

Are Remote Sensed data usable for Cross Compliance and AEM checks?



Agriculture Unit



2005-2007 test of use of RS for GAEC control

Which GAEC detected with RS?

Other elements possibly detected (SMR, AEM ...)?

Which methods to use?

Quantification of results?

Use for risk analysis?





QuickBird VHR
May 2005

Soil erosion (Italy)

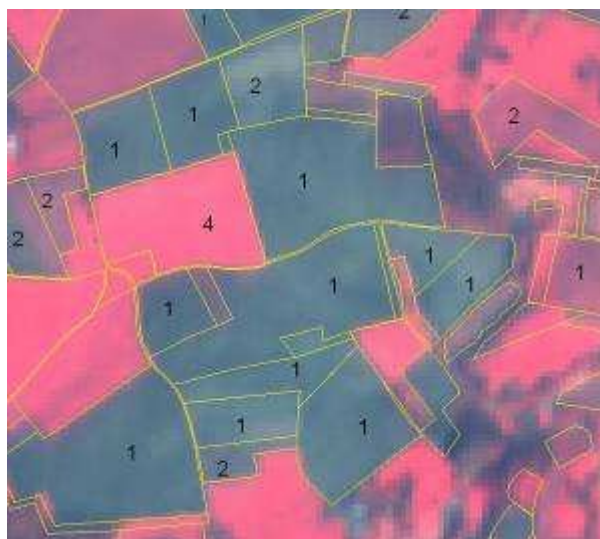


Ikonos VHR

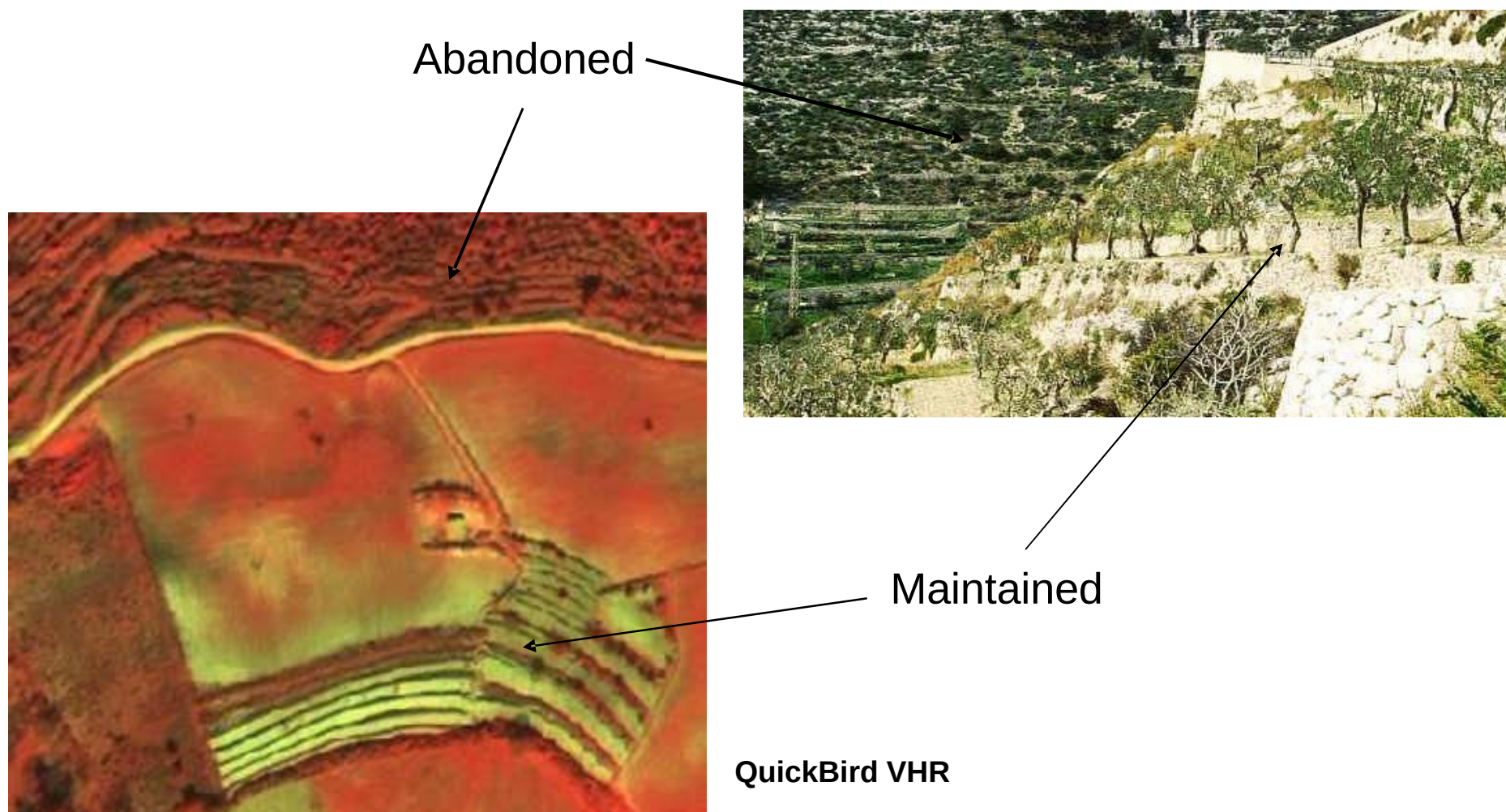
Stubble management (Italy)

- 1 Bare soil
- 2 Sown parcel
- 4 Rape seed

HR SPOT 4
January 2006



Minimum soil cover (Belgium Wallonia)

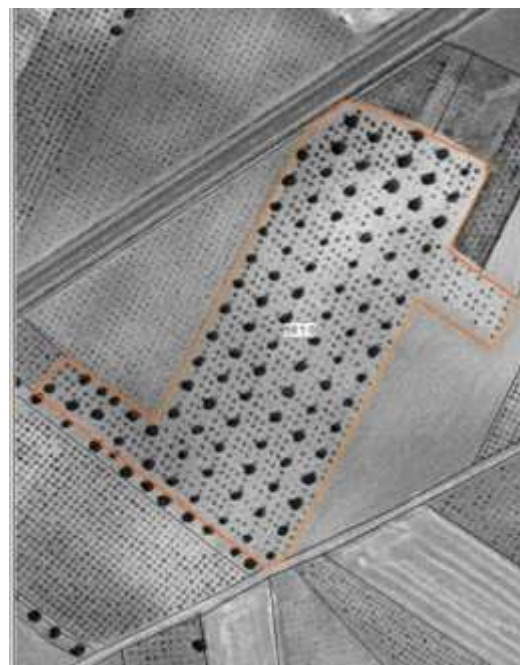


Maintenance of terraces
(Italy)



Livestock stocking rate
(Ireland)

© Space Imaging
Ikonos



LPIS Orthophoto
Or **OLIGIS**



© Space Imaging
Ikonos April 2005

**Prohibition of the grubbing up
of olive trees**
(Spain)



© UK
Perspectives



© Space Imaging,
Ikonos 2005



Maintenance of olive groves
(Italy)

QuickBird VHR

Retention of landscape features
(UK – England)

**LPIS
ORTO-
PHOTO**



**VHR IKONOS
IMAGE**

22-04-05

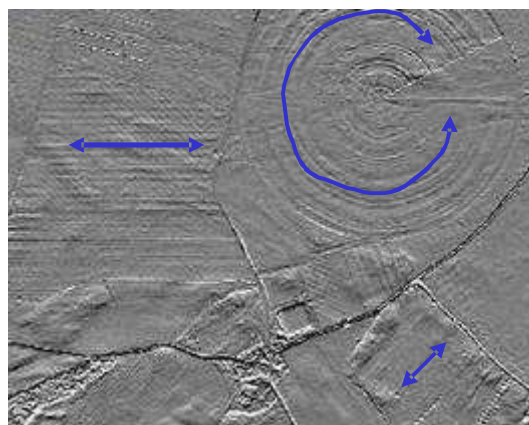
**Retention of landscape features including, hedges, pond,
trees in line, in group or isolated
(Spain)**

Detection of ploughing and/or crop rows direction

(Spain)



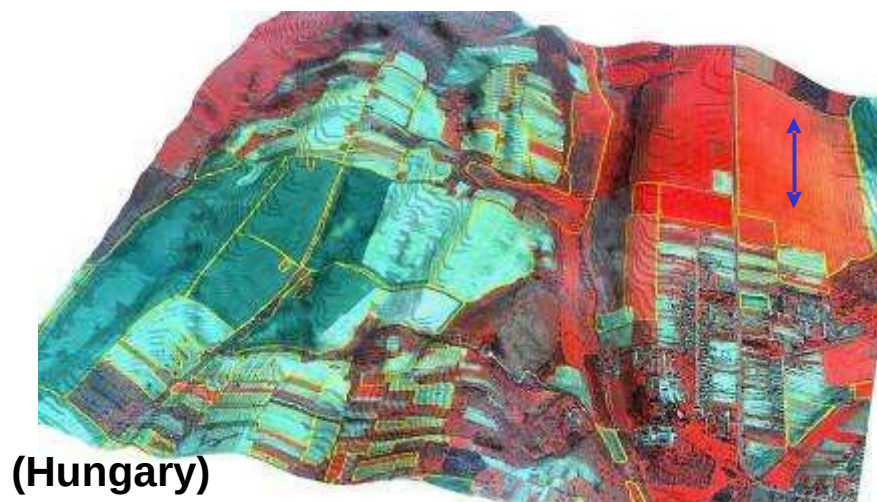
VHR Ikonos panchromatic image



→
Borders filter enhancement

Superimposed on Digital
Terrain Model

**Land management reflecting
site-specific conditions**
(e.g. no row crops on slopes)



(Hungary)

**LPIS
ORTOPHOTO**



(Spain)

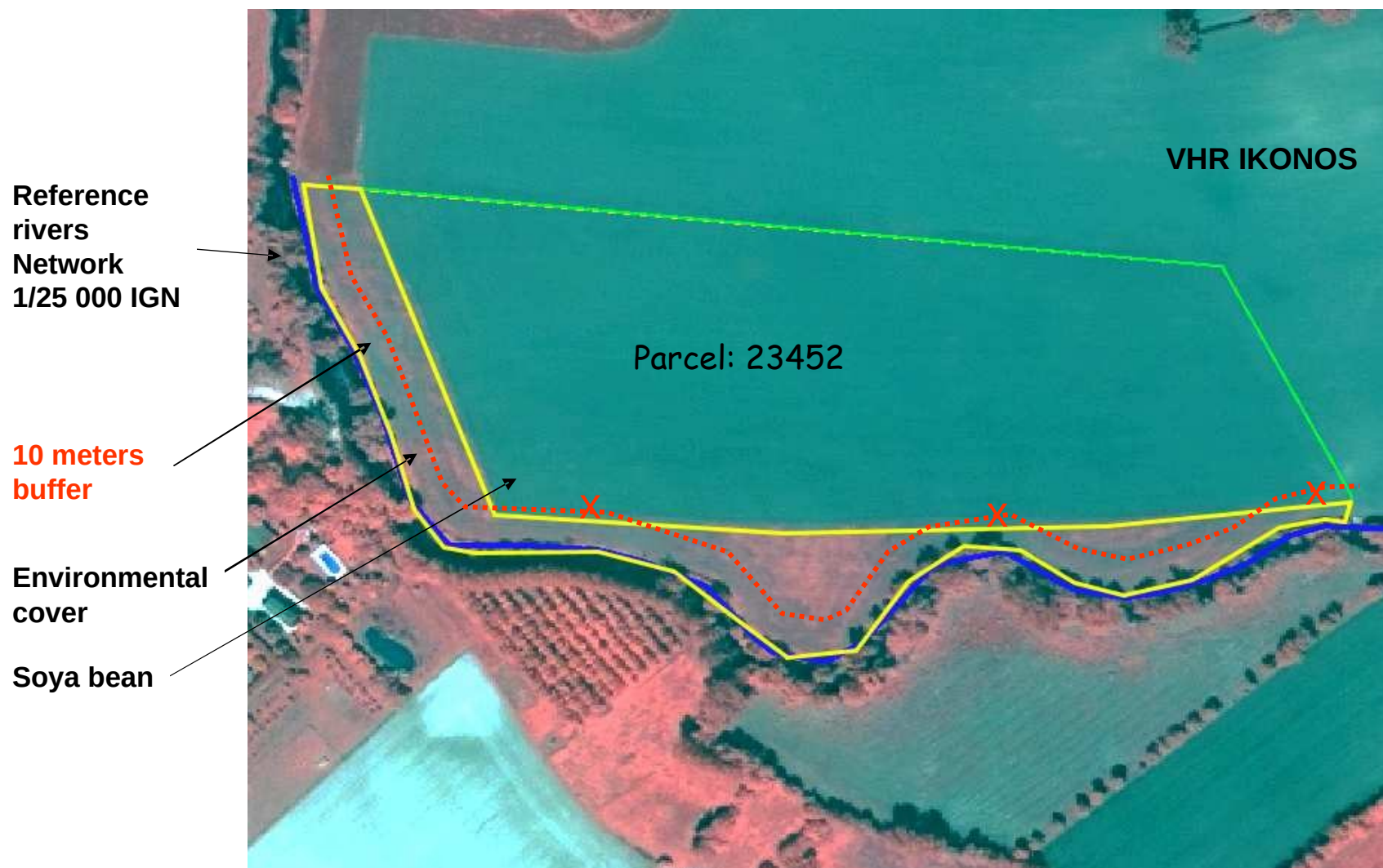
**VHR IKONOS
IMAGE**

22-04-05

VHR IKONOS (Ireland)



Avoiding encroachment of unwanted vegetation



**Establishment of buffer strips along water courses
(France)**

Extend the use of RS imagery

Detect or control also Environmental SMR, AEM ?

Sludge, organic storage, leakage, pollution evidence



Leakage

Standards where some defined requirements can be detected using RS images

Issue	Standards	VHR	HR
Soil erosion: Protect soil through appropriate measures	– Minimum soil cover	✓	✓
	– Minimum land management reflecting site-specific conditions	✓	✓
	– Retain terraces ★	✓	
Soil organic matter: Maintain soil organic matter levels through appropriate practices	– Standards for crop rotations ★	✓	✓
	– Arable stubble management	✓	✓
Soil structure: Maintain soil structure through appropriate measures	– Appropriate machinery use ★	✓	
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats	– Minimum livestock stocking rates or/and appropriate regimes ★	✓	
	– Protection of permanent pasture	✓	✓
	– Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins,	✓	
	– Establishment and/or retention of habitats ★	✓	
	– Prohibition of the grubbing up of olive trees ★	✓	
	– Avoiding the encroachment of unwanted vegetation on agricultural land	✓	
	– Maintenance of olive groves and vines in good vegetative condition ★	✓	
Protection and management of water: Protect water against pollution and run-off, and manage the use of water	– Establishment of buffer strips along water courses,	✓	
	– Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures.		

ANNEX III

GAEC referred to in Article 6

★ Optional

Standards	A T	B E	B G	C Y	C Z	D E	D K	E E	E S	F I	F R	G R	H U	I E	I T	L T	L U	L V	M T	N L	P L	P T	R O	S E	S I	S K	U K
- Minimum soil cover	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓				✓				✓		✓	✓	✓	✓		✓
- Minimum land management reflecting site-specific conditions		✓	✓	✓	✓				✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
- Retain terraces	✓		✓	✓	✓	✓			✓			✓			✓		✓		✓				✓		✓		
- Standards for crop rotations where applicable	✓		✓			✓				✓	✓				✓	✓	✓		✓	✓	✓	✓	✓		✓		✓
- Arable stubble management	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓
- Appropriate machinery use	✓		✓	✓				✓	✓	✓		✓		✓	✓			✓	✓		✓				✓	✓	✓
- Minimum livestock stocking rates or/and appropriate regimes				✓										✓									✓	✓			✓
- Protection of permanent pasture	✓	✓	✓		✓	✓		✓	✓	✓		✓			✓	✓	✓	✓			✓	✓	✓			✓	✓
- Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins,	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	✓	✓		✓	✓			✓	✓	✓		✓
- where appropriate, prohibition of the grubbing up of olive trees									✓		✓				✓							✓			✓		
- Avoiding the encroachment of unwanted vegetation on agricultural land	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
- Maintenance of olive groves and vines in good vegetative condition											✓	✓			✓				✓			✓			✓		
- Establishment of buffer strips along water courses,			✓							✓	✓																
- respect of authorisation procedures for using water for irrigation.																											

According to GAEC web database (GAEC defined by MS in 2007)

Distinguishable but:

No or few quantification of results

Few feedbacks in the 'summary statistics'

Need to assess the efficiency

Real Negative
False Positive
False Negative
Real Positive

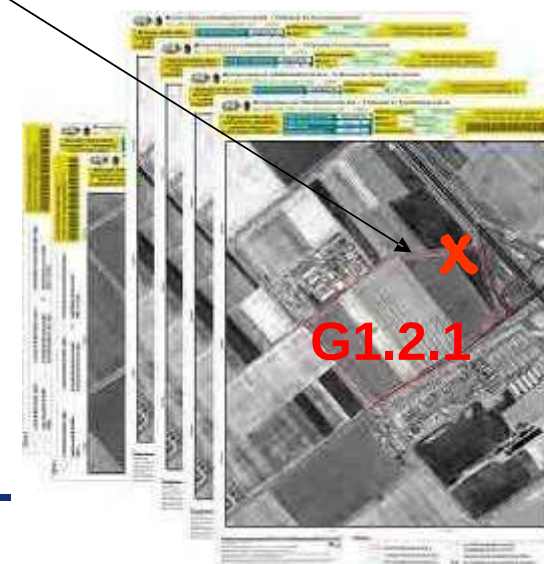


Support office work on each dossier before **systematic field visit** (When GAEC sample is part of the CwRS one)

Locate parcels with possible infringements
Possibly estimate the extent of infringement

Produce **piece of evidence to farmers**

Field control faster and more efficient



Use of diagnosis codes

G1.1.1 Obligation of minimum soil cover in winter

G1.2.1 Prohibition of certain crops on slopes > 10%

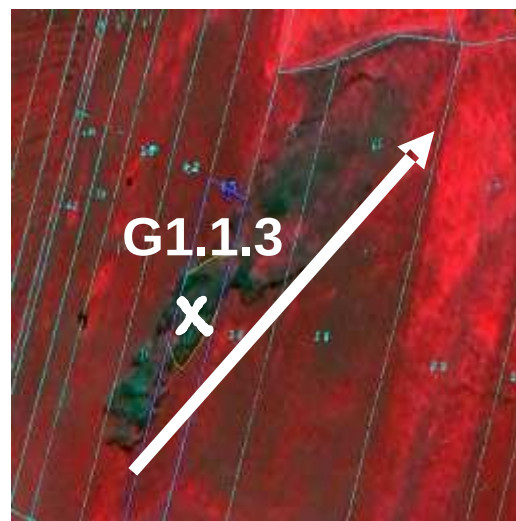
G2.2.1 Prohibition of burning stubbles

G3.0.1 Avoid heavy poaching by animals

G4.4.1 Avoid unwanted vegetation on arable land

Locate and document the infringement

VHR QuickBird Image



Erosion

Extent

Out of parcel

Number of parcels not compliant

Out of farm

Ease and optimise the work of controller on the field



Report also infringements out of GAEC sample

Administration to decide for follow up

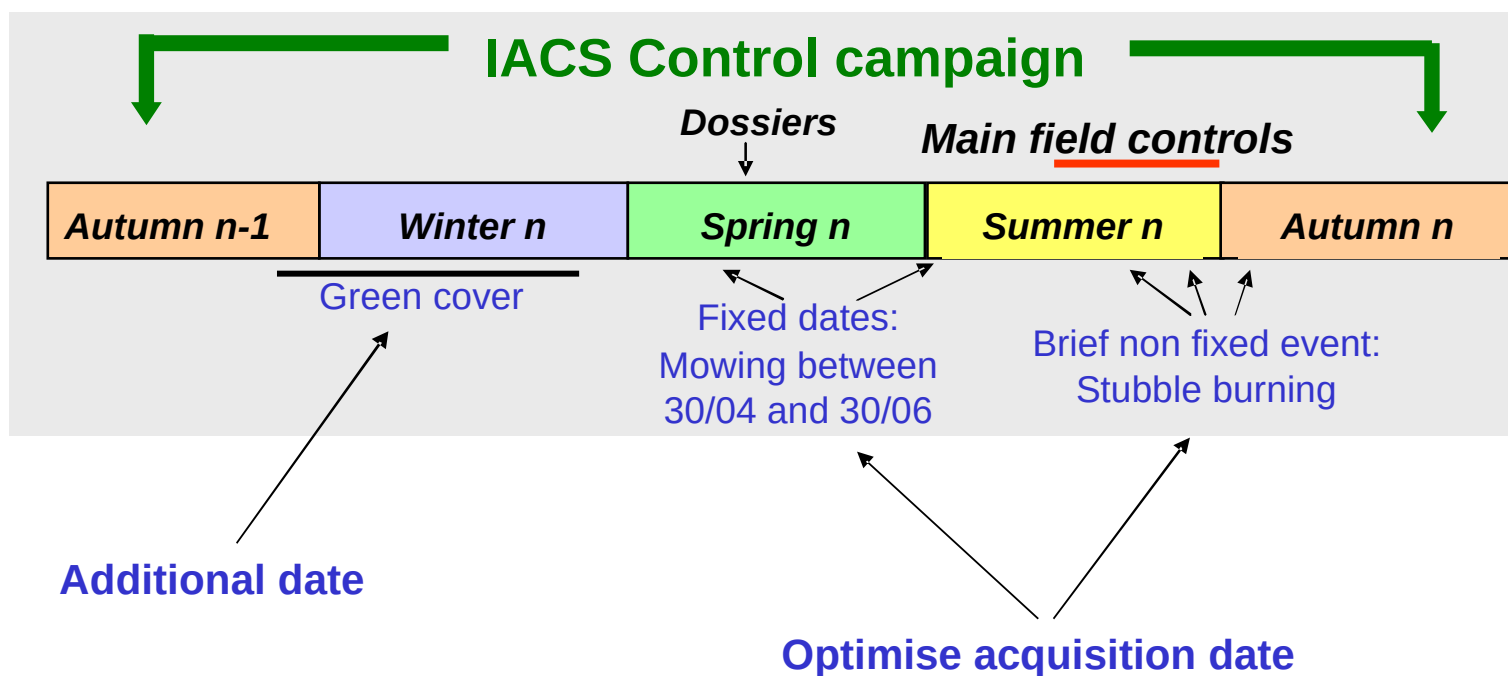
Letter to farmer, warning, evidence, high risk for next campaign ...



Heterogeneous list of detailed requirements to check (SMR, GAEC, AEM)

More temporal checks (winter, fixed date, reference period ...)

RS images Allow to be 'present' all through the year

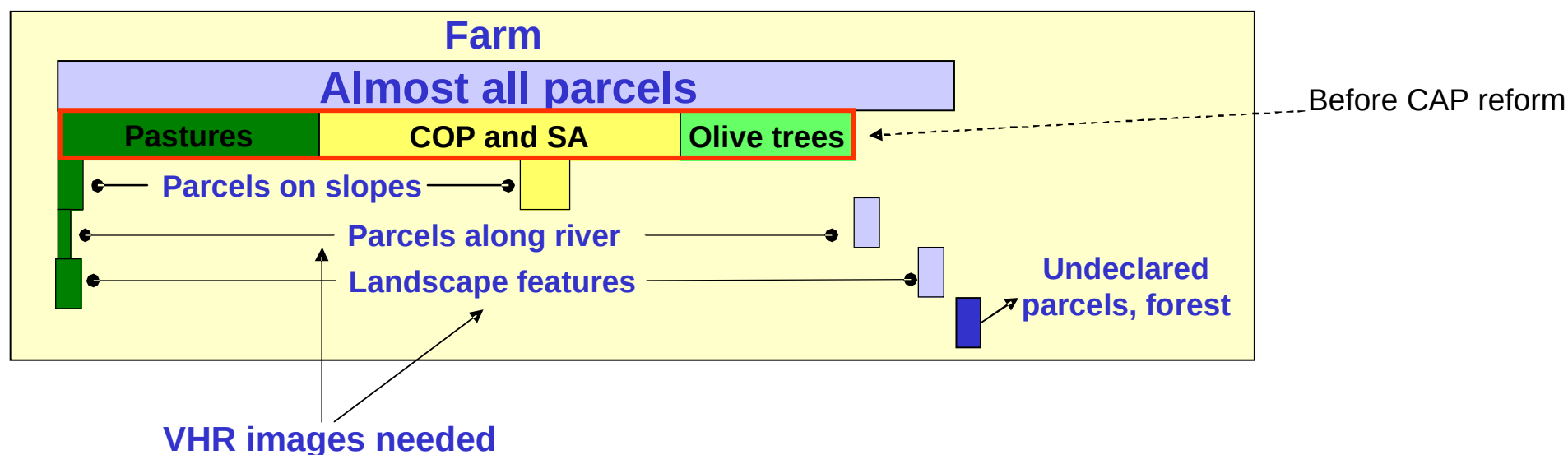


Heterogeneous list of detailed requirements to check (SMR, GAEC, AEM)

More spatial check (slope, riverside, undeclared area ...)

More 'objects' to identify (fire, erosion, bush, tree lines, isolated trees ...)

RS images Allow and ease the access, identification and location of 'objects'

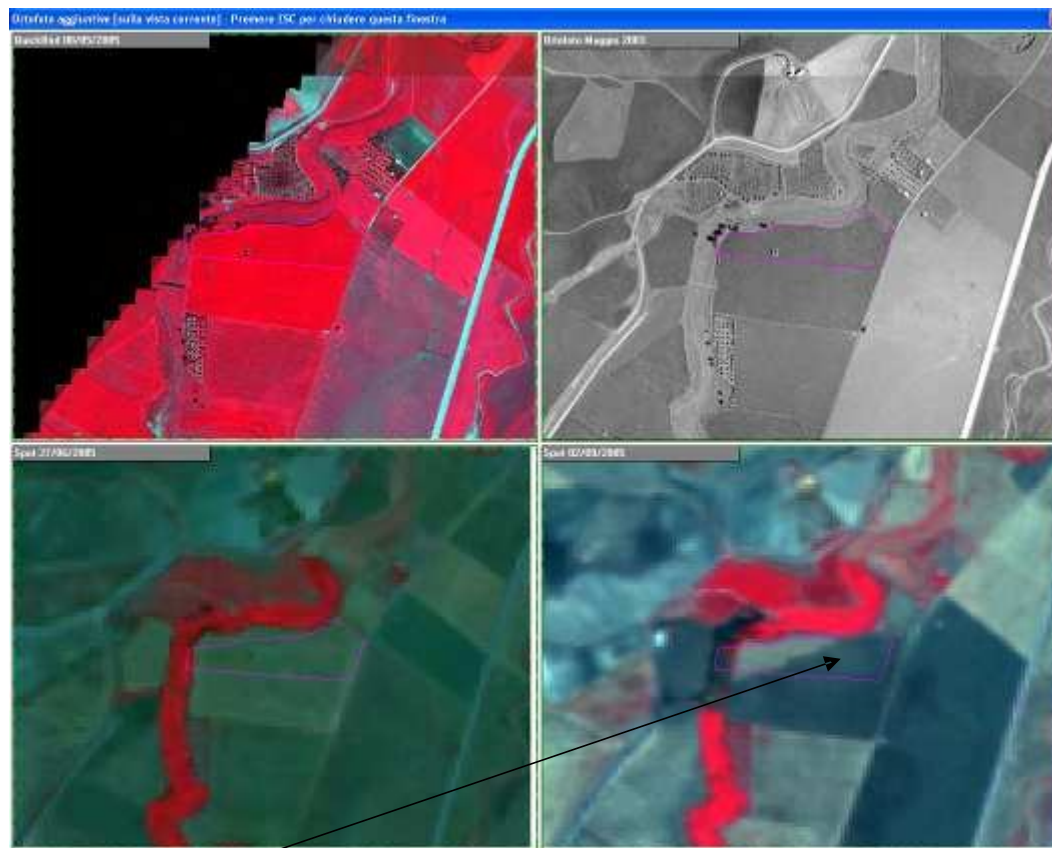


Except few cases, Very High Spatial Resolution is needed



SPOT HR
July 2007
(Bulgaria)

Stubble burnt



(Italy)

SPOT HR
September 2005

Combine GAEC's criteria with SPS for Risk Analysis

Selection of CwRS sites

GAEC sample within CwRS sample

After update of 796/04 legislation

Possible change in number and size of sites

Reduce size, increase number

Possible change in images composition

2 VHR images + 1 HR images

New CAPI knowledge and CwRS strategy

Examples from the field



Examples from imagery



Provide elements of expertise

Indicate rules to follow:

- Area measurement or not
- Take photo as evidence
- Sanction or no sanction

Specify:

- Type of satellite or aerial photography
- Date of acquisition
- Spectral bands combination
- Code to apply

Step not yet fully done by Member States

