

FONDO ESPAÑOL DE GARANTÍA AGRARIA  
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# CROP MEASUREMENT METHODOLOGY

FONDO ESPAÑOL DE GARANTÍA AGRARIA


Brussels April 22<sup>nd</sup>

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## OUTLINE

1. Background
2. Crop Measurement Methodology in Spain 2013
3. 5 Meter Buffer Rule *versus* Crop Measurement Methodology
4. Conclusions

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## 1- Background

### Feasibility for measurement

Visual verification: Do all RP boundaries match land features or follow limits of land cover/land use?

1. **YES:** RP suitable for measurement + digitizing.
2. **NO:** Are there ineligible features within a buffer of 5 meters of the boundary of the RP?
  - a. **YES:** observed eligible area, area declared and the reference area = 0
  - b. **NO:** RP suitable for measurement + copy-pasting

high percentage of “not suitable for measurement” reference parcels


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1- Background

### LPIS in Spain

- **2010 -2012**  
All reference parcel boundaries that can be identified by CAPI or **match cadastral parcel boundaries** are suitable for measurement.
- **June 2013**  
**Proposal of amendment to the methodology** for RP not identifiable in the image and having one or more ineligible features in a 5 meter buffer.

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1- Background

### ES proposals

**OBJECTIVE:** To allow copy-pasting in some cases where there is an ineligible feature within the 5m buffer.

**Proposal A**  
RP suitable for measurement + copy-pasting **if the ineligible features within the 5m buffer are digitized.**

**Proposal B**  
RP suitable for measurement + copy-pasting **if the ineligible features within the 5m buffer are in the part of the boundary that matches distinctive land features.**

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**1- Background**

**ES proposal: suitable for measurement**

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**1- Background**

**ES proposal: suitable for measurement**

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## 1- Background

### JRC counterproposal

LPIS QA. Changes to the ETS guidance Wim DEVOS Baveno, October 15, 2013

**A solution is needed where more items can be measured and none are copy-pasted**

```

graph TD
    Start([Inspect the RP]) --> D1{Can the LUI be delineated?}
    D1 -- Yes --> End([Add to QE1 DQ_scope])
    D1 -- No --> P1[Identify each and all crops or agricultural land use/cover of the LUI]
    P1 --> D2{Does this completely match an aggregate of reference parcels?}
    D2 -- Yes --> P2[Substitute the reference parcel with the resulting aggregate]
    D2 -- No --> P1
    P2 --> End
  
```

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## 1- Background

### JRC counterproposal: suitable for measurement

RP preselection

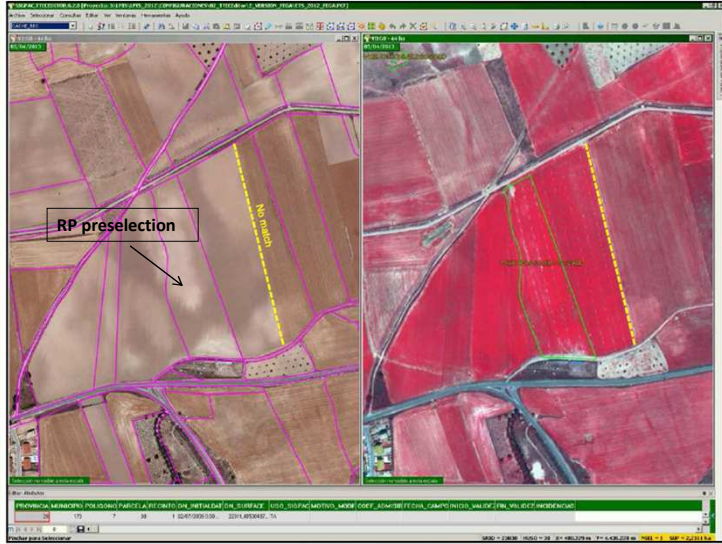
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## 1- Background

**JRC counterproposal: Not suitable for measurement**



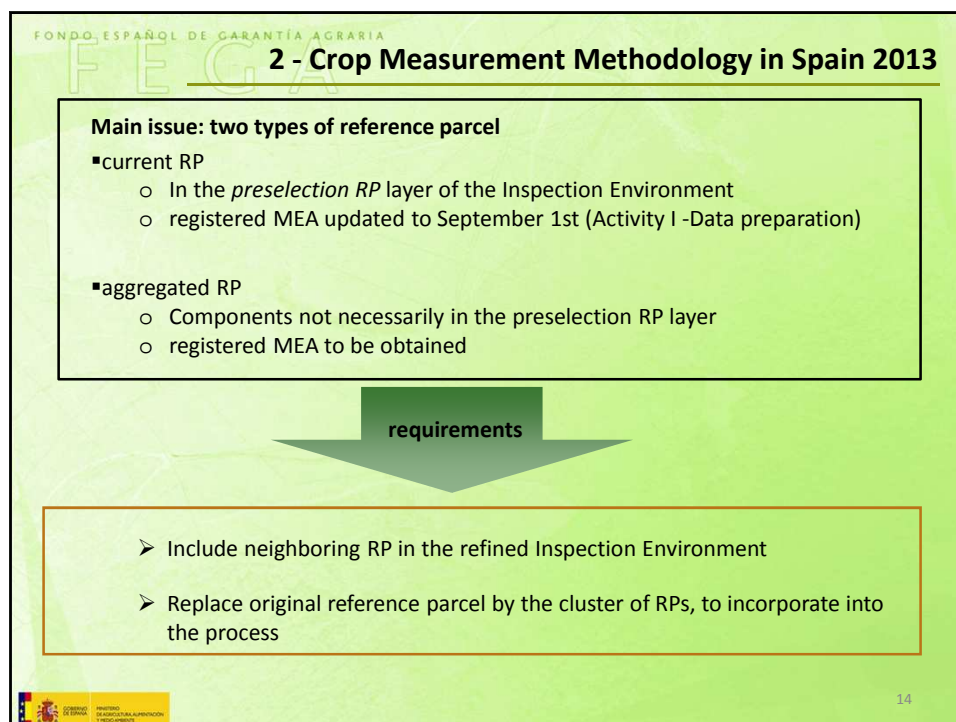
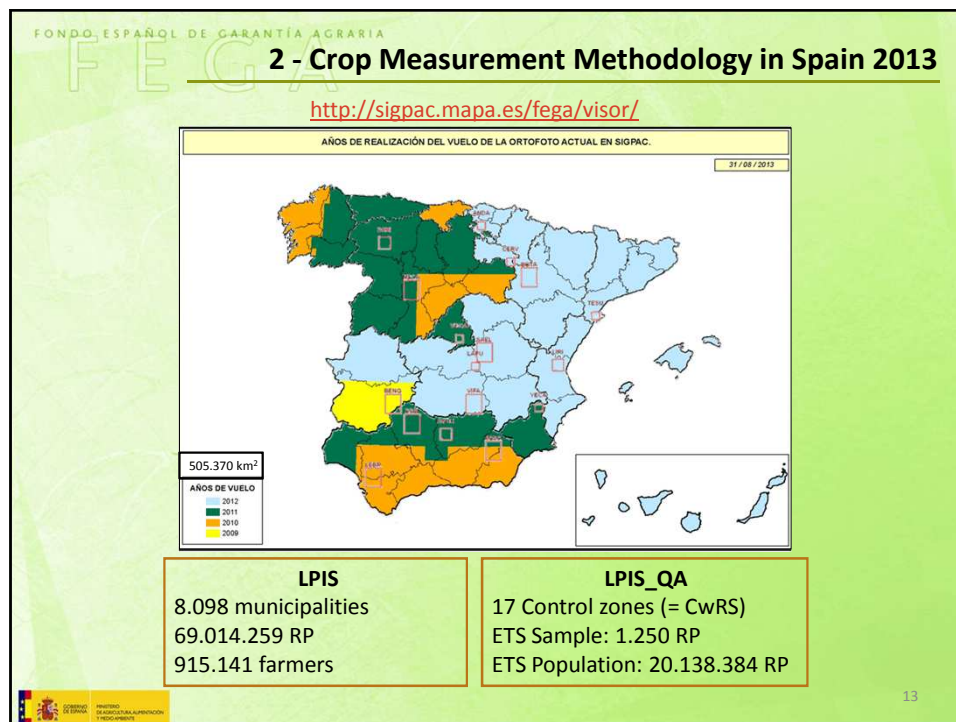
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## 2 - Crop Measurement Methodology in Spain 2013

### New inspection environment

**Vector layers**

- Cadastral parcel
- Cadastral subparcel (RP)
- Preselection RP
- ETS parcel
- ETS\_recinto\_expandido

**Raster layers**      **Orthoimage**      **2013 VHR image**

The RP is the cadastral subparcel (recinto) topologically related to cadastral parcel

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## 2 - Crop Measurement Methodology in Spain 2013

### Feasibility for measurement. Example 1

2009 orthoimage      2013 VHR image

Can the LUI be delineated? No

Does it intersect with a visible cropping pattern? Yes

**Expand the LUI to the smallest visible cropping pattern.**

- ETS\_recinto\_expandido
- Preselection RP
- ETS parcel
- Aggregation of RP


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## 2 - Crop Measurement Methodology in Spain 2013


Example 1



2009 orthoimage      2013 VHR image

Does the expanded LUI completely match an aggregation of reference parcels?      Yes

Substitute the RP with the resulting aggregate. Feasible for measurement


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## 2 - Crop Measurement Methodology in Spain 2013

Example 2








2011 orthoimage      2013 VHR image

Can the LUI be delineated?      No

Does it intersect with a visible cropping pattern?      Yes

Expand the LUI to the smallest visible cropping pattern.

 ETS\_recinto\_expandido  
 Preselection RP  
 ETS parcel  
 Aggregation of RP


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## 2 - Crop Measurement Methodology in Spain 2013

Example 2

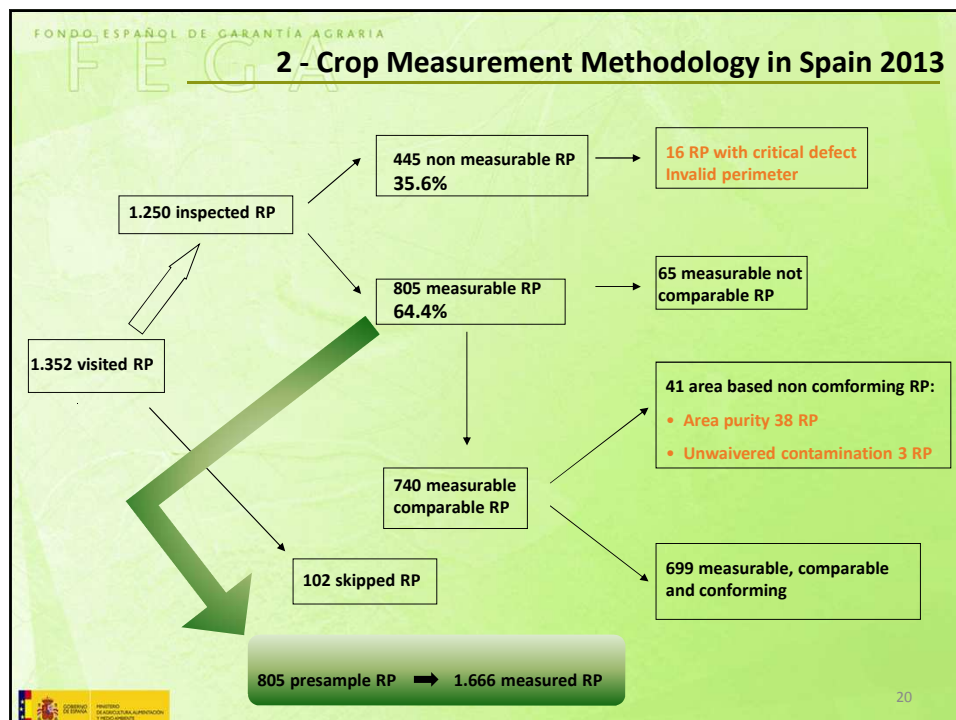


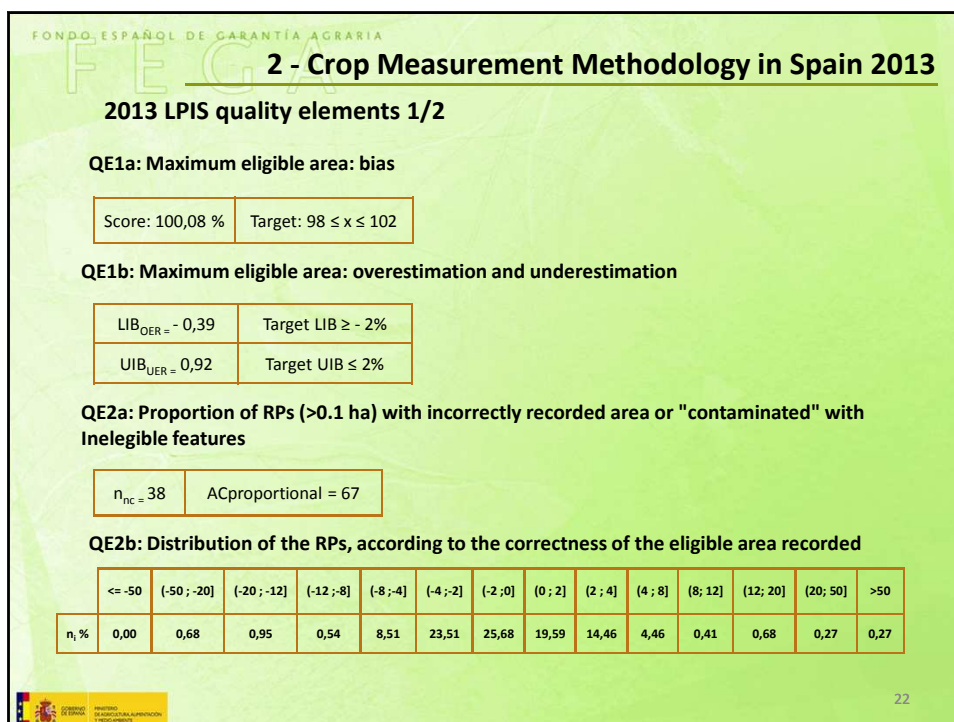
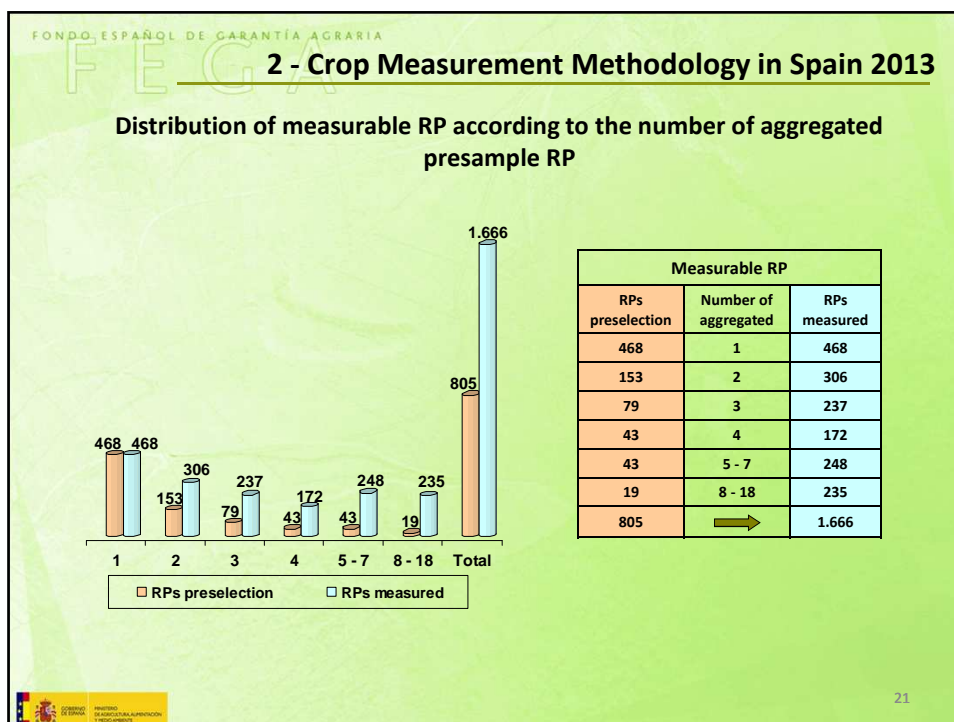
The image shows two side-by-side aerial photographs of the same agricultural area. The left image is a 2011 orthoimage with a yellow grid overlay on a parcel. The right image is a 2013 VHR image with a purple outline of the same parcel. A white arrow points to a discrepancy in the boundary between the two images, labeled 'No match'.

2011 orthoimage      2013 VHR image

Does this completely match an aggregate of reference parcels? No  
Not feasible for measurement

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## 2 - Crop Measurement Methodology in Spain 2013

### 2013 LPIS quality elements 2/2

**QE3: Categorization of the non-conforming RP**

Issues	Updates	Upgrades	Completeness	Errors	Design	GAC
n <sub>nc</sub>	1	0	22	34	0	0

**QE4: Occurrence of RP with critical defects**

n <sub>nc</sub> = 16	AC = 18
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**QE5: Ratio of total declared area in relation to the total area recorded for the conforming RPs**

V1 % = 99,53	V2 % = 99,64
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**QE6: Cumulated rate of non-conforming reference parcel due to undetected land cover changes, as observed in ETS, accumulated over the years.**

Score: 15,01	Target: < 25%
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**QE 7: Rate of irregularities determined during on-the-spot checks**

p = 0, 8959	p > 0,05
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### 3 - 5 Meter Buffer Rule *versus* Crop Measurement Methodology

#### Analysed two factors

- Number of non measurable reference parcels
- Workload

#### Basis:

- 2013 experience
- Pilot study: sample of 200 reference parcels

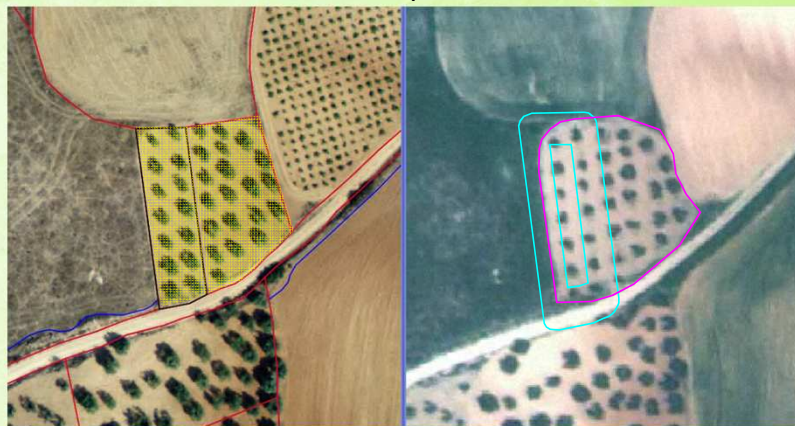


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### 3 - 5 Meter Buffer Rule *versus* Crop Measurement Methodology

Example 3



2009 orthoimage

2013 VHR image

5 Meter Buffer Rule : unmeasurable

Crop Measurement Methodology: measurable

- Cadastre parcel
- Cadastre subparcel (RP)
- Preselection RP
- ETS parcel
- Aggregate of RP
- 5 meter buffer



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### 3 - 5 Meter Buffer Rule *versus* Crop Measurement Methodology

Example 4

2009 orthoimage      2013 VHR image

5 Meter Buffer Rule: measurable

Crop Measurement Methodology: unmeasurable

- Cadastre parcel
- Cadastre subparcel (RP)
- Preselection RP
- ETS parcel
- 5 meter buffer

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### 3 - 5 Meter Buffer Rule *versus* Crop Measurement Methodology

Example 5

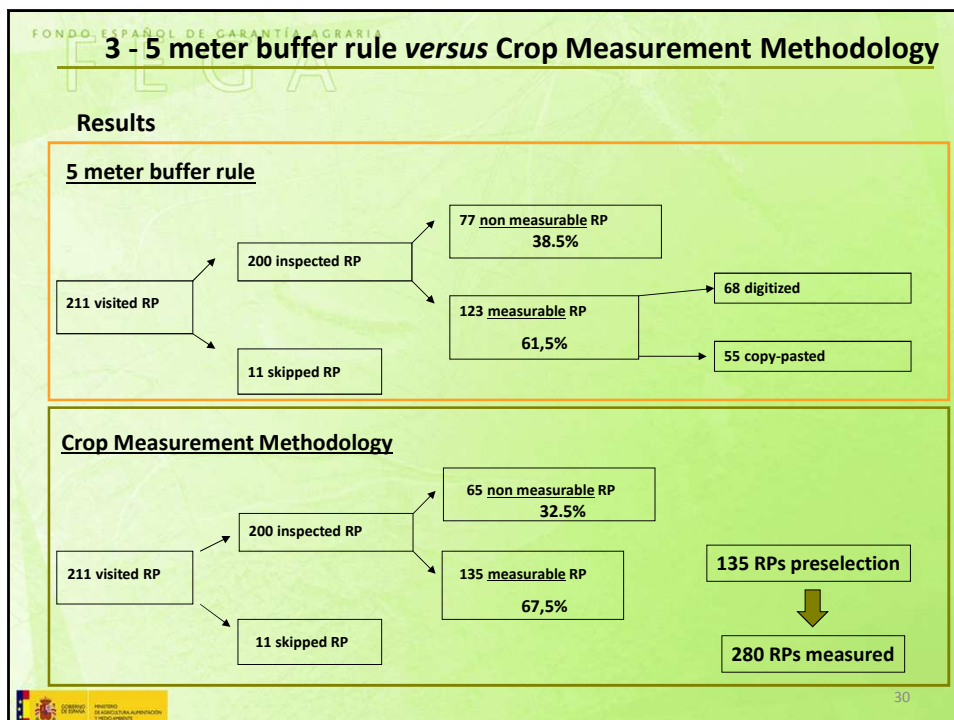
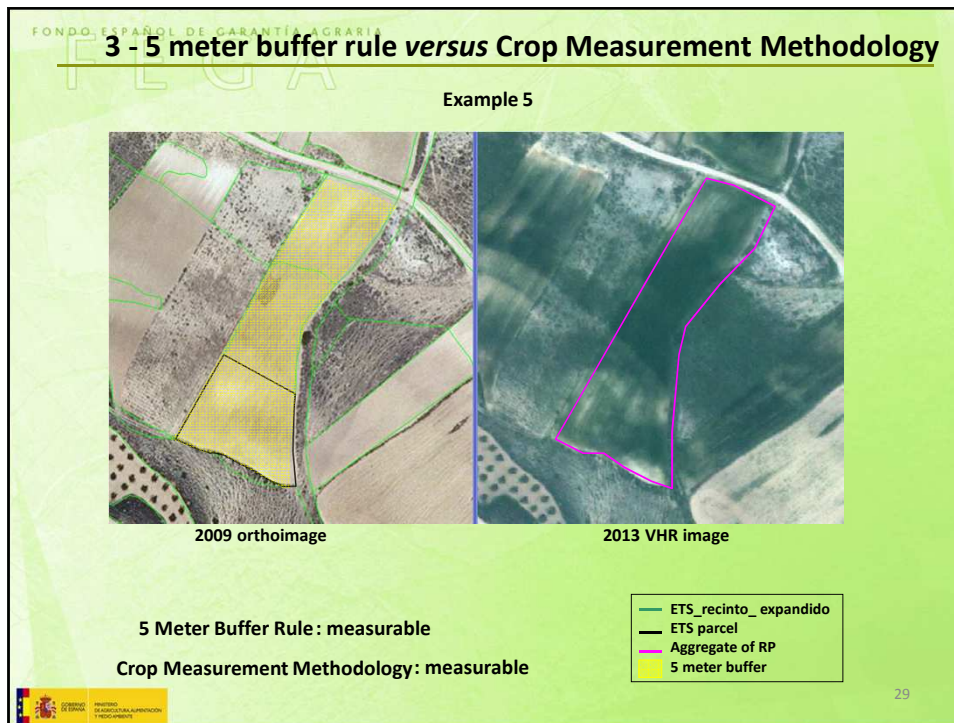
2009 orthoimage      2013 VHR image

5 Meter Buffer Rule: measurable

- Cadastre parcel
- Cadastre subparcel (RP)
- Preselection RP
- ETS parcel
- 5 meter buffer

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## 4 - Conclusions

Number of non measurable Preselection RP (% s/inspected RP)

5 Meter Buffer Rule	38.5 %
Crop Measurement Methodology	32.5 %

6% less unmeasurable reference parcels

Number of digitized Preselection RP (% s/inspected RP)

5 Meter Buffer Rule	34 %
Crop Measurement Methodology	68 %

34% more preselection RPs digitized

Number of digitized measured RP (% s/inspected RP)

5 Meter Buffer Rule	34 %
Crop Measurement Methodology	140 %

106 % more measured RPs digitized

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**4 - Conclusions**

**Workload**

**Every year**

- More reference parcels digitized (previously copy-pasted + aggregated)
- Longer time to decision taking

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Double time inspection

**First year**

- Incorporating new layer
- Adapting environment and processes
- Assimilating the methodology

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One month extra work

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**4 - Conclusions**

**Some considerations on the Crop Measurement Methodology**

- Better adapted to LPIS based on Cadastre
- Accomodates to the need of “no items copy-pasted”
- Barely accomodates to the need of “more items can be measured”
- Increase of workload
- Still inadequate in extensive farming areas (example)

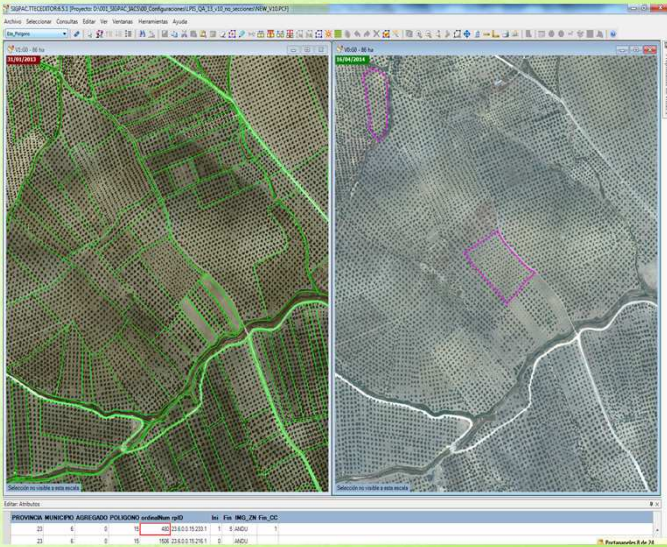
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## 4 - Conclusions


**ETS 2013: example of area with very high percentage of non measurable parcels according to the Crop Measurement Methodology**



PROVINCIA	MUNICIPIO	ASIGNADO	POLIGONO	noMedibles	%	Fin	IMO	ZN	Fin	CC
25	E	0	40	23403	100	1	0	0	0	0
25	E	0	10	100	100	1	0	0	0	0

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## Thank you for your attention

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