Changes in soil organic matter content of grassland and maize land in the Netherlands between 1970 and 2009

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EGF 2010 Kiel
- Why look at changes in soil organic matter (SOM)?
- Materials & Methods
- Results
- Discussion + Conclusion
SOM - farmers

Important for farmers

- Cation exchange capacity
- Mineralisation
- Water retention capacity
- Disease suppressiveness
- Soil workability
SOM important for environment and therefore for policy

- Soils contain large amounts of C
- Most of soil C is found in the upper layer (0 – 20)
- Decline will contribute to global warming
- SOM in EU countries decreasing! (England/Wales – Brittany - Belgium)
so

SOM is important for farmers

and

for government (global warming)

but..

what is the situation in the Netherlands

?
Content

● Why look at changes in soil organic matter (SOM)?

● **Materials & Methods**

● Results

● Discussion + Conclusion
Total agricultural area: 2,000,000 ha

Grassland (900,000 ha) on
- sandy soil
- marine clay
- fluvial clay
- peaty soils

Maize land (250,000 ha) mainly on
- sandy soils
Soil samples from BLGG AgroXpertus

4.500.000 soil samples from 1970-2000

- <1984 results of soil analyses reported in reports
- ≥ 1984 digitally recorded

In 2005-2006 because of legislation many soil samples

- Regular clients
- New clients (soils not sampled in > 10 years)
- Used these results for statistical analysis.
Content

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Changes in SOM

Soil Organic Matter, %

- Grassland (0-5 cm)
- Grassland (0-10 cm)
- Maize on dairy farms
- Arable land
Decline in % SOM Northern marine clay, grassland

soil organic matter, %
grassland 0 -5 cm
grassland 0 -10 cm
Decline in % SOM  Northern marine clay, grassland

SOM categories
Frequency, %
'71/'72
'80/'81
'83/'84
'98/'99
'00/'04
'04/'08

Decline in % SOM
Northern marine clay, grassland
Stable SOM

(permanent grassland versus ley farming)
Maïze land

Permanent maize on sandy soil from **4.0 to 4.25%** = increase

But, also an increase in maize area on the expense of grassland (high in SOM)
Why look at changes in soil organic matter (SOM)?

Materials & Methods

Results

Discussion + Conclusion
Conclusions

- On average no decline in SOM
- A lot of variation between regions
Discussion: Legislation needed?

Minimum SOM values (per soil type)

Combination of
1. Soil workability
2. Water retention
3. Cation Exchange Capacity (CEC),
4. Dynamic soil (soil life)
5. Erosion
6. ....
Investments in monitoring programme seems needed to get more insight in the reasons of decrease or increase of SOM content
Questions?

Many thanks for the invitation