

Applications to manage the Carbon footprint of the Agriculture sector

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Any business needs an EMS because



- Businesses (including farmers) need to be lean and green to prosper in a future of scarce resources.
- Insulate themselves from
 - spiralling fossil fuel prices,
 - widespread water shortages,
 - rising waste disposal costs.
- Need to deal with ever changing legislation as well as increasing demands for transparency from investors, customers and local communities
- More than 400 tools are now listed at
 - <http://www.environmenttools.co.uk/>



Main types of tools on offer to all sectors

- Basic carbon calculators
- Managing carbon
- Sustainability and CSR
- Environmental compliance suites
- Environmental modules as extra
- Energy, asset and facilities management
 - focused on reducing energy and other utility costs. They are often linked to automatic metering, building energy controls and bill payment systems.
- Footprinting and LCA
 - Product-level footprinting is complex and data is in short supply, but software tools are starting to appear on the market.
- Sector-specific tools



Spoilt for choice!

Carbon auditing tools for Agriculture and Land use in the UK



- Free tools available in the UK
 - CLA Carbon Accounting for Land Managers (CALM) tool
 - <http://calm2.circlesquared.com>
 - Developed by <http://www.increment.co.uk/>
 - CPLAN GHG calculator (partly free)
 - <http://www2.cplan.org.uk/>
 - Developed by group of farmers in Scotland
 - Cool Farm Tool
 - <http://www.growingforthefuture.com/>
 - Developed by University of Aberdeen, supported by Unilever, PepsiCo, others
- Other tools listed at website (CCE, CLIPS, Carbon statement)



Why is Agriculture special?

- Agriculture has greater need for specially designed tools as it is important to record factors not relevant to other economic sectors
- Capacity for exploiting the natural Carbon sequestering potential at its disposal
- Being an important contributor to GHG other than carbon dioxide (CO_2), such as methane (CH_4) and nitrous oxide (N_2O)



Mitigation potential for Agriculture



- Many agricultural practices can potentially mitigate GHG emissions, the most prominent of which are
 - Improved crop land and grazing land management
 - Restoration of degraded lands
 - Cultivated organic soils.
- Lower, but still significant mitigation potential is provided by
 - Water management, set-aside, land use change
 - Agro-forestry, livestock management and manure management.



Mitigation technologies and practices

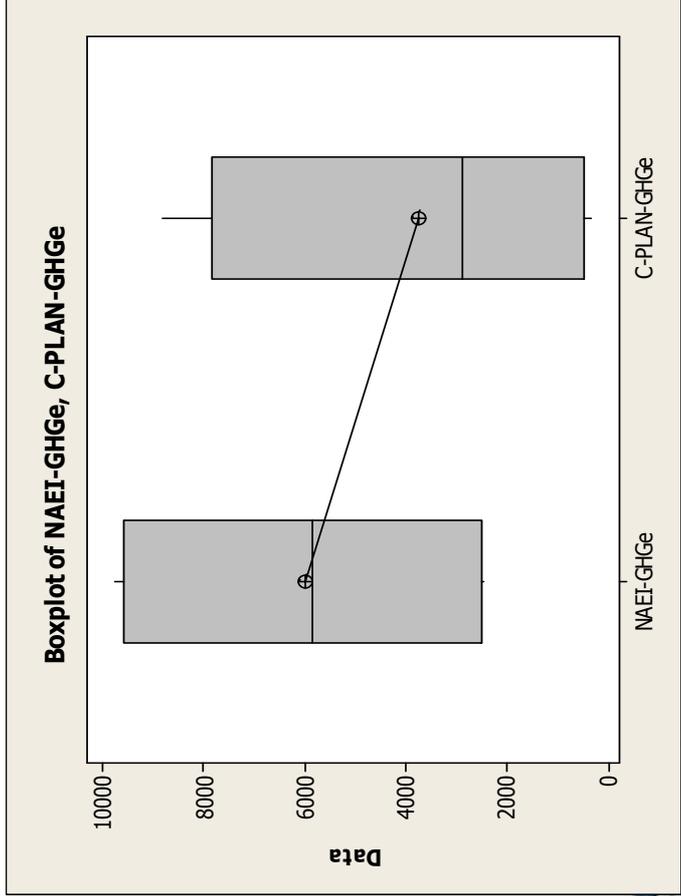
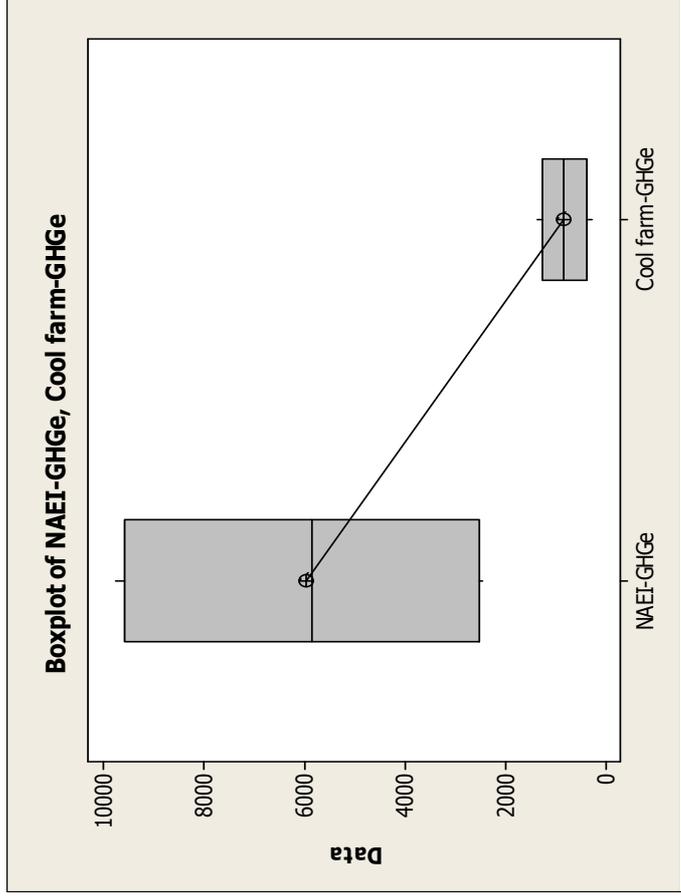


- Reducing emissions
 - managing more efficiently the flows of C and N in agricultural ecosystems
 - Managing livestock to make more efficient use of feeds
 - Approaches that best reduce emissions depend on local conditions and therefore vary from region to region
- Enhancing removals
 - Any practice that increases the photosynthetic input of C
- Avoiding (or displacing) emissions
 - Managing well the crops and residues from agricultural lands
 - Using agricultural management practices that forestall the cultivation of new lands

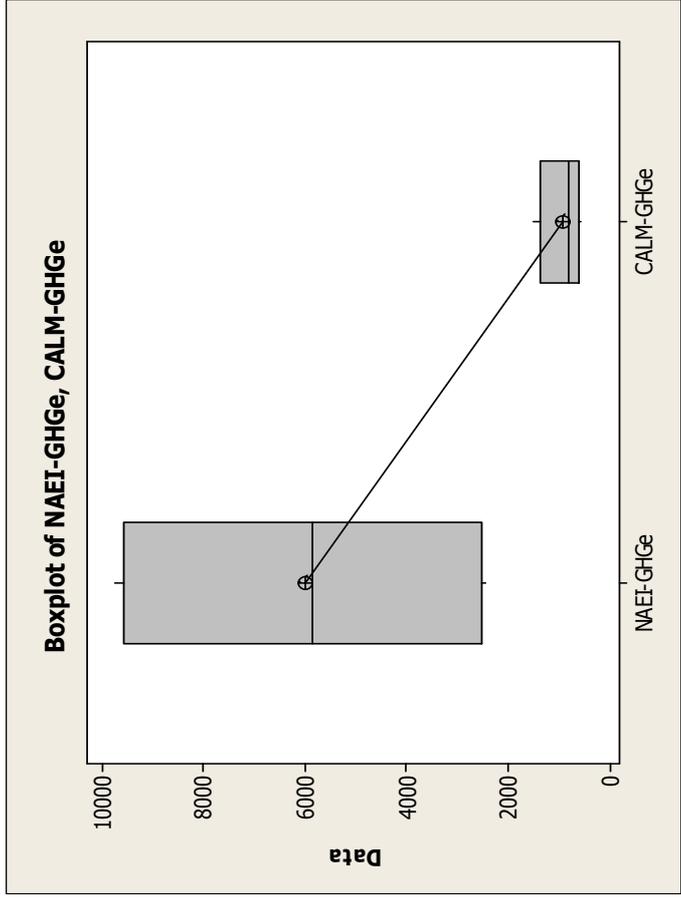


Id	Criteria	CALM	Cool Farm	CPLAN (free)
1	Execution Platform	WWW	MS-Excel	WWW
2	Scope (boundaries)	Farm	Farm	Farm
3	Tier	1,2	1,2	1,2
4	Accuracy	No data	No data	Upper/lower bound of estimates
5	Scenario analysis	+work	+work	+work
6	Usability	Navigation can be tricky	As good as MS-Excel	Simple but a bit slow to use
7	Output generation	Emissions and standard report	Only emissions	Only emissions
8	Handling complexity	Not relevant to this operational context to one user	Not relevant to this operational context as all tools are tailored to one user	Not relevant to this operational context as all tools are tailored to one user
9	Analytical power	NA	NA	NA
10	Auditability	Need additional support	Need additional support	Need additional support
11	Improved transparency	Web application	YES	Web application
12	Cutting costs	Not possible to assess as Government dithers	Not possible to assess as Government dithers	Not possible to assess as Government dithers
13	Engagement and workflow	Not relevant to this operational context to one user	Not relevant to this operational context as the tools are tailored to one user	Not relevant to this operational context as the tools are tailored to one user





Tool	2-sample T test results T-Test = 0 (vs not =)
C-PLAN	difference: 2239, 90% CI (-3395, 7872) P-Value = 0.46
Cool Farm	difference: 5153, 90% CI (465, 9841) P-Value = 0.081
CALM	difference: 5040, 90% CI (356, 9724) P-Value = 0.085

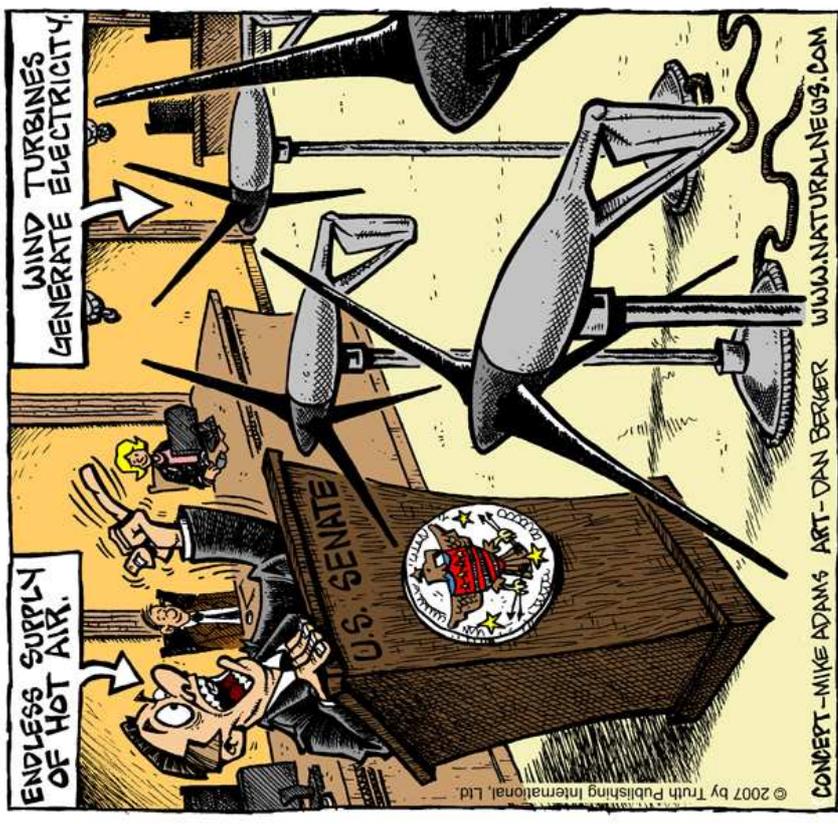


Conclusions

- There is a high potential for mitigation in Agriculture but it is poorly understood
- There is insufficient software tool support for this sector both,
 - For estimating the GHG emissions
 - Understanding the impact of mitigating measures
- There is awareness of the need for further research as demonstrated by,
 - <http://www.ahdb.org.uk/projects/GreenhouseGasActionPlan.aspx>



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QUESTIONS?

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