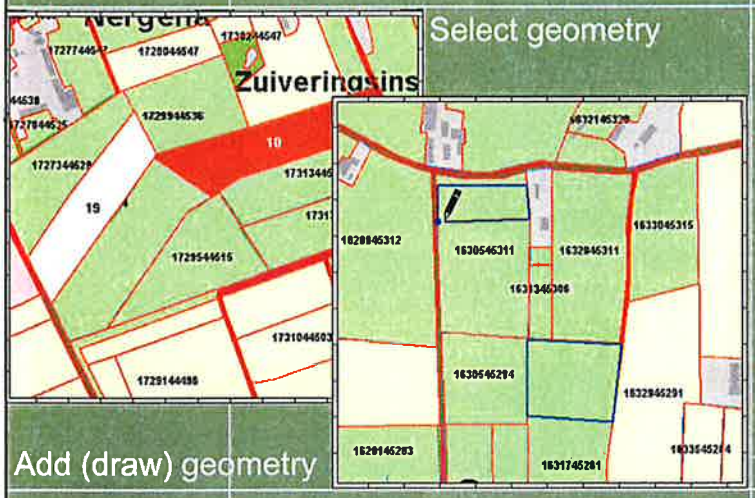
Ministry Of Ag.

Digital

Farmer

From paper to electronic

Internet declaration



Ministry Of Ag.

Digital

Farmer

DEMO

From paper to electronic

Internet applications

- **Interactive;**
- **Higher quality geometry:**
  - Re-use of field boundaries;
- **Higher quality of declaration:**
  - Checks on completeness;
  - Checks on consistency;
- **Add aerial photo's as background:**
  - Increased recognition;
  - but:
    - expensive to fly every year;
    - processing time > 6 months;
    - Decreased performance.

Improvements - 1

Increased use of internet:

- 80% of the Dutch Ag. sector has access to internet;
- Internet declarations are of higher quality;
- Ministry of Ag. maintains continuously updated register of land parcels;
- Cost reduction on government side.

Improvements - 2

Integrate with farm management systems:

- Cost efficiency on farmer side;
- Single register, multiple use;
- Use of digital geo-information for own purposes;
- Requires investments;
- How are base maps provided?

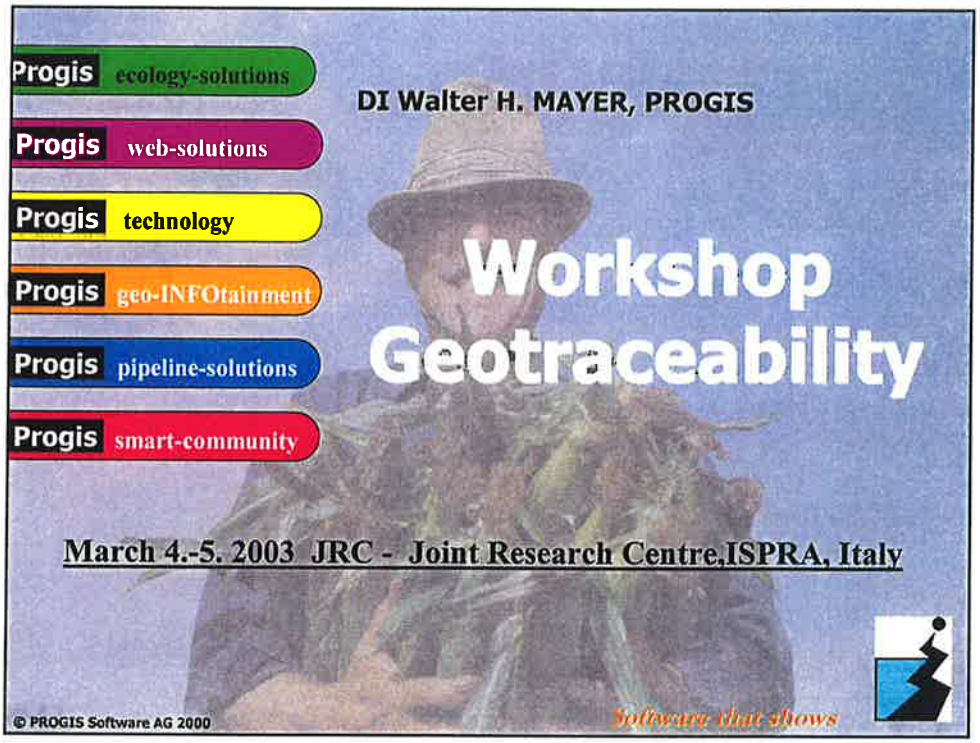
Improvements - 3

Timely and accurate base information through Remote Sensing:

- Using early-season field geometry by satellite information;
- detecting land use parcels based on land preparations;
- automated delivery through internet.

Geo Information

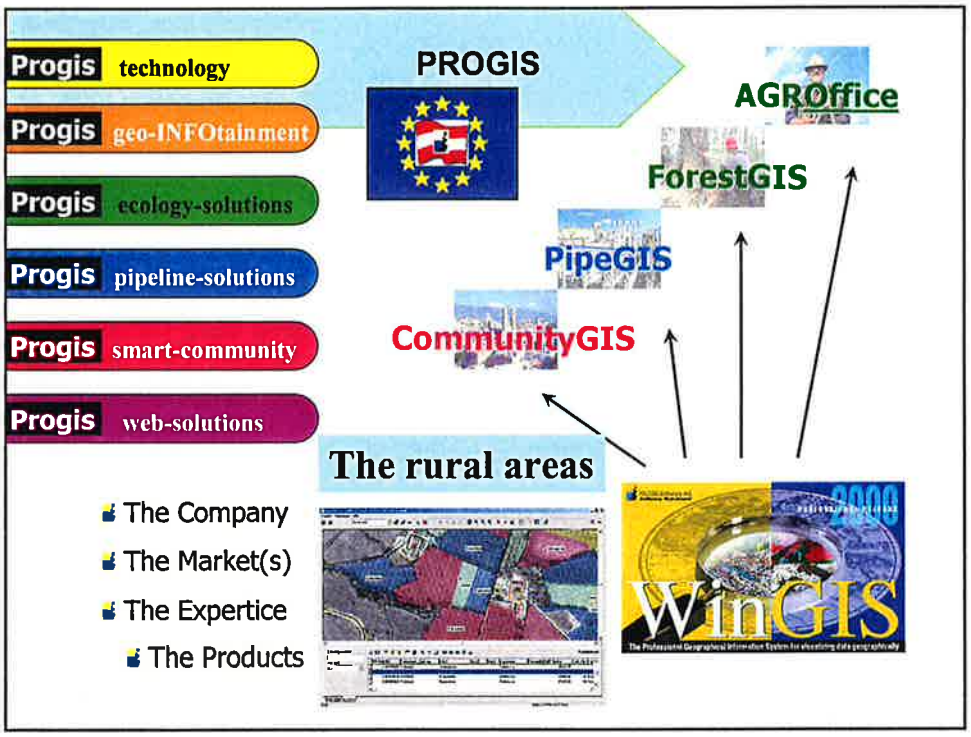
Opportunities for food safety and quality control

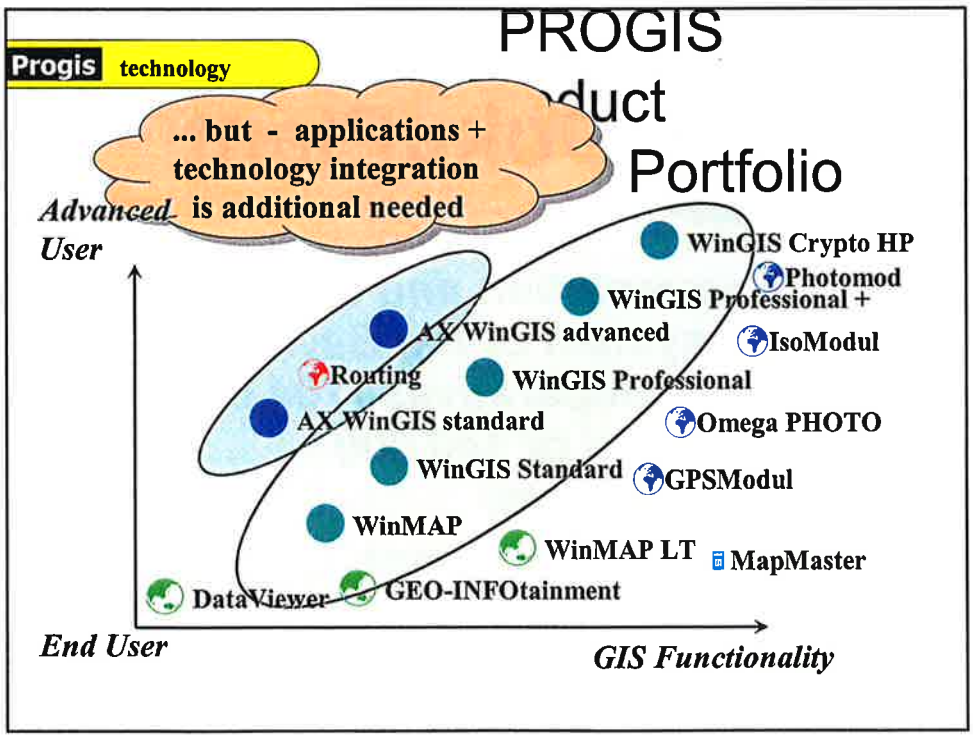


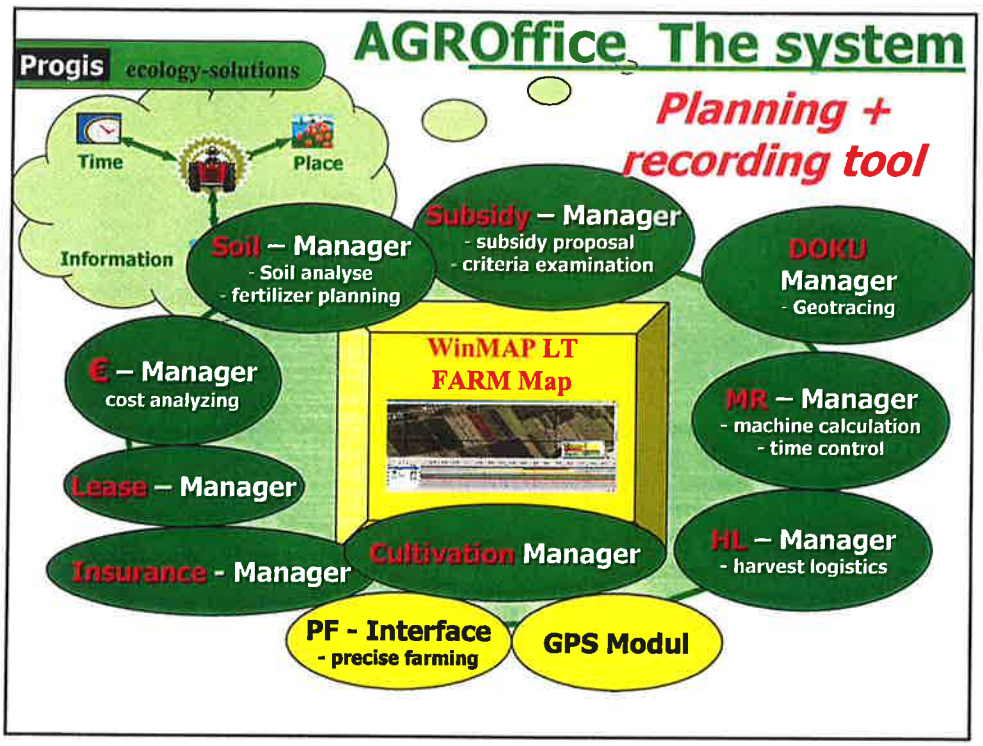
MR DokuPlant

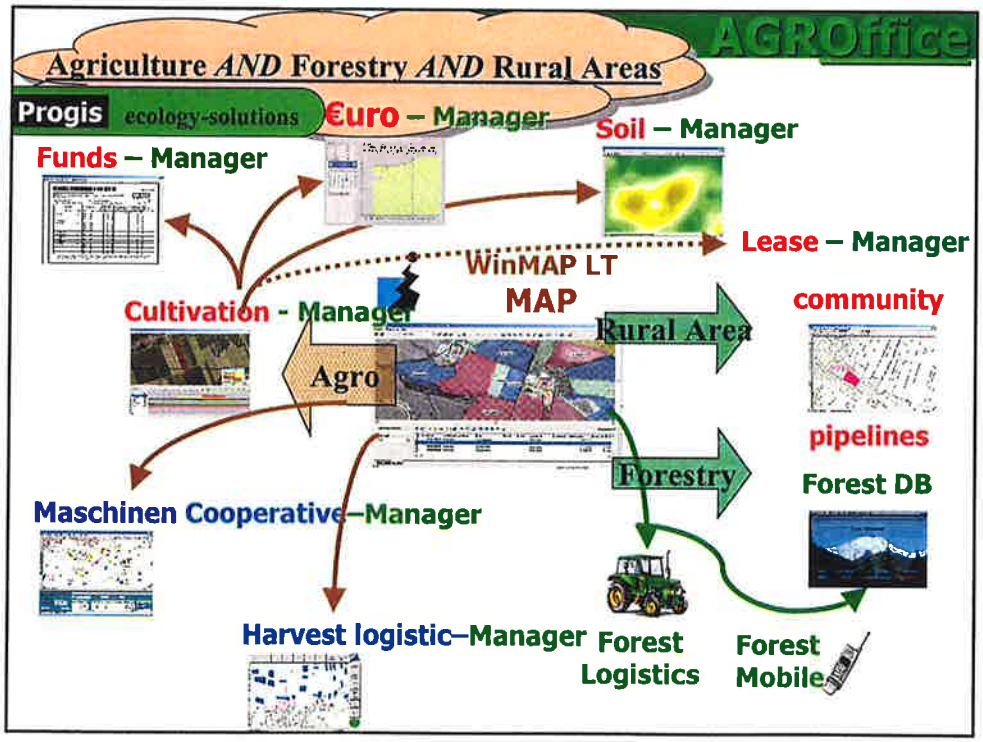
The documentation and quality control system of the Bavarian machine cooperatives (104.000 members out of 140.000 bavarian farmers)

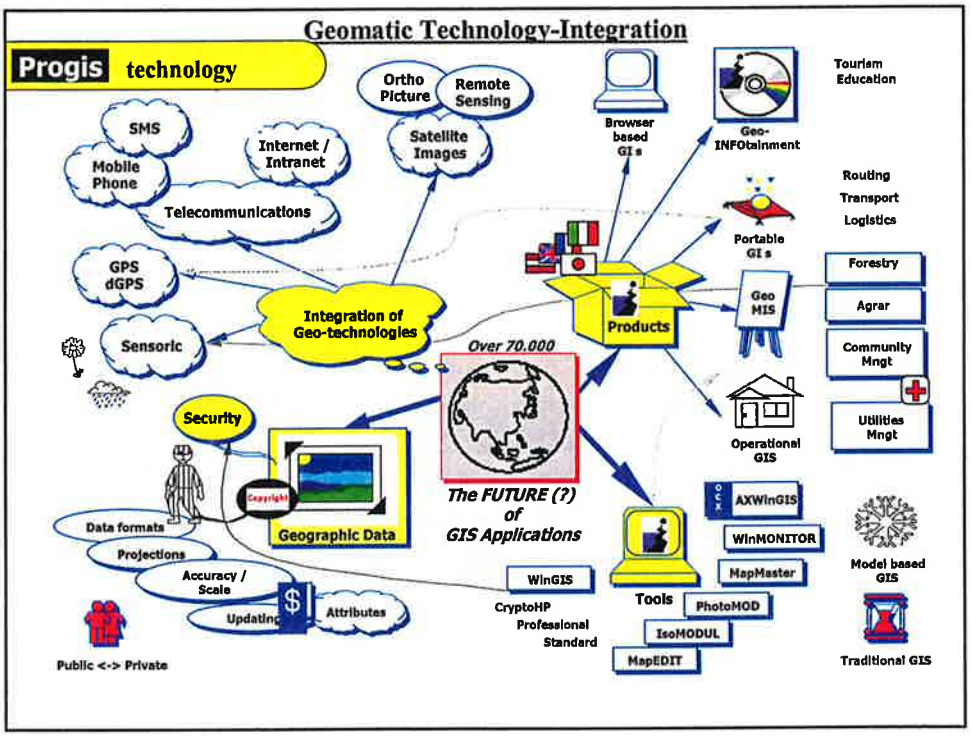
Framework and concept


Progis technology
Progis geo-INFOtainment
Progis ecology-solutions
Progis pipeline-solutions
Progis smart-community
Progis web-solutions
PROGIS
AGROffice
ForestGIS
PipeGIS
CommunityGIS
The rural areas
The Company
The Market(s)
The Expertice
The Products
WinGIS


PROGIS
Progis technology
... but - applications + technology integration is additional needed
Portfolio
Advanced User
WinGIS Crypto HP
Photomod
WinGIS Professional +
AX WinGIS advanced
IsoModul
Routing
WinGIS Professional
AX WinGIS standard
Omega PHOTO
WinGIS Standard
GPSModul
WinMAP
WinMAP LT
MapMaster
DataViewer
GEO-INFOtainment
End User
GIS Functionality


Progis ecology-solutions
AGROffice The system
Planning + recording tool
Time
Place
Information
Soil – Manager
- Soil analyse
- fertilizer planning
Subsidy – Manager
- subsidy proposal
- criteria examination
DOKU Manager
- Geotracing
WinMAP LT
FARM Map
€ – Manager
cost analyzing
MR – Manager
- machine calculation
- time control
Lease – Manager
Insurance - Manager
Cultivation Manager
HL – Manager
- harvest logistics
PF - Interface
- precise farming
GPS Modul


AGROffice
Agriculture AND Forestry AND Rural Areas
Progis ecology-solutions
€uro – Manager
Soil – Manager
Funds – Manager
Lease – Manager
WinMAP LT
MAP
Cultivation - Manager
Agro
Rural Area
community
pipelines
Forestry
Forest DB
Maschinen Cooperative–Manager
Harvest logistic–Manager
Forest Logistics
Forest Mobile

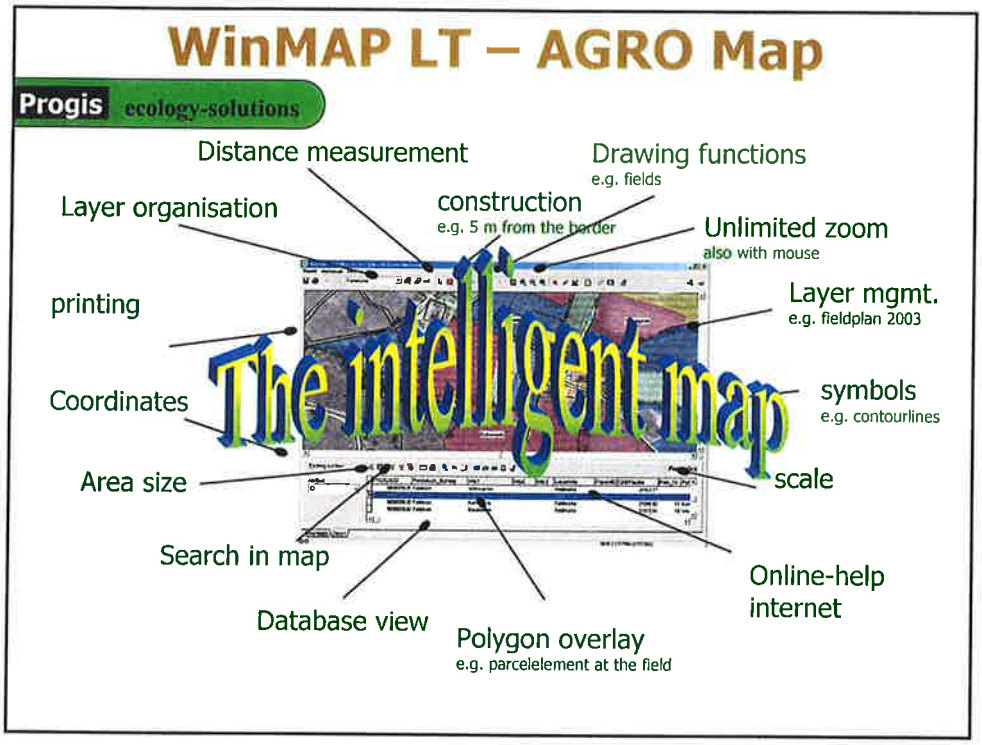


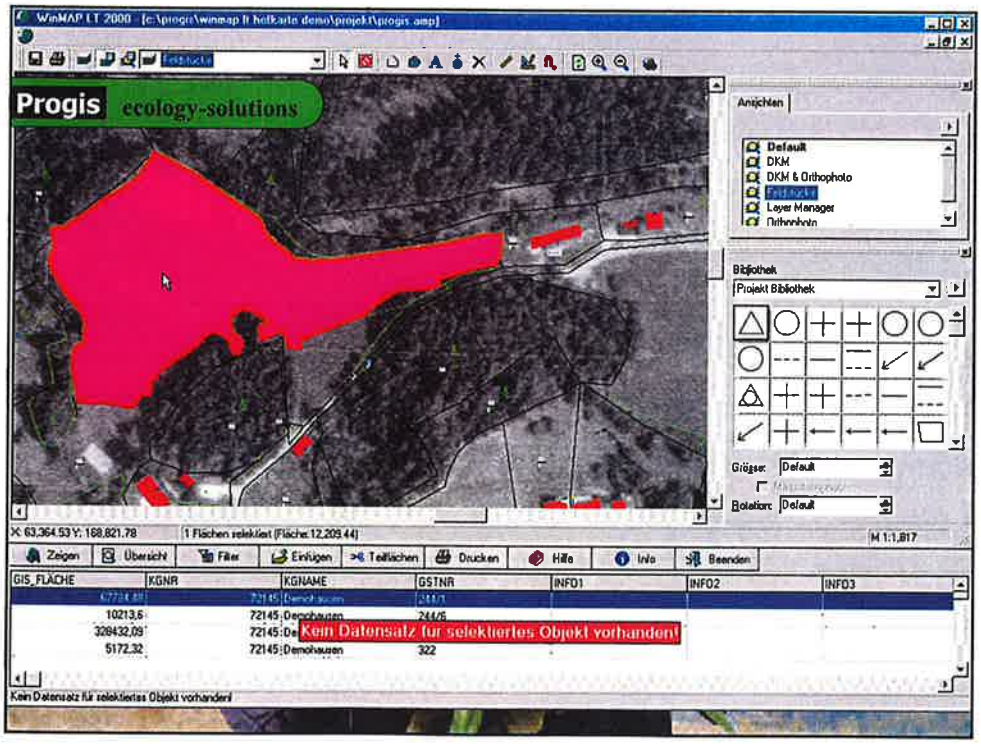
Progis ecology-solutions

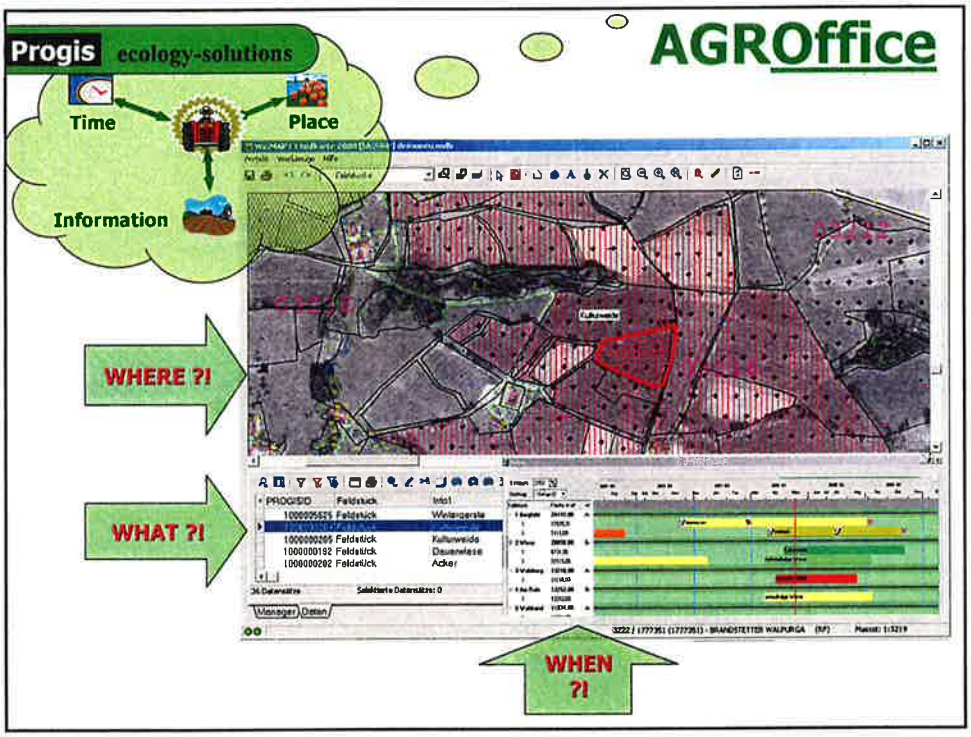
digital AGRO Map

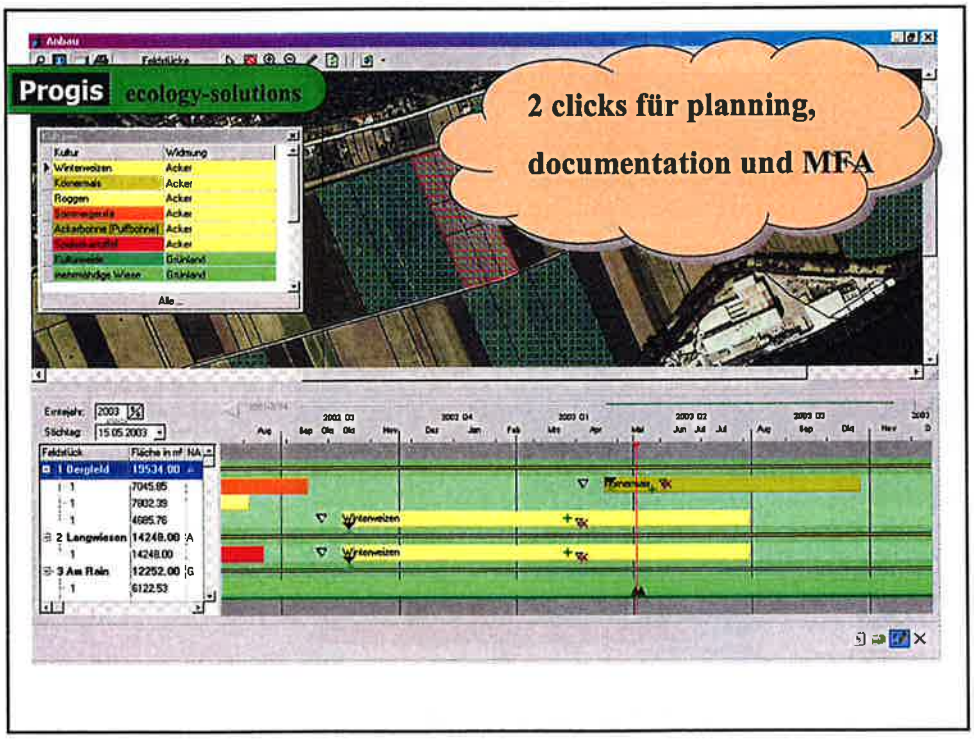
area immage (orthophoto)
~ 1:5.000

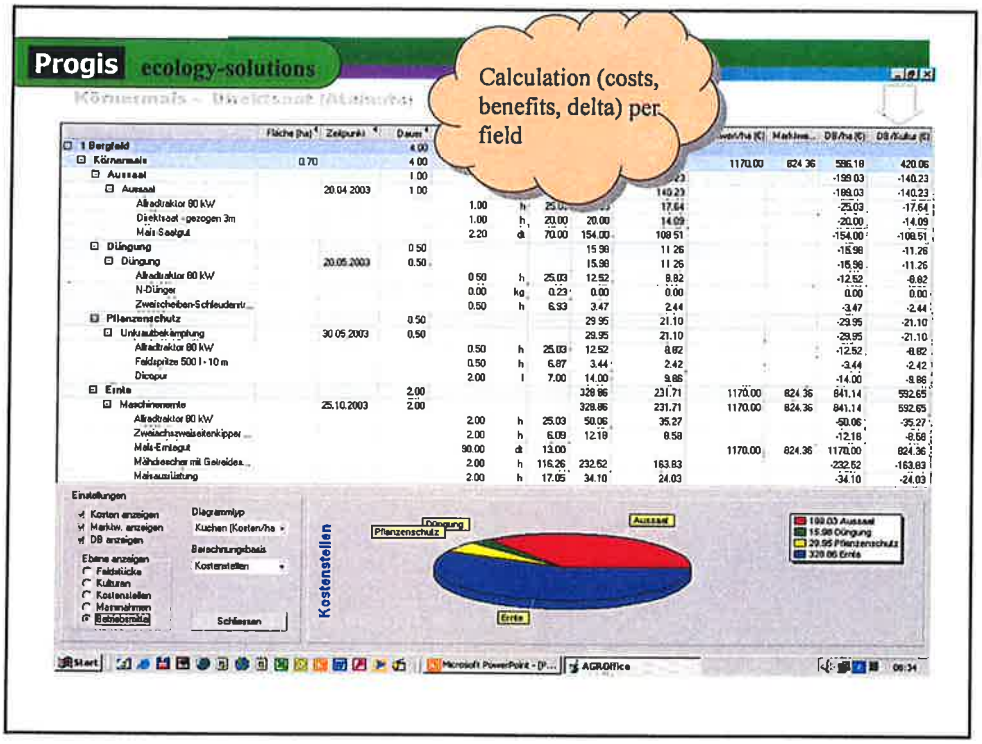
digital cadastre map
1:2.000

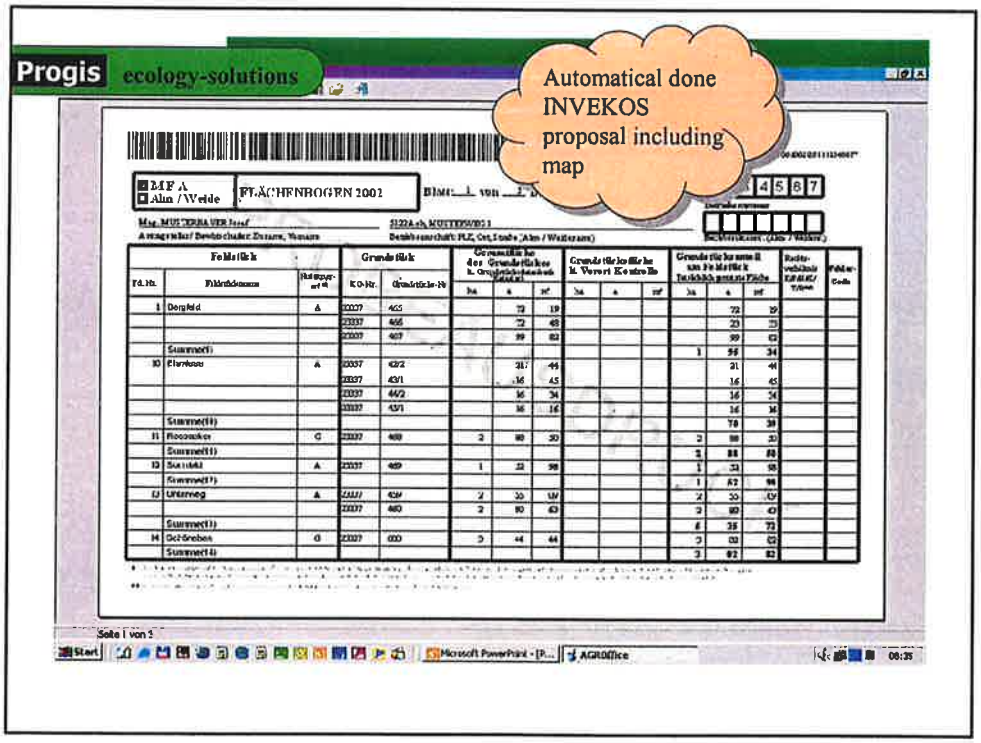

WinMAP LT – AGRO Map
Progis ecology-solutions
Distance measurement
Drawing functions
e.g. fields
Layer organisation
construction
e.g. 5 m from the border
Unlimited zoom
also with mouse
printing
Layer mgmt.
e.g. fieldplan 2003
The intelligent map
Coordinates
symbols
e.g. contourlines
Area size
scale
Search in map
Online-help
internet
Database view
Polygon overlay
e.g. parcelelement at the field


Progis ecology-solutions
Ansichten
Default
DKM
DKM & Orthophoto
Layer Manager
Bibliothek
Projekt Bibliothek
Größe:
Default
Rotation:
Default
Zeigen
Übersicht
Filter
Einfügen
Teilflächen
Drucken
Hilfe
Info
Beenden
GIS_FLÄCHE
KGNR
KGNAME
GSTNR
INFO1
INFO2
INFO3
Kein Datensatz für selektiertes Objekt vorhanden!

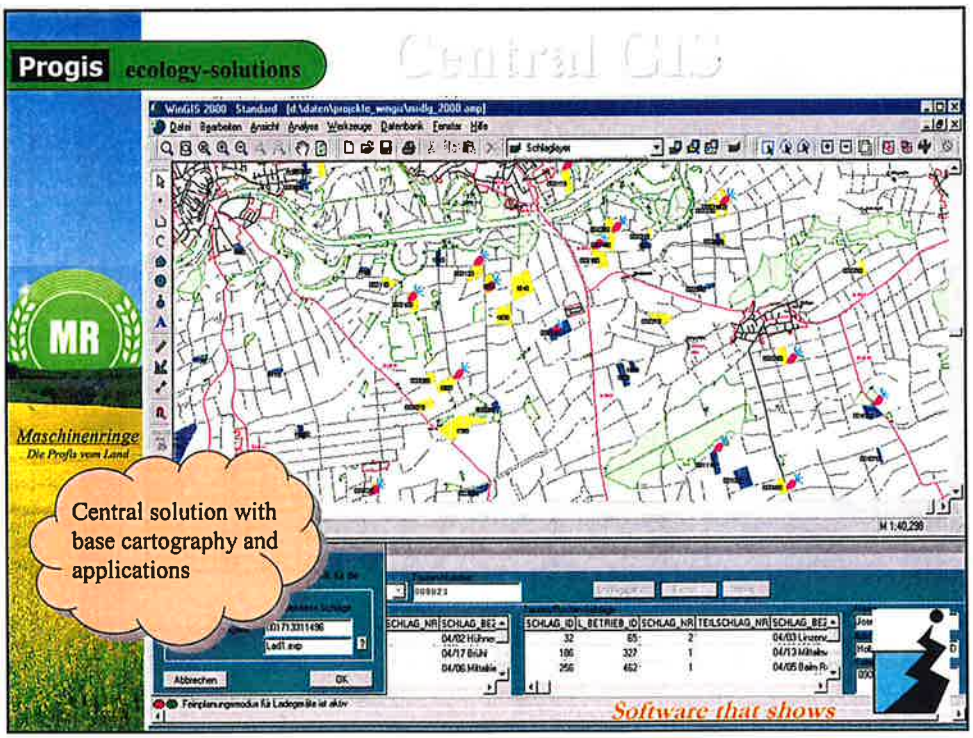

Progis ecology-solutions
AGROffice
Time
Place
Information
WHERE ?!
WHAT ?!
WHEN ?!


Progis ecology-solutions
2 clicks für planning,
documentation und MFA

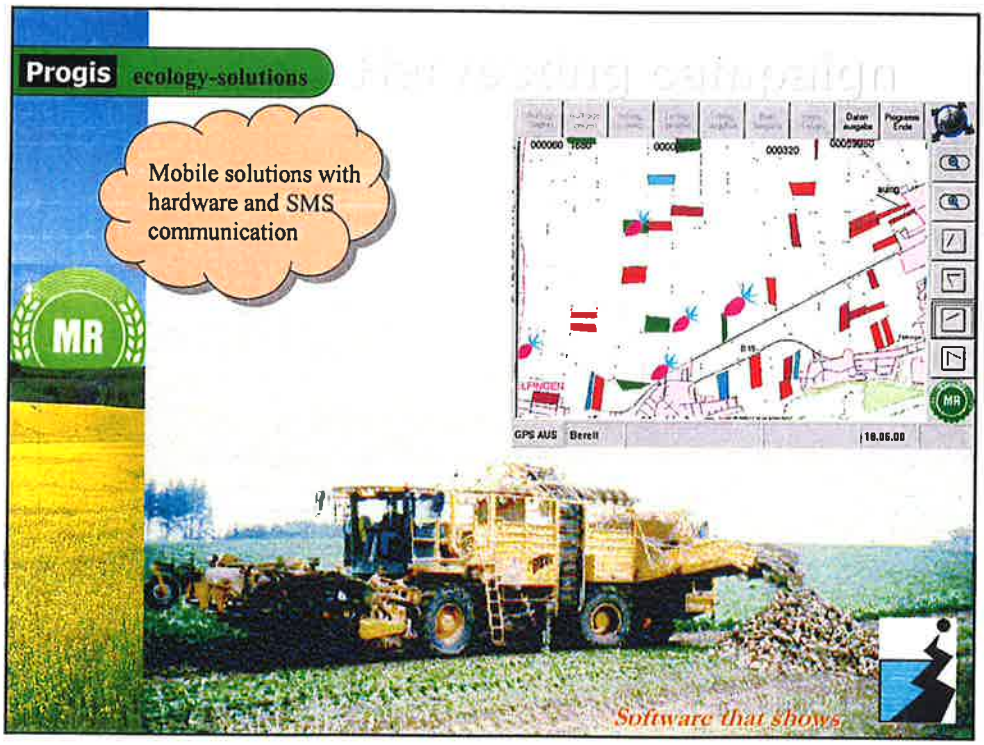

Progis ecology-solutions
Calculation (costs, benefits, delta) per field
Kostenstellen
Pflanzenschutz
Düngung
Aussaat
Ernte


Progis ecology-solutions
Automatical done INVEKOS proposal including map
FLÄCHENBOGEN 2002


Progis ecology-solutions
(SUGAR BEET) LOGISTICS
Efficient use of harvesters with GPS
Logistics for seeding, cultivation and harvesting
MR
Maschinen- und Betriebshilfsring Dillingen e.V.
Software that shows


Progis ecology-solutions
MR
Maschinenringe
Die Profis vom Land
Central solution with base cartography and applications
Software that shows


Progis ecology-solutions
Central GIS + mobile GIS +
SMS Communication + GPS
MR
Maschinenringe
Die Profis vom Land
GPS
Office
Telefon
SMS
Harvester


Progis ecology-solutions
Mobile solutions with
hardware and SMS
communication
MR
GPS AUS
Bereit
Software that shows

Progis web-solutions

- Most visited internet page in Austria
  - 1000 page impressions per minute (peak)
  - 1.000.000 page impressions per day
  - Over 45 Mio page impressions in 3 months

•Web as add on tool

• web not only top down

• but also bottum up

- ✓ TAXI orange
- ✓ EXPO Lisbon
- ✓ City Info Taiwan
- ✓ Gewebepark Halle

Quality and documentation Systeme for agricultural field documentation

- Documentation a must according German environmental legislation from 2004
- Product custody (Toxin-limits)
- Transparency and traceability – consumers, politicians and industry wants it
- QM at the meat level already available or under construction
- AVIKO, Rain am Lech, und KCB are buying only documented products according EUREP-GAP framework
- Different potatoe industries ask for complete documentation
- Grain buyers from NL buy and sell only documented goods (effects already grain trade in north west of Germany

Quality and documentation – systems for agriculture

Pflanzenschutztagung Bonn 09/02

Plans:

Introduction of GIS-based riskmanagement maps on the movement potential of fertilizers and herbicides within soil and surface water streams

Preposition: GPS- und GIS-technology on top of agricultural tractors and equipment

Quality and documentation – systems for agriculture

- **Agenda 2000 – valuation**
- **Foreseen:**
- farm audits from independent control instituts as preposition for payments
- farms should be motivated to take part in qualitiy certification programs, e.g. payment 200 €/ha

INVECOS-GIS
from German Agriculture Ministries

Integrated, geobased administration and control-system for agricultural areas for area payments

EU-Regulation: After 2005 area payments only based on orthoimages

Comparision of different documentation systems

Field based database - paper

- Cheap, easy to fill out
- No statistics
- No datatransfer to whom ever (buyer, ministry etc.)
- No PC know how necessary

Comparision of different documentation systems

Field based database - PC

- complex
- For the computer specialist
- Benefit: detailed statistics
- Some have GIS capability, link to PALMs
- expensiv
- Datatransfer ????
- compatibility?

Comparision of different documentation systems

Internet based field database

- User does not like to do online databases
- slowly online access
- For the computer - fan
- Data transfer is easy
- Data protection ?? Data security ?? Data privacy ??

Comparision of different documentation systems

And the maschine-cooperatives?

Introduction of a quality and documentation system for the Bavarian agriculture ⟶

MR-DokuPlant ⟶

1. Step:

Before and during work on the fields

Field database at the farmer

MR-DokuPlant- docu paper,
MR DokuPlant LT software,
MR DokuPlant AGROmap SW
MR DokuPlantAGROffice SW
With/without GIS SW

farmer

DokuPlant — Erntejahr 20__ — Hauptfrucht — Betriebsnummer — Flurstücksnummer/Teilfläche

Anbauer: Name, Vorname:_____ Straße:_____ PLZ, Ort:_____

Schlag: Schlagbezeichnung:_____ Größe:_____ ha Klärschlammdüngung in den letzten 5 Jahren: ja / nein wann:_____

Auflagen: Wasserschutzgebiet: ja / nein Bewirtschaftungsauflagen (z.B. KULAP):_____ Art der Auflagen:_____ Laufzeit:_____

Vorfrucht: Zwischenfrucht vor der Hauptfrucht: Aussaat Zwischenfrucht:_____ Saatmenge: ___ kg/ha

Saat/Pflanzung Datum Saat:_____ Saatgutmenge:_____ dt o. Einheiten/ha = Körner o. Knollen/m²:_____

Saatgutkategorie: Basis / Z-Saatgut / Eigennachbau Anerkennungsnummer:_____ gebeizt mit:_____ Gentechnisch verändert: ja / nein

Saattechnik: konventionell / Mulchsaat / Direktsaat Aussaatbedingungen: gut / mittel / schlecht Saatgut bezogen von:_____

Düngung seit Ernte Vorfrucht (organisch/mineralisch in kg Reinnährstoff/ha)

Datum	Stadium (EC)	Düngemittel	Menge (dt, m³/ha)	N	P_2O_5	K_2O	
	Klärschlamm, Kompost, Bioabfälle						

Pflanzenschutz seit Ernte Vorfrucht

Datum	Stadium	Pflanzenschutzmittel	ml, l, kg, g/ha

Bodenbearbeitung seit Ernte Vorfrucht

Datum	Arbeitsgang/Geräte

Letzte Bodenuntersuchung: Wann:_____ Methode:_____ (z.B. CAL/DUF/Voth)

	Ergebnis
pH-Wert	
Phosphat	
Kalium	
Magnesium	
Stickstoff	

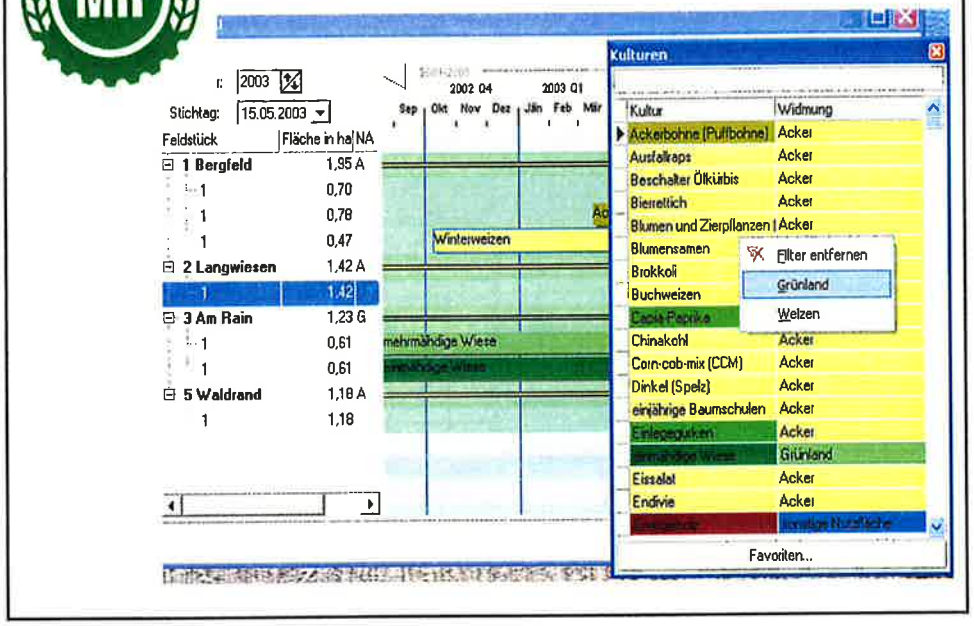
Beregnung: Datum/mm: 1._____/_____ 2._____/_____ 3._____/_____

Ernte	Ertrag:	dt/ha
Datum Ernte		
Bedingungen	Gut/Mittel/Schlecht	
Ablieferung	Eigenlager/Erfasser	
Datum Ablieferung		
Belüftung Eigenlager	Ja / Nein	
Mietenschutz bei Rüben	Wann	Mit was

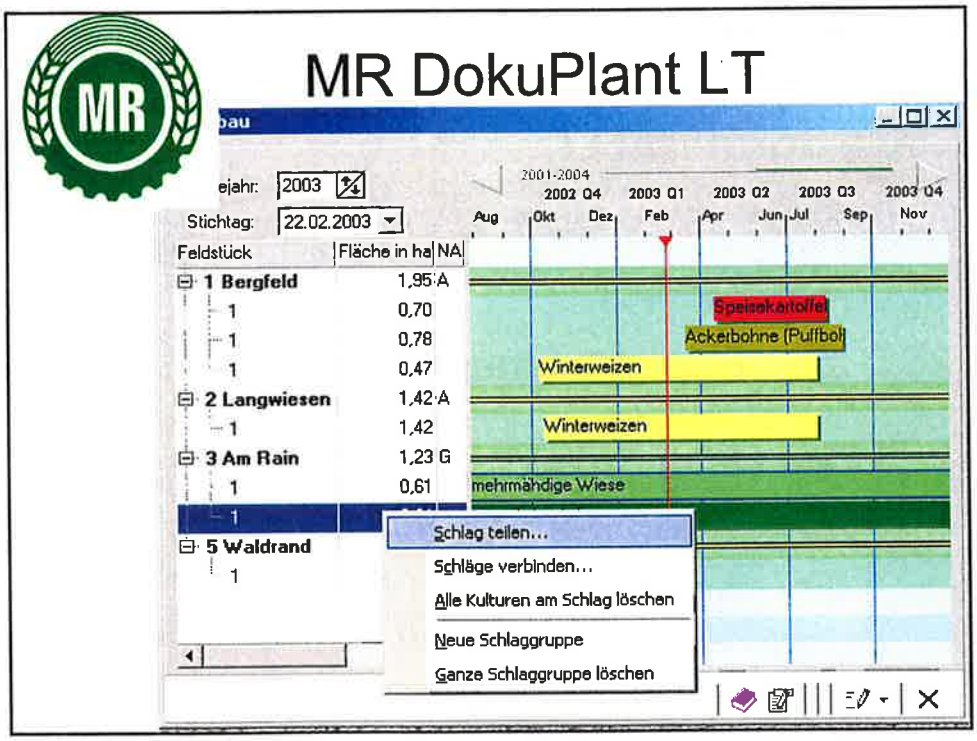
Qualitätsparameter	
Wassergehalt	
Rohprotein	
Fallzahl	
Stärke/Zucker	
Ölgehalt	
Schmutzanteil	

Erfassungsbogen in Anlehnung an LKP und LBP

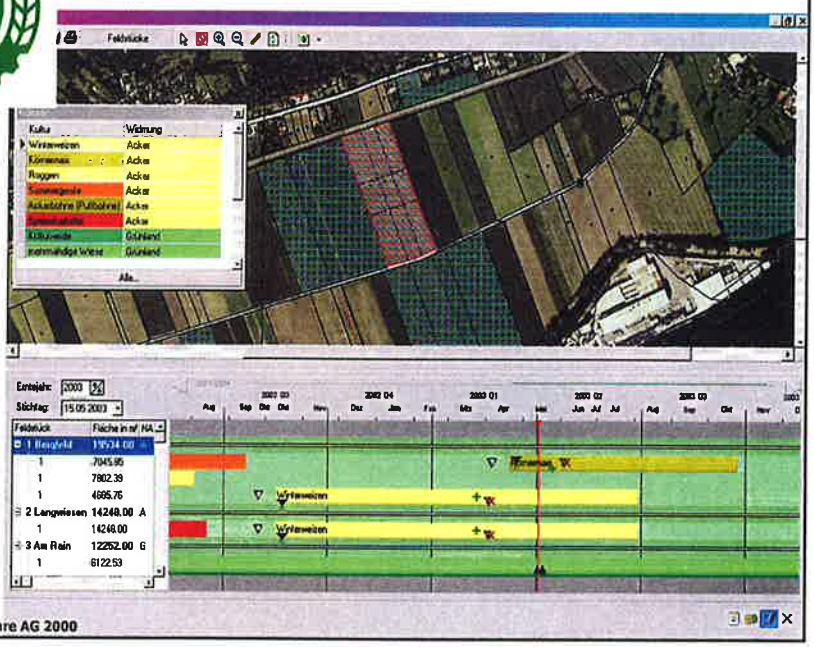
MR DokuPlant LT



MR DokuPlant LT



MR DokuPlant AGROffice

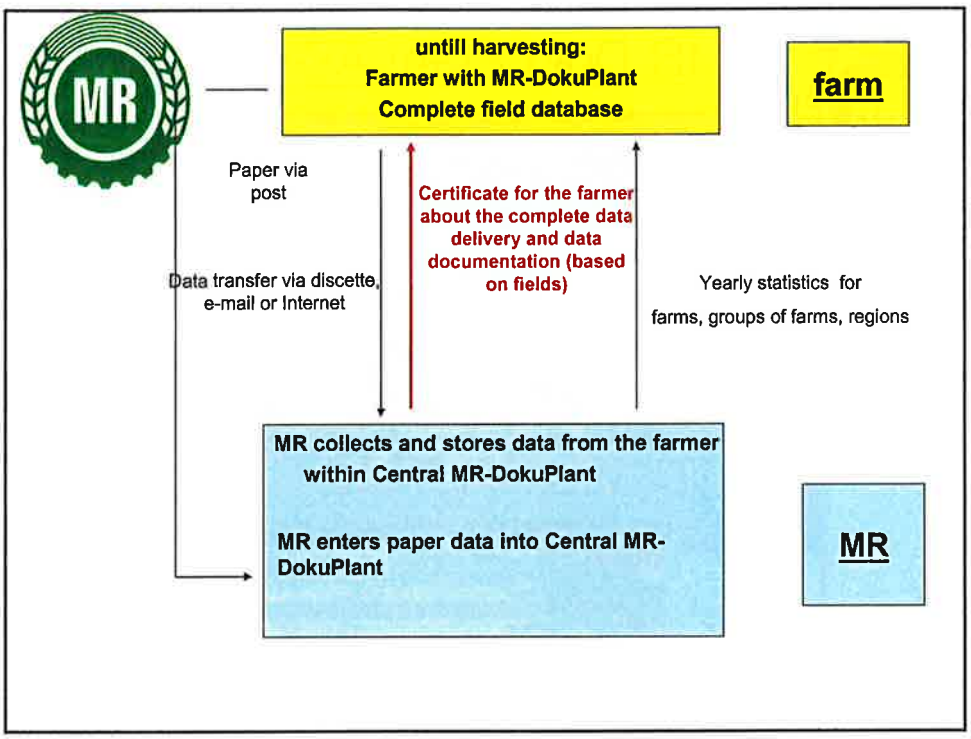


2. Step:

Short before harvesting

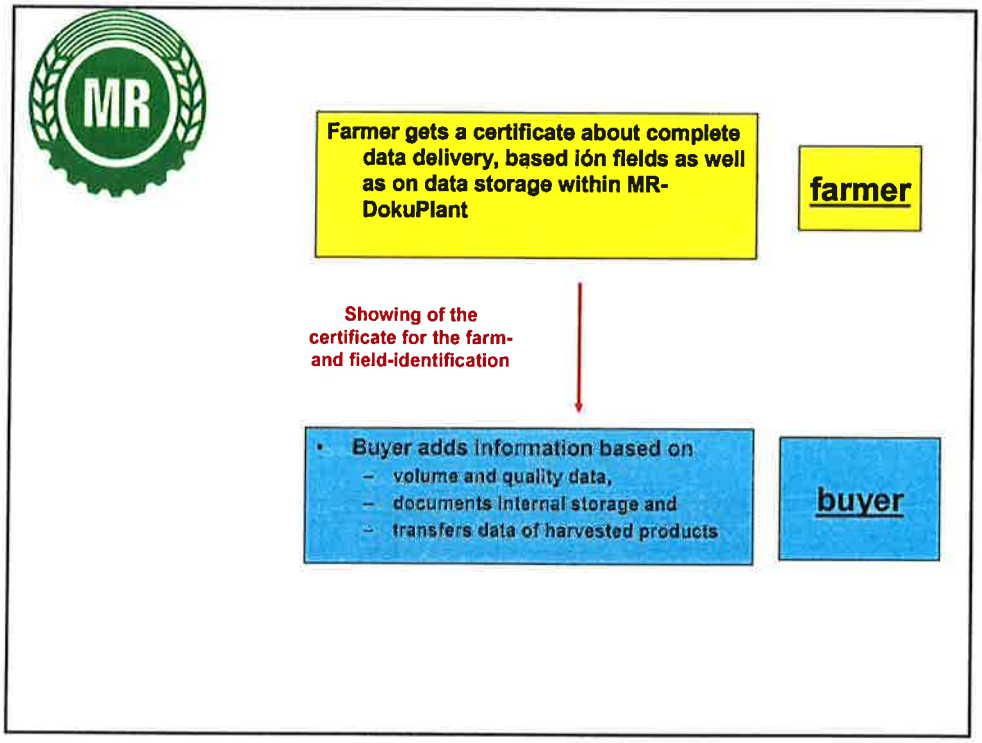
Documentation from farm to MR HQ

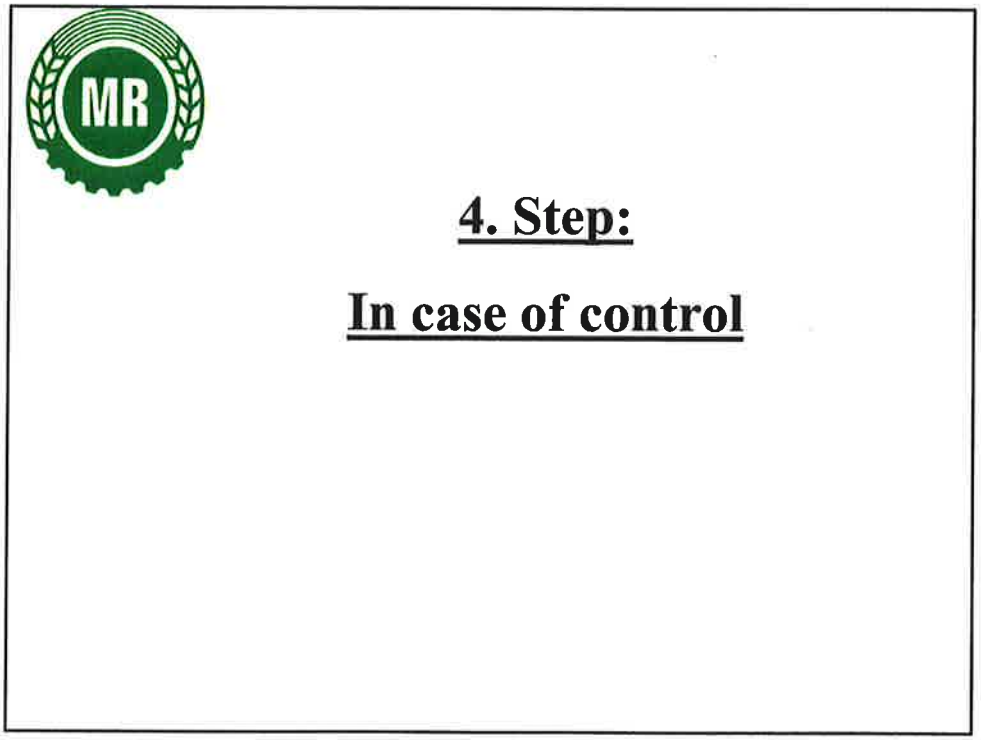
MR-DokuPlant Zentrale

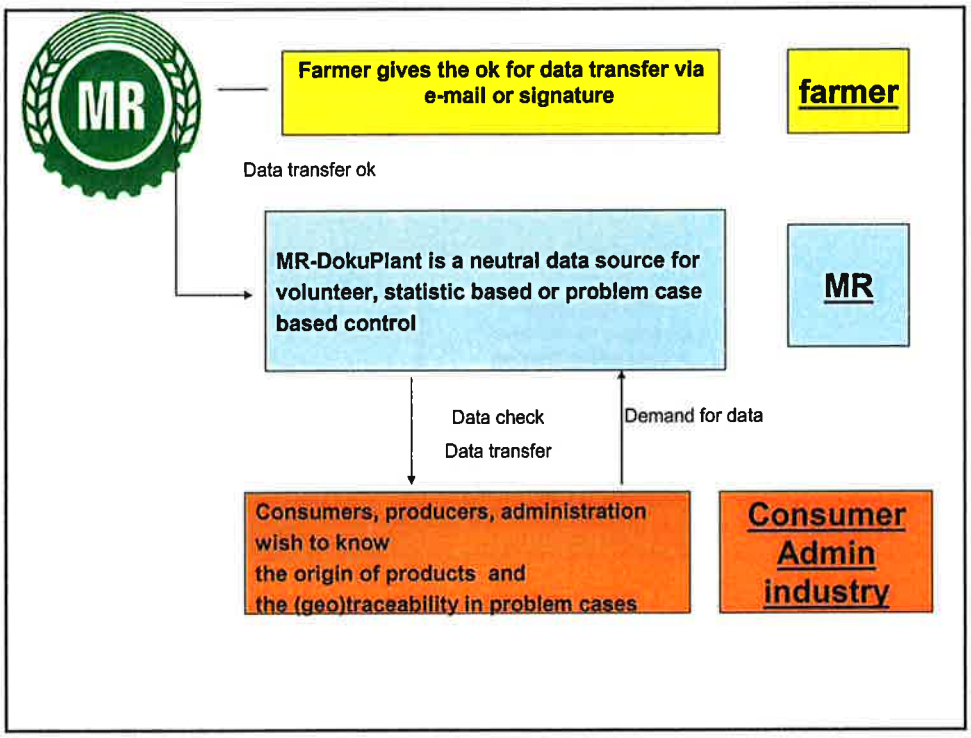


3. Step:

At harvesting and delivery to the buyer


Farmer gets a certificate about complete data delivery, based ión fields as well as on data storage within MR-DokuPlant
farmer
Showing of the certificate for the farm- and field-identification
Buyer adds information based on
volume and quality data,
documents internal storage and
transfers data of harvested products
buyer


4. Step:
In case of control



Next step

MR-DokuPlant with barcodes gives QM system without gaps

Use of barcodes for field and farmer identification

Preposition: automatical data capture

Module based MR-DokuPlant

At the farm

farmer

- **MR-DokuPlant-papers**
  Manual documentation
- **MR-DokuPlant LT**
  easy to use documentation software
- **MR-DokuPlant AGROmap**
  including orthophoto based area calculation
- **MR-DokuPlant AGROffice +/- GIS**
  Area calculation, EU Invekos paper, cost and revenue planning, statistics

Module based MR-DokuPlant

at the MR-outlet (78)

MR

- **MR-DokuPlant – central documentation and administration software**
  including statistics
- **MR-DokuPlant – Multi-mandant AGROffice**
  with modules:
  - GIS,
  - INVEKOS,
  - costs and revenues calculation,
  - logistics integration for different fruits as well as
  - fertilizer recomendation and
  - precision farming base platform

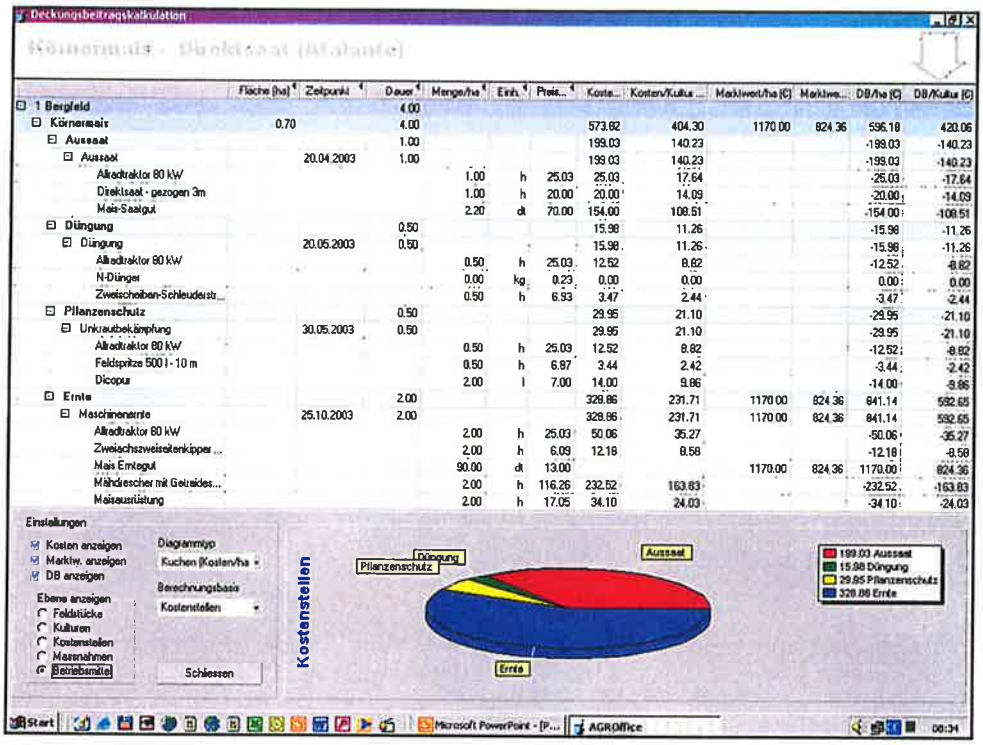
Documentation - system MR-DokuPlant

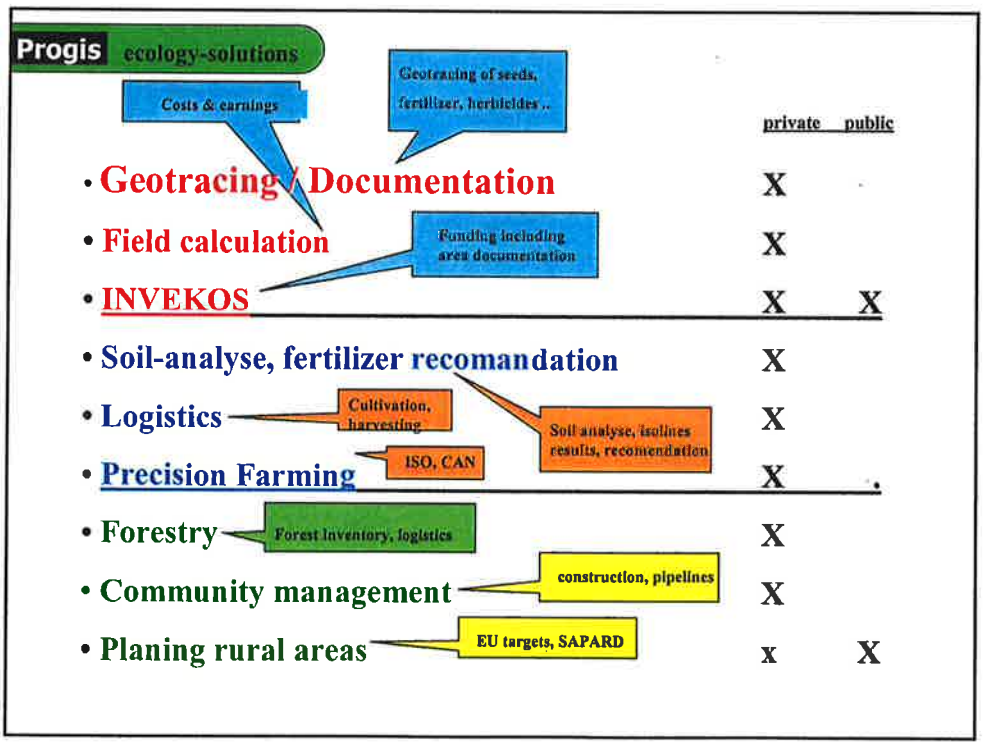
Frame:

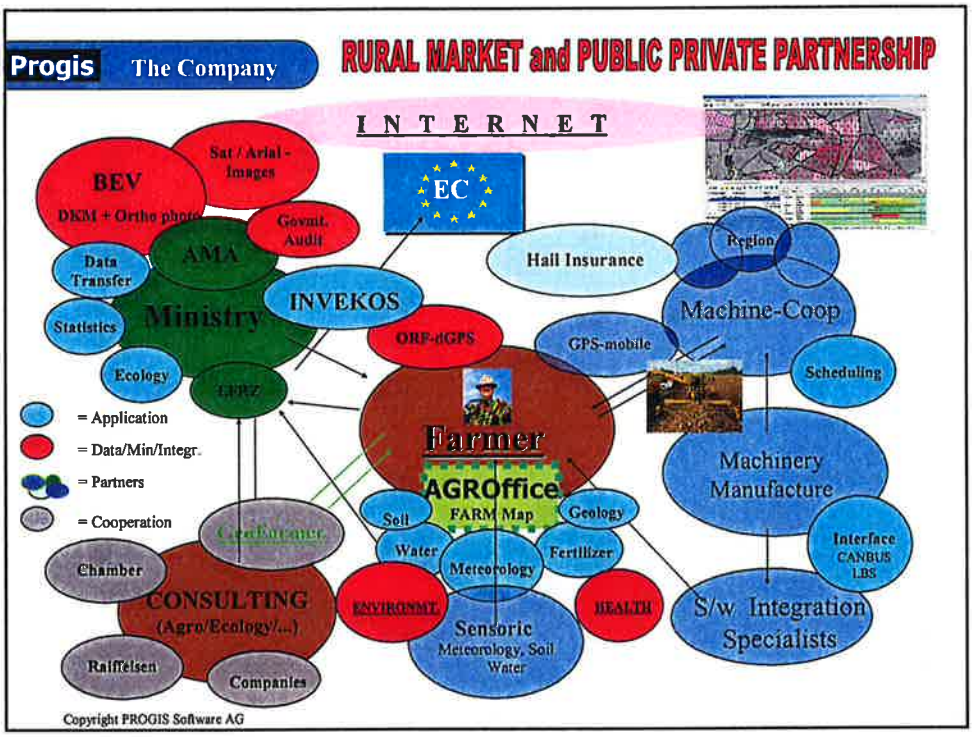
- Target: data belong to the farmer, he decides if they can be used or transfered to other users
- External data-suppliers transfer their data for integration (orthoimage, cadastre vector data etc.)

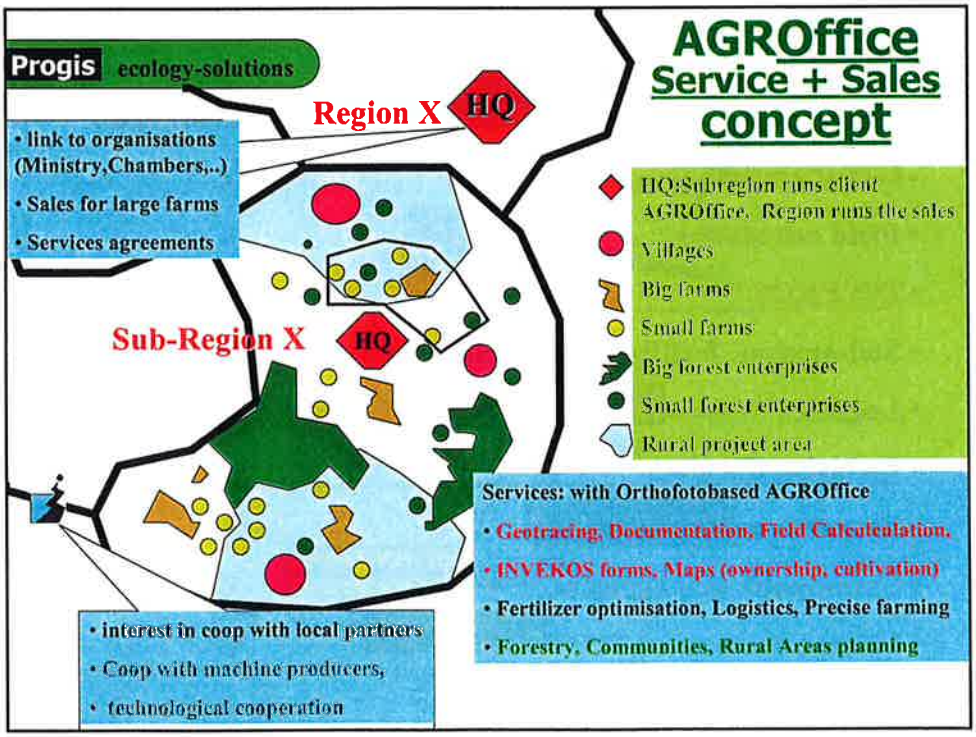
  (MR works with them in combination with billing: fertilizer machinery, herbicides-, seed-, harvesting-, transport-, soilwork-machinery etc.
- LKP: soil investigation and quality control integration from external sources
- Buyers want compatible larger data pools

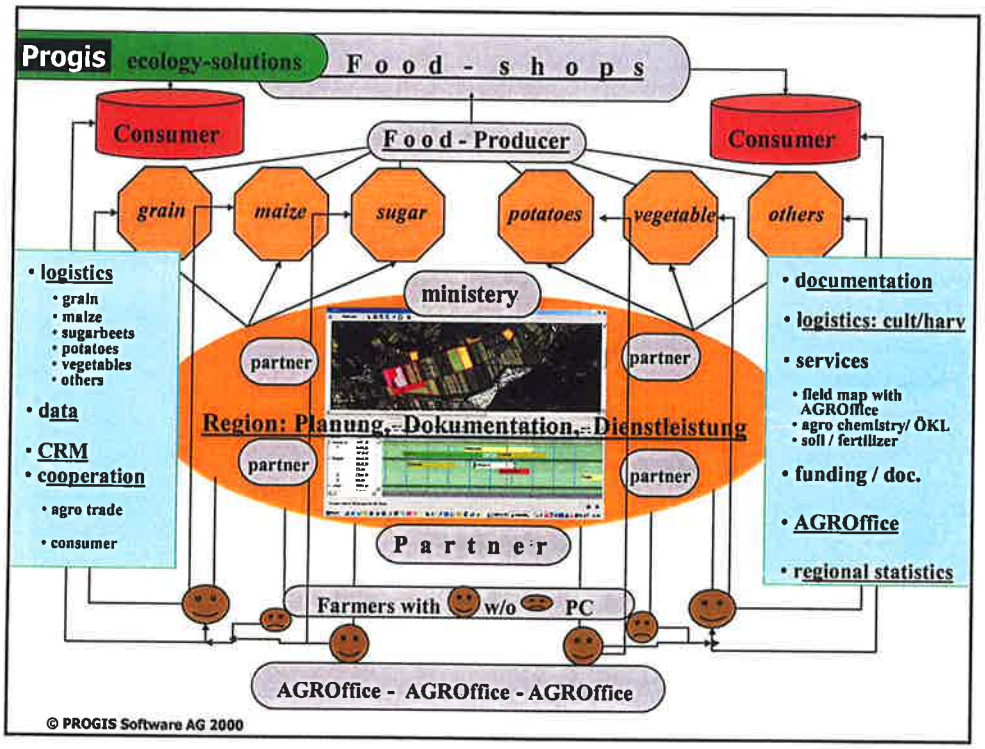
Detailed Cost calculations based on farm level and done with MR-DokuPlant AGROffice


Deckungsbeitragskalkulation
Einstellungen
Kosten anzeigen
Marktw. anzeigen
DB anzeigen
Ebene anzeigen
Feldstücke
Kulturen
Kostenstellen
Maßnahmen
Betriebsmittel
Diagrammtyp
Kuchen (Kosten/ha
Berechnungsbasis
Kostenstellen
Schließen
Kostenstellen
Düngung
Pflanzenschutz
Aussaat
Ernte
199.03 Aussaat
15.98 Düngung
29.95 Pflanzenschutz
328.86 Ernte


Progis ecology-solutions
Costs & earnings
Geotracing of seeds, fertilizer, herbicides ..
private public
• Geotracing / Documentation X
• Field calculation X
Funding including area documentation
• INVEKOS X X
• Soil-analyse, fertilizer recomandation X
• Logistics X
Cultivation, harvesting
Soil analyse, isolines results, recomendation
• Precision Farming X
ISO, CAN
• Forestry X
Forest inventory, logistics
• Community management X
construction, pipelines
• Planing rural areas x X
EU targets, SAPARD


Progis The Company
RURAL MARKET and PUBLIC PRIVATE PARTNERSHIP
INTERNET
BEV
DKM + Ortho photo
Sat / Arial - Images
Govmt. Audit
EC
Data Transfer
AMA
Ministry
Statistics
Ecology
INVEKOS
ORF-dGPS
Hail Insurance
Region
Machine-Coop
GPS-mobile
Scheduling
= Application
= Data/Min/Integr.
= Partners
= Cooperation
Farmer
AGROffice
FARM Map
Soil
Water
Meteorology
Geology
Fertilizer
Machinery Manufacture
Interface CANBUS LBS
Chamber
CONSULTING
(Agro/Ecology/...)
ENVIRONMT.
HEALTH
Sensoric
Meteorology, Soil Water
S/w Integration Specialists
Raiffeisen
Companies
Copyright PROGIS Software AG


Progis ecology-solutions
AGROffice
Service + Sales
concept
Region X
HQ
• link to organisations (Ministry,Chambers,..)
• Sales for large farms
• Services agreements
HQ:Subregion runs client AGROffice. Region runs the sales
Villages
Big farms
Small farms
Big forest enterprises
Small forest enterprises
Rural project area
Sub-Region X
HQ
Services: with Orthofotobased AGROffice
• Geotracing, Documentation, Field Calculation,
• INVEKOS forms, Maps (ownership, cultivation)
• Fertilizer optimisation, Logistics, Precise farming
• Forestry, Communities, Rural Areas planning
• interest in coop with local partners
• Coop with machine producers,
• technological cooperation


Progis ecology-solutions
Food - shops
Consumer
Food - Producer
Consumer
grain
maize
sugar
potatoes
vegetable
others
• logistics
• grain
• maize
• sugarbeets
• potatoes
• vegetables
• others
• data
• CRM
• cooperation
• agro trade
• consumer
ministry
partner
partner
Region: Planung, Dokumentation, Dienstleistung
partner
partner
Partner
• documentation
• logistics: cult/harv
• services
• field map with AGROffice
• agro chemistry/ ÖKL
• soil / fertilizer
• funding / doc.
• AGROffice
• regional statistics
Farmers with w/o PC
AGROffice - AGROffice - AGROffice
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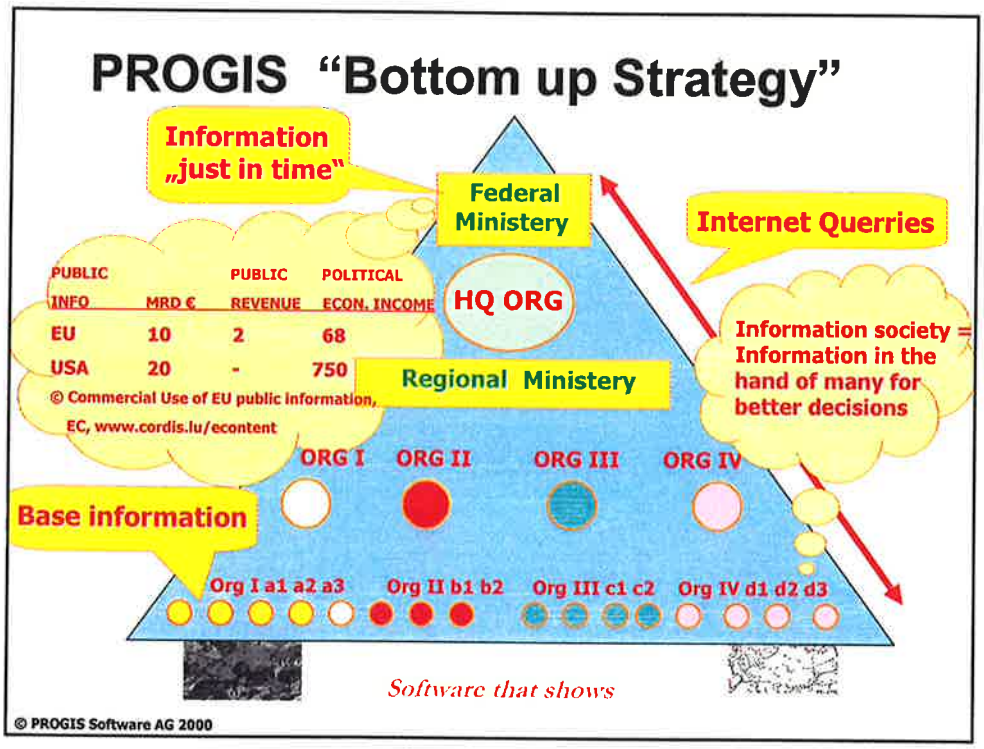
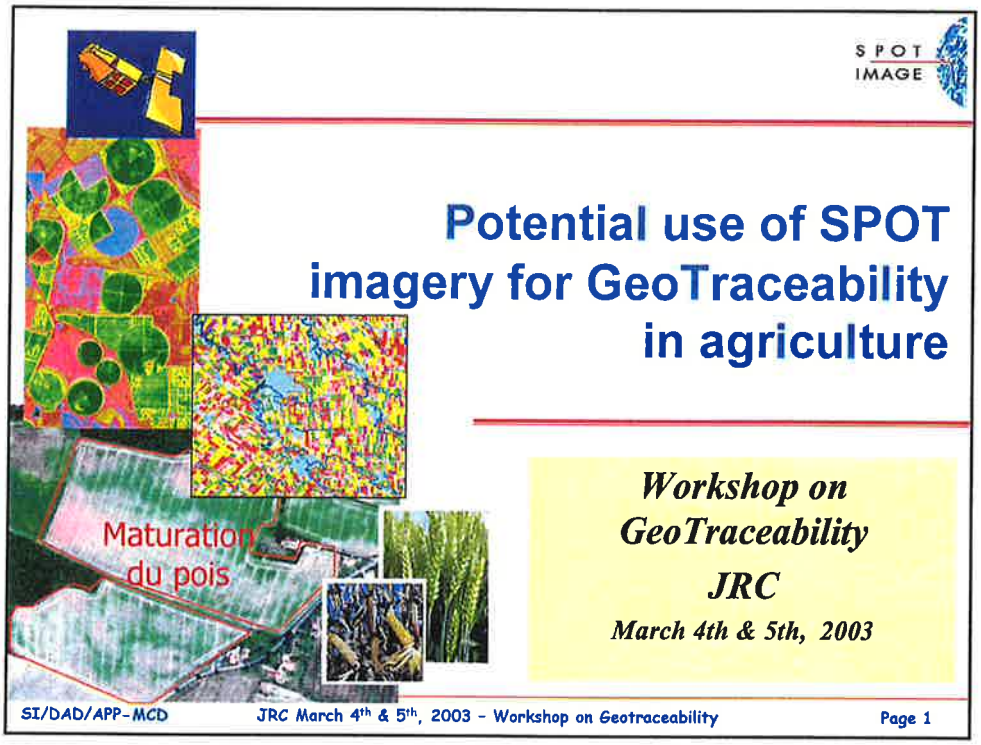
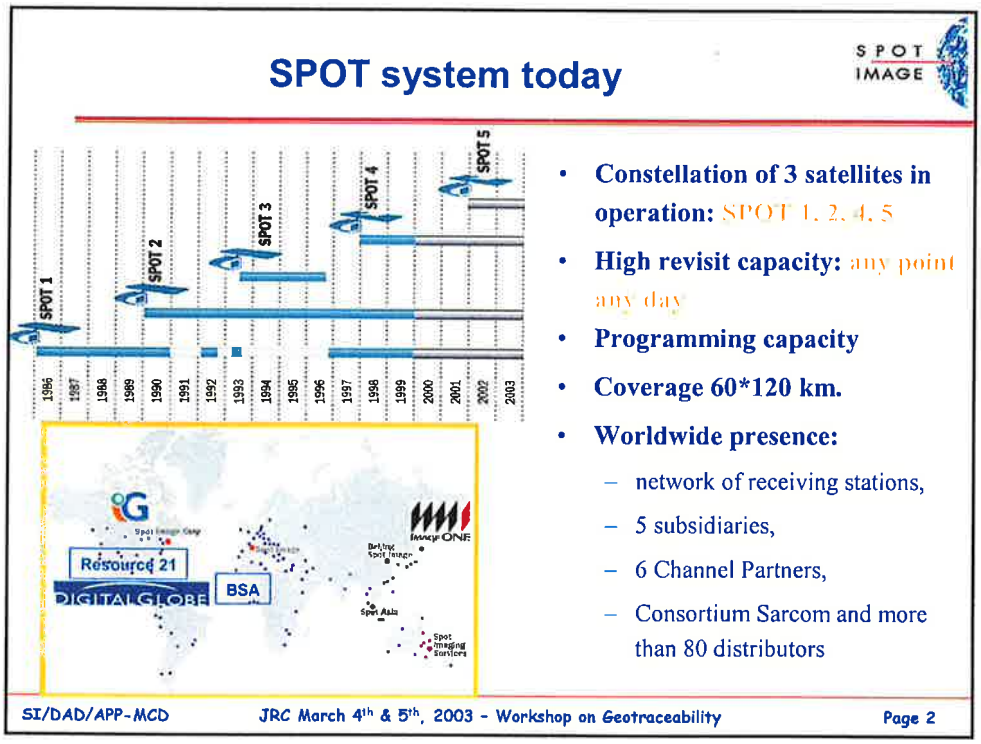

PROGIS "Bottom up Strategy"
Information „just in time"
Federal Ministery
Internet Querries
PUBLIC INFO
MRD €
PUBLIC REVENUE
POLITICAL ECON. INCOME
EU 10 2 68
USA 20 - 750
© Commercial Use of EU public information, EC, www.cordis.lu/econtent
HQ ORG
Regional Ministery
Information society = Information in the hand of many for better decisions
ORG I
ORG II
ORG III
ORG IV
Base information
Org I a1 a2 a3
Org II b1 b2
Org III c1 c2
Org IV d1 d2 d3
Software that shows
© PROGIS Software AG 2000


Progis ecology-solutions
Progis web-solutions
Progis technology
Progis geo-INFOtainment
Progis pipeline-solutions
Progis smart-community
DI Walter H. MAYER, PROGIS
Workshop
Geotraceability
THANK YOU
March 4.-5. 2003 JRC - Joint Research Centre,ISPRA, Italy
© PROGIS Software AG 2000
Software that shows


SPOT IMAGE
Potential use of SPOT imagery for GeoTraceability in agriculture
Maturation du pois
Workshop on GeoTraceability
JRC
March 4th & 5th, 2003
SI/DAD/APP-MCD
JRC March 4th & 5th, 2003 - Workshop on Geotraceability
Page 1


SPOT system today
SPOT IMAGE
SPOT 1
SPOT 2
SPOT 3
SPOT 4
SPOT 5
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
Resource 21
DIGITAL GLOBE
BSA
Image ONE
Spot Asia
Spot Imaging Services
• Constellation of 3 satellites in operation: SPOT 1, 2, 4, 5
• High revisit capacity: any point any day
• Programming capacity
• Coverage 60*120 km.
• Worldwide presence:
– network of receiving stations,
– 5 subsidiaries,
– 6 Channel Partners,
– Consortium Sarcom and more than 80 distributors
SI/DAD/APP-MCD
JRC March 4th & 5th, 2003 - Workshop on Geotraceability
Page 2

One stop shop : a large range of complementary products

SPOT IMAGE

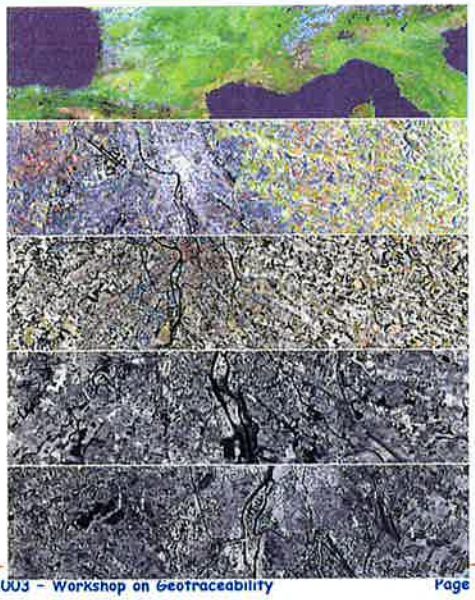
VEGETATION - 1 km

ERS, ENVISAT - 25 m

SPOT 4 - 20 m

SPOT 4 - 10 m

RADARSAT - 10 m



One stop shop : a large range of complementary products

SPOT IMAGE

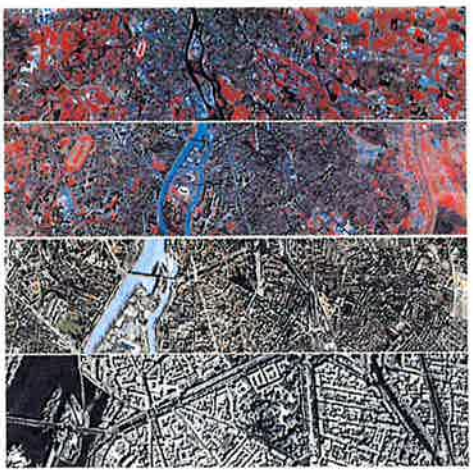
SPOT 5 - 10 m

SPOT 5 - 5 m

SPOT 5 - 2.5 m

VHR - 0.6 / 1 m

Ikonos, Quickbird, Eros, Kvr, ...



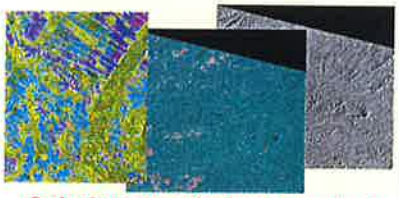
Operational use of satellite imagery in Agricultural Information Systems

- **Offering comprehensive systems based on a multi-sensor approach**

Multispectral SPOT images
Multi-spectral 20 to 10 - meters resolution: perfectly suited to crop recognition

SPOT Végétation images
1-km information for stratifying rural territories and global production follow-up

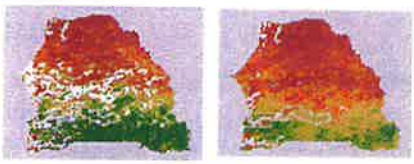
SPOT Panchromatic images
B&W 10, 5 and 2.5-meters imagery : a perfect information for parcel identification and field support



Radar imagery and coherence products
A perfect complement for land cover monitoring and management in specific areas in the world

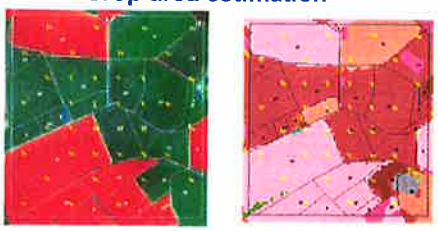
Agriculture – Applications overview

Green vegetation monitoring



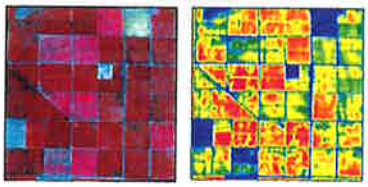
NOAA / AVHRR & VGT - NDVI - Senegal (CSE)

Crop area estimation

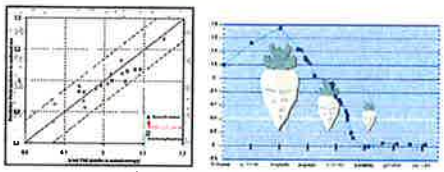


MARS program –
Statistics and control of agricultural lands

Parcel delineation and Precision agriculture



Yield prediction



Sugar beet, UK

Improving accuracy with SPOT 5

- Interest of Spot 5 for a better delineation of agricultural parcels and enrichment of the crop recognition capacity

Small agricultural parcels seen by SPOT 5 - 5 m

Olive trees counting with SPOT 5 - 2.5 m

Creation and up-dating of land parcel databases (Cadastre and agriculture)

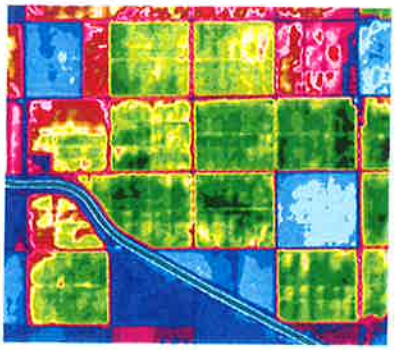
- SPOT 5 in 2.5 m or 5m:
  a good compromise
  for creating and up-dating
  Land Parcel databases
  upon large territories

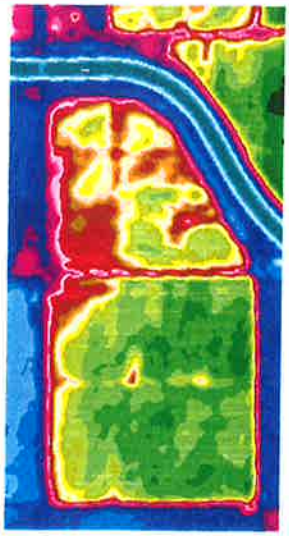
Precision farming

SPOT IMAGE

Example of SPOT products FIELDView

- *for crop variability mapping against diseases and water stress*

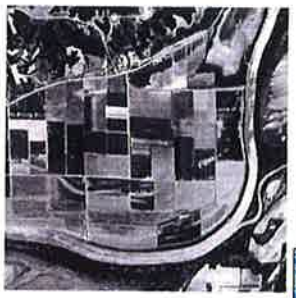


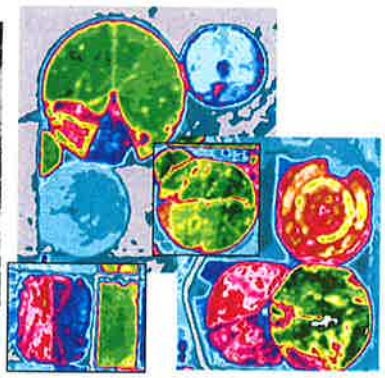


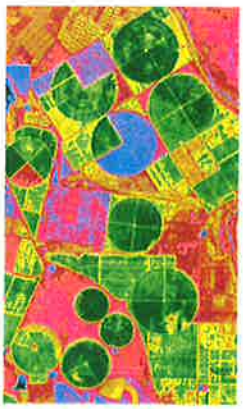
Precision farming

SPOT IMAGE

- *Specific products: FIELDView for pivot irrigation monitoring*



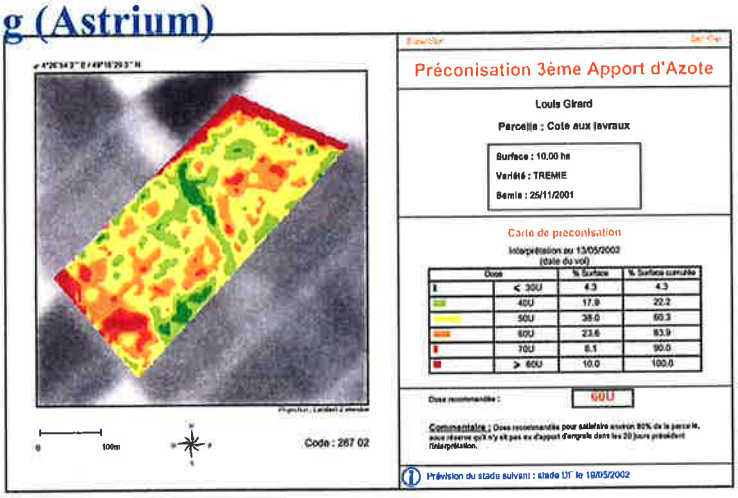




- *Adaptation of programming capacity (validation of images at parcel level) close to customers*

Precision farming

- **Example of value-added products in Precision Farming (Astrium)**

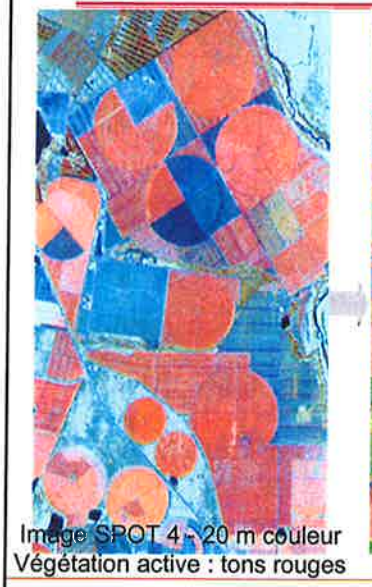


Precision farming

- **Type of products derived from SPOT Imagery (Astrium) :**
  - From two biophysical variables :
    - LAI
    - Chlorophyll content
  - Examples of dedicated information products :
    - Starter kit : exact parcel delineation
    - Quantity of Nitrogen absorbed by the crop at parcel level, in January
    - Estimation of crop density (yield potential), at the end of winter
    - Map of the risk of crop laying
    - Follow-up of the development of the crop at parcel level (tour de plaine, detection of abnormalities)

For wheat, barley, colza, corn
For farmers and cooperatives

Precision farming



Analysis of biomass variations

Pivot irrigations

Information on quality of the irrigation

Parcels with Irregular irrigation

Well irrigated parcels

Impact on corrective actions

Support to agricultural production management

- **SUCRETTE Project (Système de sUivi de la Canne à sucRE par TélédéTEction) : support to the management of sugar cane production**

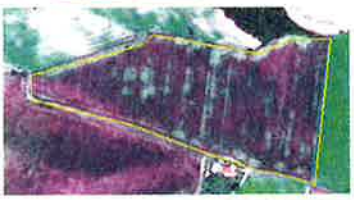
  - RTE Project, CIRAD et Spot Image
  - Several applications :
    - Creation, up-date and management of sugar cane parcels database
    - Follow-up of the crops and harvest management
    - Evaluation of production
    - Diagnosis of infrastructures (irrigation, drainage)
    - Land reclamation of the sugar cane production perimeter

Sucrette

Interest of SPOT imagery in Agriculture (1/2)

- **Same information at several scales (integration)**
  - Inside the parcel
  - Parcel
  - Group of parcels with same crop
  - Watershed or sub-watershed levels
  - Designated regions
  - Management units, vulnerable zones, etc.
- **Homogeneity in space and time (comparability)**
- **Covering vast territories at specific periods and crop stages** (thanks to programming capacity of SPOT satellites)

Interest of SPOT imagery in Agriculture (2/2)



- **Characterization of the variability**
  - Within the parcel
  - Between parcels
- **Estimation of crop density (estimation of production and detection of abnormalities)**
- **Accuracy of the localization**
- **Characterization of the crops and precise acreage estimates**
- **Spatial analysis for a better diagnosis**
- **Support document to field survey**

Interest of SPOT imagery for Geotraceability in Agriculture (1/4)

- **Unique spatial referential for the georeferentiation of data**
  - *Better structuring the information in the system*
  - *Improved normalization*
  - *Improved exchanges between users*
  - *Make the up-dating process of the basic information easier*

- ❑ Creation or up-date of land parcel databases, with precise acreage estimate
- ❑ Integration of several existing databases (LPIS, Cadastre, Infrastructures, vulnerable zones, production perimeter, commercial perimeter, actors, etc)
- ❑ Geographical basic analysis of elements
- ❑ Support to field data collection campaigns

Interest of SPOT imagery for Geotraceability in Agriculture (2/4)

- **Diagnosis and traceability of the parcel in its environment**
  - *Complementing the parcel labeling with a diagnosis of its surroundings*
  - *Improving communication tools (belonging to)*
  - *Making the control easier at creating a local level*
  - *Opening to other regulations (agricultural pollution & water)*

- ❑ Group analysis and identification of resembling parcels (same crop pattern, geography, precedent, etc.)
- ❑ Spatial analysis and diagnosis of the parcel according to surrounding parcels (proximity and influence versus other parcel or river, e.g. for fertilizer application)
- ❑ Characterization of the environment of the parcel as part of the certification

Interest of SPOT imagery for Geotraceability in Agriculture (3/4)

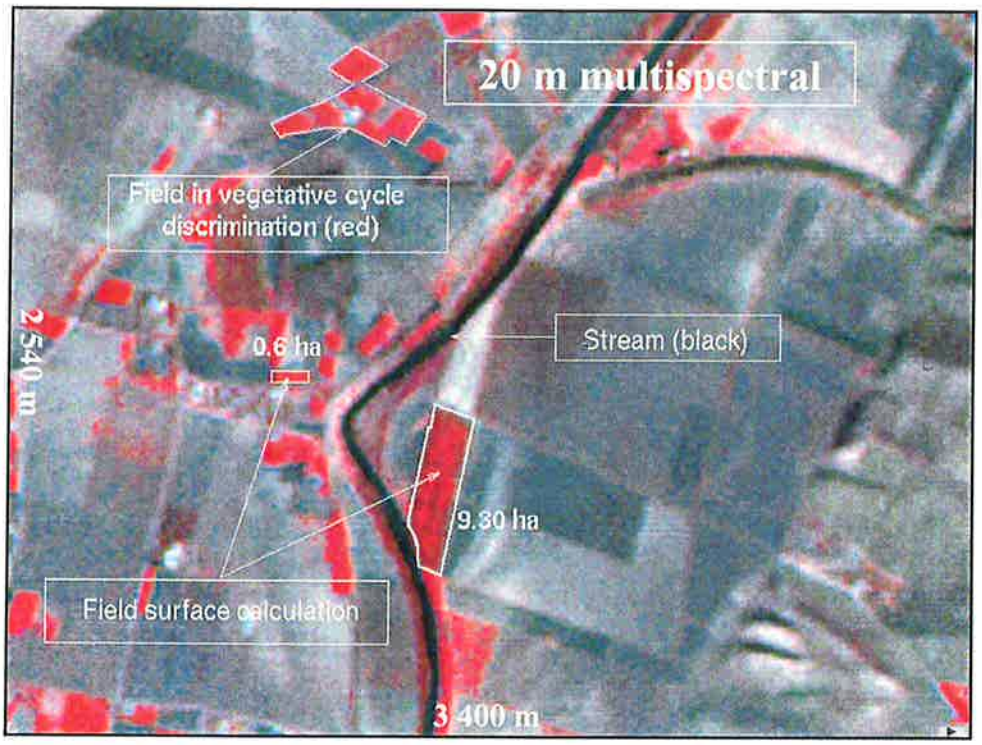
- **Diagnosis of the parcel upon its historical**
  - *Complementing the parcel labeling with a diagnosis of its history*
  - *Improving communication tools*
  - *Improving the guarantee before the record process at parcel level*

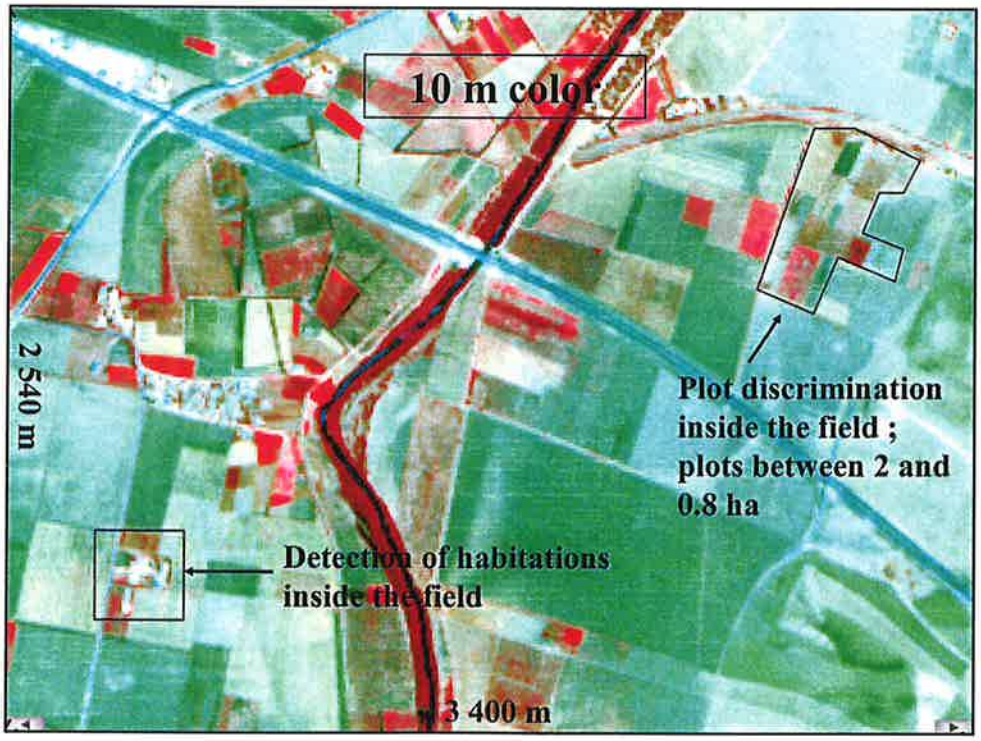
    - ❑ Diagnosis of the crop pattern on previous years at parcel or local levels (on archive imagery)
    - ❑ Spatial analysis and diagnosis of the parcel and its environment on previous years
    - ❑ Capacity to achieve some checks on previous years
    - ❑ Diagnosis of evolution on a parcel or on its environment

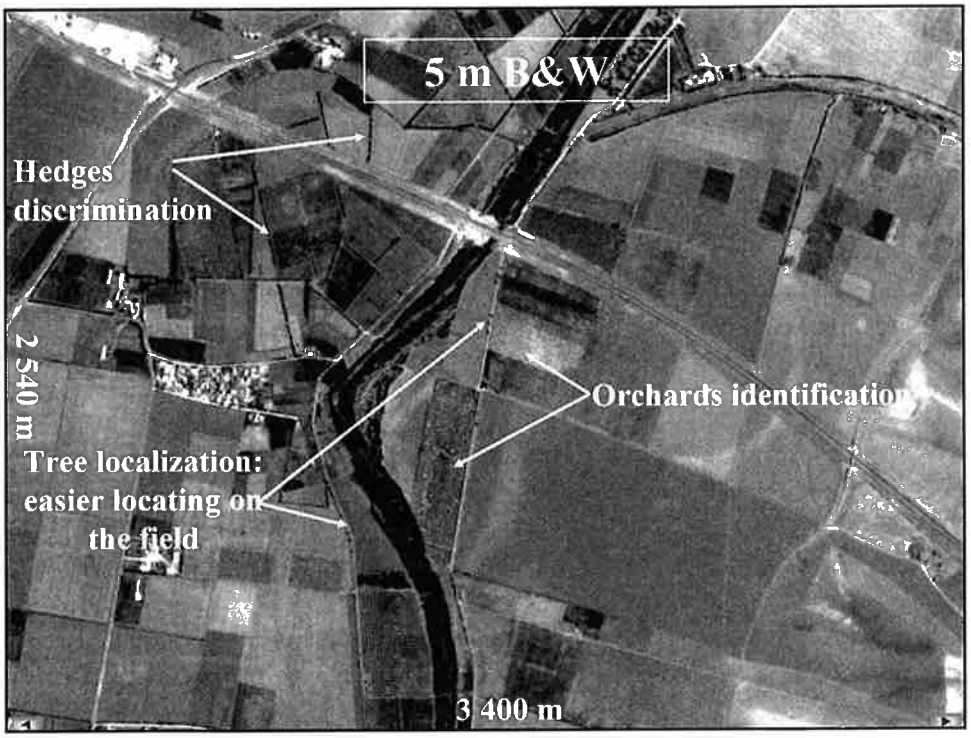
Interest of SPOT imagery for Geotraceability in Agriculture (4/4)

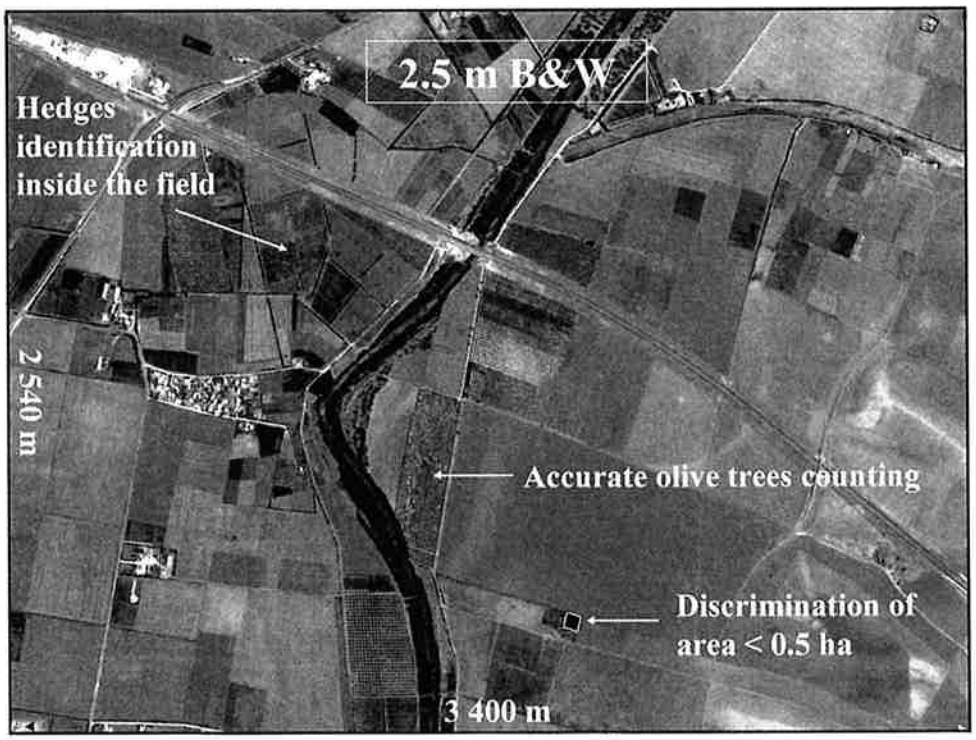
- **Control of certain parameters on the parcel traceability**
  - *Contribute to the credibility of the process*
  - *Contribute to cross-checks*
  - *Reduce in situ control process*

    - ❑ Control of the heterogeneity in the parcel or between parcels
    - ❑ Control specific parameters such as : quantity of Nitrogen absorbed by the crop at the end of winter time
    - ❑ Check of agricultural land use patterns
    - ❑ Check of acreage measurements
    - ❑ Several levels of checks allowed (parcel, farm or zone level), in space and in time (on archive or evolution)

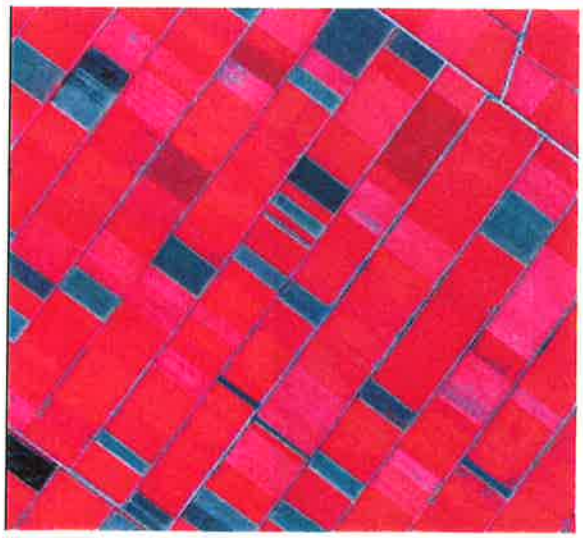

20 m multispectral
Field in vegetative cycle discrimination (red)
2 540 m
0.6 ha
Stream (black)
9.30 ha
Field surface calculation
3 400 m


10 m color
2 540 m
Plot discrimination inside the field ; plots between 2 and 0.8 ha
Detection of habitations inside the field
3 400 m


5 m B&W
Hedges discrimination
2 540 m
Orchards identification
Tree localization: easier locating on the field
3 400 m


2.5 m B&W
Hedges identification inside the field
2 540 m
Accurate olive trees counting
Discrimination of area < 0.5 ha
3 400 m

Interest of SPOT 5 for agriculture



- Cotton fields at different maturation stages
- Irrigation substructures (covered canals)

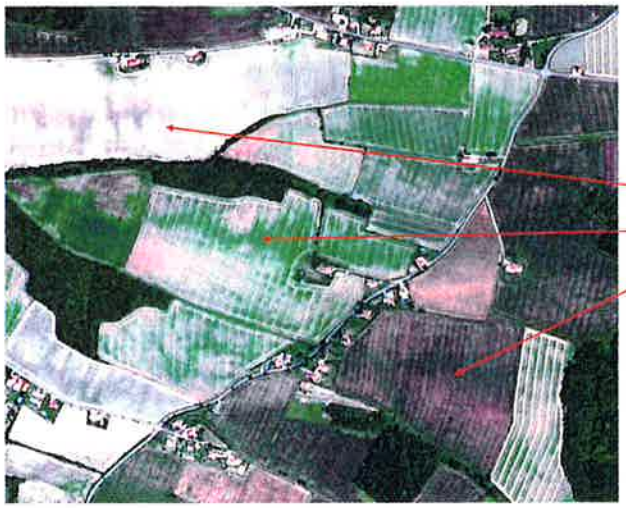
Image SPOT 5, 5 m Couleur, Grèce, le 03/08/02

Interest of SPOT 5 for agriculture

- Sugar cane field in process of harvesting
- Parcel identification in very homogeneous area

Image SPOT 5, 2.5 m Couleur, La Réunion, le 06/07/02

Crop identification

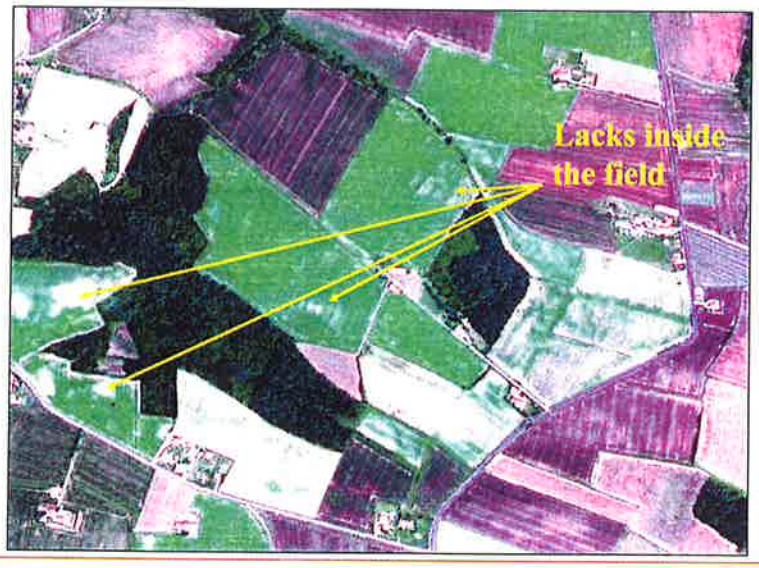


- Sunflower
- Pea
- Wheat

Crop identification

- Rapeseed

Lack



Emergence heterogeneity

Maturation heterogeneity

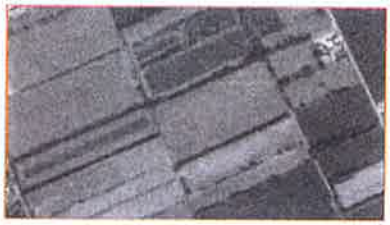
- Pea reaching maturity (intra parcel heterogeneity)

Disease

- Take-all on wheat

Unharmed wheat

The hedges



- To take an inventory of hedges
- To control and follow the hedges replanting (AEM)
- To characterize the hedges (dense, scattered, ...)

SPOT IMAGE

5 rue des Satellites

BP 4359

31030 Toulouse Cedex 4
France

Tel: +33-5-62 19 40 40

Fax: +33-5-62 19 40 11

http://www.spotimage.fr/

JOINT RESEARCH CENTRE
EUROPEAN COMMISSION

ipsc

FP6, ERA and Traceability

Peter CHURCHILL (DG JRC, EC)

Strategy for the JRC

THE JOINT RESEARCH CENTRE

As the Scientific & Technical arm of the Commission the JRC must contribute to the ERA

⇓

- The overall objectives for the JRC were set in the EC Communication "Fulfilling the JRC's Mission in the ERA"
  - ✓ To support the policy making process by providing a broad range of Scientific & Technical services
  - ✓ To contribute to the development and operation of EU systems of scientific reference for policy decision

ERA – Background

THE JOINT RESEARCH CENTRE

European Research Area (ERA) has become the **reference** framework for **research policy** issues in Europe

- ***Why do we need the ERA?***

✓ Improvement in the integration of EU RTD initiatives to maximise Europe's efforts

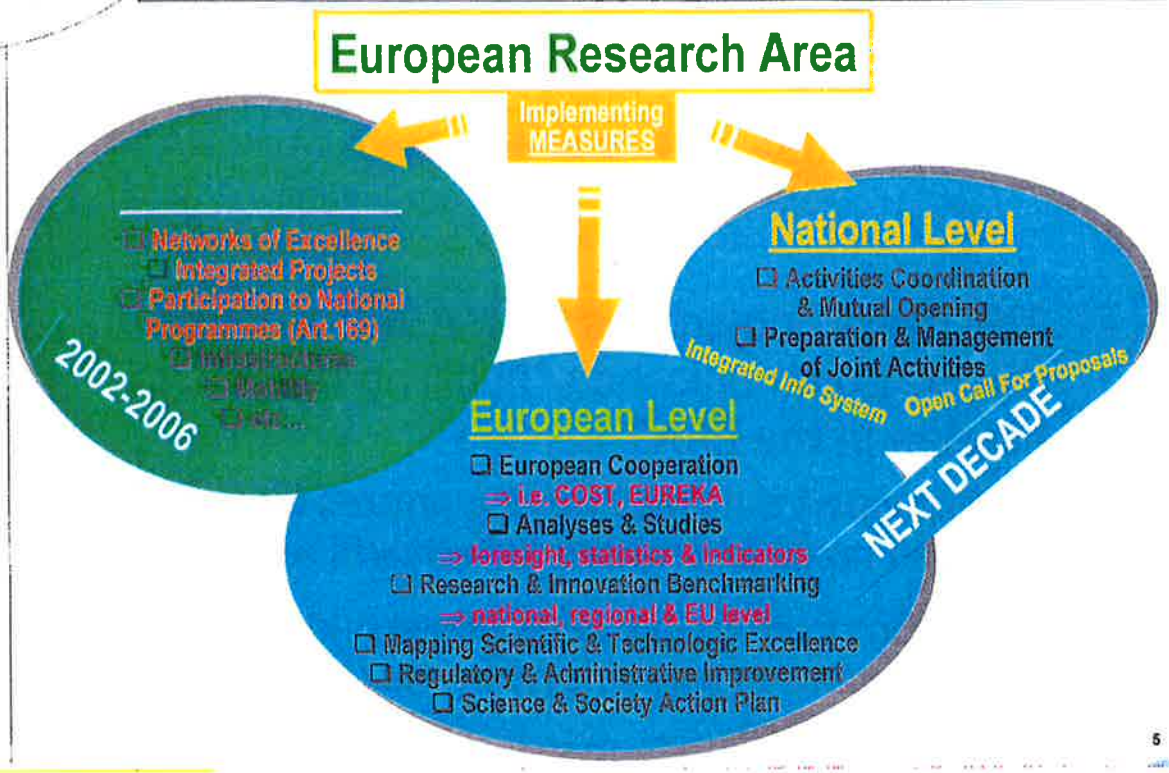
✓ EU's major technological rivals (e.g. US) are stepping up their RTD investment

✓ EU is facing problems affecting the economy, society & citizens for which science holds the key to a large extent (i.e. BSE, Foot & Mouth disease, GMOs)

✓ Sustainable development is a major political objective in the EU's agenda
⇒ needs for specific research in many areas & interdisciplinary approaches

✓ Information, communication science & technologies are playing a growing role in the competitiveness of European economy, living conditions & model of society

ERA – Background



THE JOINT RESEARCH CENTRE

5

ERA – Background

- Key Issues

✓ Integration of EU RTD efforts supported by FP instruments and other measures

✓ Closer collaboration and coordination of research and innovation activities at both national and Europe level
⇒ Networking, Links with other organisations
⇒ Project integration with EUREKA / "Innovation 2000 Initiative"
⇒ Complementarity with COST

✓ Coherent development of research and innovation policies in Europe ⇒ Common Targets, Benchmarking of RTD policies, Mapping of Centres of Excellence, Science & Technology Foresight, Statistics & Indicators, Regulatory & Administrative environment improvement

✓ Lasting effect: long-term programmes covering elements of variable scale

THE JOINT RESEARCH CENTRE

FP6 Outline – Instruments

THE JOINT RESEARCH CENTRE

3 New Instruments in response to the need for change, as stressed in various reports (e.g. FP's five-year assessment)

1) **Networks of Excellence**
   (Grant - "up to 25% of value of capacity and resources proposed by participants")
2) **Integrated Projects**
   (Grant – up to 50% of the budget)
3) **Community Joint Participation in National Programmes (Art. 169 of Treaty)**
   (This Article has never been used before and its implementation still requires a more substantial preparation phase)

⇒ Implemented in the **1st SPECIFIC PROGRAMME: Integrating Research**

FP6 Outline – Instruments

THE JOINT RESEARCH CENTRE

- Other instruments / measures

✓ **Specific Targeted Research or Innovation Projects**
(Grant – up to 50% of the budget)

✓ **Specific Research Projects for SME's**
(Grant – up to 50% of the budget)

✓ **Integrated initiatives relating to Infrastructure**
(Grant – 50% - 100% of the budget)

✓ **Actions to promote Human Resources & Mobility**
(Grant – up to 100% of the budget)

✓ **Coordination Actions**
(Grant – up to 100% of the budget)

✓ **Specific Support Actions**
(Grant – up to 100% of the budget)

JRC Strategy: Role in Networks

THE JOINT RESEARCH CENTRE

- "JRC Networks in the ERA" Paper (20th Dec. 2001)
  - ✓ 4 objectives and 4 types of networks proposed:
    1. Establishing Scientific & Technical reference networks for policy making (e.g. GMO detection, emissions, air quality, energy technology observatory)
       - ➢ Networks for policy scientific & technical reference
    2. Supporting the co-ordination of research activities in selected areas (for example nuclear safeguards, nuclear medicine or technology foresight)
       - ➢ Networks for research co-ordination
    3. Contributing to the integration of research efforts in Europe (e.g. in actinide research or in metrology)
       - ➢ Networks for research integration
    4. Exploring new avenues and building up competence (e.g. authenticity of organic food)
       - ➢ Networks for competence building / anticipation

The Project

Research Project

Europe- Canada

IST-200134281

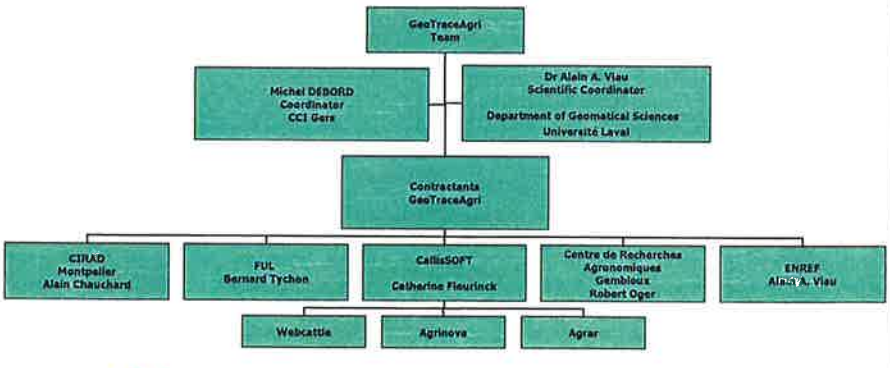
Geographical Traceability of Food Products

B. TYCHON and R. OGER

Fondation Universitaire Luxembourgeoise (Belgium)

Centre de Recherches Agronomiques (Belgium)

GeoTraceAgri Partners



General Context

Succesive crisis in different agricultural food chains (dioxine, USB,…)

Food security has become a main concern for consumers and public authorities (Food Security Agencies).

With the increasing globalization, Georeferenced information is the most universal tool for visualising on the WEB current status and events.

Certification and control tools

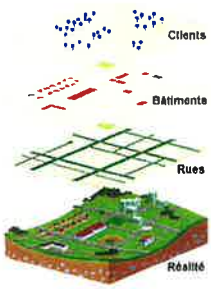
Geographical Traceability in Agriculture

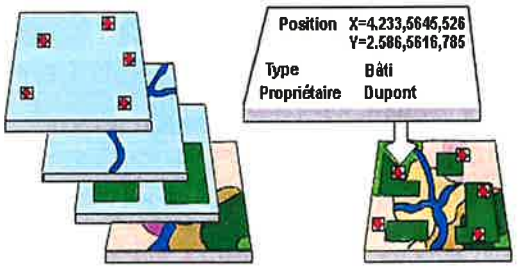
Traceability, capacity to trace the history, the use or the location of an entity through registered identifications.

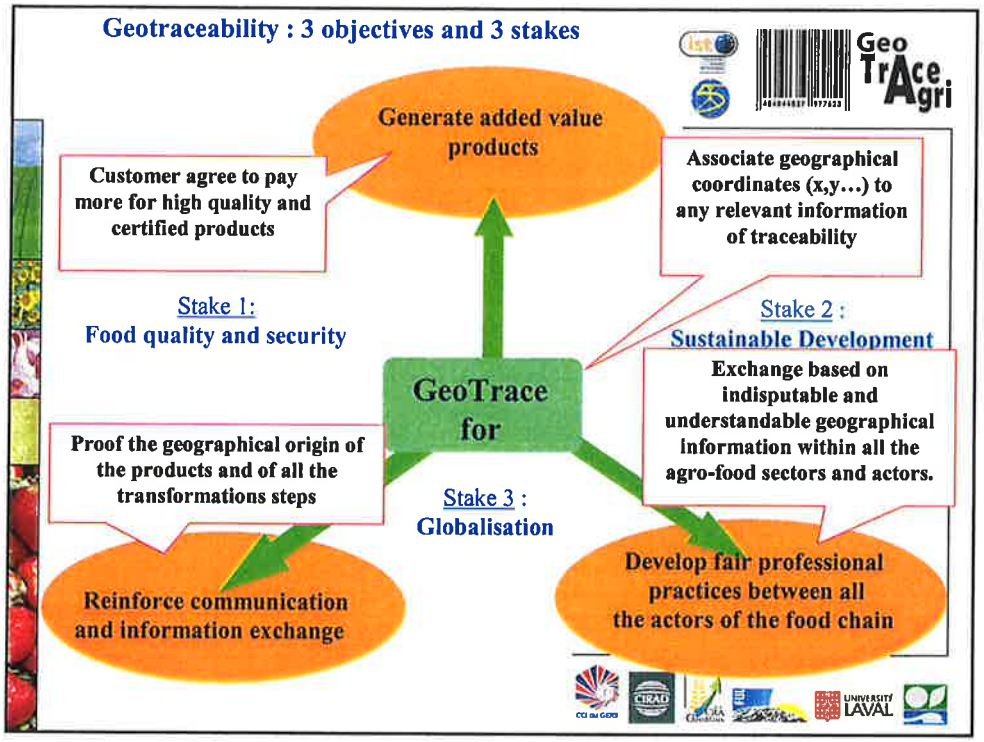
The traceability allows to follow and therefore to recover a product or a service from its creation (production) up to its destruction (consumption).

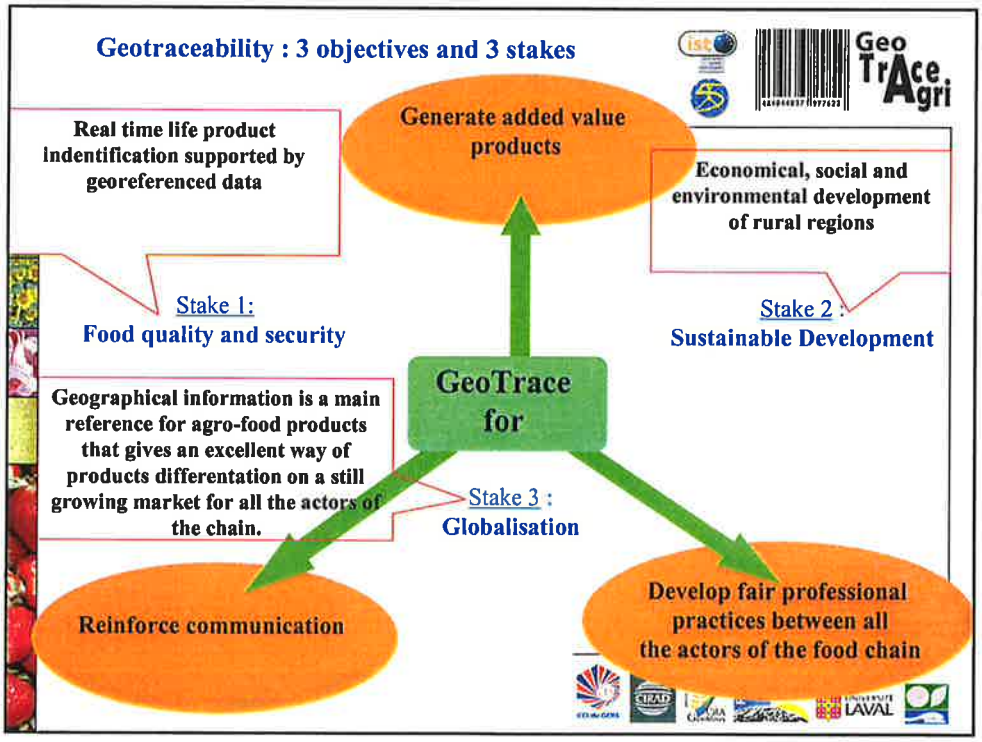
Concept of geographical traceability

⇨**Associate geographical coordinates to relevant information on production traceability and develop local GIS for the management and use of these data**






Geotraceability : 3 objectives and 3 stakes
Geo TrAce Agri
Generate added value products
Customer agree to pay more for high quality and certified products
Associate geographical coordinates (x,y…) to any relevant information of traceability
Stake 1:
Food quality and security
Stake 2 :
Sustainable Development
GeoTrace for
Exchange based on indisputable and understandable geographical information within all the agro-food sectors and actors.
Proof the geographical origin of the products and of all the transformations steps
Stake 3 :
Globalisation
Reinforce communication and information exchange
Develop fair professional practices between all the actors of the food chain


Geotraceability : 3 objectives and 3 stakes
Geo TrAce Agri
Real time life product indentification supported by georeferenced data
Generate added value products
Economical, social and environmental development of rural regions
Stake 1:
Food quality and security
Stake 2 :
Sustainable Development
GeoTrace for
Geographical information is a main reference for agro-food products that gives an excellent way of products differentation on a still growing market for all the actors of the chain.
Stake 3 :
Globalisation
Reinforce communication
Develop fair professional practices between all the actors of the food chain

Project Objectives

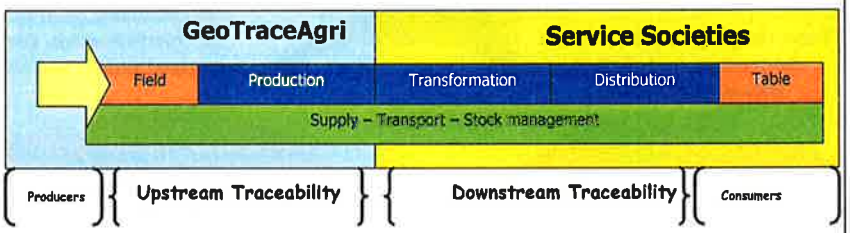
1. Define indicators and determine relevant georeferenced indicators classes for traceability for different agricultural sectors and different spatial scales

1- Upstream traceability

Environment, agronomic and morphologic characteristics, agricultural practises at the parcel, watershed, regional scales (AOC)

2- Downstream traceability

From the stock management to the food distribution with all the intermediate transformations and transport processes



Definition of traceability indicators

1- Proximity indicators (neighbourhood)

Take into account all the local or regional information around the area of concern (parcel), the maximum distance to be considered depending on the agricultural activities, environmental and anthropic constraints (crop diversification, land occupation,…)

Definition of traceability indicators

2- Agri-environmental indicators (Use of the Environment)

Indicators related to the agricultural and agri-environemental practises (fertilisation, length of the growing period, biomass and yield (EU-CGMS), impact on the groundwater, …)

Definition of traceability indicators

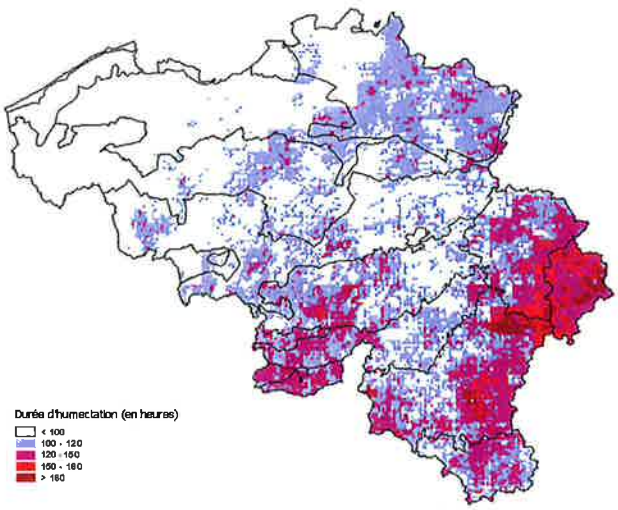
3- Generic indicators (environment)

Indicators that will describe the general context (physical, morphological, biological, climatic, hydrological,…) to define the environment where the production takes place

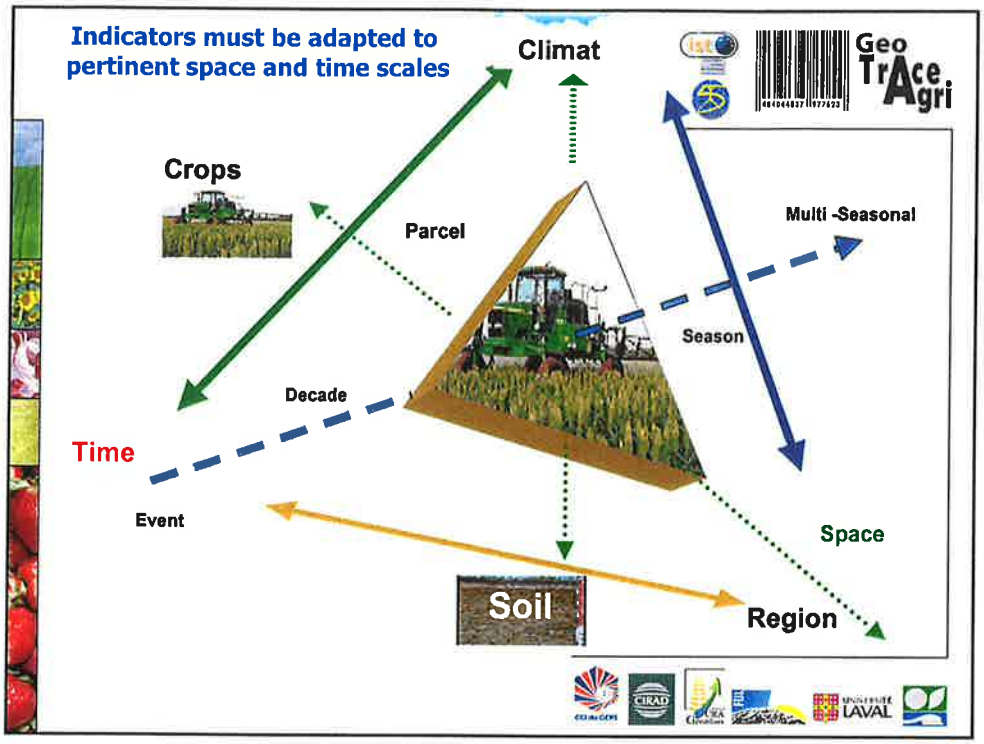
Definition of traceability indicators

4- Events indicators

Indicators that will describe how the year of production is unusual by comparison with a common year. For example meteorological conditions (drought, frost, inondations,…), environmental incidents, human actions (new building,new material,…) around or into the parcel may be used to build events indicators.



Spatial repartition of leaf wetness duration in 2002 (+/- 7 days before flowering of winter wheat) in Belgium (Risk Indicator of mycotoxins occurence)



Project objectives

2- Set up a geomatic reference system for geographical traceability for vegetal sectors and transpose it in a second step into other agricultural sectors (animal, sea food,...)) in order to :

- qualify the georeferenced agricultural information as an essential identification tool that will increase the products and services value of the different vegetal sectors;
- develop integration, visualization and diffusion tools of geospatial traceability data with their metadata extracted from the system.
- build geo-directories at regional and local scale for a management of historical data;

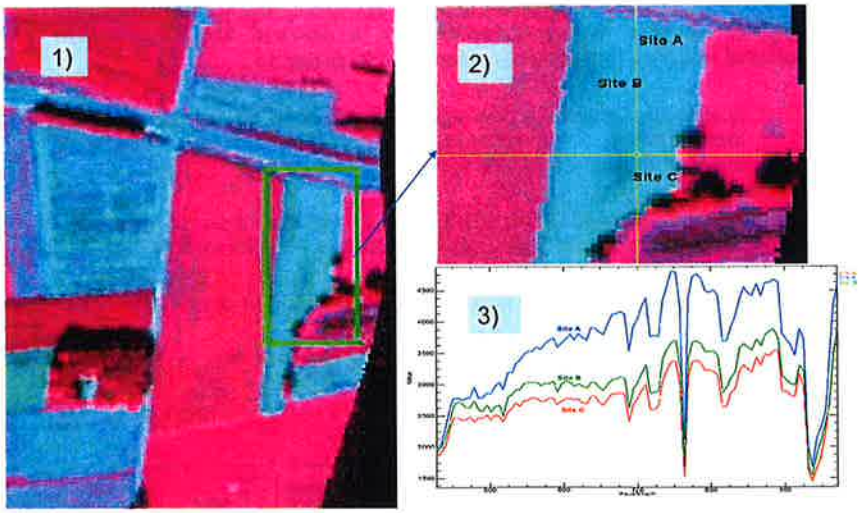
The referential set up

Note 1 : High variety of data for the qualification of agricultural products and their impact on the environment.

- *land use and land occupation ;*
- *topography ;*
- *climatology ;*
- *soil type ;*
- *soil and parcel hydraulic ;*
- *yields ;*
- *inter and intra-parcel agricultural practices (variety, fertilization, harvest date).*

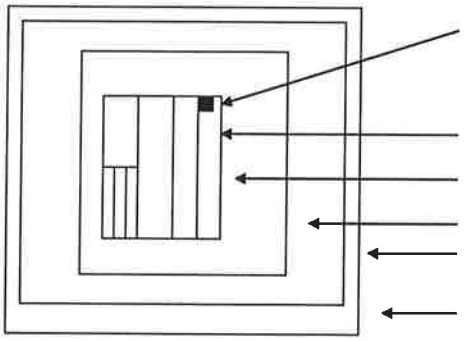
Note 2 : Recent technological evolution (new aerospatial and remote sensors, yield sensors on agricultural machines, GPS, probes...)

1) Visual interpretation of Pseudo-color infrared image using the 750,650 and 550 nm bands to RGB : roads, vegetated areas, farms, ... are clearly identified.
2) The experimental site : three positions in the site providing contrasting ligther tone (Point A), darker tone (Point C) and middle tone (Point B).
3) Radiance spectrum of the three pixels; the ligther point tone above the others.



The referential set up

Geographical space and data scales



- smallest identification level = pixel level **A**
- agricultural parcel **B**
- farm **C**
- agricultural region or watershed **D**
- country **E**
- EC **F**

The referential set up

Producer

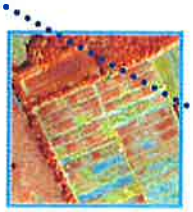
The different scales of traceability

Parcel (seasonal and annual)
(1 meter or less)

Field (seasonal and historical)
(1 meter)

Farm (historical)
1: 5 000

Local (historical and generic)
1: 20 000

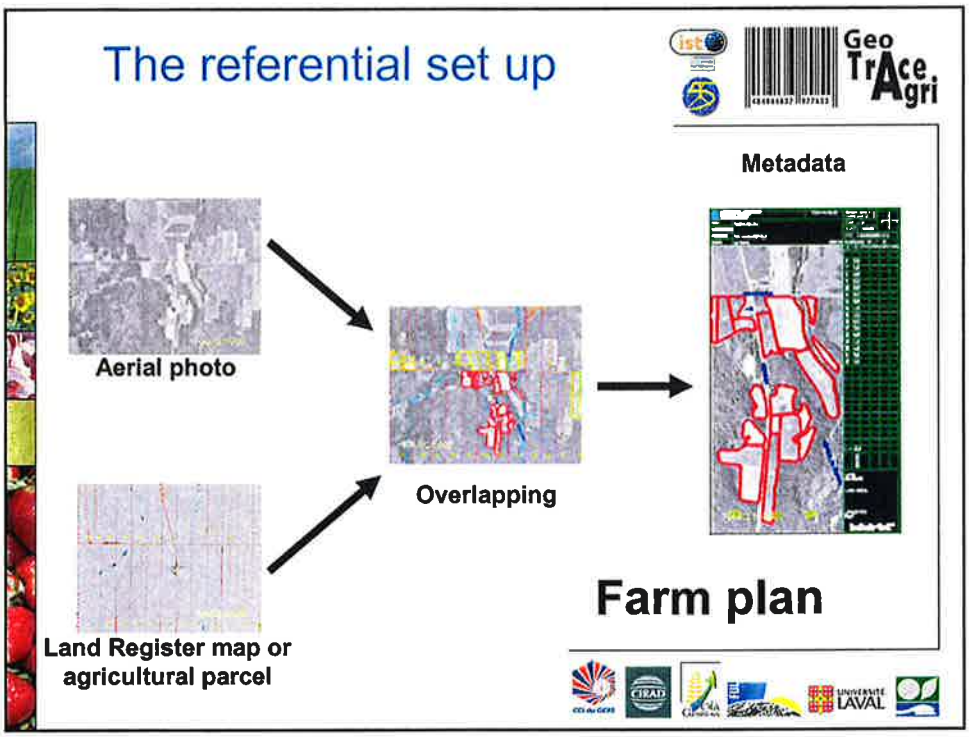


Regional (scaled statistics)
1: 50 000

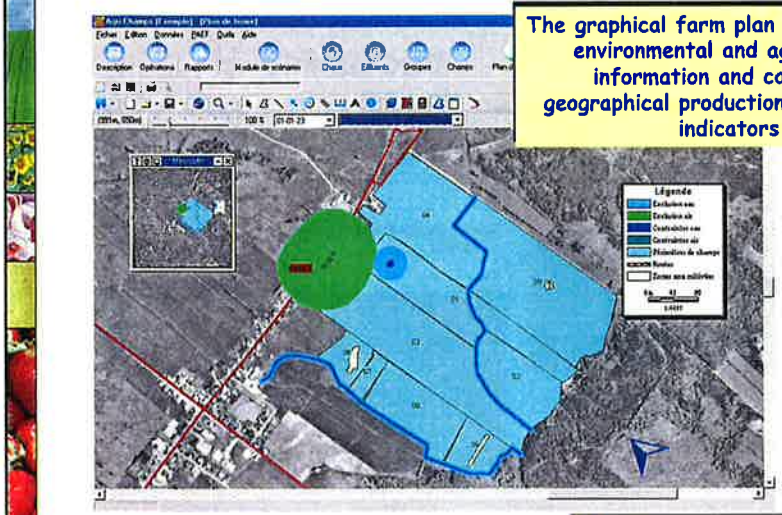
Region

UNIVERSITÉ LAVAL
GAAP

The referential set up

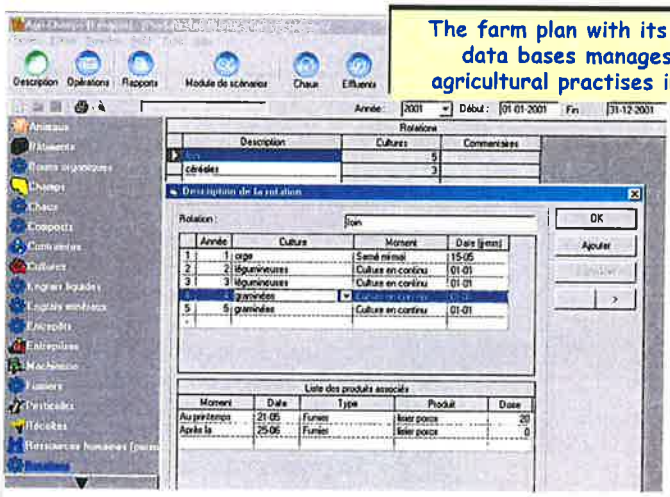


The referential set up



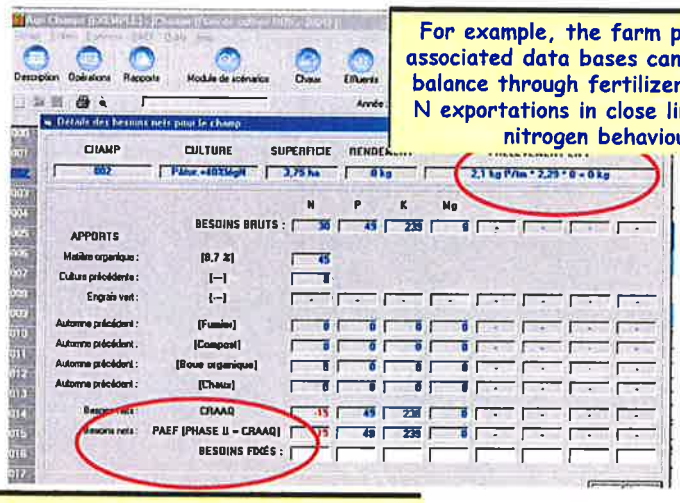
The graphical farm plan manages agri-environmental and agricultural information and calculates geographical production traceability indicators

Referential set up



The farm plan with its associated data bases manages all the agricultural practises information

Referential set up

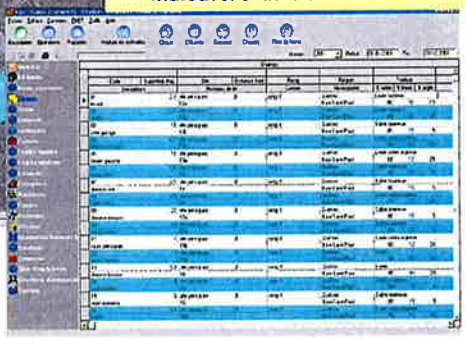


For example, the farm plan and its associated data bases can manage N-balance through fertilizer inputs and N exportations in close link with soil nitrogen behaviour.

Ex: fertillzer indicators are calculated according to each sector by the soflware.

Referential set up

Final objective = calculation and management of georeferenced indicators at the local GIS level



In BELGIUM the crop acreages are precisely known, thanks to the
Integrated Administration and Control System (IACS)
managed by the Ministry of Agriculture

⇒ Map with boundaries of nearly all agricultural fields (± 600 000)
⇒ Yearly updated with farmer declarations (!)

Proof of geometric accuracy: overlay IACS with geo-corrected SPOT-XS images

SPOT-XS, 30 May 1997

SPOT-XS, 6 August 1997

Project objectives

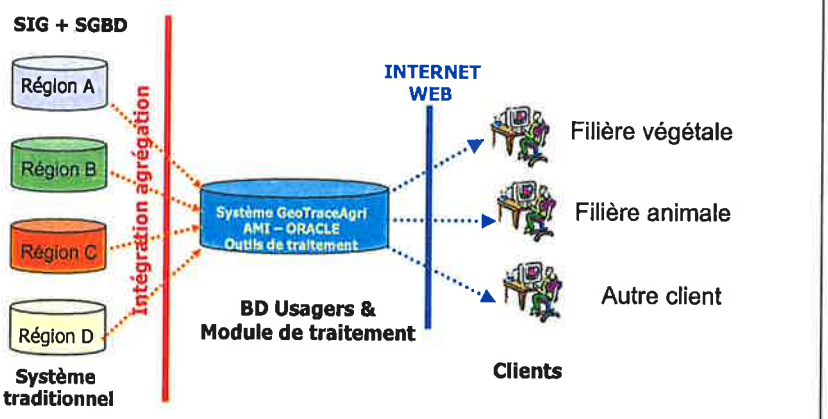
3 – Develop an operational computer decision system that will ensure the geographical traceability of the agricultural products for all the actors of the different sectors (production of demonstrator)

Germany	Belgium	France	Netherland	Luxembourg	U.K. Uni	Québec Canada
Sea Food sector	Potatoes sector	Cereal sector	horticulture sector	Cereal sector	Meat sector	Cereals sector
	Fodder production	environment				Porc
	Cereal sector	Tropical Fruits				Beaf
		Traditional agriculture	Traditional agriculture			Fruits
						Precision farming

The system GeoTraceAgri

Système Décisionnel GeoTraceAgri

(Base de données distribuées géographiquement)
Serveur central de traitement et de contrôle d'accès



Achievements

1) Definition of the indicators that are relevant to geographical traceability;
2) Definition of norms valid at the EU-level;
3) Definition of a geomatic reference system;
4) Development of secure and user-friendly visualization and communication tools for the information transfer through the food chain of all agricultural sectors
5) Validation of steps 1-4 by various contributors and user groups (participative approach) and dissemination

Thank you

Certification and control processes at farm level

EUREPGAP

Stefano Cardinali
DNV Region South Europe Certification

The Global Pre-Farm Gate Standard **Fruit and Vegetables**

MANAGING RISK

DET NORSKE VERITAS

- Foundation established in 1864
- Headquarter: Oslo
- 40.000 Customers
- Market Leader

DNV

MANAGING RISK

Objective

Safeguard

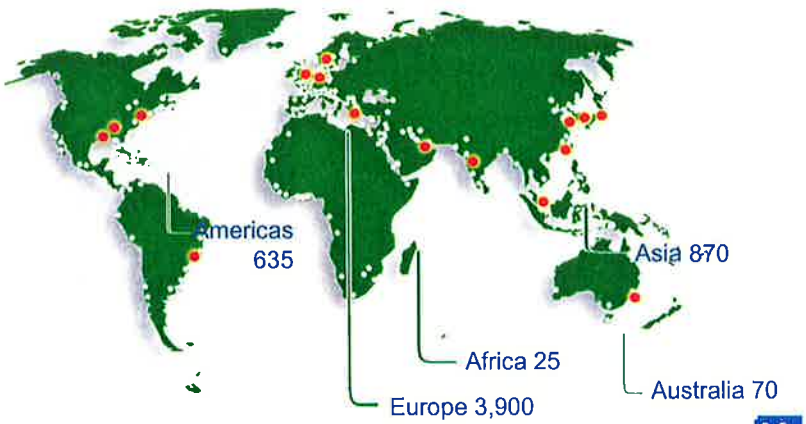
LIFE,

PROPERTY,

and ENVIRONMENT

MANAGING RISK

International Organization



MANAGING RISK

DNV Italy

Total Employees: 177

Total NEX: 281

MANAGING RISK

International Accreditation

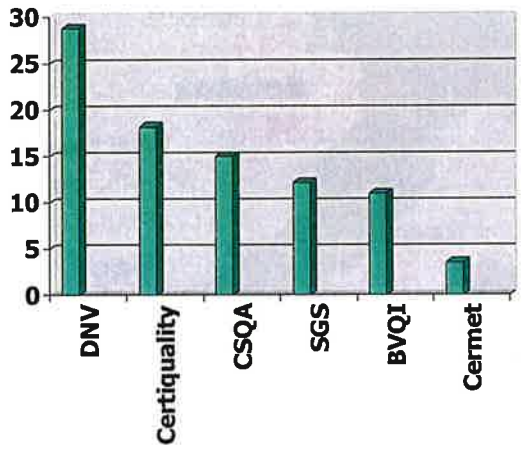
Korea · Norway · Sweden · Finland · Netherlands · USA

Japan · France · UK · Brazil · Austria · Belgium

Spain · Italy · Germany · Switzerland · Denmark · Australia, New Zealand

MANAGING RISK

Certificates issued in the agro-food sector (March 2002)



MANAGING RISK

Conclusions to start with:

- Agriculture needs to produce affordable food in a sustainable way
- Consumers are demanding confidence in the food they eat
- Retailers are the direct link to the consumers in the Food Chain
- Retailers are responding to the consumers desires

MANAGING RISK

Introducing EUREPGAP...

Harmonised standards that specify:

- How Food is grown
- Where Food is grown
- What was used to produce food

Clear process

- Information to support the guidelines
- Record Keeping
- Traceability
- Certification

MANAGING RISK

EUREPGAP

EUREPGAP
The Global Standard for Safe and Sustainable Agriculture

MANAGING RISK

EUREPGAP

Our History

- Started as Retailer Initiative in 1997
- Grown to a full and equal supply chain partnership
- Became first globally accredited reference scheme for potatoes, fruit & vegetables

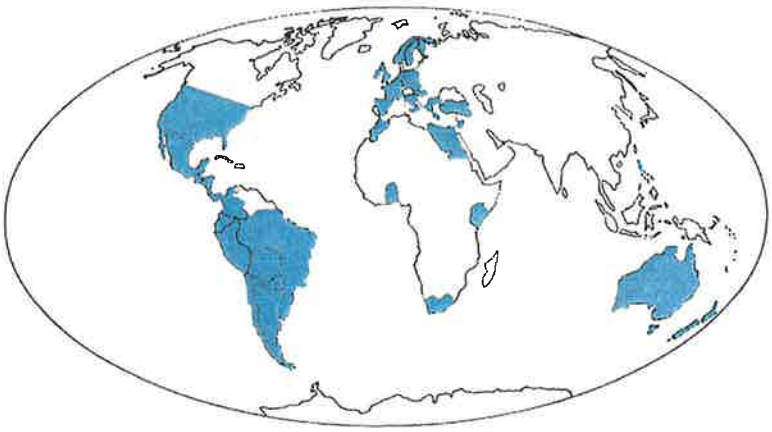
MANAGING RISK DNV

Retail Members

EUREPGAP

SPAR ÖSTERREICH
MIGROS
MARKS & SPENCER
SOMERFIELD
WAITROSE
ASDA
KESKO
DELHAIZE
McDonald's Europe
KF
EROSKI
TESCO
SUPERQUINN
Laurus
SAINSBURY'S
D.R.C.
Safeway
Superunie
ICA handlarna
coop norway

Supplier Members EUREPGAP



MANAGING RISK DNV

Governing Structure EUREPGAP

Chairman

Steering Committee

Council

Technical and Standards Committees

Standards + General Regulations

FoodPLUS

FoodPLUS GmbH

MANAGING RISK DNV

EUREPGAP

Our Goals

- To achieve a Safe and Sustainable Agriculture
- To have a food chain co-operation to encourage continuous improvement
- To Maintain a consumer focus on GAP issues

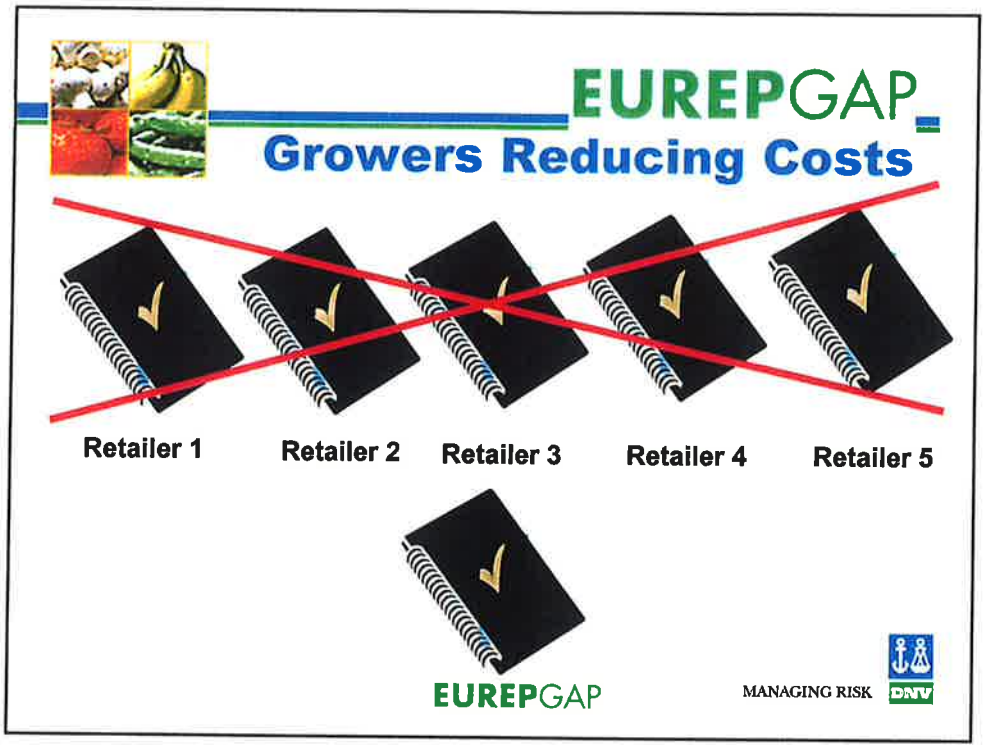
MANAGING RISK DNV

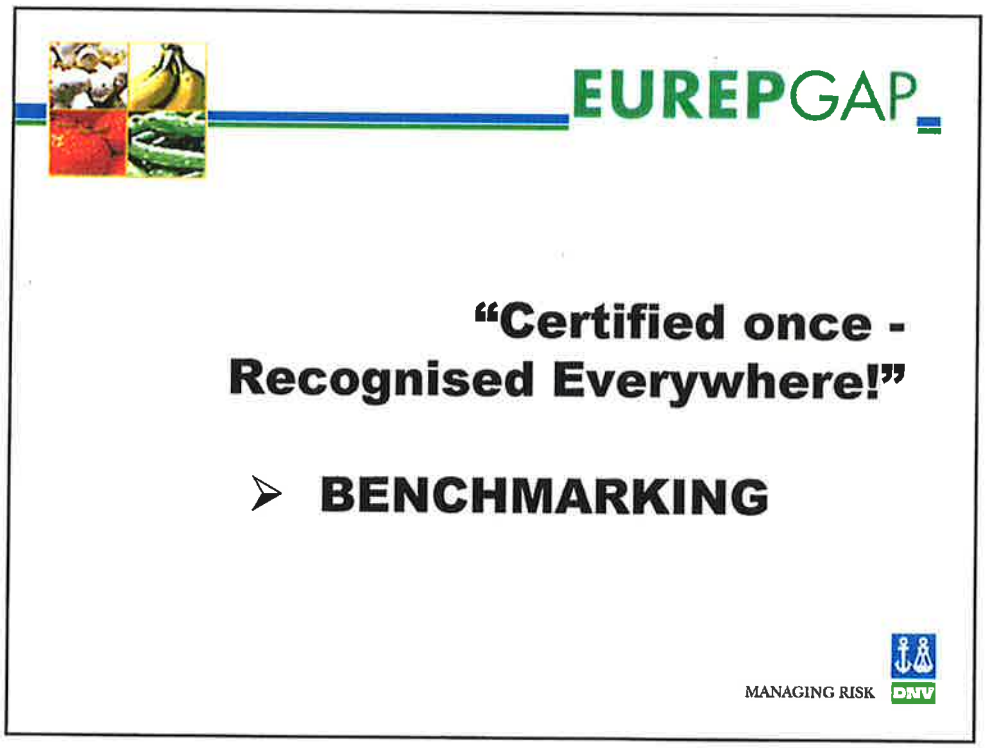
EUREPGAP

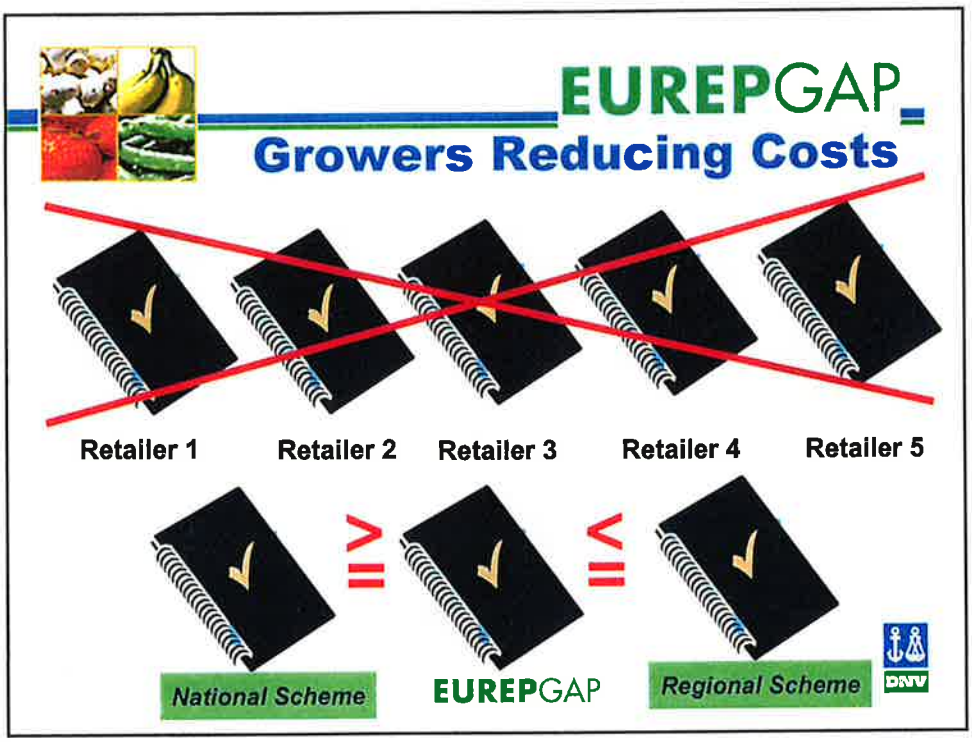
is ...

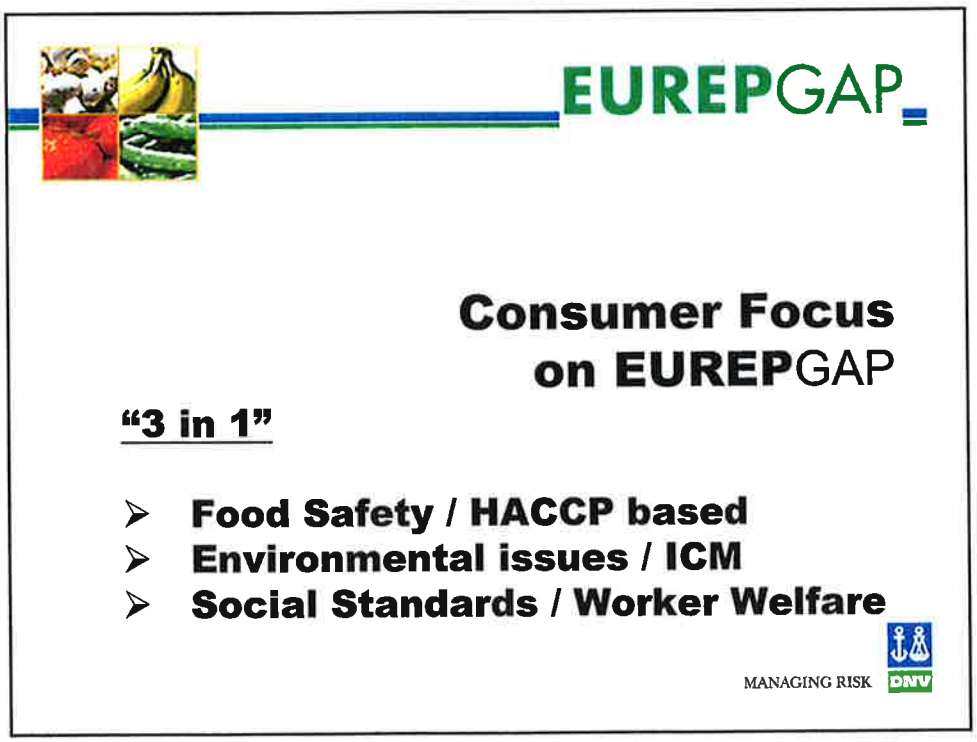
... a „Food Chain Partnership"

MANAGING RISK DNV
Slide 5


EUREPGAP
Growers Reducing Costs
Retailer 1
Retailer 2
Retailer 3
Retailer 4
Retailer 5
EUREPGAP
MANAGING RISK
DNV


EUREPGAP
"Certified once -
Recognised Everywhere!"
BENCHMARKING
MANAGING RISK
DNV


EUREPGAP
Growers Reducing Costs
Retailer 1
Retailer 2
Retailer 3
Retailer 4
Retailer 5
National Scheme
EUREPGAP
Regional Scheme
DNV


EUREPGAP
Consumer Focus
on EUREPGAP
"3 in 1"
Food Safety / HACCP based
Environmental issues / ICM
Social Standards / Worker Welfare
MANAGING RISK
DNV

GAP Framework Standard

Framework encourages:

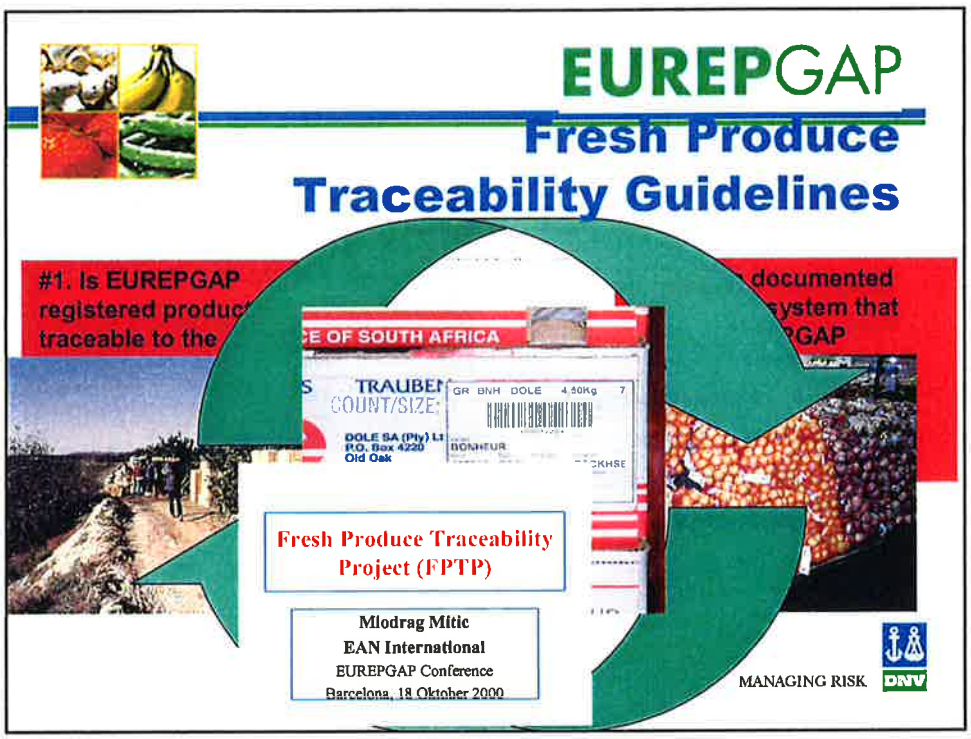
- High Priority for consumer and operator health, safety and welfare.
- Implement Traceability
- Minimum Use of Agrochemicals
- Move Towards Integrated Crop Managem
- Efficient Use of Resources
- Promotes Environmental awareness

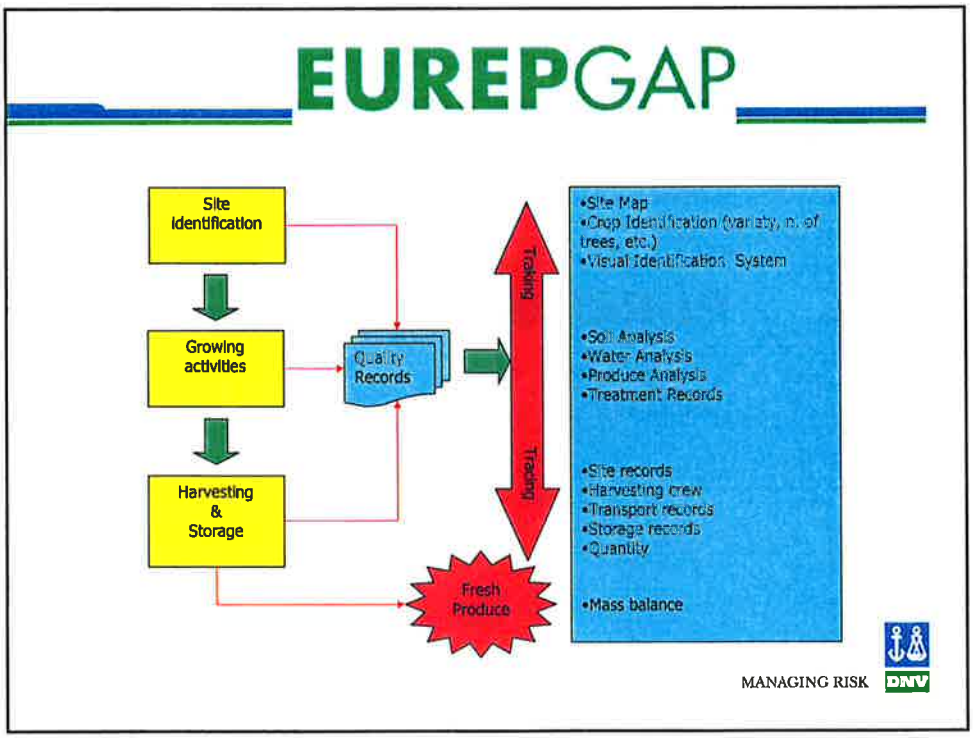
MANAGING RISK DNV

EUREPGAP

EUREPGAP Traceability

MANAGING RISK DNV


EUREPGAP
Fresh Produce
Traceability Guidelines
#1. Is EUREPGAP
registered produc
traceable to the
documented
system that
PGAP
E OF SOUTH AFRICA
TRAUBE
COUNT/SIZE:
GR BNH DOLE 4.50Kg
DOLE SA (Pty) Lt
P.O. Box 4220
Old Oak
BONHEUR
Fresh Produce Traceability
Project (FPTP)
Mlodrag Mitic
EAN International
EUREPGAP Conference
Barcelona, 18 Oktober 2000
MANAGING RISK
DNV


EUREPGAP
Site Identification
Growing activities
Harvesting & Storage
Quality Records
Tracking
Tracking
Fresh Produce
•Site Map
•Crop Identification (variety, n. of trees, etc.)
•Visual Identification System
•Soil Analysis
•Water Analysis
•Produce Analysis
•Treatment Records
•Site records
•Harvesting crew
•Transport records
•Storage records
•Quantity
•Mass balance
MANAGING RISK
DNV

THE DEPARTMENTS OF THE INSTITUTE: ACCOMPANYING THE PRODUCERS

- The INAO is a public administrative body under the supervision of the Ministry of Agriculture, created in 1935
- The INAO orientate the efforts of the applicants, prepare the work of the enquiry commissions and of the experts working on defining the geographical areas, check to see that the production conditions and the terms of the approval procedures are respected.

- By means of the protection of defined areas, the INAO is involved in the development of the territory and the fight against rural abandonment and uncontrolled urbanism
- A central department in Paris and 26 offices in the provinces located at the heart of the areas of production (250 staff approximately)

PDO AND PGI IN FIGURES

◆ Wine and spirit AOC

- 466 appellations d'origine
- 52% of french production
- 80,000 farms and estates are included in *AOC*
- Turnover : 15 billion Euros
- The both represent 82 % in value of french production
- The AOC and VDQS represent 55% of the total surface area

◆ Dairy AOC

- 45 appellations exist for dairy products
- 40 for cheeses, 4 for butters and 1 for cream
- 28,000 milk producers are included in AOC
- AOC cheese production in 2001 reached 186770 T
- 20% of French production
- The turnover is of around 2 billion Euros

◆ Others AOC

- 23 AOCs other than those in wine or dairy produce.
  - ✓ Olives and Olive Oils 8 AOC
  - ✓ Fruit and Vegetables 7 AOC
  - ✓ Meat 3 AOC
  - ✓ Honey 2 AOC
  - ✓ Condiments 1 AOC
  - ✓ Fourrage 1 AOC
  - ✓ Essential Oil 1 AOC
- Turnover is estimated at 150 million Euros.
- They cover some 9,000 producers

◆ PGI Products

- 65 French PGIs have been registered in Brussels :
  - ✓ 31 "Poultry"
  - ✓ 9 "Fruit and vegetables"
  - ✓ 4 "Lamb Meat"
  - ✓ 4 "Fresh Pork Meat"
  - ✓ 4 "Cheeses"
  - ✓ 3 "Beef"
- These concern 25,000 farms in 2001
- The turnover estimated at 1 billion Euros

PROTECTED DESIGNATION OF ORIGIN : THE CONCEPT

- **the Law of 1919 :**

"*An Appellation d'Origine includes the name of a country, a region or an area serving to designate a product from that country, region or area, and with qualities and characters that exist due to the geographical environment, comprised of natural factors and human factors*

- **Terroir :**

« *system in which there are complex interactions between a set of human factors (techniques, collective usage etc.), agricultural production and a physical environment. The terroir is valorised by a product to which it confers an original, typical nature* »

DEFINING THE BOUNDARIES OF THE PRODUCTION AREAS

- **The boundarie materialise portions of territory within which the Appellation d'Origine is produced.**

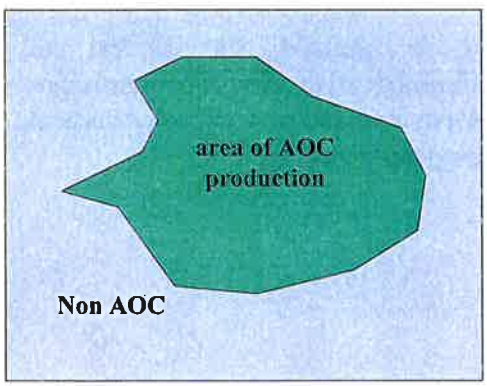
- **It is defined by a list of administrative entities (communes, départements) as well as by natural geographic limits.**

BOUNDARY DEFINITION PROCEDURE

- Commission of Enquiry
- General principles
- Validation by the National Committee
- Commission of Experts
- Definition Criteria
- Geographical area and zone drafts
- Validation by the National Committee
- Public Enquiry
- Processing of Claims
- Final Area proposed to the National Committee
- AOC Decree

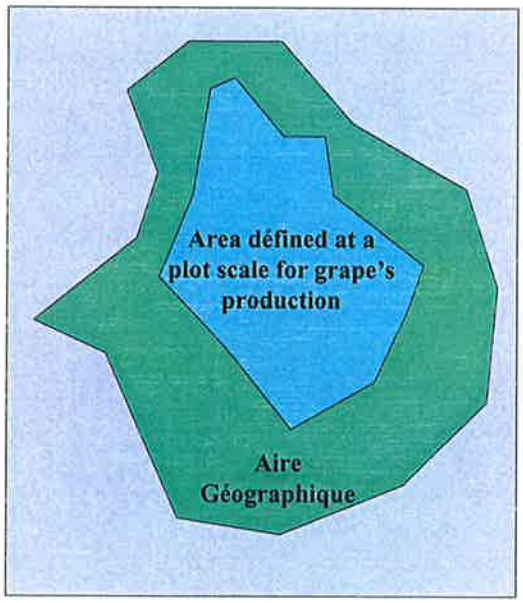
The géographical area of production

- Each area of production is defined by a list of administrative unities ("communes", "départements"),
- All the manufacturing process has to be realised in this territory.
- It is the procedure chosen for dairy



« la délimitation parcellaire »

- boundaries based on natural limits with much precision, for the entire territory of géographical area.
- The procedure is applied for all plots planted or not.
- It limits the area of crop growing.
- It is the procedure chosen for vineyard



Vineyard

Disadvantages :

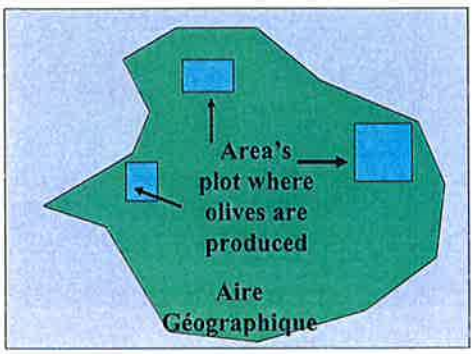
- It's a very long and costly procedure.
- It doesn't take the other characterics of products (variety, pruning…) into account.

Advantages :

- It's interesting for crops that are grouped on a small territory, with a major part of the territory occupied by the crop. It's easier to protect the territory of such limited areas.
- Each stage of procedure is legally defined, so INAO may be protected against litigations.

L'identification Parcellaire

- Inside the «aire géographique », I.N.A.O. identifies only the plots where the crop is grown, checking all the production conditions .
- It is the procedure chosen olive oil, cheesnut…



AOC Olive oil

Disadvantages :

- It is a new procedure, that has to be legally defined.
- It is difficult to protect isolated plots.

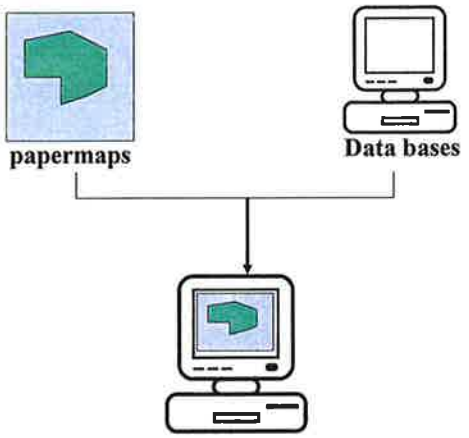
Advantages :

- It is less expensive than the first method, it makes it possible to check more aspects of process (variety,...) and to follow the modifications on plots.
- This procedure is interesting when producers are scattered on a huge territory

GEOTRACEABILITY

- I.N.A.O. manages data bases for the different products, and is working on the improvement of the management.
- The difficulties consist in finding a common tool to the numerous organisations that work with the producers and use the datas with distinct needs and in updating regularly the datas.
- Today the boundaries of the production areas are stored on papermaps (cadastre) and other informations are stored in data bases
- INAO is about to set up a GIS for the end of year.

Cadastre informatisé



L'INSTITUT NATIONAL DES APPELLATIONS D'ORIGINE
PDO and PGI

• • • • • • • • •

Institut National des Appellations d'Origine

1. Genesis of the AOC

2. Protected Designation of Origin

3. AOC recognition procedure

4. Definition of production areas

5. Production conditions

6. Approval of products

7. Protection of "terroirs"

Institut National des Appellations d'Origine

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MARCH 2003

1 – HISTORY AND GENESIS OF THE APPELLATION D'ORIGINE

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History shows that the custom of naming products after the place where they are manufactured or harvested is very ancient. However, it was not until the late 19th century that the political powers in France, faced with the increasingly intense growth of domestic and foreign trade and above all the almost total destruction of the country's vines by phylloxera in 1870, decided to intervene.

1905: THE ADMINISTRATIVE PHASE

With the Law of 1st August 1905, the public authorities entrusted the **administration with the task of defining the zones in which agricultural produce could benefit from a designation of origin.**

1919: THE LEGAL PHASE

The public powers gave **the courts the mission of defining the designation zones and of defining the "local, loyal and consistent" customs (Law of 6 May 1919)..**

1935: CREATION OF THE COMITE NATIONAL VINS ET EAUX DE VIE

Decree of 30 July 1935.With this law, the recognition and regulation of AOCs were entrusted to a public establishment, the INAO, whose decision-making body, the Comité National, was given the power of proposal to ministries.

1990: EXTENSION OF THE AOC TO INCLUDE DAIRY PRODUCE AND AGRIBUSINESS PRODUCTS OTHER THAN WINES AND SPIRITS

The economic success of AOC wines and eaux-de-vie since 1935 encouraged the legislator to extend the competence of the INAO to all unprocessed or processed agricultural or food products.. **The Law of 2 July 1990 saw the creation of 2 more National Committees, covering dairy produce and agribusiness products.**

1992: THE PROTECTION OF GEOGRAPHIC DESIGNATIONS

On 14 July 1992, a European regulation established a system of protection for geographic names, involving two notions: Protected Designation of Origin (PDO) and Protected Geographic Indication (PGI).
On 3 January 1994, a French law detailed the principles designed to transfer this European legislation:

- only AOCs could become PDOs
- only labels and certificates of conformity could achieve European protection in the framework of the PGI
- The INAO was given responsibility for the defence of the geographic names of products under PGI through a Mixed Commission.

1999: PROTECTED GEOGRAPHIC INDICATION

After the broadening of its competences in 1990 to include dairy produce and agribusiness products, the Agricultural Orientation Law published on 9 July 1999 entrusted the Institut National des Appellations d'Origine with the management of **Protected Geographic Indications (PGI), and provided for the creation of a fourth National Committee..**

2 – APPELLATION D'ORIGINE CONTROLEE (PROTECTED DESIGNATION OF ORIGIN)

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THE CONCEPT

The *Appellation d'Origine Contrôlée* identifies an unprocessed or processed agricultural product, which draws its authenticity and typicity from its geographical origin.

This status guarantees a close **link between the product and the *terroir***, which is a clearly defined geographical area with its own geological, agronomical, climatic, etc. characteristics, as well as particular disciplines self-imposed by the people in order to get the best out of the land. This notion of *terroir* encapsulates both natural and human factors, and means that the resulting product may not be reproduced outside its territory.

The purpose of the AOC is thus to protect a **duly established reputation**.

The production conditions of the product are also the result of a culture and a history: they include **local, loyal and consistent customs and are included in the decree**.

Finally, **products with the AOC status must be submitted for approval under the responsibility of the INAO, including an analytic and organoleptic examination**.

AOC: EVER-INCREASING INTERNATIONAL RECOGNITION

The definition of an *Appellation d'Origine* was set by **the Law of 1919** :
"An *Appellation d'Origine* includes the name of a country, a region or an area serving to designate a product from that country, region or area, and with qualities and characters that exist **due to the geographical environment, comprised of natural factors and human factors**."

The Decree of 30 July 1935 defines *Appellations d'Origine Contrôlée* for viti-viniculture products.

The Law of 2 July 1990 broadens this concept to include all unprocessed or processed agricultural or alimentary products that meet the above requirements. These products can only benefit from AOC status if they "possess a duly established reputation and have been subject to an approval procedure".

Each AOC is defined by decree following a proposal by the INAO. The decree defines the production area, and determines the production and approval conditions for the product.

This status and the steps taken to achieve it are now recognised and protected on the European level (regulation 2081/1992 PDO/PGI for products other than wines and spirits, regulation 1493/1999 for VQPRD – *Vins de Qualité Produits dans une Région Déterminée*).

Wines are ruled by a specify regulation n°1493/99 on the common organisation of the market in wine which provides each member state the publication of a list of its geographical names used to name a quality wine produced in specified regions.

It creates a protection for the benefit of these geographical designations, granted following a registration procedure involving the authorities of the member States.

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3 – THE RECOGNITION PROCEDURE FOR APPELLATION D'ORIGINE CONTROLEE

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The request to be recognised as an *Appellation d'Origine Contrôlée* is made by the producers of the appellation grouped together in an **Appellation Defence Syndicate**.

As the *Appellation d'Origine Contrôlée* derives its specific nature from restrictive production conditions, these conditions must be perfectly accepted by the producers themselves.

The first phase in the recognition process for an *Appellation d'Origine Contrôlée* is therefore the **application of the group of producers in question** that is submitted to the local office of the INAO.

To back up their application, they present a file comprising all the technical, economic, historical and legal documentation necessary to demonstrate the link between the product and its *terroir*, the usage related to it over the ages, its originality and its reputation.
The request is examined by the services of the INAO that begin by taking a look at both the content and the form of the file with the professionals. This is the first stage of the collaboration between the service and the professionals on the content of the file.
Once the file has satisfied the abovementioned minimum conditions, it is presented to the competent Regional Committee, if there is one.
Accompanied by the assessment of the Regional Committee, the application is then **sent on to the competent National Committee**.

In order to examine the application, **the National Committee appoints a Commission of Enquiry from** among its number, composed of professionals who must not be from the region in question. This commission is charged with the task of carrying out an in-depth study of the application and submitting a report to the National Committee so that it can take its decision.
The Commission of Enquiry goes to the area in question, studies the product, its geographical area and the sector and production conditions to analyse the economic, legal, sociological and technical environment.
Within the context of its work, it may also call on external scientific skill.

At the end of this first mission, a report is written up and submitted to the National Committee.

The National Committee may, in the light of the conclusions of the Commission of Enquiry, judge that the product does indeed correspond to the definition of an *Appellation d'Origine Contrôlée*, may ask for further information from the Commission or may reject the file.
If the National Committee decides in favour of the file, the Commission of Enquiry then continues its work with the applicants to come up with a precise definition of the appellation production conditions.
In parallel, external experts are called in by the INAO (geologists, pedologists, historian's etc.) to define the production area. Public Enquiry procedures are implemented to define the boundaries of and the plots contained in the future appellation.
It is from these exchanges between the Commission of Enquiry, the National Committee and the Syndicate (which receives all the reports of the Commission) that a draft decree is finally written up to recognise the appellation of origin to establish its boundaries and to define its production conditions.

When the National Committee approves the final report of the Commission of Enquiry and therefore recognises the suitability of the product to benefit from an *Appellation d'Origine Contrôlée*, **it is in fact approving the draft decree to recognise the *Appellation d'Origine Contrôlée*.**

RECOGNITION OF AN A.O.C.
MODIFICATION OF A PRODUCTION CONDITION

• • • • • • • • •

Application from the Syndicate

INAO Services

Assessment by the Regional Committee (if there is one)

National Committee
Nomination of a Commission of Enquiry
Composed of members of the national committee, professionals
who are traditionally selected from outside the region in question

Report written up
giving its opinion on the application
and possibly setting the production conditions

National Committee
Presentation of the report

Approval, Adjournment or Rejection

Nomination of a Boundaries Commission

National Committee
Approval of the boundaries
Approval of the draft decree written up by the services of the INAO

Transmission of the draft decrees to the Ministries
For signature and publication in the "Journal Officiel"

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4 – DEFINING THE BOUNDARIES OF THE PRODUCTION AREAS

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All A.O.C.s are primarily and necessarily linked with the existence of ***terroirs***: each of these can be defined as a system in which there are complex interactions between a set of **human factors** (techniques, **collective usage etc.**), agricultural production and a **physical environment**. The *terroir* is valorised by a product to which it confers an original, **typical nature.**

The INAO is therefore called upon **to define the boundaries of a place of production** which must be based, on the one hand, on natural factors composed of the set of natural elements characterising a geographical entity, that is to say mainly the geology, pedology, climatology, topography, natural flora and hydrograhic network, and on the other, on human factors comprising the set of elements requiring human intervention, that is to say production usages and use of the name. The method used by the INAO to define these boundaries must therefore take into account the complex local realities, and only the observation of these realities on site enables us to determine the most relevant definition criteria, criteria which may well vary from one region to another.

The boundaries materialise portions of territory within which the *Appellation d'Origine* is produced. They are defined by a list of administrative entities (*départements*, *cantons, communes*) as well as by natural geographic limits.

THE PROCEDURE

The National Committee appoints a **Commission of Enquiry** entrusted with the task of studying the syndicate's application on site and whose main mission is to determine the **general principles governing the drawing up of the boundaries**. This commission is composed of professionals of the National Committee and it submits its finding to that Committee.

A **Commission of Experts** is then appointed. Its members are chosen for their scientific and technical knowledge in disciplines such as geology, pedology, agronomy, history, geography, oenology, etc. The experts have the objective of fixing or modifying the boundaries of the production areas and appellation zones. To begin with, this commission determines **objective criteria for the definition on** the basis of general principles. The application of these criteria then leads to a draft project.

The work on defining the boundaries is divided into two phases:

The Enquiry:
The draft project drawn up by the experts is submitted to the National Committee. If the latter gives its approval, the project is put up for Public Enquiry for a period of 2 months. This involves informing people locally of the project via the press and making the project available to the public in the town halls of the zone in question.

Examination of Claims
The claims received during the Public Enquiry are studied by the Commission of Experts. The final geographical area and its zones are proposed to the National Committee under cover of the Commission of Enquiry. If the latter give sits approval, the project is made official in the A.O.C. Decree.

7 – BOUNDARY DEFINITION PROCEDURE

• • • • • • • • •

Commission of Enquiry

Validation by the National Committee

General principles

Commission of Experts

Definition Criteria

Geographical area and zone drafts

Validation by the National Committee

Public Enquiry

Processing of Claims

Final Area proposed to the National Committee

AOC Decree

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5 – PRODUCTION CONDITIONS

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An AOC product is a finished product which can be recognised by consumers.

The conditions of production are composed of all the elements to be respected to achieve the AOC status. These elements stem from local customs and practices which give the product its character and its distinctive local features.

For the *Appellations d'Origine*, the existence of local customs and ways is an indispensable condition.

The conditions of production include a set of jointly established rules concerning the product. By doing an inventory of these rules, we can attempt to establish a classification shared by all AOC products. By convention, we could, for example, establish that an application for AOC recognition must be examined in six fundamental stages:

1. The production area

This includes

- the area of production of the raw materials
- the area of processing

2. The origin of raw material (animal or vegetable)

3. The management methods used for crops and livestock (e.g. vine pruning, herd management)

4. The methods for collecting or harvesting the raw materials

Date and period of milk collection, manual grape-picking, picking olives off the tree only

5. The processing and collection of the harvest

Vinification of the full grape-bunch, use of the milk within a defined period of time

6. **The preparation of the product** (e.g. preparation of cheese in a copper container for Comté, minimum refining time in the cellars for Roquefort, compulsory ageing of wine).

The conditions of production are written up in the appellation decree.

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6 – APPROVAL OF PRODUCTS

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THE NOTION OF APPROVAL

It soon became apparent after the creation of the Comité National Vins et Eaux-de-Vie in 1935 that a product meeting all the production requirements for an AOC could nevertheless present defects or a lack of typicity, depending on the know-how of the producer.
This is why some professionals started submitting their production for analytic and organoleptic inspection around the 1950s (Pineau des Charentes in 1946, Bordeaux Clairet in 1951, Entre-Deux-Mers in 1953, etc.).
The European Community regulations in 1970, then the French ones in 1974, stipulated the practice of analytic and organoleptic examination and generalised this practice to include all viticulture AOCs.

This purpose of the ultimate phase in the AOC system was to validate:

- Compliance with production conditions
- Compliance of the products with particular criteria and aptitude for consumption (analysis).
- Presentation by the products of specific organoleptic characters, designated as "typicity".
- The appreciation of these characters is recognised as mainly a task of professionals of the AOC.

The approval procedure for a product is an essential element in the AOC. The approval commits the INAO with regard to both producers and consumers.

THE METHODS OF IMPLEMENTATION OF THE APPROVAL

Procedures specific to each production of AOC (still wines, sparkling wines, eaux-de-vie, dairy products and other agribusiness products) have been defined by regulations following proposals by the National Committees of the INAO, although there are some constants that are to be found in each sector.

The approval operates annually among all producers using an AOC status, according to two principal systems:

- for products the entire volume of which can be granted at the same time; an approval certificate mentioning the volume selected for AOC is issued,
- for products produced in stages over all or part of the year (e.g. cheeses); samples are taken throughout this period to verify compliance of the products with the AOC.

In all cases, the producer's commitment to the appellation requirements and thus his/her commitment to comply with the production conditions of the said appellation are subject to declaration documents with the INAO.
(e.g. declaration of aptitude for olive producers and for manufacturers of olive oil).
Based on these declarations, cross-checked if necessary with other sources (e.g. computerised winemaking declarations, operation or company records), the INAO proceeds to the inspection of the production conditions using documentary methods and by making visits to the sites.
For nearly all appellation products, the inspection of production conditions is supplemented by an examination of the product, including analyses and an organoleptic examination – which is mainly visual, olfactory and gustatory – carried out by commissions of professionals, producers, traders, oenologists and wine technicians, under the responsibility of the INAO.

7 – PROTECTION OF TERROIRS

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The *terroir* is a non-reproducible and limited entity. It therefore merits protection. The objectives of the INAO mission are therefore the protection of a collective patrimony through the maintenance of the appellation and the sustainable operation of farms.

EFFECTS ON THE TERROIR

Harmful effects on the area of production may be temporary or irreversible; in the latter case they definitively denature a component of the environment (subsoil, soil, climate, hydrology, etc.).
At present, the **pressure of urbanism** is one of the major elements in the definitive "shifting" of farmland. Infrastructures also have major consequences on farming, particularly by their dividing effect (high-speed trains, motorways, roads, electricity lines, etc.). Finally the exploitation of subsoil by quarrying or gravel extraction operations presents a real risk of loss of appellation surface area.

REGULATORY TOOLS

Article 9 of the Law of 19 July 1976 enforces protection against **establishments classified as "hazardous, insalubrious or unsuitable"**, which are assessed by the INAO. Article 16.1 of this same law stipulates that the assessment by the Ministry of Agriculture is required prior to any **authorisation granted to operate or extend a quarry** in an appellation area. The Ministry's assessment is given after consultation with the INAO.

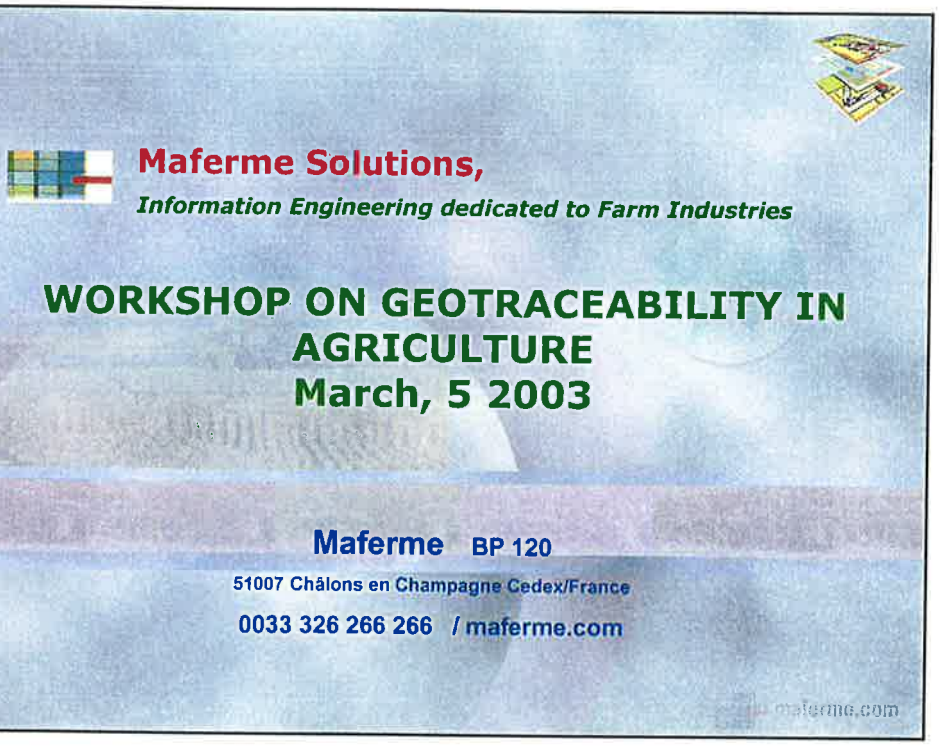
Article R 11.16 of the Compulsory Purchase Code stipulates that the Ministry of Agriculture give an assessment after consultation with the INAO when a compulsory purchase project involves parcels of land planted with vines under the AOC and previously declared of public utility.

In 1990 specific legislative provisions were adopted for the benefit of AOCs. Since the **Law of 2 July 1990 (repeated by article L641.11 of the Rural Code)**, any land development or town-planning and any road-building, construction, soil or subsoil exploitation, economic activity installation project in AOC zones, likely to have a harmful effect on the area, the production conditions, the quality or the image of the product, must be subject to consultation with the Ministry of Agriculture and the INAO.

Articles 108 and 111 of the Agricultural Orientation Law of 9 July 1999 adds to the procedures put in place for the protection of *terroirs*, by providing for consultation with the INAO on all **town-planning draft documents** before they are made public or approved. This law also creates *Zones Agricoles Protégées* (ZAP) and *Plans d'Occupation des Sols*. The INAO is consulted before their creation.

By means of the protection of defined areas, the INAO is involved in the development of the territory and the fight against rural abandonment and uncontrolled urbanism.

The Solidarity and Renewal Law of 13 December 2000 implements basic rules that are common to town planning. These guidelines become territorial coherence schemes and the *Plans d'Occupation des Sols* (POS) are replaced by *Plans Locaux d'Urbanisme* (PLU).
This new urban planning system should give a more global, more coherent view of the different town-planning documents, and long term, this should modify the work performed by the INAO in giving its assessments.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Agenda:
to describe our practical experience and our user need
• Company overview
• Our trade approach
• Concrete examples
• What implementation strategy
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The company

- A service company
- Agro-environment and traceability field
- Farming, stock breeding, vineyard industries

Our trade:

We provide tools and services for cooperatives, wine trades, food-processing industries to allow them to:

- assist farmers with environment and quality procedures
- develop productions with first and second conversions

Maferme Solutions,

Information Engineering dedicated to Farm Industries

A multi-industry offer of comprehensive tools and services designed for:

- **Industry traceability and balance control of farming practices and plots features** in comparison with any production specifications
- **Pre-qualification** of farms via a multireferential Sensible Farming approach
- **Agro-environmental plots management** by taking into account pedologic, environment and regulation features of plots in order to ensure fertilization and plant-care protection
- **Technical and commercial assistance for farming-related agents**, from agronomic follow-ups to orders taken at farmers'
- **Consolidated and standardized information provided** to the whole industry within the frame of contract commitments
- **Specific training on services sales and quality procedures**

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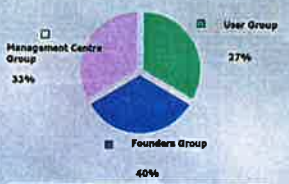
Our Company:

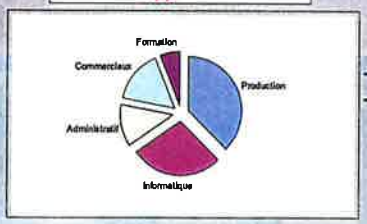
Partners



Clients

- 80 stocking bodies
- 10.000 farmers
- including service :
  - 100.000 ha for plots management
  - 250.000 tons for adequacy control

Team



- 30 people
- 10 year-experience

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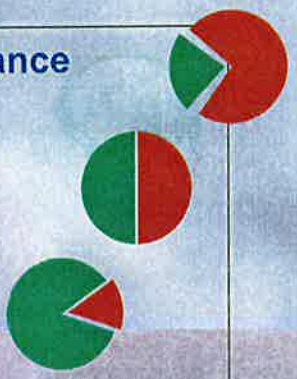
The User Group

- 15 % of cereal collection in France
- 50 % of French milling
- 85 % of French malting
  - 1er European miller
  - 1er European maltster

ARVALIS: plant Institute



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A Policy:

- Distribution via stocking bodies
- Proprietary data
- Multi-industry, simultaneous management and instant adequacy control

And Targets:

- 100 collectors / 25 000 farmers end 2003

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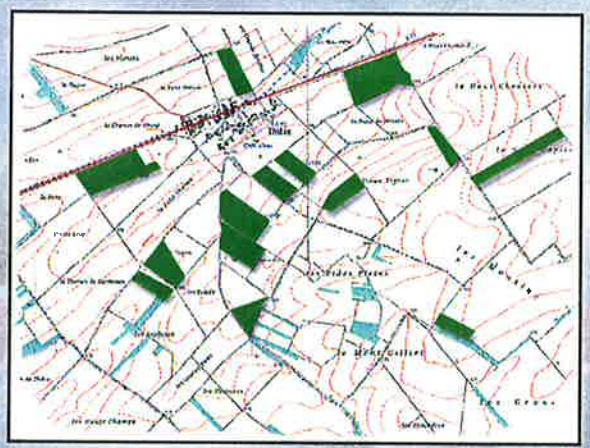
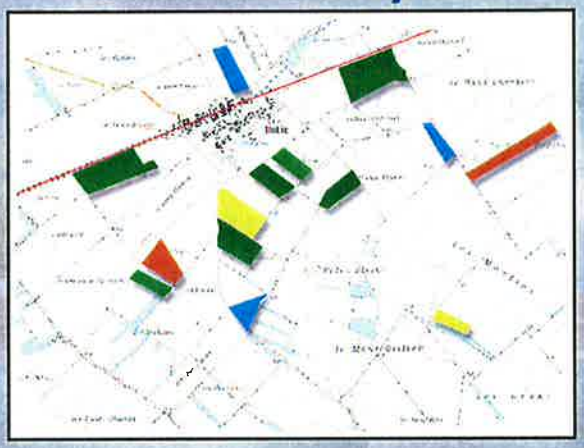
Our Trade Approach

- We enter data with the farmer's implication
- Including tools
- Lots of services
- And more & more educational skills

A complex issue, why?



A farm means: 5 to 10 different crops...



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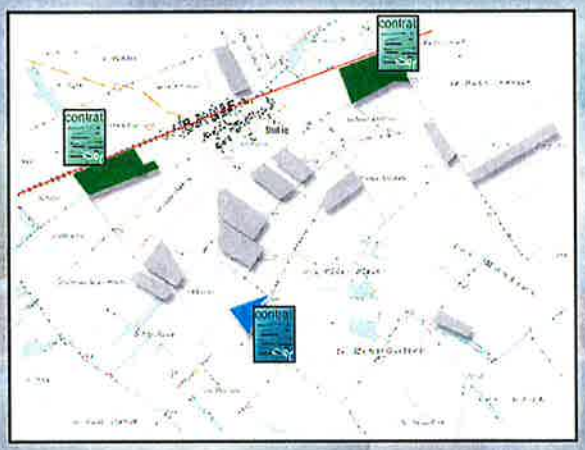
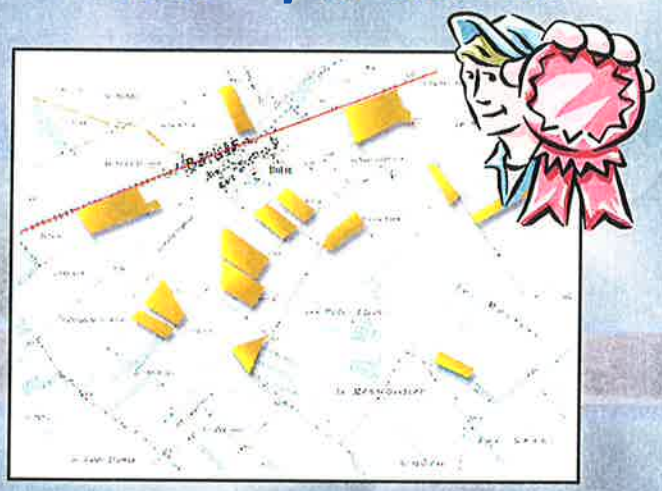
quality contracts ...

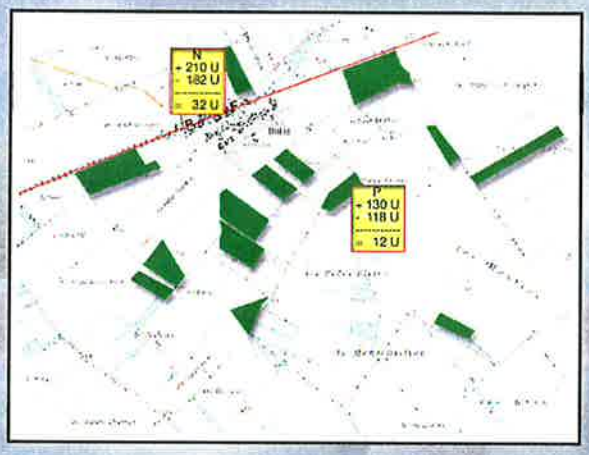


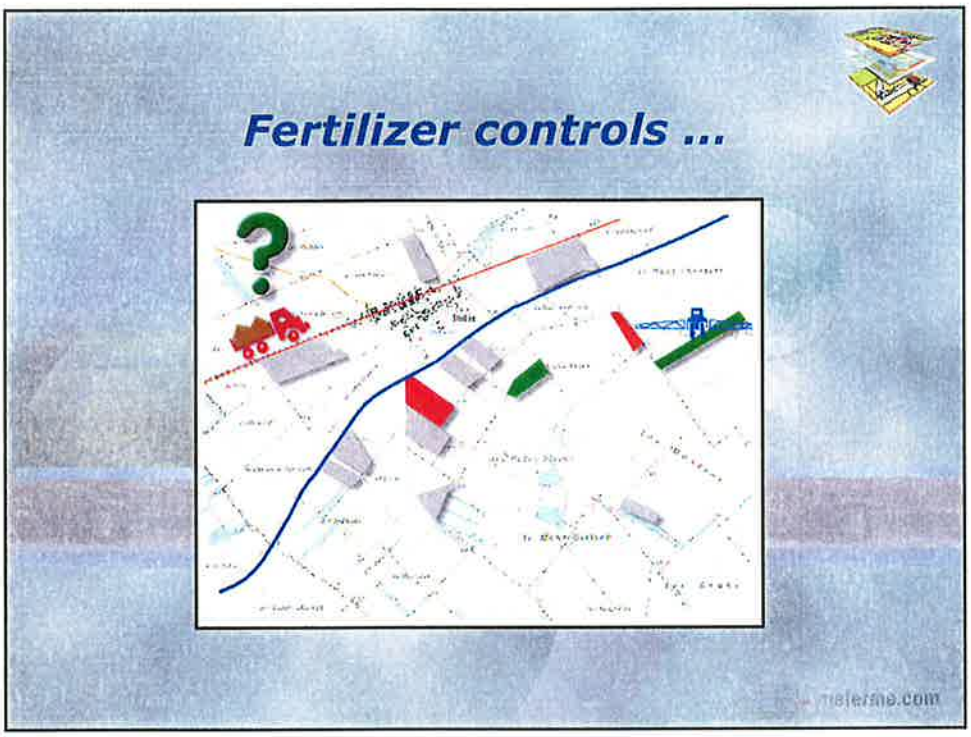
maferme.com

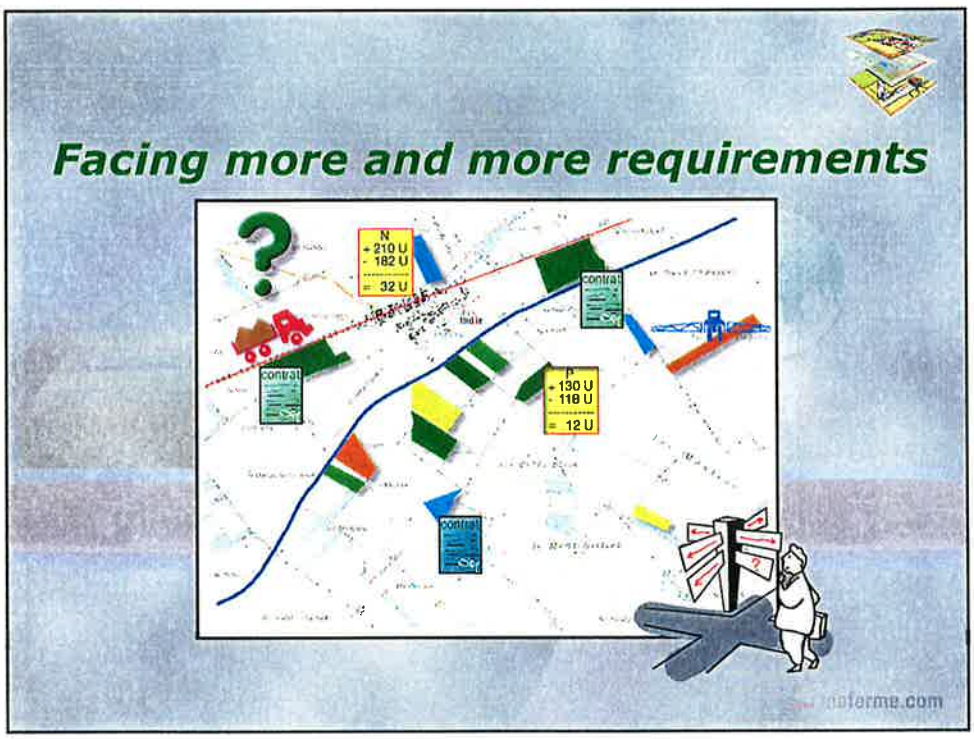
Common practices ...

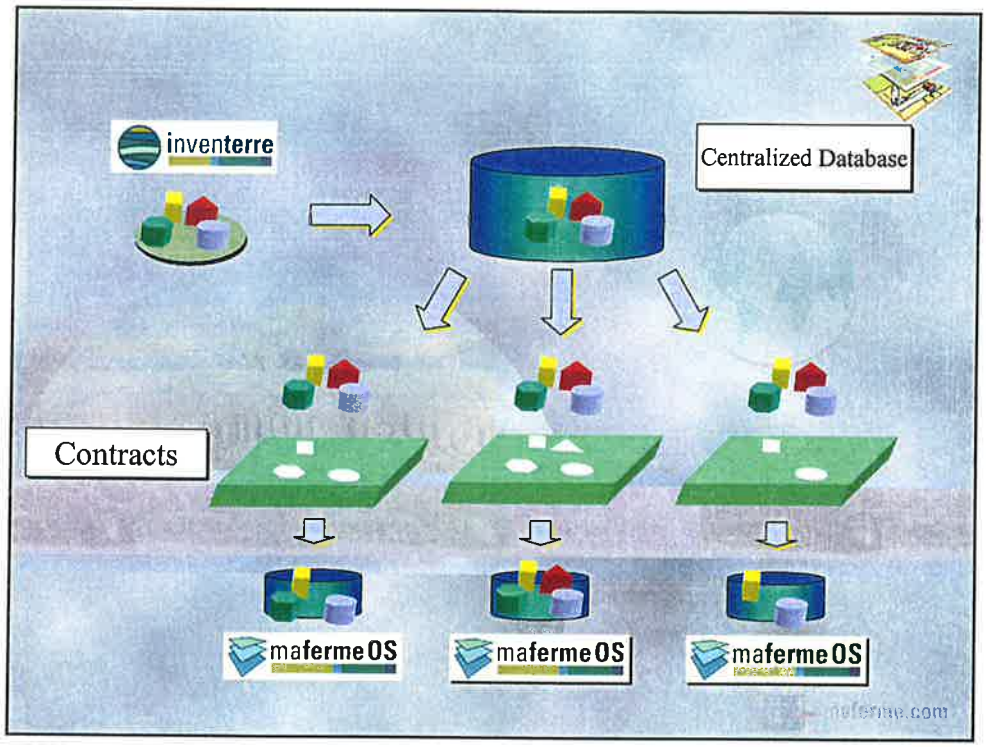


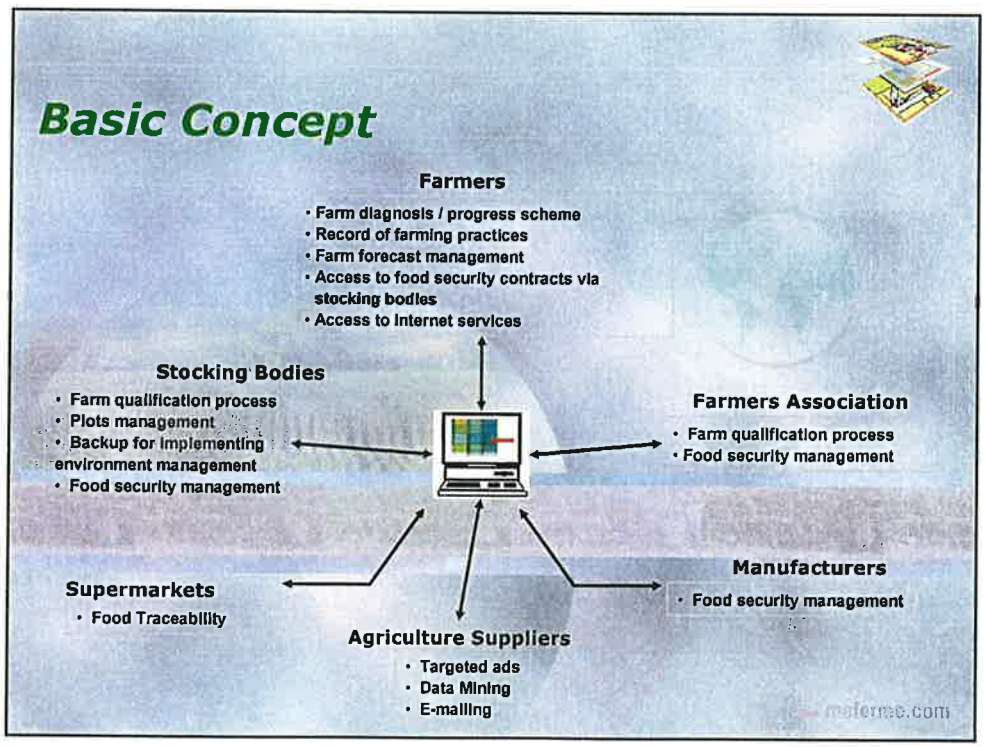
Environment-linked obligations ...




Fertilizer controls ...
?
Inde
nsferme.com


Facing more and more requirements
?
N
+ 210 U
- 182 U
= 32 U
Inde
contrat
P
+ 130 U
- 118 U
= 12 U
nsferme.com


inventerre
Centralized Database
Contracts
maferme OS
maferme OS
maferme OS


Basic Concept
Farmers
• Farm diagnosis / progress scheme
• Record of farming practices
• Farm forecast management
• Access to food security contracts via stocking bodies
• Access to internet services
Stocking Bodies
• Farm qualification process
• Plots management
• Backup for implementing environment management
• Food security management
Farmers Association
• Farm qualification process
• Food security management
Supermarkets
• Food Traceability
Agriculture Suppliers
• Targeted ads
• Data Mining
• E-mailing
Manufacturers
• Food security management

A simple Concept

quickly complicated by:

- Information entry
- Data quality/truth
- Strategic competition of participants

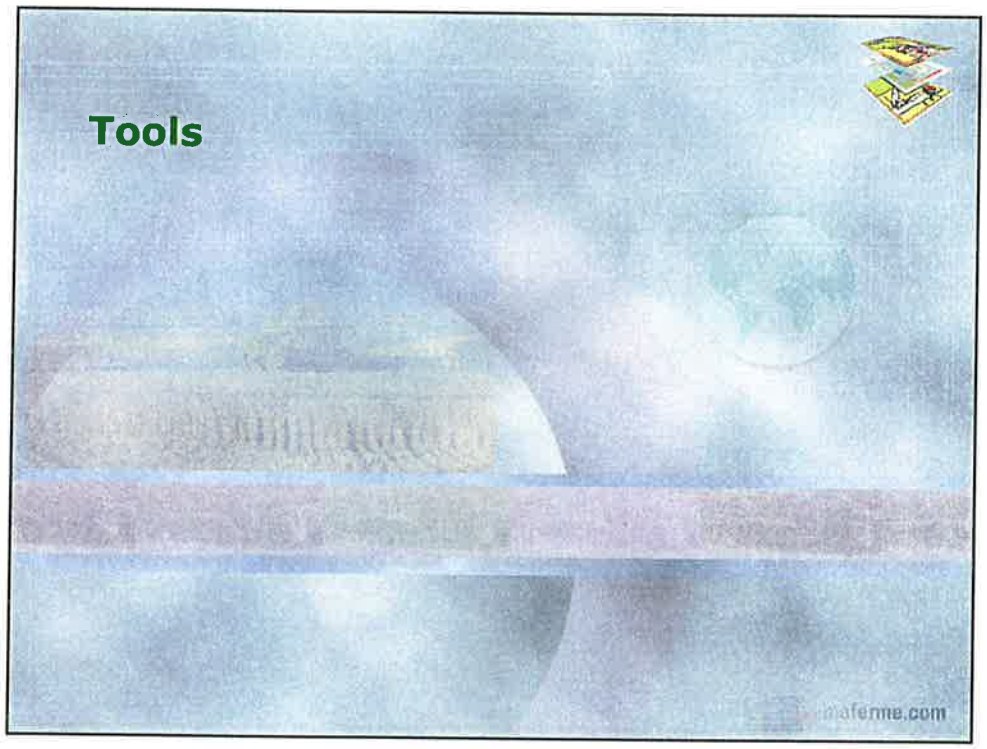
For a larger offer

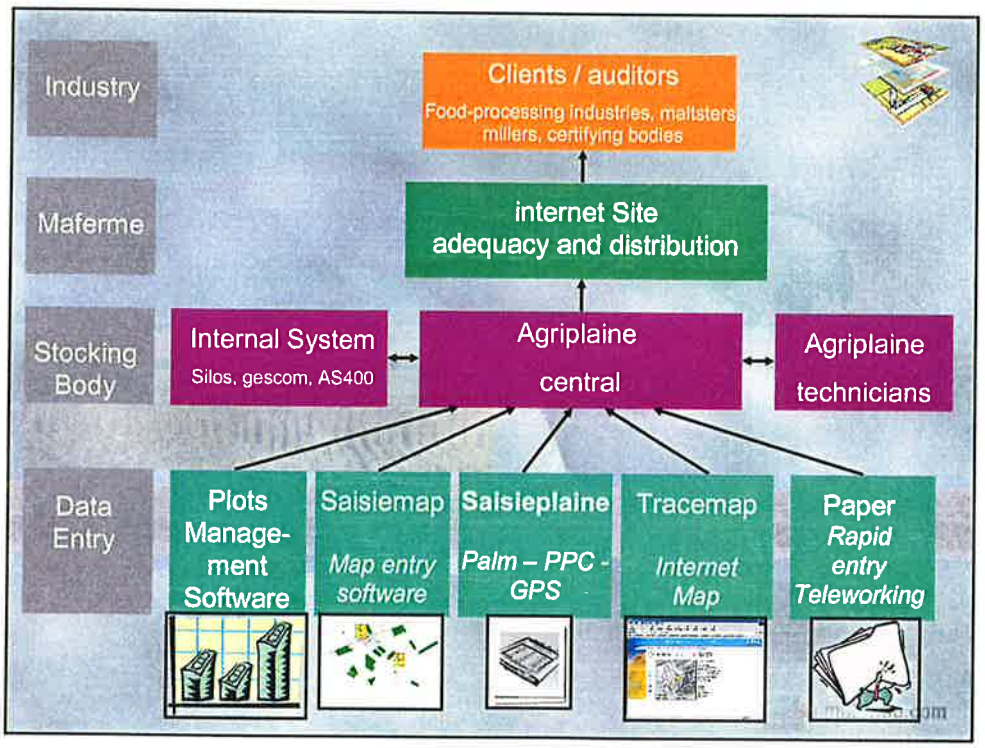
maferme.com

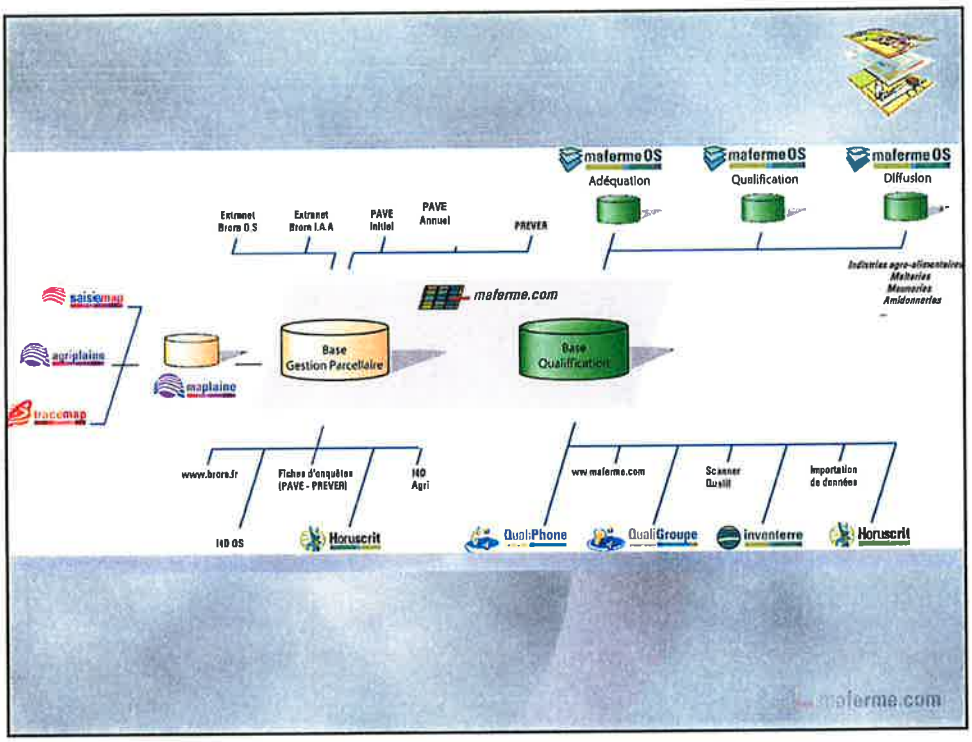
A Global Offer

	Tool	Service
Traceability Plots	Agriplaine SB and ARC	Industry contract and agro-environmental management
Qualification	Maferme Qualification	Autodiag

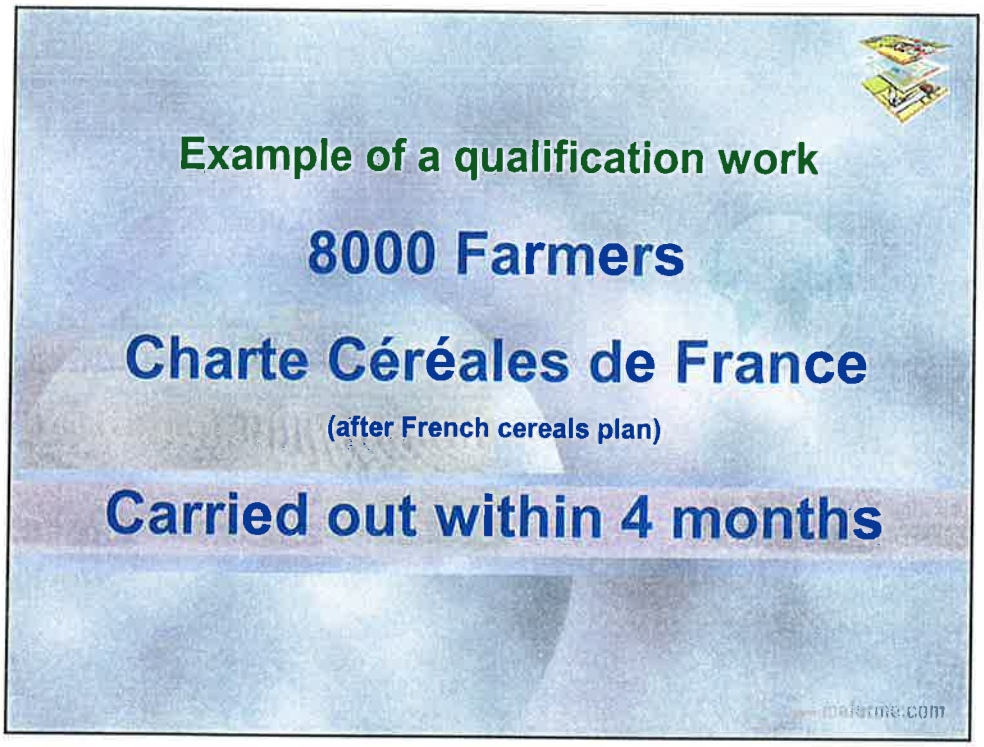
maferme.com

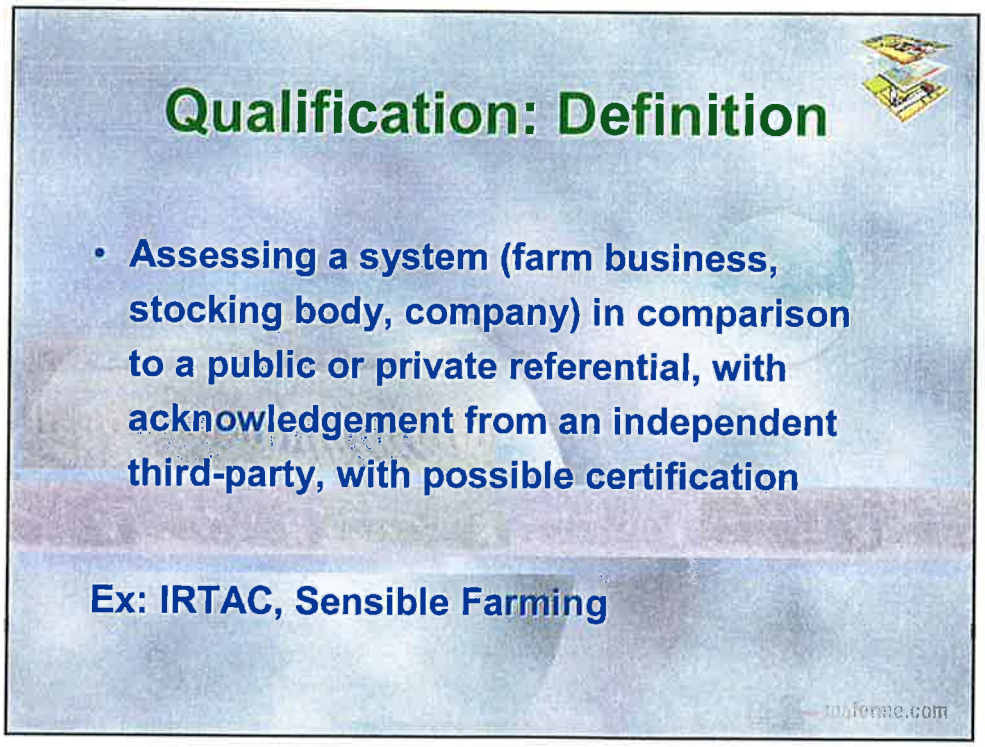

Tools
maferme.com


Industry
Clients / auditors
Food-processing industries, maltsters millers, certifying bodies
Maferme
internet Site adequacy and distribution
Stocking Body
Internal System
Silos, gescom, AS400
Agriplaine central
Agriplaine technicians
Data Entry
Plots Manage-ment Software
Saisiemap
Map entry software
Saisieplaine
Palm – PPC - GPS
Tracemap
Internet Map
Paper
Rapid entry
Teleworking


maferme OS
Adéquation
maferme OS
Qualification
maferme OS
Diffusion
Extranet Brors D.S
Extranet Brors I.A.A
PAVE Initial
PAVE Annuel
PREVER
Industries agro-alimentaires
Malteries
Meuneries
Amidonneries
maferme.com
saisiemap
agriplaine
maplaine
tracemap
Base Gestion Parcellaire
Base Qualification
www.brors.fr
Fiches d'enquêtes (PAVE - PREVER)
IHO Agri
IHO OS
Horuscrit
www.maferme.com
Scanner Qualif
Importation de données
QualiPhone
QualiGroupe
inventerre
Horuscrit
maferme.com


Services
Qualification Example
Example of Plots Management
maferme.com


Example of a qualification work
8000 Farmers
Charte Céréales de France
(after French cereals plan)
Carried out within 4 months


Qualification: Definition
• Assessing a system (farm business, stocking body, company) in comparison to a public or private referential, with acknowledgement from an independent third-party, with possible certification
Ex: IRTAC, Sensible Farming

Qualification Works

Maferme qualification tool solution

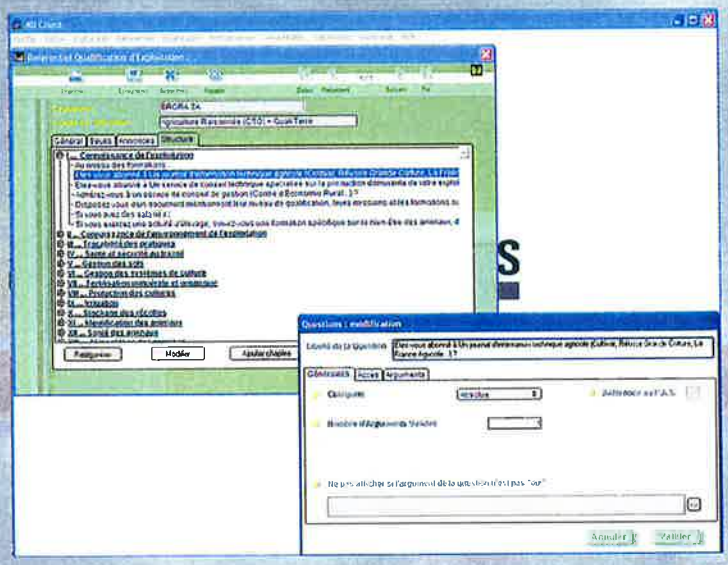
Autodiag service solution

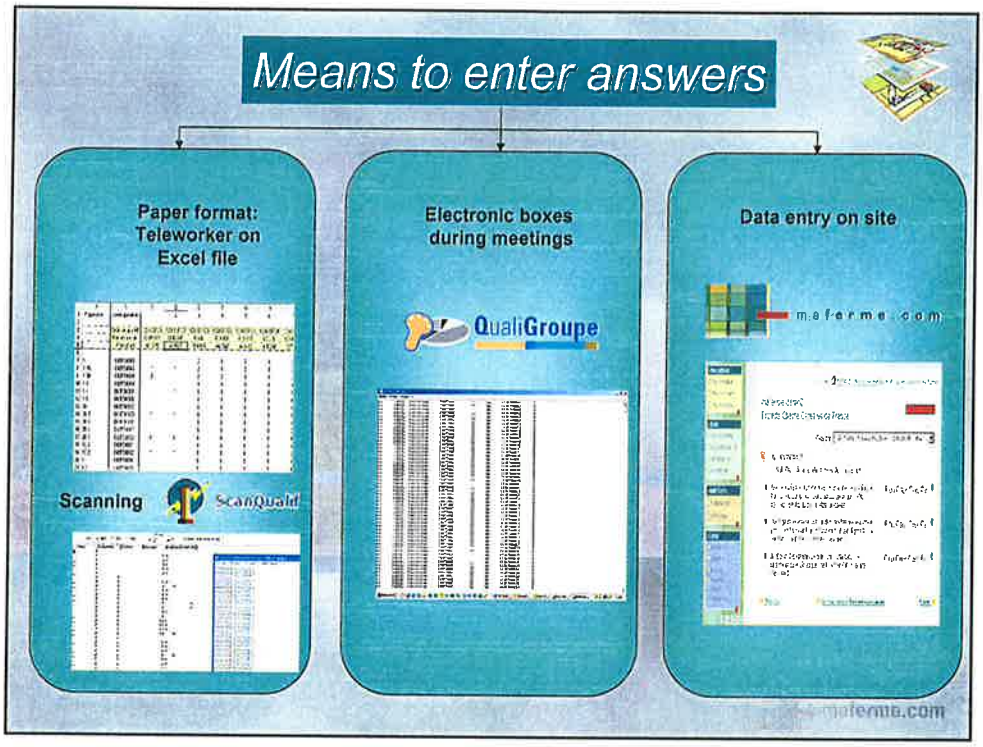
Any type of French referential: Chartes Céréales de France, Agriconfiance/NFV01-005, Potato standard, Qualiterre, Farre, AGPM corn, Sensible Farming/CSO.

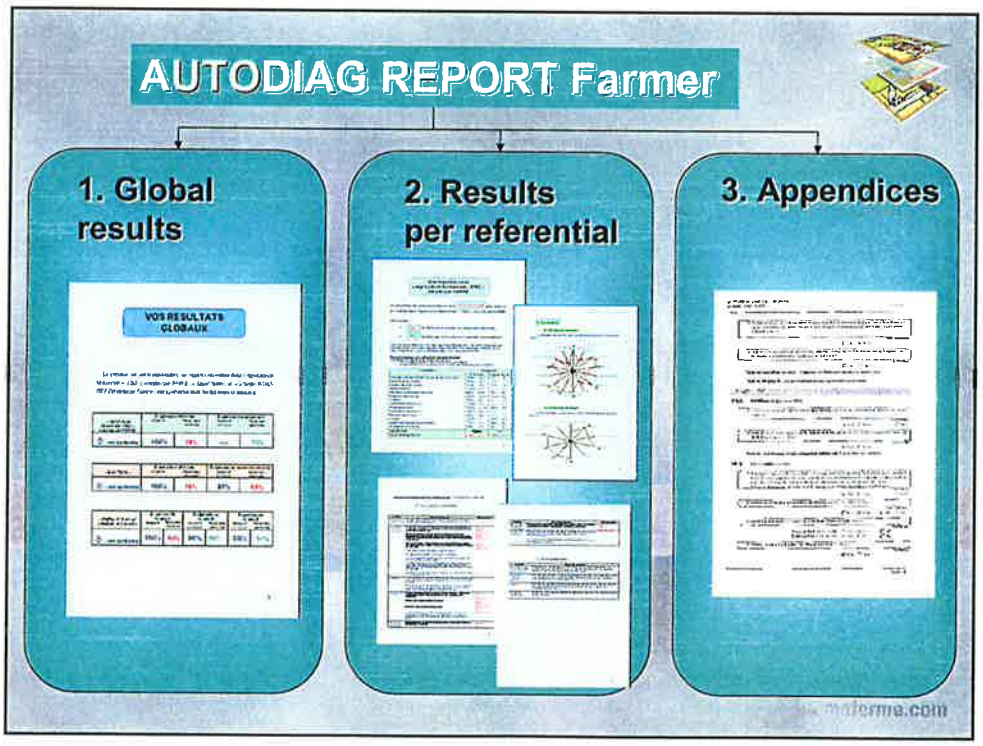
Regards the whole farm

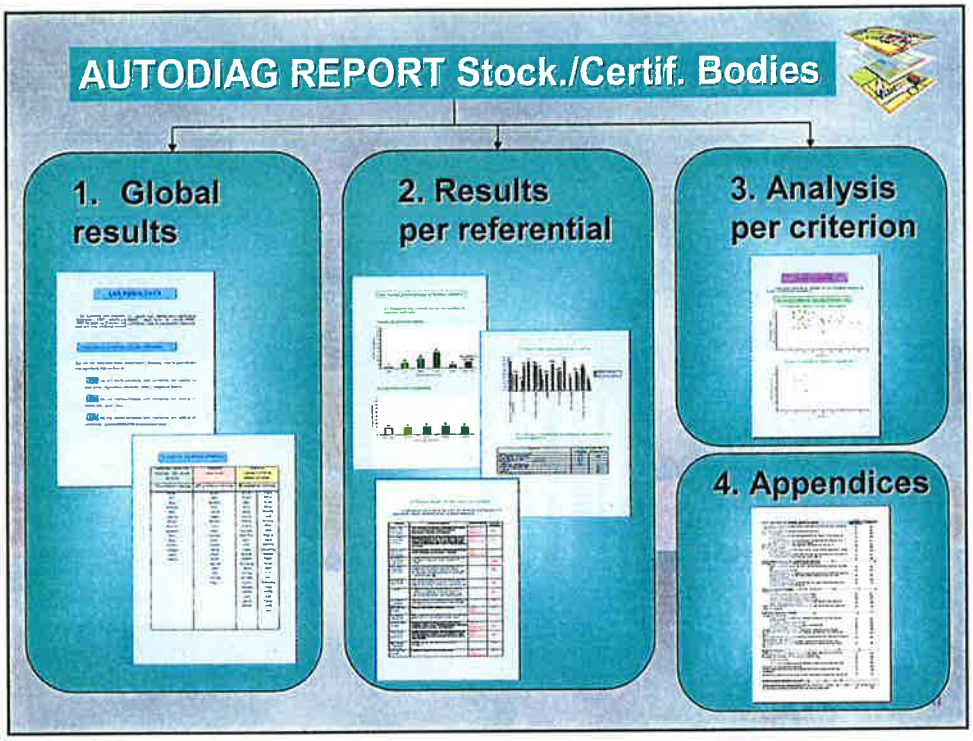
Translation with assessment questionnaire

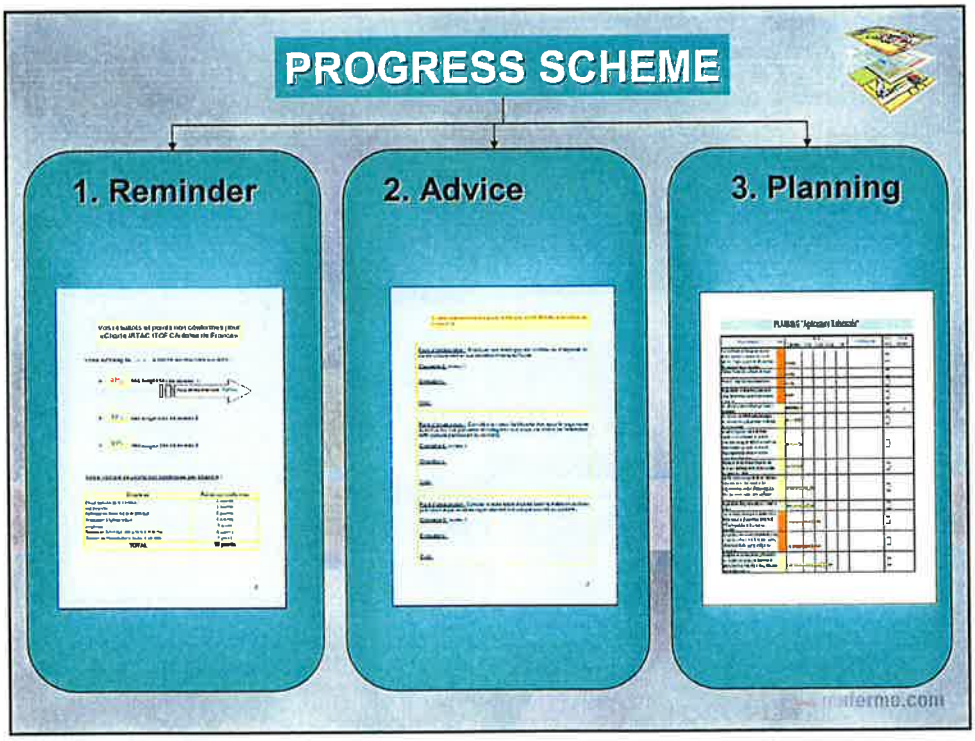
Questionnaire Creation




Means to enter answers
Paper format: Teleworker on Excel file
Scanning
ScanQuald
Electronic boxes during meetings
QualiGroupe
Data entry on site
maferme.com
maferme.com

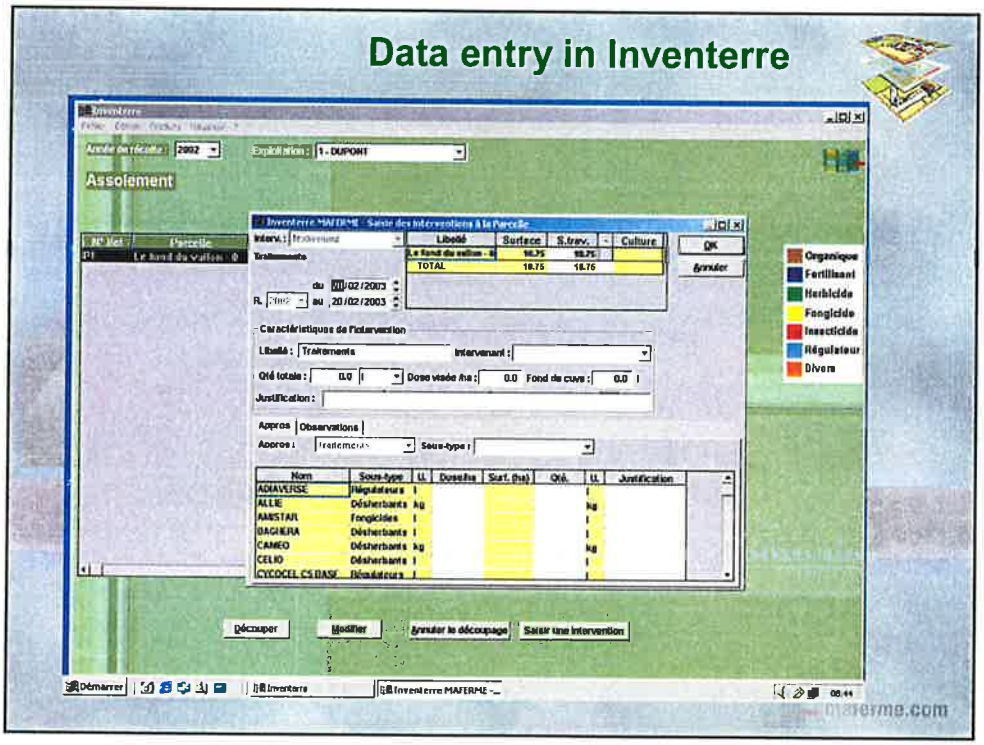

AUTODIAG REPORT Farmer
1. Global results
VOS RESULTATS GLOBAUX
2. Results per referential
3. Appendices
maferme.com


AUTODIAG REPORT Stock./Certif. Bodies
1. Global results
2. Results per referential
3. Analysis per criterion
4. Appendices

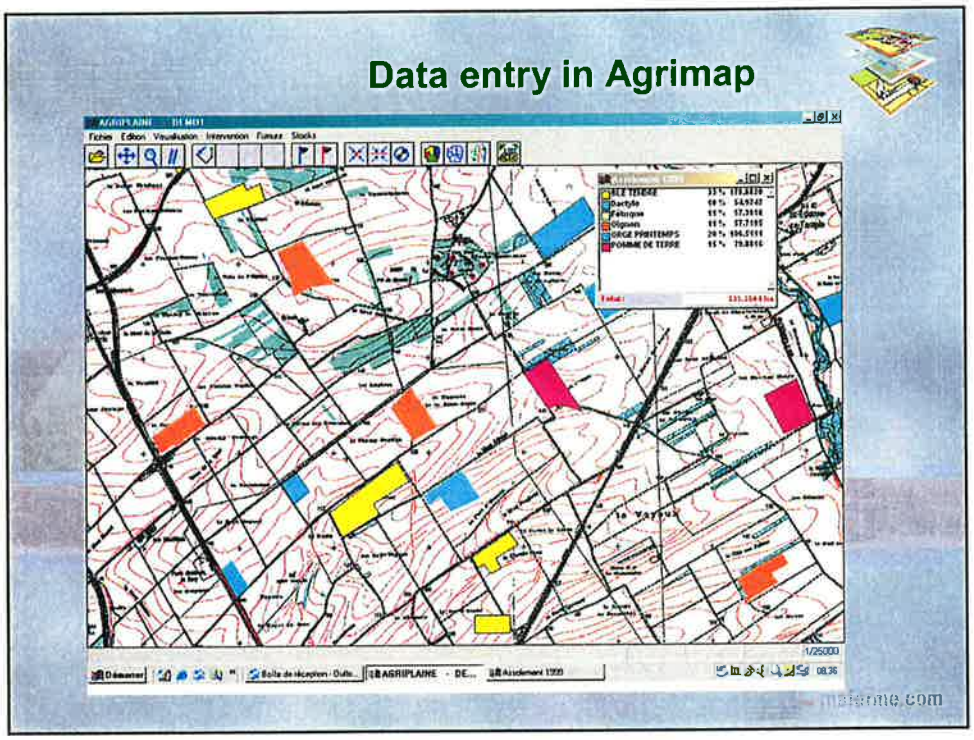

PROGRESS SCHEME
1. Reminder
2. Advice
3. Planning

Service example of plots management

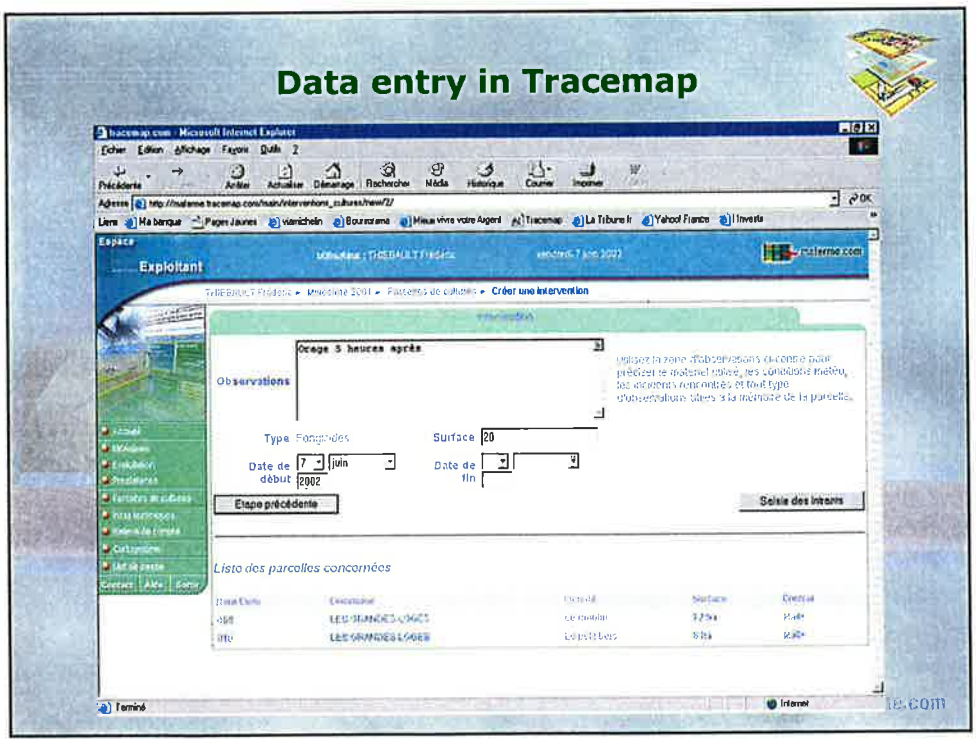
Data entry in Inventerre



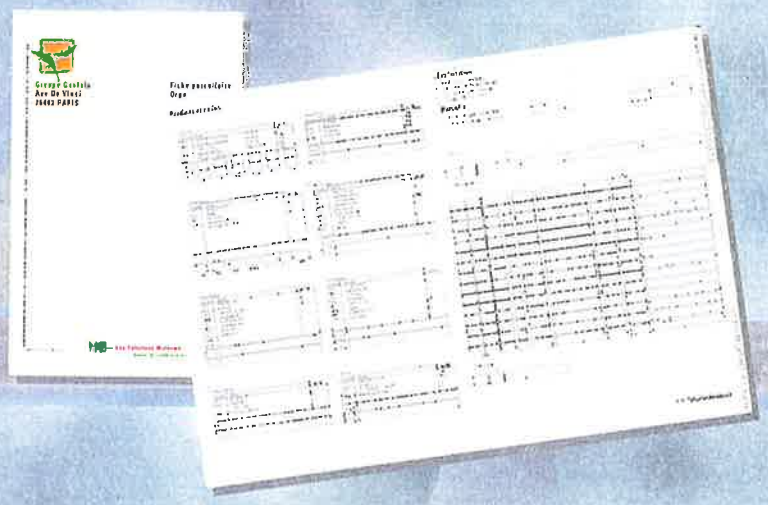
Data entry in Agrimap



Data entry in Tracemap



Scanned PLot sheets

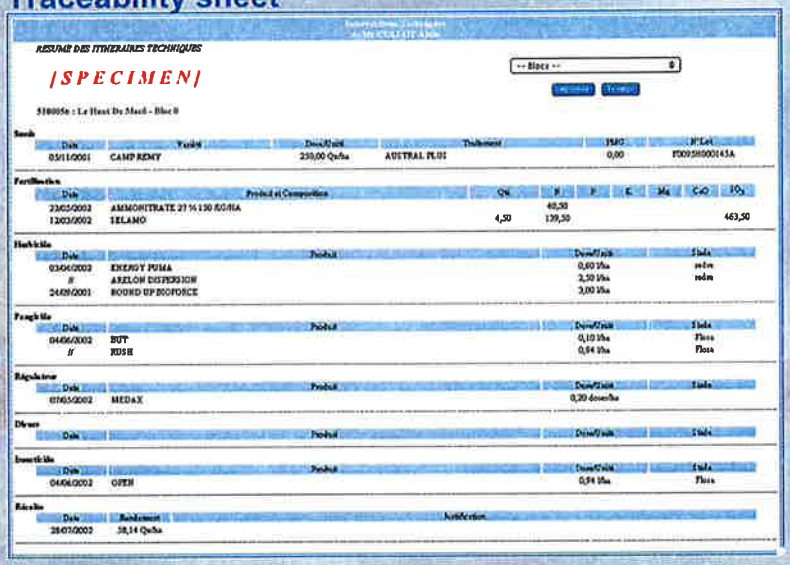


Service Provided

Service provided– food-processing industry site

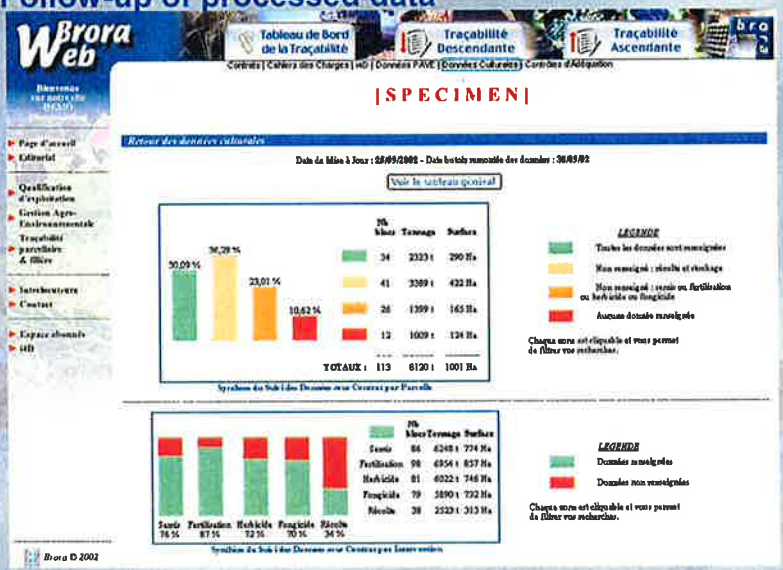
Service provided- food-processing industry site

Traceability sheet



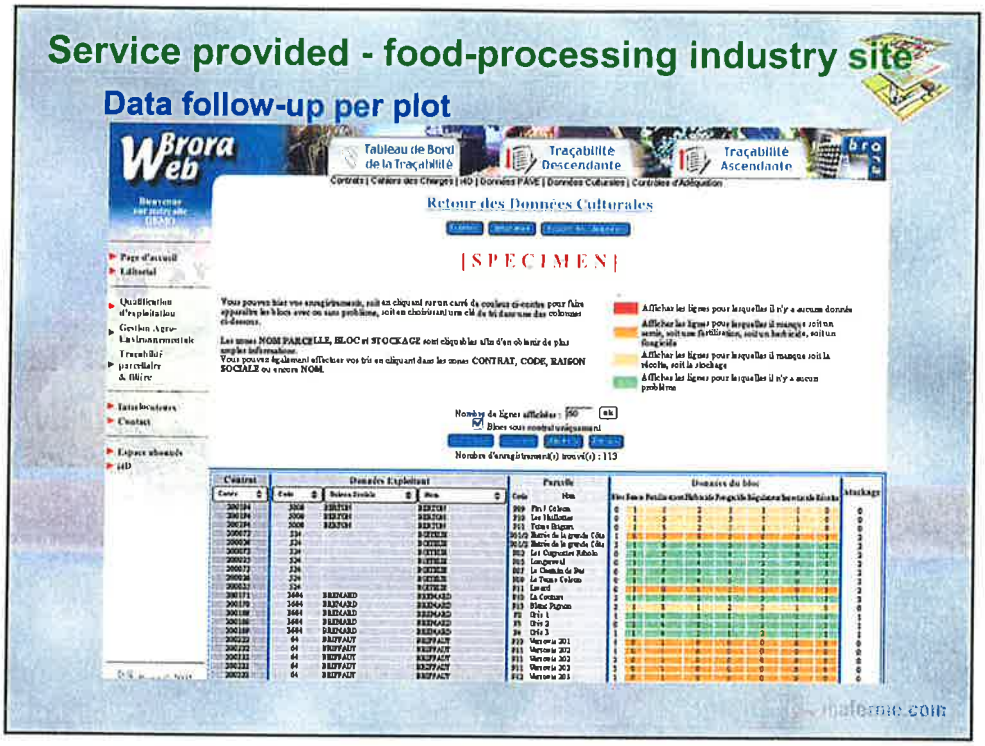
Service provided - food-processing industry site

Follow-up of processed data



Service provided - food-processing industry site

Data follow-up per plot



Service provided - food-processing industry site

Follow-up of fertilization data

A widespread plot management is not realistic today

It is reserved for commercial niches due to a real demand slack and hardly developed

It is only operable as a 100 % service to get reliable data

Data entry tools are not appropriate for mass management.

Farms will have to be qualified before tracing plots

A first simple experience for the farmer

For the stocking body, a rapid and complete implementation with loyalty

- a strong customized increase over 5 years:
  - Ex: 8 000 farms qualified year 1
  - including 600 in plot management year 2

The issue for the next three years: education

- Respecting all steps for a complete implementation of traceability:
- Training sales engineers
- Farm diagnosis < 100 questions the first year
- Progress scheme and compliance over three years.

Then to trace plots, we will need:

- to leave the keyboard

- to get an automatic, georeferenced, time sample of data,

- to gather such samples on the farmer's account

- So that he can validate the samples and pass them on as a responsible owner

GEOSYS initiative: Based on 3 criteria

1st workshop on Geotraceability in agriculture

1 **16 Years of Geographic Information Management for Agriculture**

Perfect mastering of Techniques and context

2 **The US experiment of geotraceability**

Early development of solutions for agri-insurance

3 **A demand for a positive ROI geotraceability**

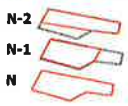
Pragmatic approach for dedicated solutions

GEOSYS

JRC March 5, 2003

Some applications

1st workshop on Geotraceability in agriculture



•Cropping and spraying history management

•Distance management (seeds, GMO…)

•Exclusion zones (pollution effect)

•Proximity zones (agri-pollution source, and human safety)

•Soil quality / Potential/ "terroir "

Logistics, marketing, environment

GEOSYS

JRC March 5, 2003

Geotraceability: Expense or income?

1st workshop on Geotraceability in agriculture

- Traceability to be conform to the regulation
  - Control , Nitrogen
- Traceability for safety
  - Exclusion zones

- Traceability for optimization of production
  - Logistics
  - Selection of optimal land/product
- Traceability for added value
  - Origination

GEOSYS

JRC March 5, 2003

The agricultural parcel: pivot between Transversality and verticality

1st workshop on Geotraceability in agriculture

Base unit **for production string**

Consummation
Distribution
Process
Gathering
Crop

Reference unit **for environment**

Parcel
Farm
Water basin
Region- Country

M. DOUCHE
Sud Ouest Légumes

GEOSYS

JRC March 5, 2003

Creating value with geography when satisfying Traceability requirements

Managing Vegetables by Computer and Cartography

CLIC

(Conduite Legumière par Informatique et Cartographie)

Implementation at
Sud Ouest Légumes

GEOSYS Bonduelle COOP DE PAL JRC, March 5, 2003

Sud Ouest Legumes

Creating value with geography when satisfying Traceability requirements

- 50/50 Partnership Euralis et Bonduelle
- 13 000 Ha of vegetables
  - Sweet corn
  - Green beans
  - Garden peas
  - Broccoli
- Production zone covering 5 departements

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A triple objective

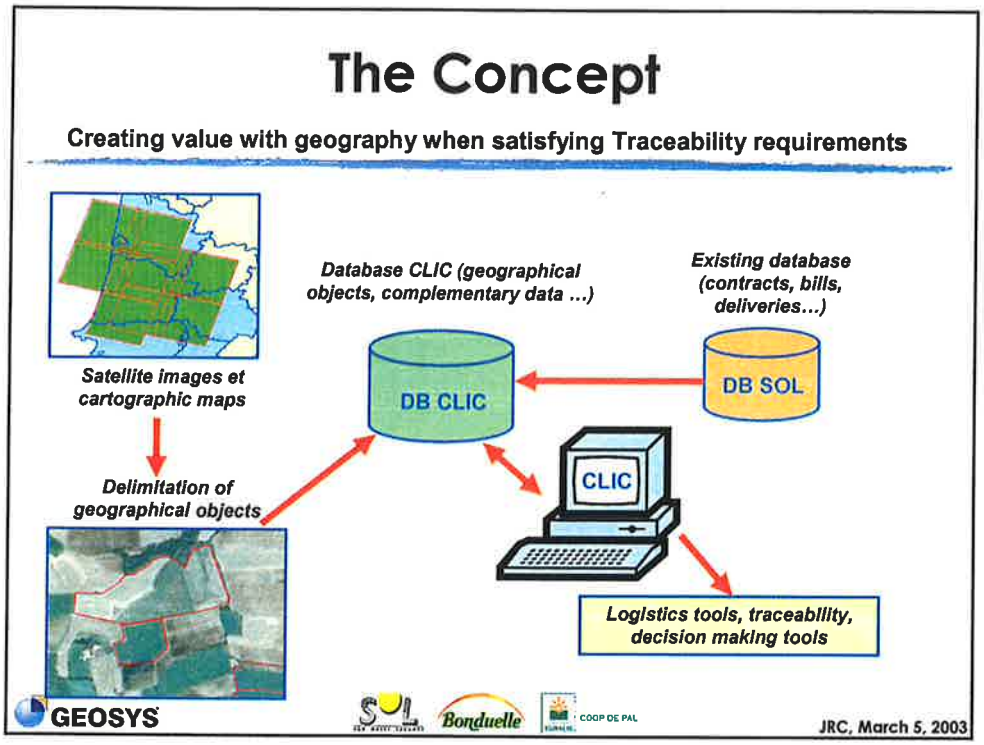
Creating value with geography when satisfying Traceability requirements

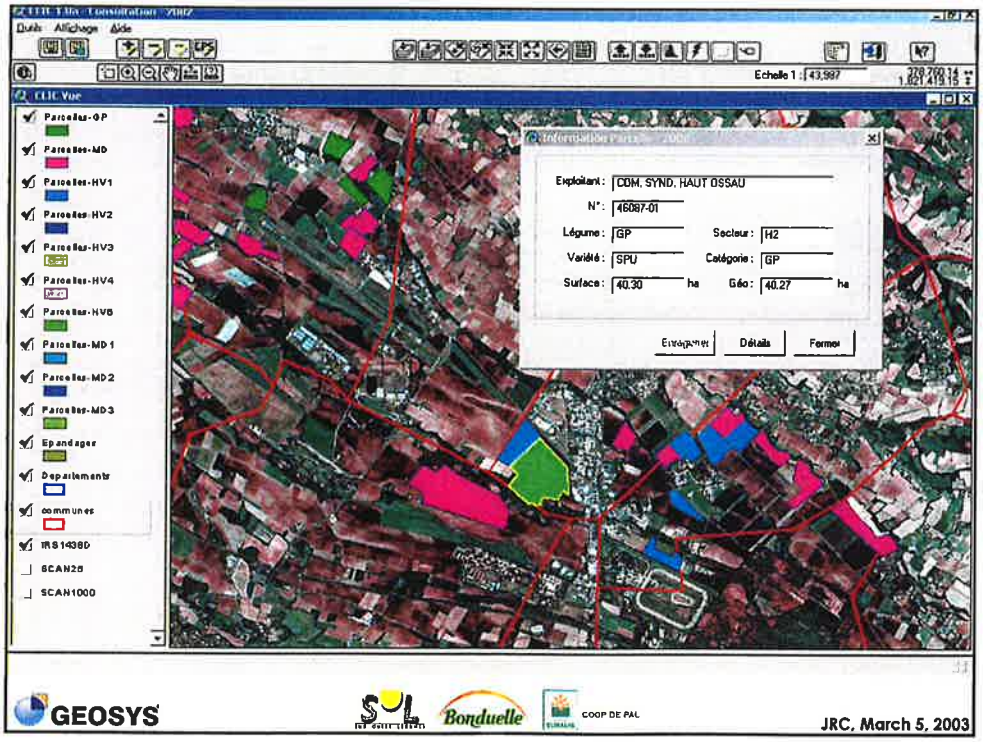
- Traceability and security of products
- Navigation et logistics
- Improvement of agronomical know-how and decision making tools

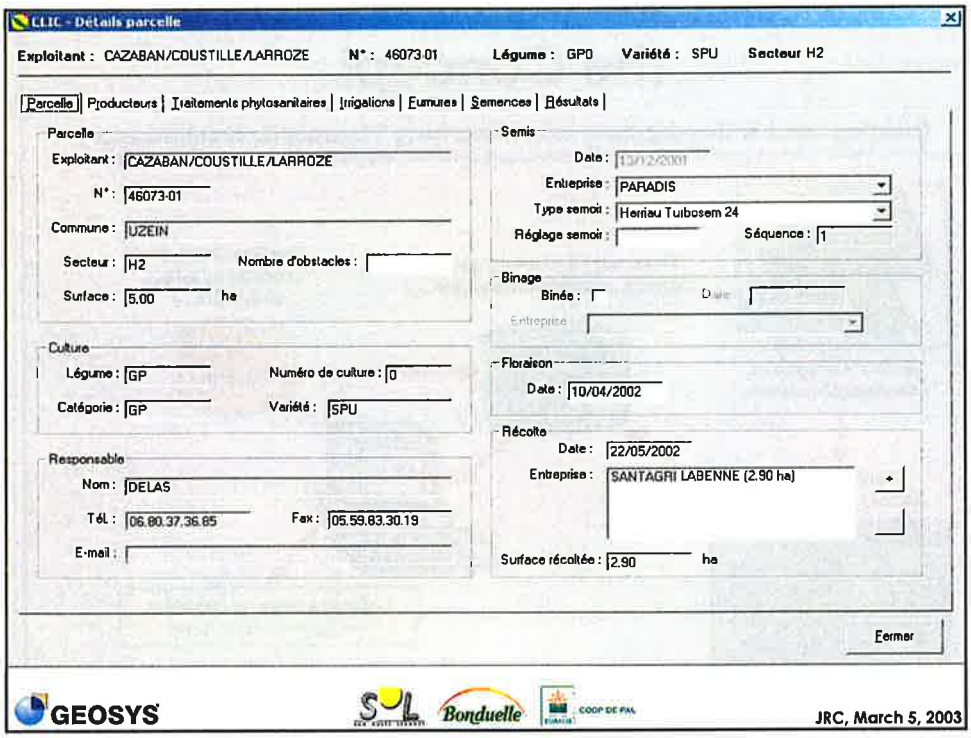
Calendar

Creating value with geography when satisfying Traceability requirements

- **October 2001** : Project kick-off
- **January 2002** : Validation of specifications
- **Mai 2002** : Delivery of the application
- **Campaign 2002** (June - October) : system fully operational


The Concept
Creating value with geography when satisfying Traceability requirements
Satellite images et cartographic maps
Database CLIC (geographical objects, complementary data ...)
Existing database (contracts, bills, deliveries...)
DB CLIC
DB SOL
CLIC
Delimitation of geographical objects
Logistics tools, traceability, decision making tools
GEOSYS
Bonduelle
COOP DE PAL
JRC, March 5, 2003


Exploitant : COM. SYND. HAUT OSSAU
N° : 46087-01
Légume : GP
Secteur : H2
Variété : SPU
Catégorie : GP
Surface : 40.30 ha
Géo : 40.27 ha
Détails
Fermer
GEOSYS
Bonduelle
COOP DE PAL
JRC, March 5, 2003



Navigation et logistics

Creating value with geography when satisfying Traceability requirements

- Context :
  - Big fleet (trucks, harvesting sites, helicopters).
  - Each campaign different locations of parcels.
  - Little recognition points (isolated parcels, access points…)
- Use :
  - Automatic printing of all (up to date) navigation documents
  - Reuse of parcel limits in next campaign
  - Use of precise geographic coordinates for GPS guidance of helicopters

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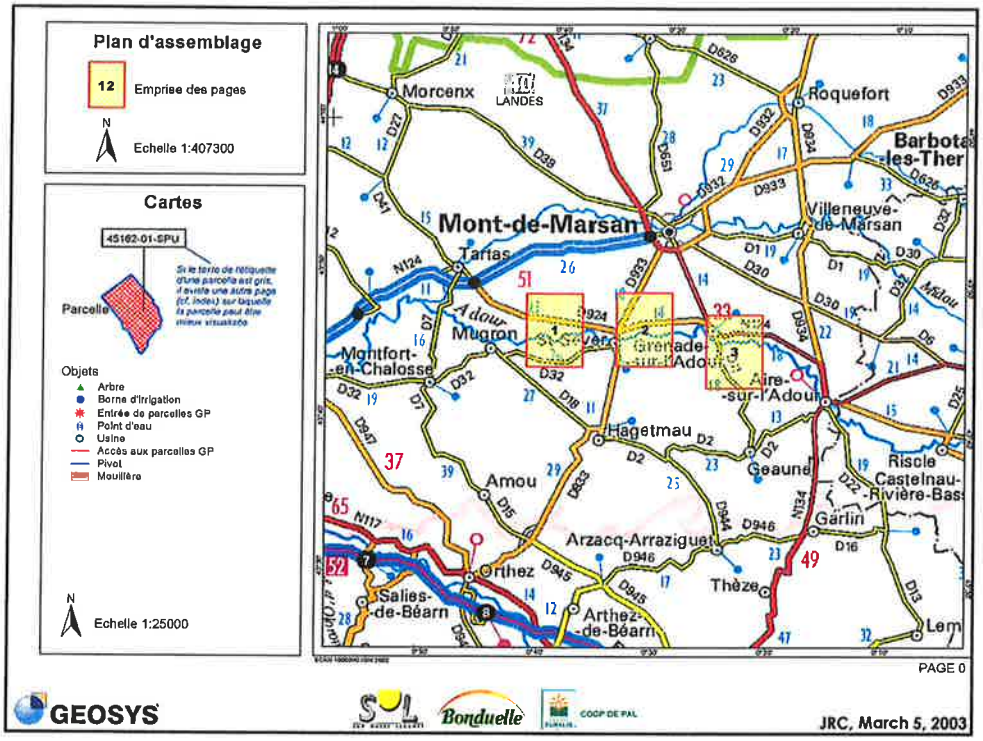
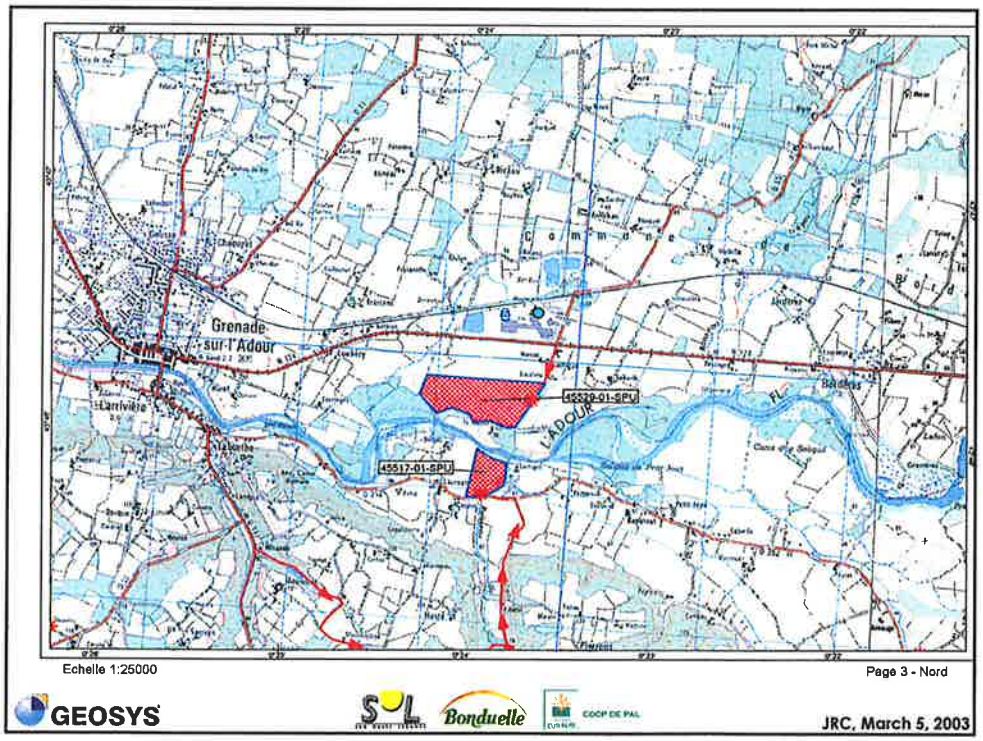

Plan d'assemblage
12
Emprise des pages
N
Echelle 1:407300
Cartes
45162-01-SPU
Parcelle
Si la table de l'étiquette d'une parcelle est grise, il existe une autre page (cf. index) sur laquelle la parcelle peut être mieux visualisée
Objets
Arbre
Borne d'irrigation
Entrée de parcelles GP
Point d'eau
Usine
Accès aux parcelles GP
Pivot
Mouillère
N
Echelle 1:25000
Morcenx
LANDES
Roquefort
Barbotan-les-Thermes
Mont-de-Marsan
Villeneuve-de-Marsan
Tartas
Saint-Sever
Grenade-sur-l'Adour
Aire-sur-l'Adour
Montfort-en-Chalosse
Hagetmau
Geaune
Amou
Riscle
Castelnau-Rivière-Basse
Garlin
Arzacq-Arraziguet
Orthez
Thèze
Salies-de-Béarn
Arthez-de-Béarn
Lem
PAGE 0
GEOSYS
Bonduelle
JRC, March 5, 2003


Grenade-sur-l'Adour
45529-01-SPU
45517-01-SPU
L'ADOUR
Echelle 1:25000
Page 3 - Nord
GEOSYS
Bonduelle
JRC, March 5, 2003

Traceability and alimentary security

Creating value with geography when satisfying Traceability requirements

- Context
  - Need of full traceability of parcel
  - Need of pluri-annual traceability of soil
  - Risk management of phytosanitary
  - Risk management of crossed pollination GMO
- Use
  - Printing of complete information sheet of parcel in case of crisis or customers demand (including map of geographic situation).
  - Automatic detection of phytosanitary non conformities
  - Localization and identification of all parcels neighboring our sweet corn

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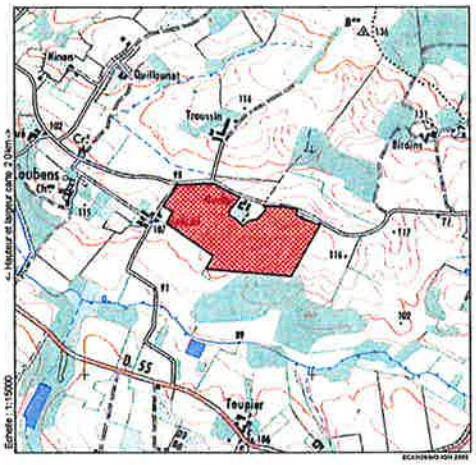
Fiche Parcellaire 2002

Parcelle 18483-01-701
EARL MONLUC

Légume : Maïs Doux 0 — Date de semis : 15/05/2002
Catégorie : Maïs Doux — Secteur : E0
Variété : 701 — Surface : 16,00 ha

Nom exploitant : EARL MONLUC
Code coopérateur :
Adresse : MONLUC
CP / commune : 40190 HONTANX



Veuillez dessiner les parcelles voisines cultivées en maïs (précisez s'il s'agit de maïs doux ou de maïs conso)

N°	Nom de l'agriculteur	Téléphone	Variété	MD/MC

Irrigations

Date										
Quantité (mm)										

Semoir

Type :
Reglage :

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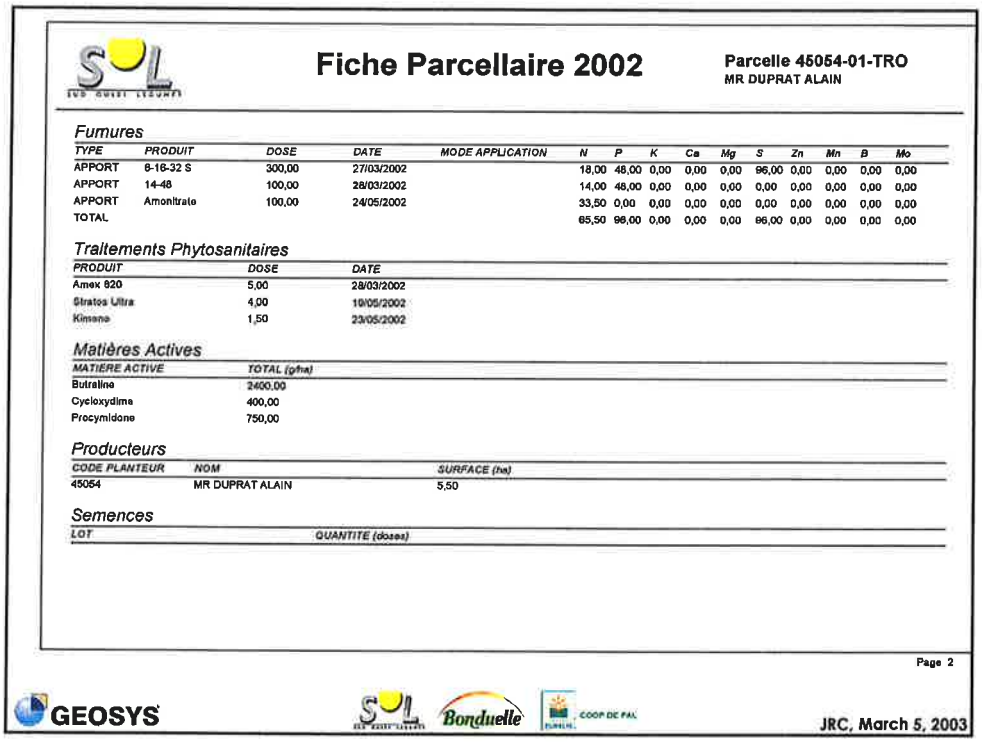


Fiche Parcellaire 2002

Parcelle 45054-01-TRO
MR DUPRAT ALAIN

Fumures

TYPE	PRODUIT	DOSE	DATE	MODE APPLICATION	N	P	K	Ca	Mg	S	Zn	Mn	B	Mo
APPORT	8-16-32 S	300,00	27/03/2002		18,00	48,00	0,00	0,00	0,00	96,00	0,00	0,00	0,00	0,00
APPORT	14-48	100,00	28/03/2002		14,00	48,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
APPORT	Amonitrate	100,00	24/05/2002		33,50	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL					65,50	96,00	0,00	0,00	0,00	96,00	0,00	0,00	0,00	0,00

Traitements Phytosanitaires

PRODUIT	DOSE	DATE
Amex 920	5,00	28/03/2002
Stratos Ultra	4,00	19/05/2002
Kimono	1,50	23/05/2002

Matières Actives

MATIERE ACTIVE	TOTAL (g/ha)
Butraline	2400,00
Cycloxydime	400,00
Procymidone	750,00

Producteurs

CODE PLANTEUR	NOM	SURFACE (ha)
45054	MR DUPRAT ALAIN	5,50

Semences

LOT	QUANTITE (doses)

Page 2

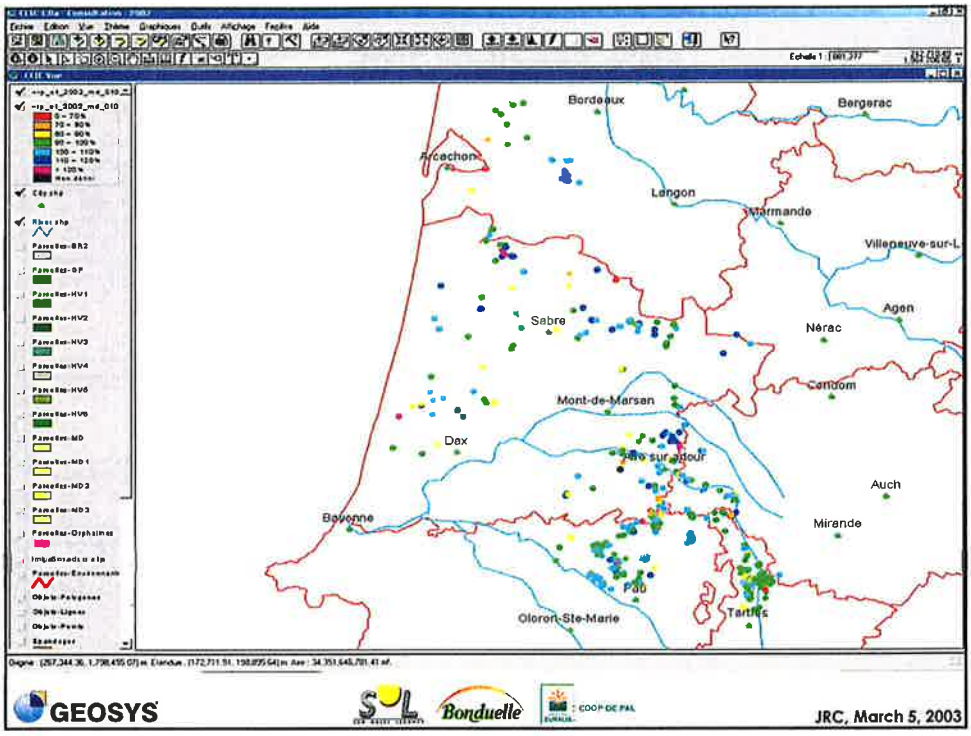
GEOSYS Bonduelle COOP DE PAL JRC, March 5, 2003

Increasing agronomic know-how

Creating value with geography when satisfying Traceability requirements

- Context :
  - Large acreages per vegetable : hence important scale effects with regards to productivity gain.
  - Huge amount of information; difficult to exploit.
- Use :
  - Cartographic representations of technical events or results (yield, parasitism, movement of harvesting sites…) allowing to make decisions on a reliable basis.
  - Intuitive analysis of cartography followed by a computed analysis using the alphanumerical system.

GEOSYS Bonduelle COOP DE PAL JRC, March 5, 2003


Bordeaux
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Bayonne
Mirande
Pau
Oloron-Ste-Marie
Tarbes
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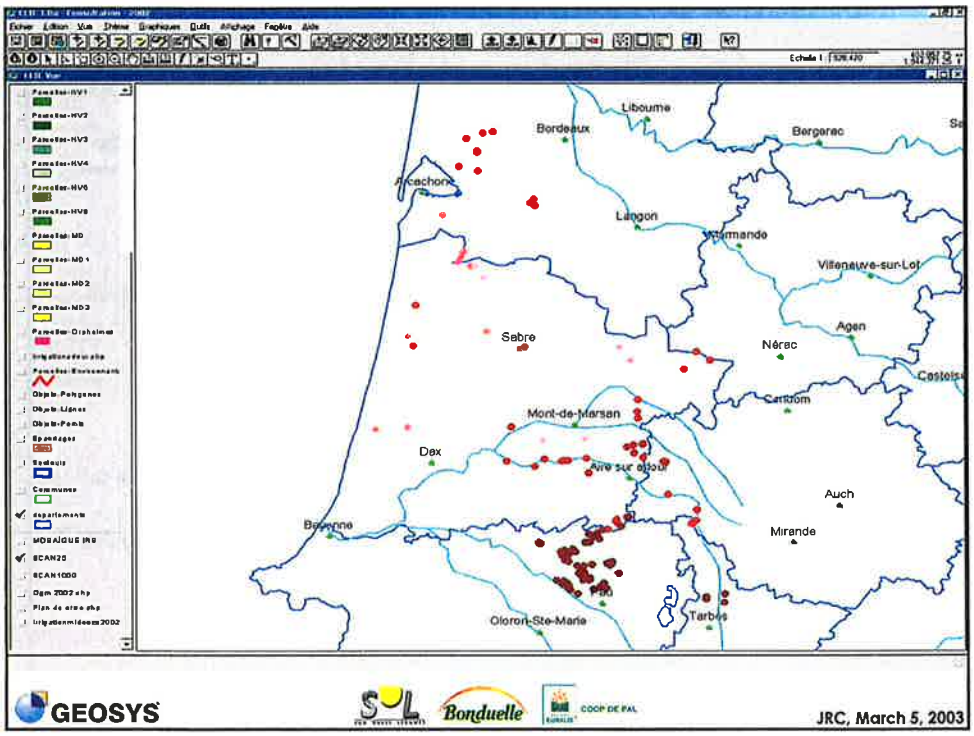
JRC, March 5, 2003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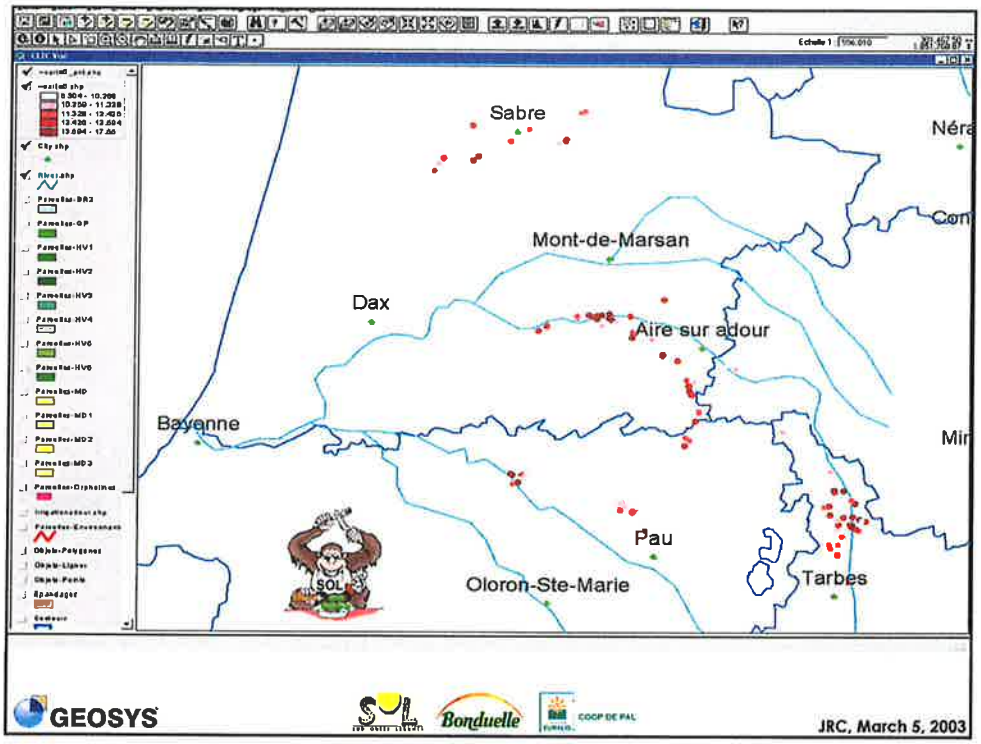
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Tarbes
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Tracking & Tracing Guidelines

Experiences in the Netherlands

JRC workshop
Ispra

Jan Kamp / Anneke van de Kamp.

Outline of the presentation

- Short introduction of Q-Point
- General Food Law
- Tracking & Tracing (T&T) - introduction
- T&T: benchmark studies
- T&T guidelines
- relation to geotraceability?

Q-Point

- originates from DLV Advisory group
  - till '90: part of Min. of Agriculture
  - privatized
- 2002: Q-Point
  - merger two parts DLV Chain Mgt. and NAKtuinbouw - Quality Man. systems
  - 26 employees
  - focus on: food safety, management systems, traceability

Why food safety demands?

- too many food scandals
- consumer focus!

- National legislation
- European legislation

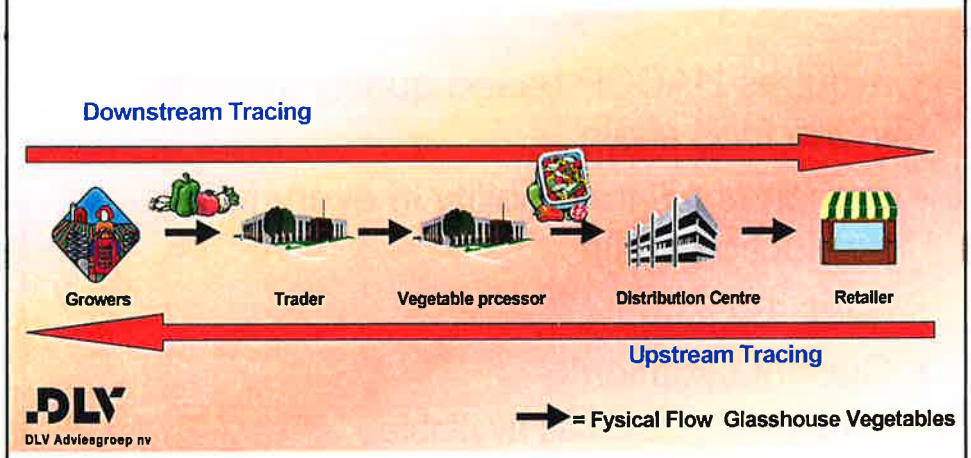
General Food Law

- requires HACCP based quality systems in the food chain
- demands full traceability in every food production chain
- date: 1-1-2005
- Current situation:
  - no clear guidelines available
  - what to expect from EU? or National gov.?

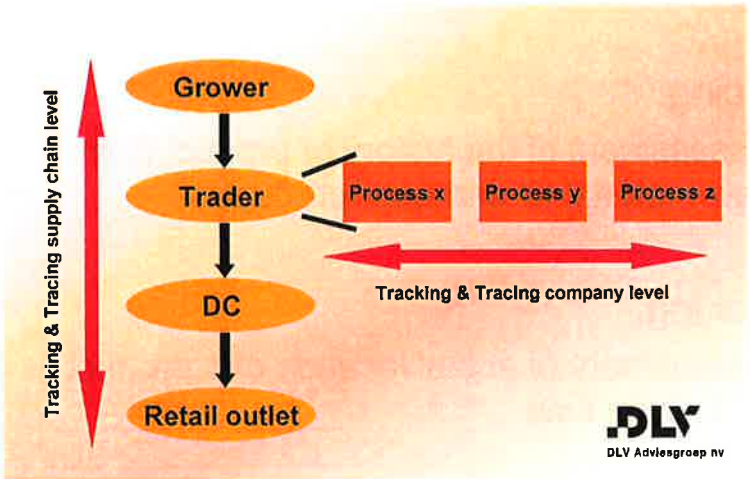
Definition of T&T

- Tracing:
  - assessment of the history of product (from raw material till end-user product)
- Tracking:
  - assessment of actual location of a product at a given time

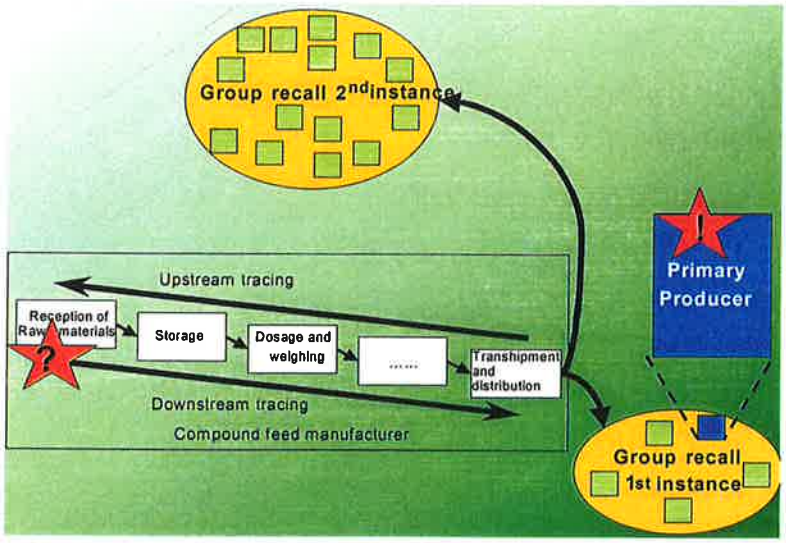
Definitions of T&T - 2



Introduction T&T - 3



Recall



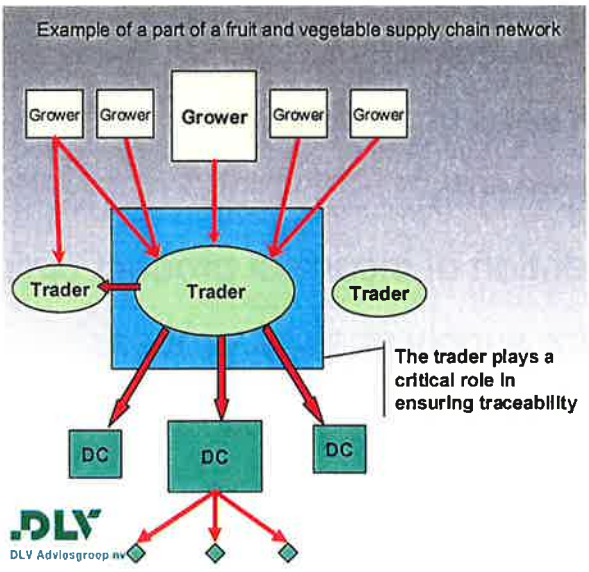
Possible benefits T&T

- assurance of food safety
- transparency
- prevention of incorrect product claims
- tool for supply chain & process improvement

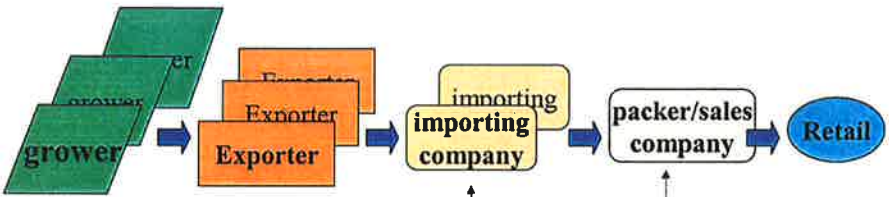
Studies Q-Point

- Benchmark study Product board for Horticulture
  - product checks (n= 300)
  - in depth interviews (n= 25)
- Benchmark study Meat and Fish
- Benchmark Animal Feed sector
- Research on non GMO certification
- Study in catering sector

Benchmark Fruit & Vegetables



Appelmix chain



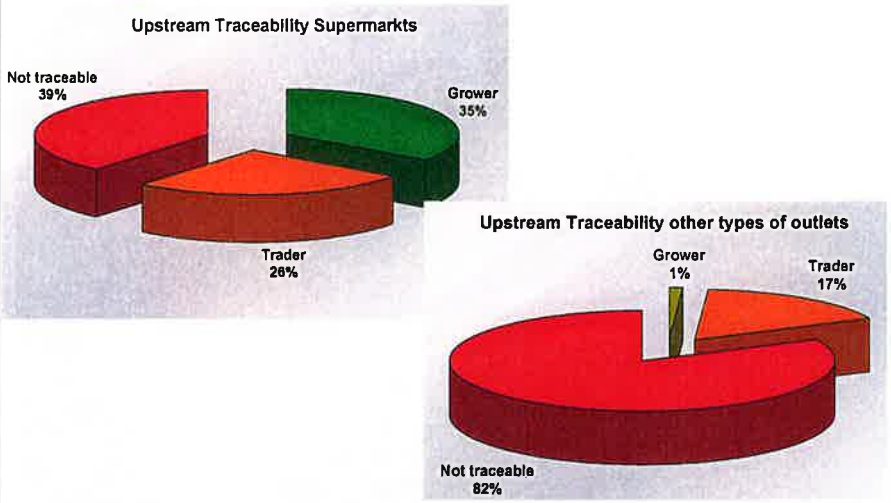
Foreign growers:
- **Brazil**
- **France**
- **South Africa**

3 foreing exporters

Two Dutch importers

Dutch packer

Benchmark Fruit & Vegetables - product checks

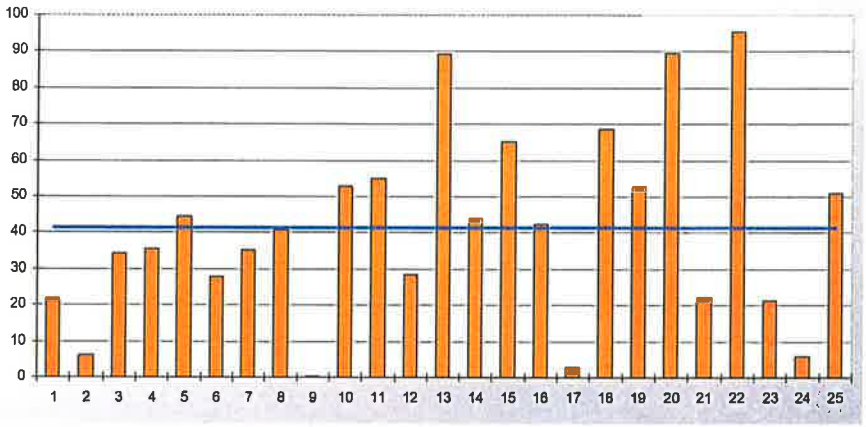


Benchmark Fruit & Vegetables

In depth interviews

- Structured interviews on the basis of the ITI-model (Information-Technique-Integration)
- Three different types of companies (traders, packers and processors)
- Every company scores between 0 (minimum) and 100 (maximum)
- Results ranked at different aspects

Benchmark Fruit & Vegetables - Results

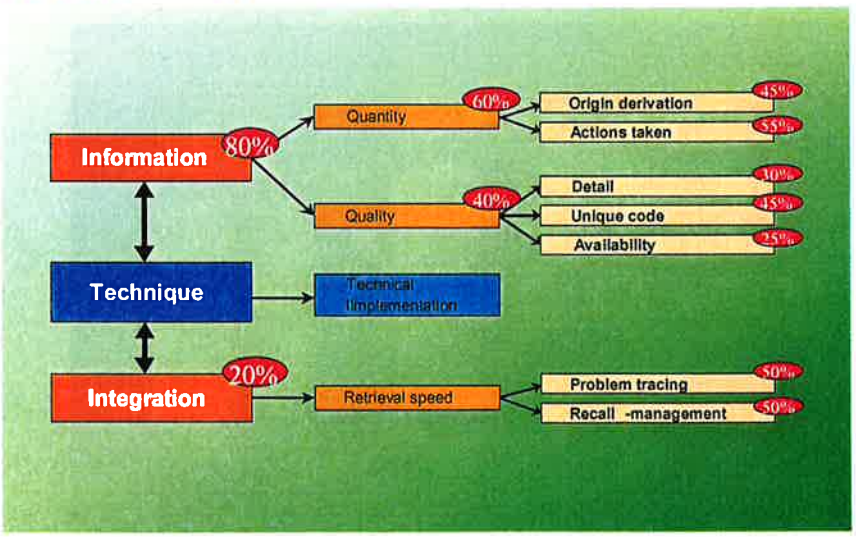


Traceability Feed

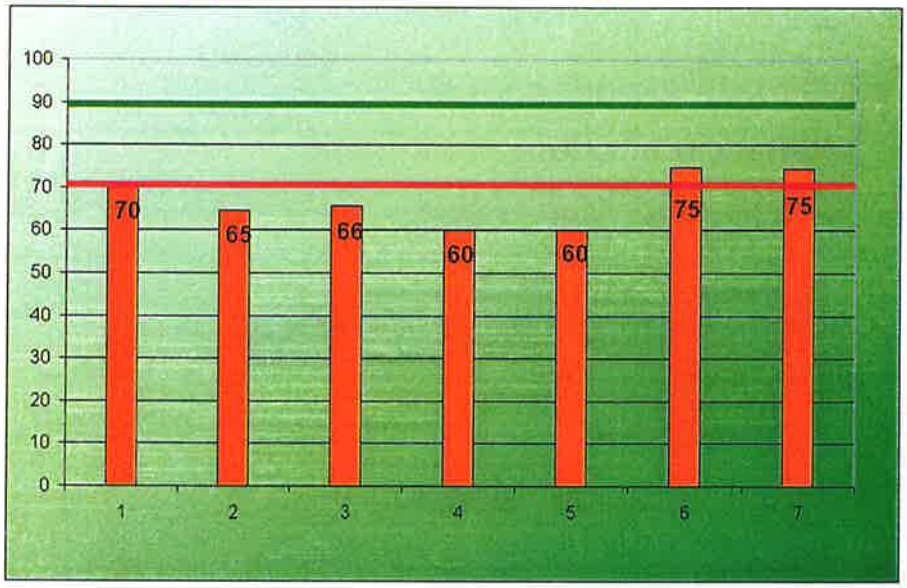
Traceability Feed

- for Product Board Animal Feed
- same idea: in depth interviews (ITI)
- development of guidelines for feed sector

ITI model Feed sector



Benchmark Feed - results



Benchmark
Some conclusions

- T&T often used reactive not proactive
- Often more focussed on trace-back than on tracking
- Focus is still on the company level rather than on the supply chain
- Too little attention for co-operation and transparency in the supply chain

T&T Guidelines

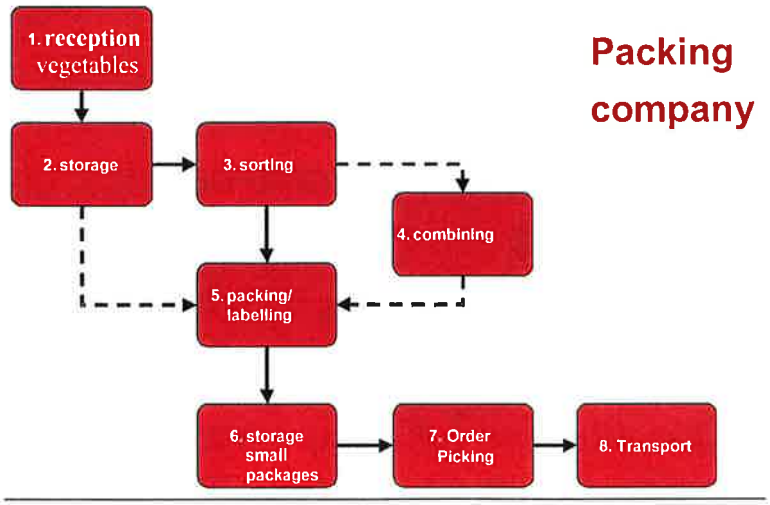
at sector or branche level:

- guidelines at chain actor level
- guidelines at chain level

Enablers: support discussion about:

- data infrastructure
- data standards
- product or lot identification

Guidelines on actor level



Guidelines - actor level

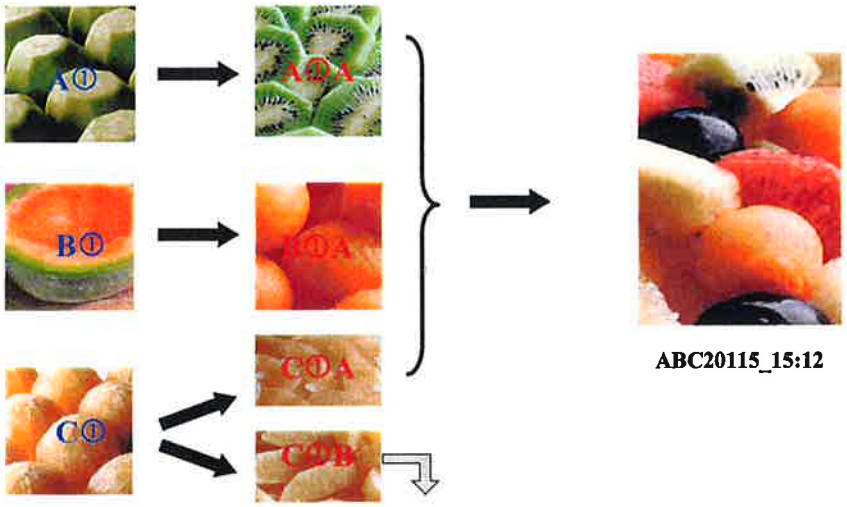
- two levels of traceability
  - basic + higher level
- preconditions:
  - clear organisation: task, responsibility, authority
  - effective segregation of batches/lots: both administrative as physical!
  - unique lot identification
  - internal auditing of T&T system and recall procedures

Guidelines - actor level - 2

for each step in the production process:

- instructions on what data to collect
  - raw material
  - other inputs
- lot or batch administration related to:
  - splitting of lots
  - combining of lots
- storage locations
- link to the time of each operation

Identification: unique coding



Guidelines - actor level - 3

Important:

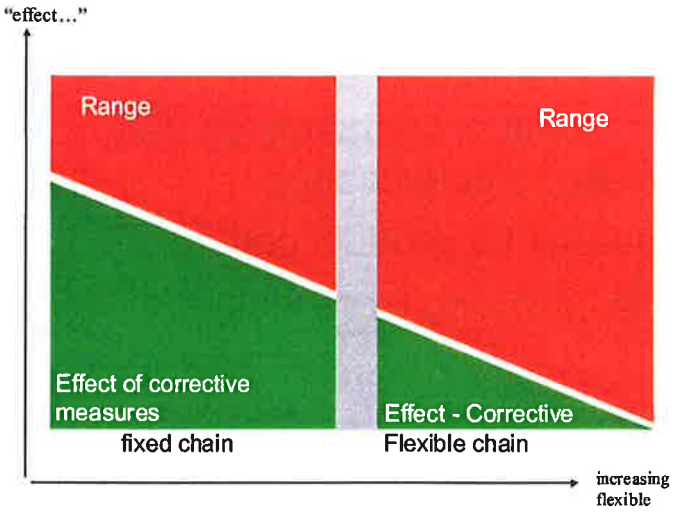
– interface between chain actors: what do you know of your raw material input?

- basic level: only name, date, product, number delivered
- higher level: also internal batch or lot code of other company is available.

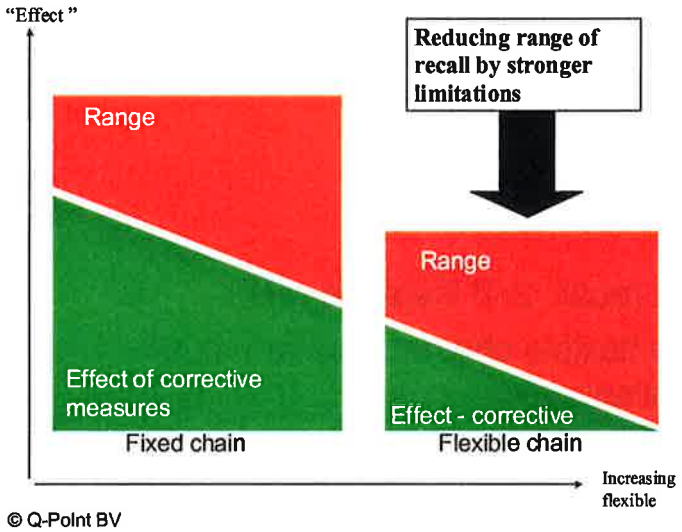
Guidelines - chain level

- distinction between:
  - more fixed chains
  - more flexible chains
- Why?
  - effect on recall: 2nd instance recall !
  - the more flexible chains: greater risk of uncontrollable recall size

Guidelines - actor level



Guidelines - actor level



Guidelines - actor level

In more fixed chains:

- easier to commit to standards on data collection and data exchange
- also: standards for product coding
- smaller risk of strong expanding recall

Conclusion: less limitations in combining or splitting of original batches/lots.

Implementation of T&T

Technology

Enablers

Organization specific

No standard solution

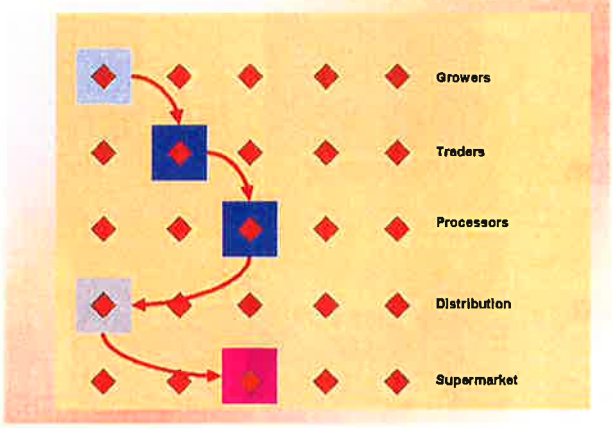
Infrastructure

- Standards
  - data definitions
  - data exchange standards (EDI, XML, ..)
- How is the branche organized?
  - is there a will to cooperate? Or highly competitive?
  - how is the chain leader (dominator)?

Transparent supply chains

Possible solutions (I)

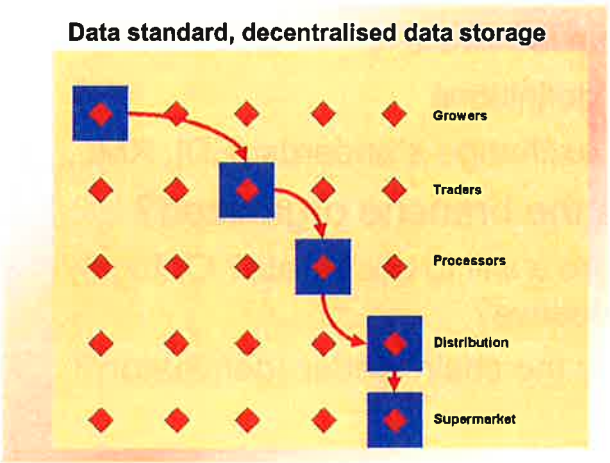
No data standard, decentralised data storage



Transparent supply chains

Possible solutions (II)

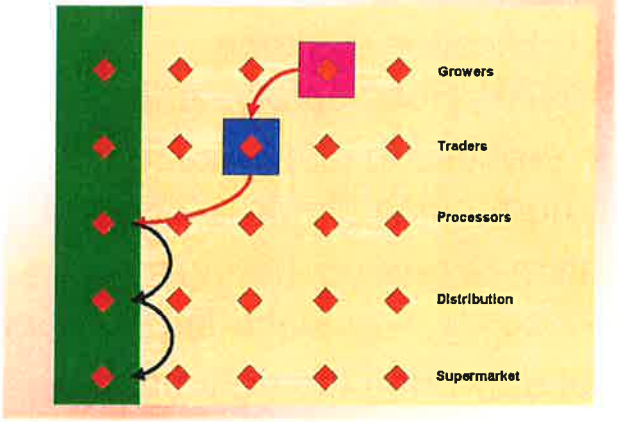
Data standard, decentralised data storage



Transparent supply chains

Possible solutions (III)

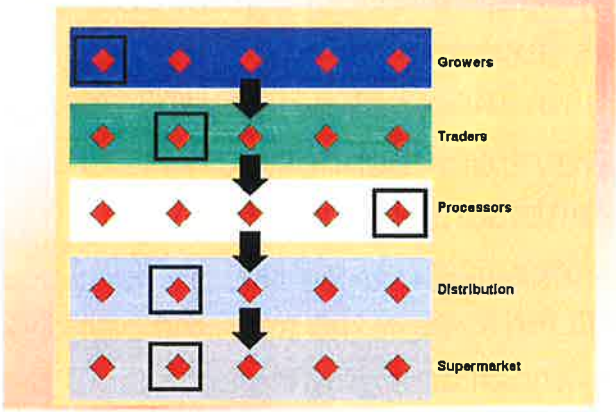
Data standard, centralised data storage (vertical)



Transparent supply chains

Possible solutions (IV)

Data standard, centralised data storage (horizontal)



Geotraceability?

Current situation at grower's level:

- part of certification systems (EUREPGAP, Food safety certificates)
- farmers: production plan -> unique location numbering (fields, plots, …).
- segregation of product during storage and processing -> actual administration
- control of delivering the right batch

Conclusions

- T&T implementation is behind schedule
- General guidelines per sector can be a stimulus (lower threshold)
  T&T guidelines Feed: in GMP protocol!!
- Stay away from technology / implementation prescriptions!
  - this is organization specific
  - must fit the state of the art in the branche
  - offer companies a growing path

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Precision Viticulture - Geotraceability

Jean-Noel Paoli
Agro-Montpellier, Agricultural Engineering Research Unit

Plan

- 1) Agro Montpellier – Agricultural Engineering Research Unit
  - Formation
  - Industrial projects support
  - Research
- 2) Precision Viticulture concept
- 3) Data registration
  - Location
  - Yield and Quality
  - Other measurements
- 4) Information use for traceability
  - Potential
  - Examples

Most of the illustrations used for this presentation come from an Eurêka project (VI-TIS) financed by French research ministry .French partners of VI-TIS project : Pellenc S.A./agro-Montpellier

Agro Montpellier – Agricultural Engineering Research Unit

- Agro Montpellier :
  - A French Higher Education and Research establishment

- Agricultural Engineering Research Unit

  - Formation/courses

    Specialization agroTIC :
    Information and Communication Technologies
    for agronomy, food industry and the environment

    Themes : sensors and measuring instruments, databases, GIS, image analysis, remote sensing, networks and internet, hypertext and multimedia, monitoring and regulating systems, project, production, etc.

Agro Montpellier – Agricultural Engineering Research Unit

- Agricultural Engineering Research Unit

  - Industrial projects support

    Partnerships with professionals to design and develop innovative tools. These projects are carried out by agroTIC students and the teachers.

    For instance : Integration of "CUMAs" into a traceability/quality approach in the field of viticulture/œnology

  - Research : Precision Viticulture

    VI-TIS : EURÊKA project. Partnership between :
    Agro Montpellier, Pellenc SA, EVENA, Julian Chivite Vineyard

    funded by the French ministry

    Research on methods to combine heterogeneous spatialized data, on modeling of expert knowledge, etc.

Precision Viticulture™ Concept

Systematic location of cultural operations

Massive and systematic registration of information localized by sensors embarked on common machines.

Organization and treatment of spatialized data to improve:

- The knowledge of vineyard and of his variability,
- The management of vineyard and cultural operations (recommendations, experimentations, work management, etc.),
- Traceability of operations.

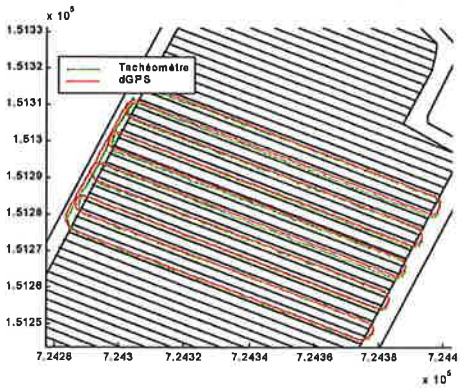
Data registration

- Position registration
  - Similar to Precision Agriculture
  - dGPS
  - Precision < 1 m

Sources : Pellenc-Agro Montpellier

In a vineyard :

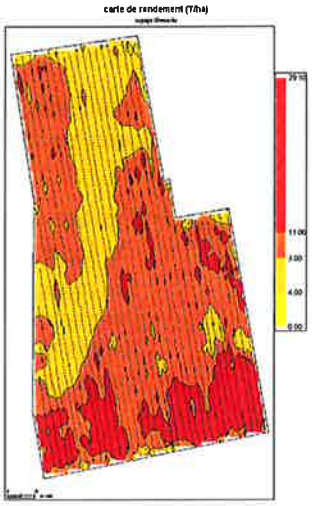
Maps can be improved by the use of the vineyard row structure



Data registration

- Yield measurement

Sensor embarked on a grape harvesting machine (Pellenc S.A.)



Yield map on a piece of 1 ha (2400 measurements)

Data registration

- Quality measurement : sugar content

Sensor embarked on a grape harvesting machine (Pellenc S.A.)

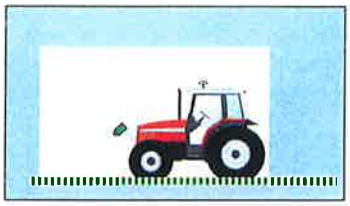
Sugar map on a piece of 1 ha (° Brix)

Data registration

- Other measurements

Remote sensing

Soil,
vigor,
vegetative expression ?



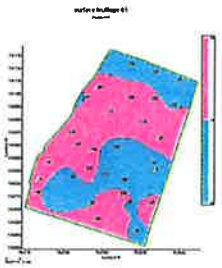
Proxi-detection

Foliar area,
vigor,
Diseases ?

Data registration

- Other measurements

Foliar area (proxi-detection)



Sources :
Agro-Montpellier,
INRA Pech-Rouge vi-tis project

Diseases (phylloxéra –remote sensing)

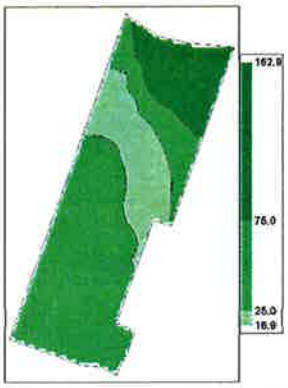
Source : Mimeau 2001- CSIRO

Data registration

- Other measurements

Sources : www.geocarta.net

Soil resistivity



Sources : Agro-Montpellier, vi-tis project

Information use

- Traceability
  - Downstream : Good Practices certification,
  - For farm managers :
    - Traceability of cultural operations
    - Traceability of experimentations
    - New operations
    - Knowledge of the land and better management of monitoring (maturity, soil, etc.)
    - Quantification of exogenous factors (civil engineering structure like Mediterranean TGV, hail, frost, etc.), effects during some year.

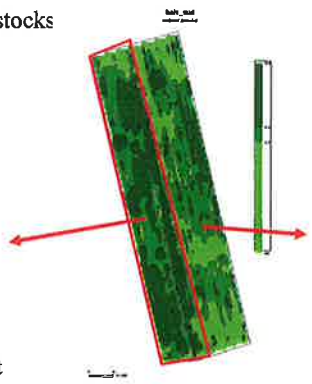
Information use

- Traceability of cultural operations
  - location,
  - date,
  - quality
    - Forgotten rows,
    - Rows over or under sprayed,
  - Work management analysis
    - Working times,
    - Etc.

Information use

- Traceability of experimentations

For instance : effect of a different stocks on yield



stock A

stock B

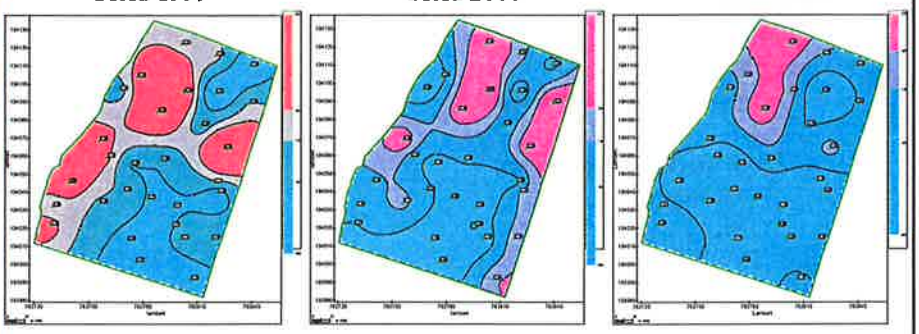
Source : Pellenc S.A. vi-tis project

Information could be used to choose stocks for a new plantation

Information use

- New operations
  - Traceability of potentially qualitative zones, and selective vintage

Yield 1999 | Yield 2000 | Yield 2001



Sources : Agro-Montpellier, INRA Pech-Rouge vi-tis project

An important spatial variability and temporal stability

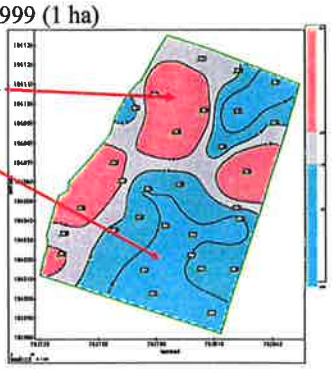
Information use

- New operations
  - Traceability of potentially qualitative zones, and selective vintage

Yield 1999 (1 ha)

From 17 T/ha

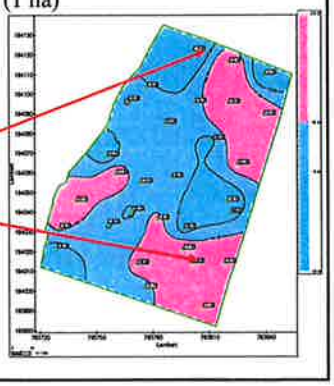
to 2,5 T/ha



Sugar 99 (1 ha)

From 130 g/l

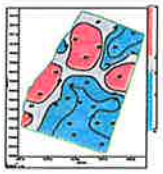
to 230 g/l



Information use

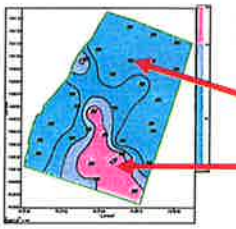
1- Definition of aims of production

Yield



Sugar

2- Rule-based System (Yield/Sugar combination)



Potential quality map

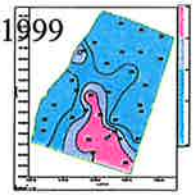
High yield and low sugar content

Correct Yield and sugar content

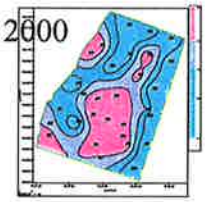
Information use

3- Traceability of potentially qualitative zones

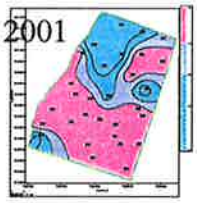
1999



2000

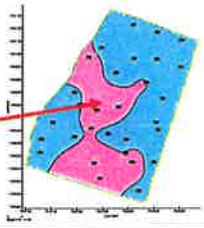


2001



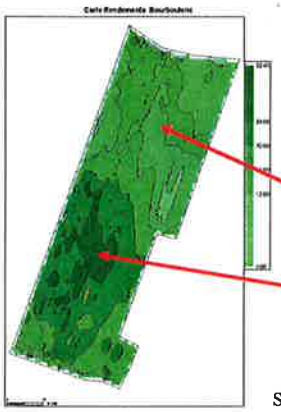
4- Identification of stable zones

Potentially qualitative zones



Information use

- Variability analysis
  - Traceability ⇒ Knowledge of a land
  - better management of monitoring, cultural operations, etc.



Yield map (2001)
Grape variety : Bourboulenc
Area : 0,95 ha (4000 stocks/ha)
Provence

High yield zone

Low yield zone

Source : Pellenc S.A., agro-Montpellier, vi-tis project

Information use

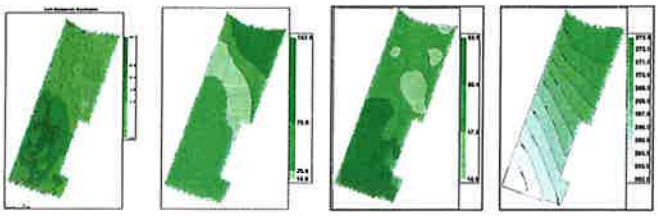
Working hypotheses :

Topography

Water availability problem

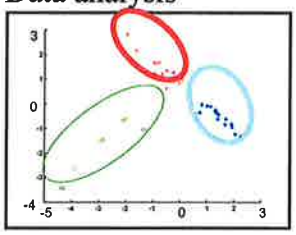
→ 1- further measurements

Information use



Yield Resistivity vigor Topometry

2- Data analysis



3 Classes

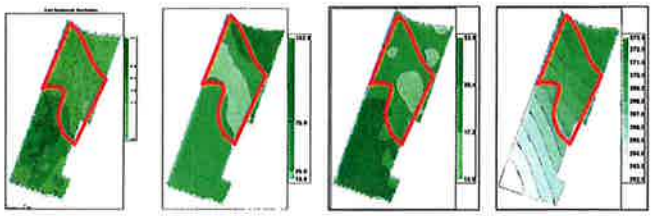
Information use

Yield Resistivity Vegetative expression Topometry

3- Cartography of the different classes

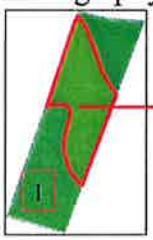
Zone 1 :
High yield,
High vegetative expression
Low altitude
Medium resistivity

Information use



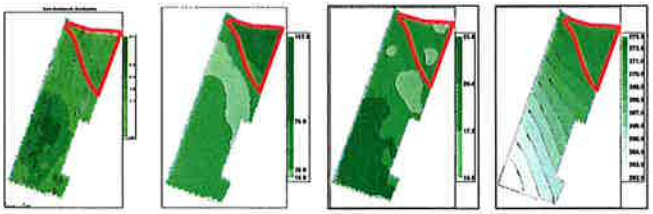
Yield | Resistivity | Vegetative expression | Topometry

3- Cartography of the different classes



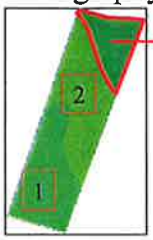
Zone 2 :
Low yield,
Low vegetative expression
Medium altitude
Low resistivity

Information use



Yield | Resistivity | Vegetative expression | Topometry

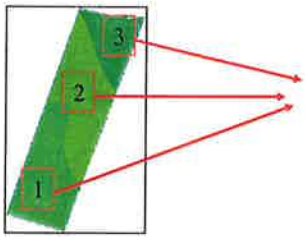
3- Cartography of the different classes



Zone 3 = Zone 2
High resistivity

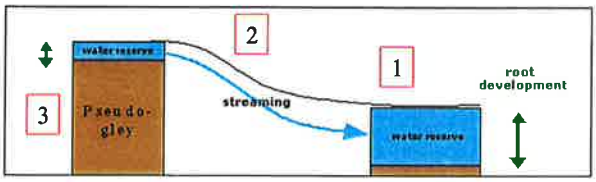
Information use

4- Define further observations



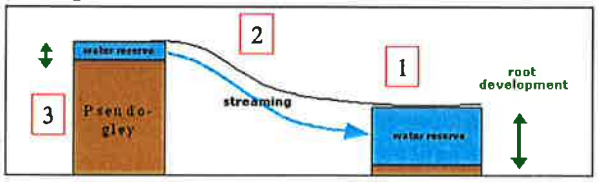
Physical observations

5- Interpretation



Information use

5- Interpretation



6- Recommendations

- Decrease vigor of the 1st zone
  - vineyard pruning
  - putting under grass,
  - fertilization, etc.

Conclusion

- Precision Viticulture provides information for traceability of on ?cultural operations and experimentations. This information increases the knowledge of lands.
- Decision support systems can be based on it to improve quality of production and work management.
- Online sensors are about to be operational. Our scientific work will participate in the development of operational decision support systems.
- But some issues have to be studied : Information exchange, data storage, software, extension services, etc.

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THE USE OF NUCLEAR MAGNETIC RESONANCE AND OF STABLE ISOTOPES ANALYSIS TO SUPPORT EUROPEAN POLICIES FOR CONSUMER PROTECTION

Claude GUILLOU, Fabiano RENIERO,
Margaret HOLLAND and Serge REZZI

Commission of the European Communities, Joint Research Centre
Institute for Health and Consumer Protection
Food Products Unit 21020 Ispra (VA) Italy

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BEVABS activities

BEVABS
European Office for Wine, Alcohols and Spirit Drinks

Avance 500 MHz CP-MAS system
ARX 400 MHz
^{13}C, ^{1}H, ^{2}H, ^{31}P, ^{19}F

2 Isotope Ratio Mass Spec.
^{13}C, ^{15}N, ^{34}S, ^{2}H, ^{18}O
EA-IRMS, Eq-IRMS
GC-IRMS, TC/EA IRMS

Wine: management of EU wine databank

Flavours: false labelling (substitution of natural flavours with synthetic ones)

Olive Oil: detection of adulteration and controls of origin by ^{1}H NMR.

Fish: control of origin by ^{1}H NMR, ^{13}C NMR, analysis of phospholipids by ^{31}P NMR.

Spreads: quantification of milk fat

Functional food:

- Cocoa and grape: structural determination of polyphenols
- Fish oil: identification/quantification of w-3 PUFAs

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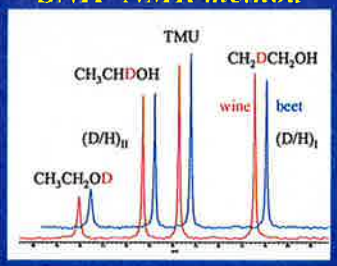
WINE DATABANK

SNIF NMR method



Quality Control

Certified Reference Material

Wine DataBank **EC Reg. N° 2729/2000**

Portugal 50

France 400

Germany 200

Italy 400

Spain 100

U. Kingdom 4

Austria 50

Greece 50

Luxembourg 4

BEVABS

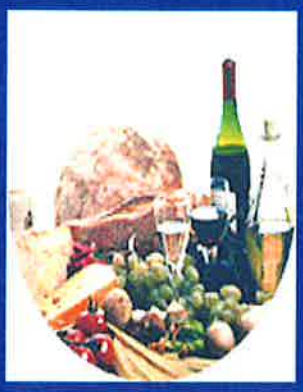
- Maintenance of databank
- Arbitration of disputes
- Analysis of samples
- Development and validation of methods
- Validation of data
- Training

Study of isotopomers of organic molecules of economic importance for flavour industry

Directive 88/388/EC (flavourings in foodstuffs)
Directive 2000/13/EC (labeling of foodstuffs)

To inform and to protect consumer by a detailed labeling giving the exact nature and characteristics of the product

"natural flavouring" may only be used for flavouring substances or flavouring preparations which are obtained from vegetable or animal materials by appropriate processes (distillation, solvent extraction, enzymatic or microbiological processes)



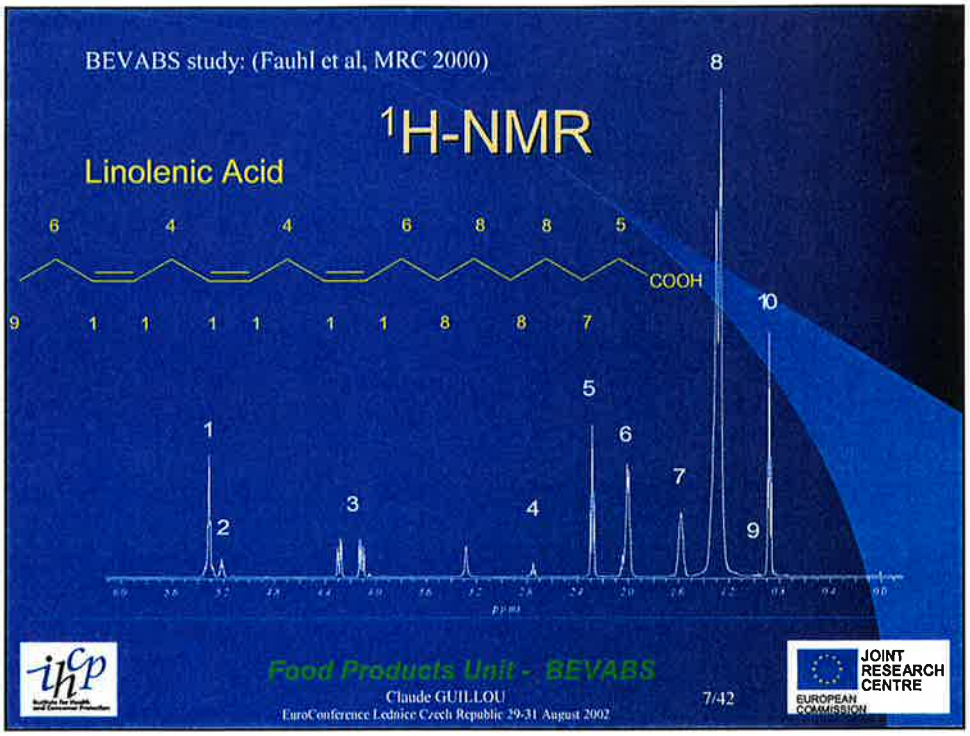
Detection of Adulteration of Olive Oil with Hazelnut Oil

Project MEDEO 2001-2003
EC DG RTD G6RD-CT-2000-00440

Coordinator: Istituto de la grasa Sevilla
partners: JRC,Eurofins, Univ Gembloux CSL York, CNR , NHRF...

^{13}C, ^{2}H & ^{1}H NMR

^{13}C, ^{18}O Isotopic analysis



^{1}H-NMR Data

(Fauhl et al, MRC 2000)

		Olefinic protons	Diallylic protons	ß-carboxylic protons	Linolenic acid/Linoleic acid	Linolenic acid/All fatty acids
Olive Oil	Average	280,9	27,0	314,9	16,9	2,2
(n=43)	St. dev.	6,4	9,3	5,2	4,5	0,4
Hazelnut Oil	Average	319,2	43,1	304,6	3,5	0,8
(n=14)	St. dev.	9,3	10,6	11,6	2,4	0,8
Sunflower Oil	Average	446,0	188,3	297,4	n.d.	n.d.
(n=7)	St. dev.	6,8	7,1	1,6		

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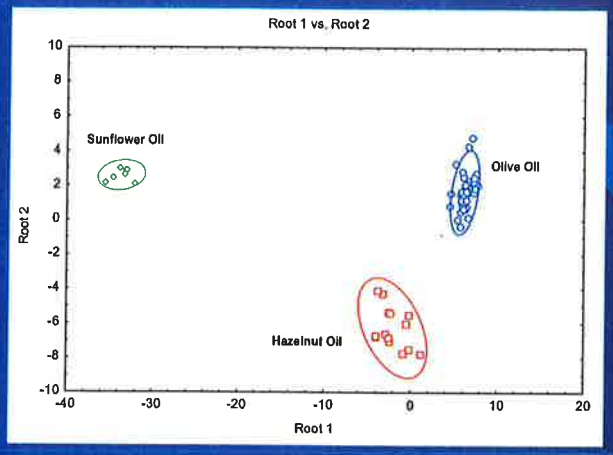
Discriminant Analysis

(Fauhl et al, MRC 2000)



$^{18}O/^{16}O$ Measurements

BEVABS unpublished results

		$^{18}O/^{16}O$
		Ratio
		δ ‰ vs SMOW
Olive Oil	Average	21,3
(n=43)	St. dev.	1,8
Hazelnut Oil	Average	16,2
(n=14)	St. dev.	1,7
Sunflower Oil	Average	21,1
(n=7)	St. dev.	0,8

Project COFAWS

COnfirmation of the Origin of Farmed and Wild Salmon

Project COFAWS 9/2001-8/2004

EC DG RTD G6RD-CT-2001-00512

Council Regulation (EC) No 104/2000

Commission Regulation (EC) No 2065/2001

Rules as regards informing consumers about fishery and aquaculture products

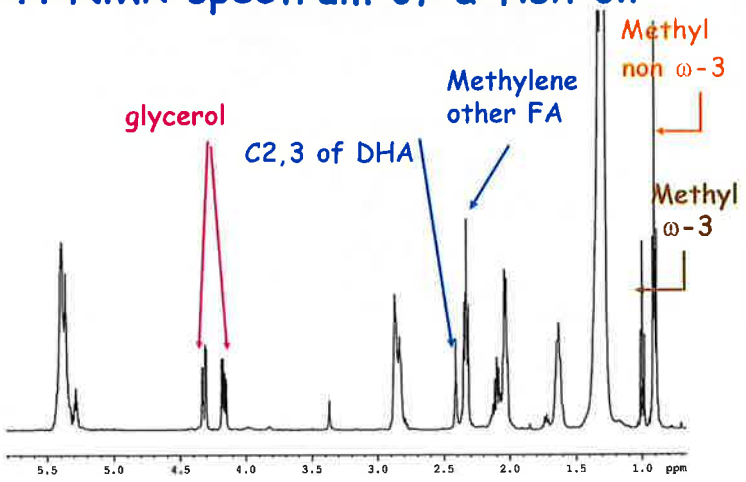
Coordinator EUROFINS
partners: JRC, Nantes univ, NAFC, SINTEF

^{13}C, ^{2}H & ^{1}H NMR

^{13}C, ^{18}O, ^{2}H ,^{15}N Isotopic analysis

11

^{1}H NMR spectrum of a fish oil



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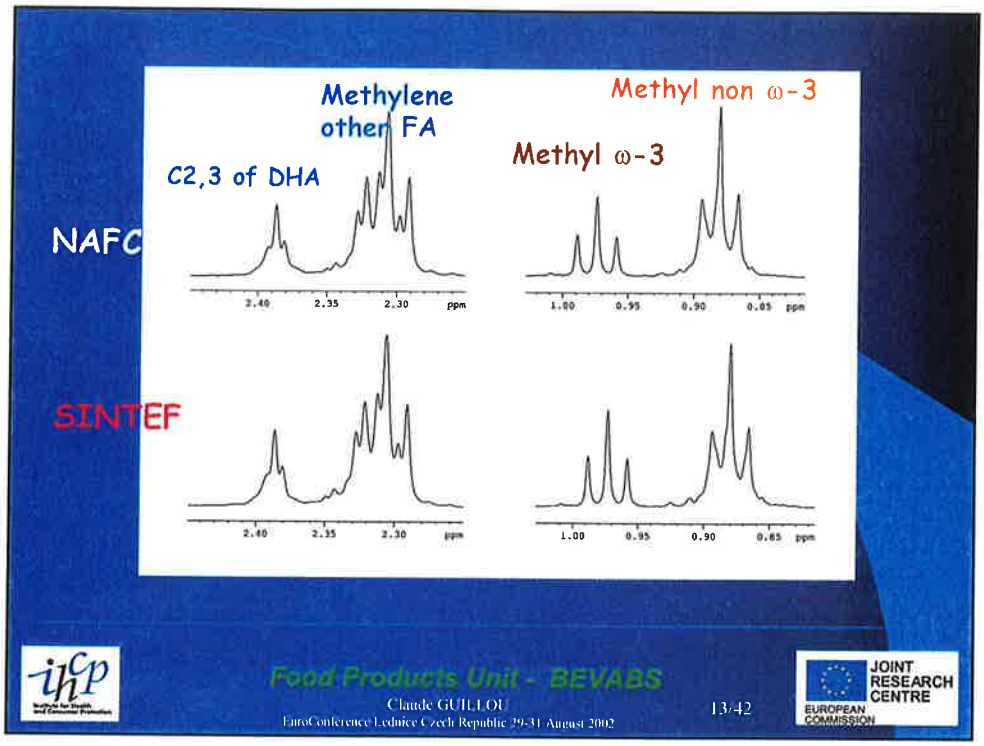
Methylene
other FA
C2,3 of DHA
Methyl non ω-3
Methyl ω-3
NAFC
SINTEF
2.40
2.35
2.30
ppm
1.00
0.95
0.90
0.85
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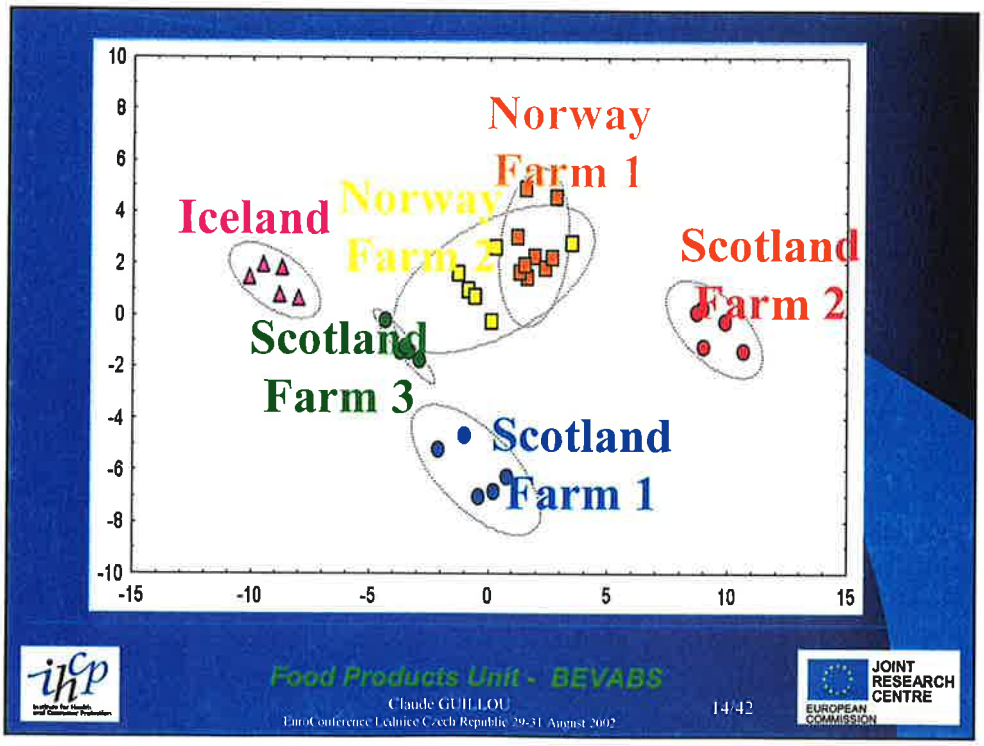
Norway
Farm 1
Iceland
Norway
Farm 2
Scotland
Farm 2
Scotland
Farm 3
Scotland
Farm 1
10
8
6
4
2
0
-2
-4
-6
-8
-10
-15
-10
-5
0
5
10
15
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BEVABS ON-GOING & FORESEEN ACTIVITIES

Training of official labs from accessing countries and not yet equipped Member states

On-going activities:

GLYCEROL : analytical methods to detect addition of glycerol in wine
EC DG RTD G6RD-CT-2000-00416

MEDEO : analytical methods to detect adulteration of olive oil
EC DG RTD G6RD-CT-2000-00440

SPREADS : detection of adulteration of spreadable fats
EC DG RTD G6RD-CT-2001-00589

WINE-DB: extension of the EU Wine Databank to accession countries
EC DG RTD G6RD-CT-2001-00646

GC-IRMS: Feasibility study for CRM for GC-IRMS
EC DG RTD G6RD-CT-2000-00515

COFAWS: Check origin of salmons (wild/farmed)
EC DG RTD G6RD-CT-2001-00512

BEVABS starting activities and possible extensions

- **ORGANIC FARMING - EEC Reg. N° 2092/91:**
  - Study of analytical tools based on isotopic techniques for traceability and for authenticity proof in the sector of organic farming
- **MILK & DAIRY PRODUCTS:** Isotopic methods for control of the geographical origin (follow up of Ispra-workshop of October 2001)
- **MEAT:** Isotopic methods applied to the control of the origin and of the diet of the livestock (link with ORGANIC FARMING)

Starting activities : ORGANIC FARMING - EEC Reg. Nº 2092/91

Study of analytical tools based on isotopic techniques for traceability and for authenticity proof in the sector of organic farming

Example of recent study

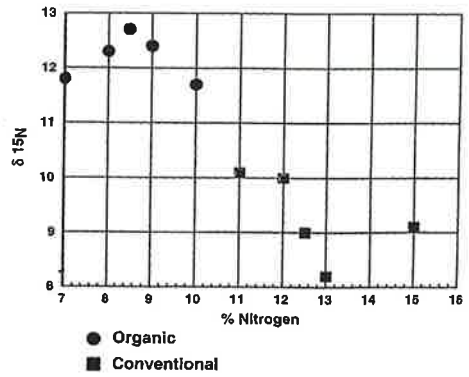
^{15}N in plant (spinaches)

Rhodes A., Kelly S. & Brereton P.

FASIS symposium Nantes (F)

November 2001

Graph 1



Organic farming- our observations:

- ^{15}N Isotopic analysis of soils and crop may provide a useful tool for traceability of organic farming
  - Collect more data
  - Study several kind of plants (cereals, legumes, fruits..)
- ^{18}O Isotopic analysis may provide important additional information
  - Still scientific and technical work to improve the measurement technique and the methodology


Protected Designation of Origin (PDO)
Protected Geographical Indication (PGI)
Certificate of Specific Character (CSC)
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Dipartimento di Chimica del Politecnico
Via Mancinelli, 7 - 210131 Milano (MI) Italy
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Eurofins, coordinator project COFAWS
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