

Deduction of ineligible areas

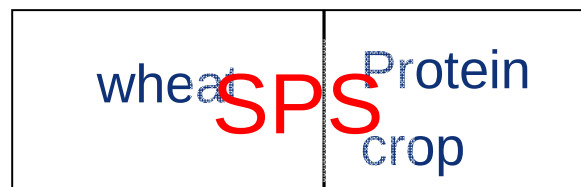
Thoughts and proposal for 2009

- Reminder: agricultural parcel 2008
- Consequences (tolerance, retained area, small ineligible features)
- Deduction of ineligible features
 - the two measurement methods & their tolerances
 - Proposal of improvement

- 2008 definition (art2 (1a) of R. 796/2004): “a continuous area of land on which a single **crop group** is cultivated by a single farmer; however, where a **separate declaration of the use of an area within a crop group** is required in the context of this Regulation, **that specific use shall further limit the agricultural parcel**”.
- Example 1

wheat	Protein crop	Perm pastures
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- 3 agri parcels



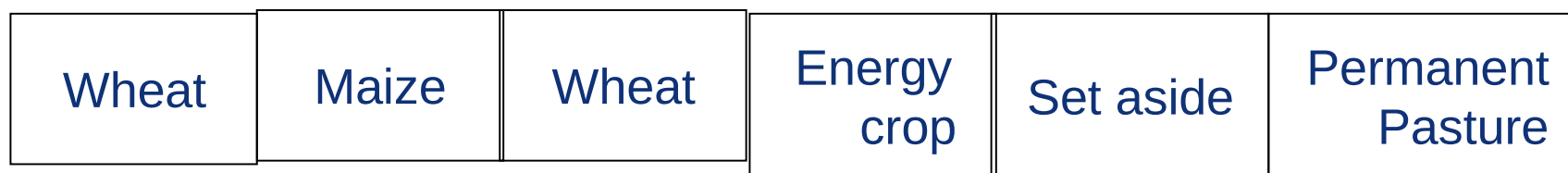
SPS, Perm
pastures

Protein
Crop

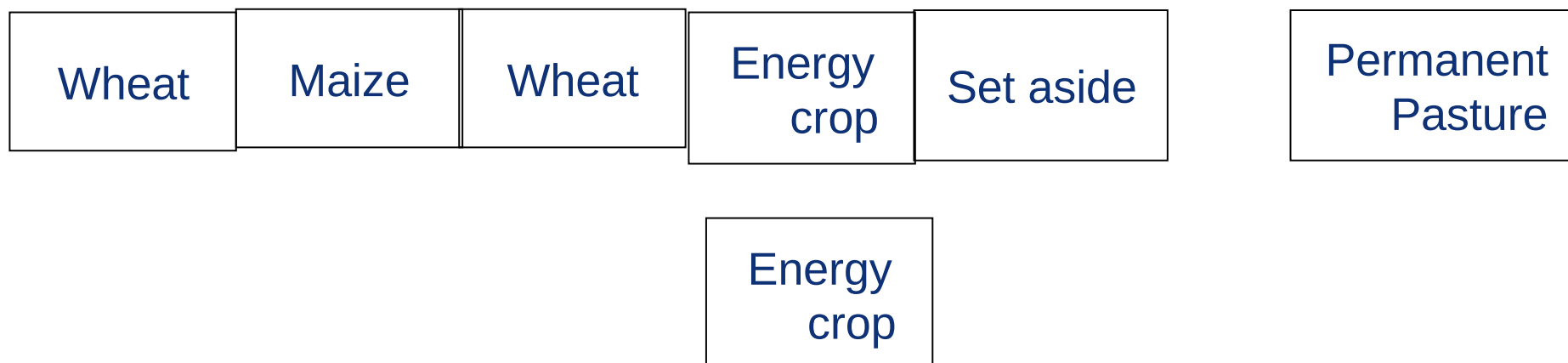
i.e. other group

- > Need to be **declared separately within crop group SPS**
- other uses in this case: set-aside (**before 2009**), possibly fruit & veg with special entitlement

- Example 2 – 2009 campaign



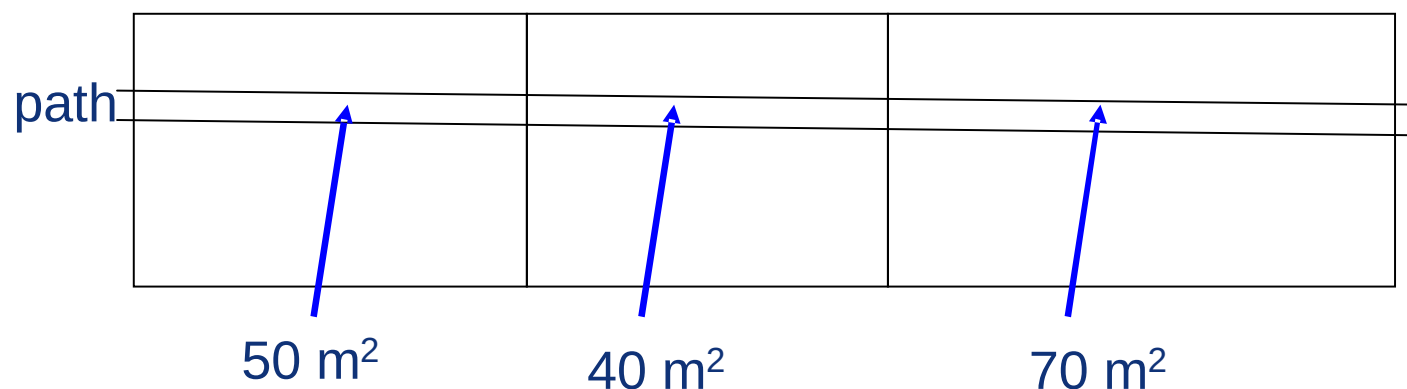
- 3 agri parcels, 2 SPS and 1 Energy crop group



- Merging single crop parcels
 - Reduces tolerance by 30 to 38%
 - does not affect the retained area, actually slightly increases it by 0.1 to 0.3%
- => No direct link between reducing tolerance and reducing retained area!

MS	# parcels merged	Declared area (ha)	Measured area (ha)	Change in perimeter	Change in retained area
UK EN	225	3465	3473	-35% (-234 km)	+0.1% (3467.4 + 3.3 ha)
NL	34	296	299.5 / 297	-37% (-30 km)	+0.3% (296.9 + 0.8 ha)
DK	48	116	115	-30% (-10 km)	+0.1% (114.6 + 0.14 ha)
BE FL	102	1467	1470	-38% (-140 km)	+0.2% (1465.8 + 2.4 ha)

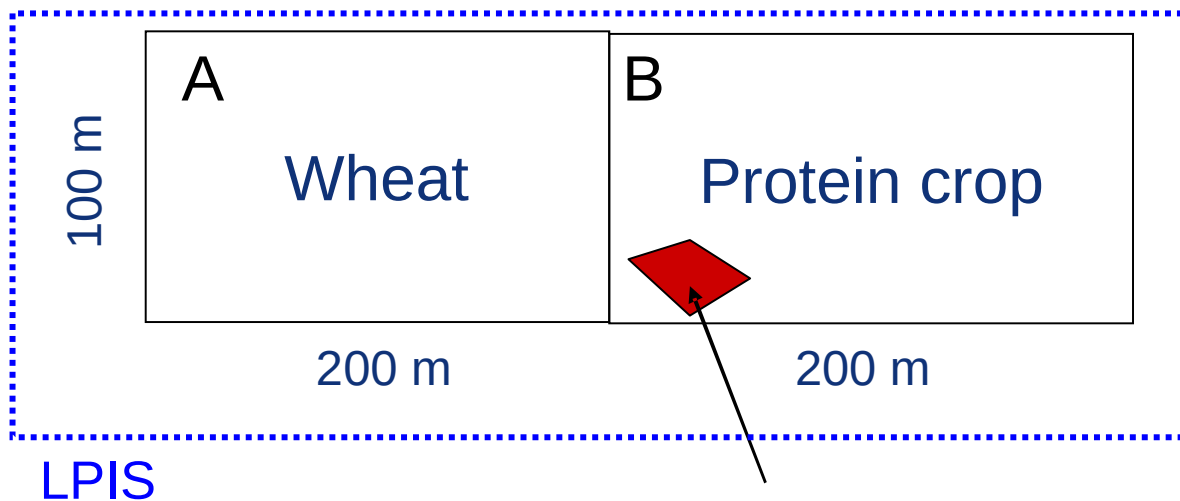
- Merging single crop parcels allows to deduct small ineligible features that otherwise would not have to be deducted



Each ineligible element is less than 100 m² in each single crop parcel (their deduction may be omitted in OTS check)

In the SPS agricultural parcel, the total area of the path = 160 m² > 100 m²
=> **the whole path should be deducted**

- Possible inconsistency in deduction of ineligible features



Declared areas

B: **2.0** ha

A+B: **4.0** ha

(= measured areas of whole parcel)

Ineligible feature 1000 m², **deducted** from whole parcel area
Measured area = **1.9** ha for B ; **3.9** ha for A+B

	Declared area	Measured area	Tolerance 1.5m buffer	Code	Retained area
Parcel B	2.0	1.9	0.09 ha	C3+	1.9 ha
Parcel A+B	4.0	3.9	0.15 ha	OK	4.0 ha

ineligible feature appears as not deducted

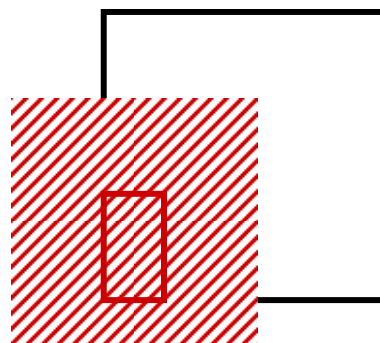
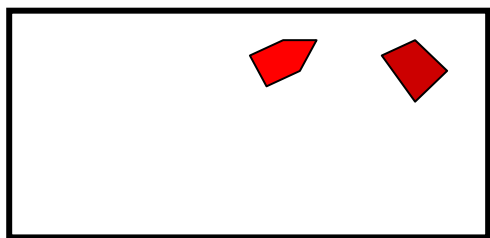
- Possible inconsistency with deduction of ineligible features



- Parcel **B**: ineligible feature **deducted**
 - Parcel **A+B**: same feature **not deducted** after application of **tolerance**
- > rare case but it would be more consistent to have this ineligible feature deducted in both parcels

- Is the approach for deducting ineligible features correct?
- Present rule: deduct from the measured parcel area
 - any ineligible feature $> 100 \text{ m}^2$
 - ineligible features below 100 m^2 if their total area $>$ parcel **tolerance**
- Compare declared area to measured area \pm **tolerance**

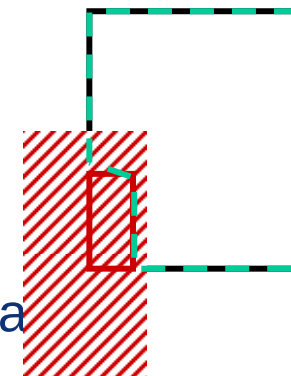
NB: Ineligible features ($> 100 \text{ m}^2$) may finally “appear” as not deducted (i.e. not significant) if their area is less than the parcel tolerance
- Does the way of measurement influence the result?



- Two ways of measuring parcels with ineligible features

- **Direct** measurement:

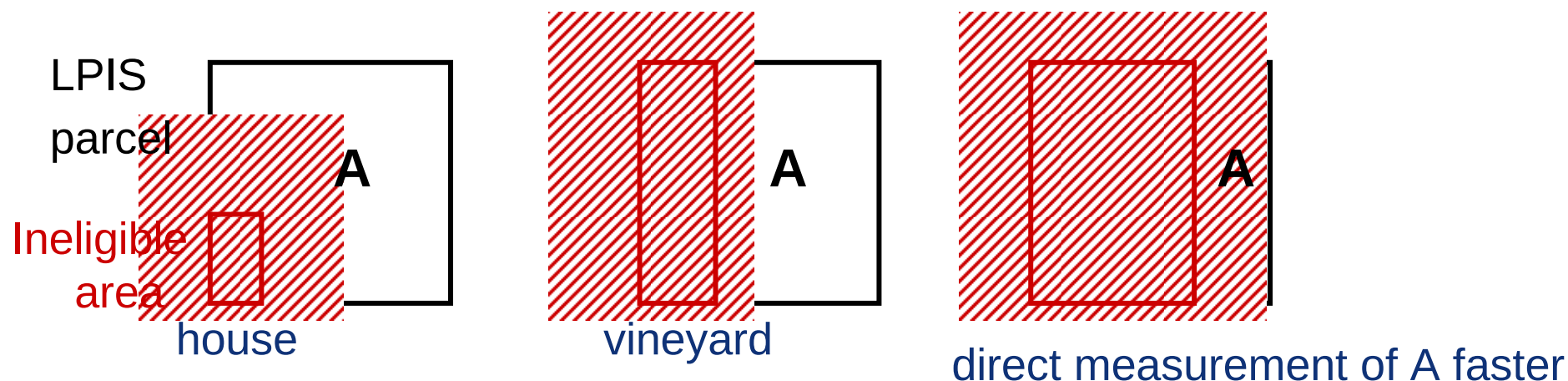
- by following the parcel limit (on screen or in the field)
- Tolerance = parcel perimeter x buffer width
- Assuming ineligible features were included in the declared area, these features are actually deducted if their area > tolerance



- **Indirect** measurement also called **deduction method**

- When LPIS parcel includes 1 claimed parcel and LPIS boundaries are confirmed
- Principle: measure area of ineligible features and deduct it from LPIS eligible area
- Tolerance = LPIS parcel perimeter x appropriate buffer width

- Rationale: avoid measuring whole parcel (A) when **deduction** method is **more effective** (smaller area measured)



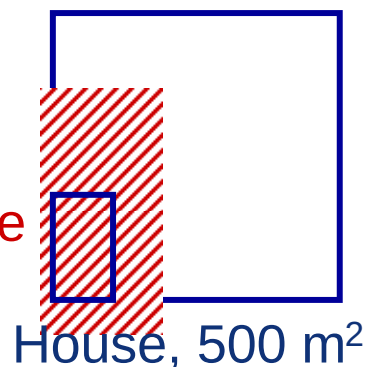
- “Measured” area = LPIS area – measured area of deduction
- Tolerance = **LPIS parcel perimeter** x appropriate buffer width

-> Isn't this **tolerance too large** when measuring a small area?

LPIS

Parcel
1.0 ha

Ineligible
area



House, 500 m²

Declared 1.00 ha

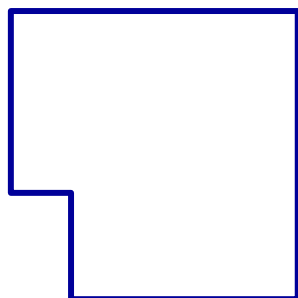
Measured 0.95 ha,
perimeter = 400 m

Tol = 0.06 ha -> declared area is inside measured +/- tol

Retained area = 1.00 ha

Looks like the house is back in!

agri
parcel



Difference with this case ?

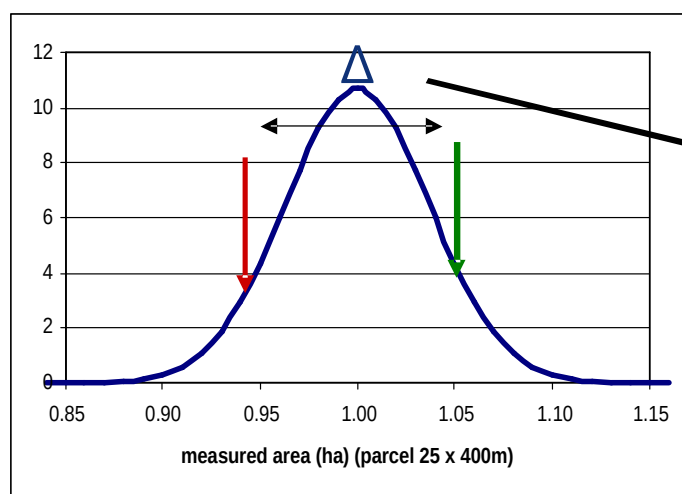
1.00 ha declared,

0.95 ha measured +/- 0.06 ha

Declared area is OK

- no difference from a measurement perspective
- in 1st case, feeling of ineligible feature unduly included because the LPIS area is known (without error)!

- **Tolerance:** defined as the **reproducibility limit** i.e. “the value less than or equal to which the absolute difference between two test results obtained under reproducibility conditions is expected to be with a probability of 95%” (ISO 5725-1)
- Reproducibility limit: maximum difference between 2 measurements made by 2 inspectors using the same method (tool) in 95% of the cases



If area measurement $\sim N(\mu, \sigma)$
 Then difference between 2 independent measurements $\Delta \sim N(0, \sqrt{2} \cdot \sigma)$
 In 95% cases, $\Delta < 1.96 \cdot \sqrt{2} \cdot \sigma = 2.8 \sigma$

1 ha parcel, VHR 1m (1.5m buffer tol)



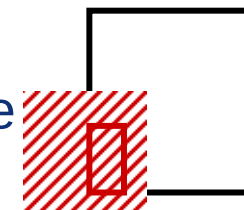
If $L = 4$ pixels i.e. operators' tracks
 are ± 2 pixels around the mean ,
 then $R = 3$ pixels

- Principle 1: the tolerance is **linked to a measurement** (and a method / tool).
- The tolerance varies mainly with the parcel shape (perimeter)
- The tolerance is an area that can be expressed as the product of
 - the parcel perimeter, i.e. a variable function of the measured object
 - and a constant linked to the measurement tool, the buffer width.

$$R = 2.8 \sigma_{\text{area}} = 2.8 \underbrace{\sigma_{\text{buffer}}}_{\text{buffer width}} \times \text{perimeter}$$

In practice, $R = 1.25 \times \text{perimeter}$ (for instance)

- The inspector measures the deduction (i.e. a small area), so the **measurement error is linked to the deduction**, not to the LPIS parcel
 - for **small deductions**, the measurement **error is very small**
An error < 0.01 ha means **tolerance is close to zero**
- What if the farmer asks to measure the eligible area instead of the deduction?
 - the **tolerance is close to the LPIS parcel tolerance**
 - consequence: the ineligible area may be less than the tolerance
- According to whether **direct measurement** or **deduction from LPIS area** is used, a different tolerance should apply, with the result that an ineligible feature may finally be deducted, or not, in the retained area!



-> Unequal treatment of farmers

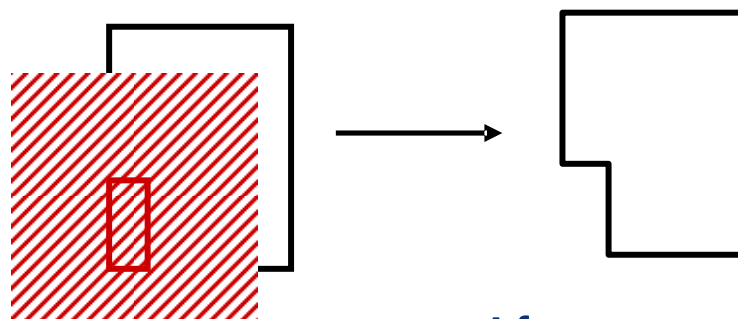
- **Conclusion:** the 2 measurements methods are not equivalent, but the application of a **tolerance linked to the LPIS parcel perimeter** (i.e. the present rule) **ensures a similar tolerance in both methods** while being pragmatic (the smaller area is measured);
- However, it may be argued that once the LPIS area is agreed by the farmer, it is not satisfactory to deduct an ineligible feature and, because of the tolerance rule, to finally "omit" this deduction in the retained area.

Proposed strategy for permanent ineligible features (building, road, wood, pond)

- Record any **permanent ineligible feature** > 0.01 ha in LPIS DB as a feedback from OTS checks, i.e. deduct its area from the LPIS eligible area; map it if above 0.1 ha.

This way, whatever the tolerance, this feature is deducted.

If a permanent ineligible feature is **at the border** of the LPIS parcel, **modify** the **LPIS parcel boundary**.



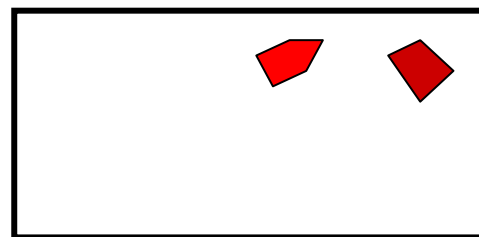
Before: max eligible area = 1.0 ha

After: max eligible area in LPIS DB = 0.95 ha

Alternative proposal for deducting ineligible features

1. Measure parcel area following external boundary
2. Compare declared area with measured area +/- tol
3. Obtain "first retained area" with tolerance rule (i.e. declared or measured)
4. Deduct "inclusions" (small areas with no tolerance) from this first retained area.

– Deduction method: step 4 only, i.e. deduct inclusions from LPIS area



Vote is open!