Cool Farm Tool

Website: https://www.coolfarmtool.org/CoolFarmTool/

Factsheet

General description of the tool

Category	Outcome-based
Objective	To help growers measure and understand on-farm greenhouse gas emissions
Geographical	International
Functionalities	Hotspots identification, soil carbon sequestration calculations, provide a footprint value/metrics
Target audience	Farmers and food supply chain managers
Developers	Unilever and researchers at the University of Aberdeen (UK) - latest update: 2014
Format	Online tool (with a specific tool for potatoes) and old Excel version available for download
Cost (tool and data)	Free (at the moment, available to producers in pilot workshops)
Past or current users	Canadian Pulse Growers Association, Heinz, Unilever, PepsiCo, Marks & Spencer, Sysco

Commodities covered

Barley, dry bean, potato, soybean and wheat

BMPs covered

Reduced tillage practices*
Fertilizer application - source
Application rate based on testing and book values
Application method - conventionally tilled land*
Cover crops*
Fertilizer application - rate
Fertilizer application - placement

**modelled partially (i.e. only to calculate the changes to longer term carbon stocks)*

Indicators covered

GHG emissions

Data inputs

Data requirements	Primary data required	Default values
Environmental conditions	Location, climate, farm size, soil characteristics (texture, organic matter, moisture, drainage, pH)	No
Crop management	Agricultural operations, crop protection, fertiliser use (fertilizer name, nutrient or product, application rate, application method, emissions inhibitors, fertilizer production-age of technology), pesticide applications (number of applications), crop residue management (amount of residue and management method)	Crop residue management (method - worst case as default)
Carbon sequestration/storage	Land use changes (changes e.g. forest to grassland, time since change, percentage of field converted), management changes (change in tillage, cover cropping, compost, manure additions, residue incorporation), annual biomass for trees in cropping system (tree species and density of trees per hectare)	No
Livestock	Livestock type, length of phases (juvenile, adult productive, adult non-productive), feed characteristics (% of diet from feed mix, type of grazing, quality of grazing), manure management (system, % per system, number of days of system use)	Feed characteristics (dry matter intake per head, average feed composition)
Energy use	Electricity consumption from grid or local renewables and fuel consumption (by type) at the field (for irrigation and farm machinery)	Fuel type used for machinery, number of operations for tillage, spraying, spreading, harversting
Primary processing	Electricity consumption from grid or local renewables and energy consumption from burning biomass and fossil fuels in factory, waste water containing organic compounds (quantity, oxygen demand, treatment)	Oxygen demand in waste water containing organic compounds
Water	No	No
Transport	Quantity of products transported by road, rail, air and ship with distances (if empty returns for road transport)	No

Others	No	No

Scope ☑ Farm level ☐ Supply chain

Ease of use for the data collector

Relatively easy, but may require specific documentation, fairly quick to fill. Qualitative data entries can be easily completed by the user. However, unless the producer has done a soil assessment, data on soil organic matter, moisture and pH can be hardly found. Quantitative data related to fertilizers and pesticides will require the user to search through its documents, but these documents should be accessible. General description on land use changes can be easily provided by a producer, but not the specific details on the tree species and densities). Any data entries related to livestock are easy for producer to fill. Data on energy use (electricity and fuel) are usually easily accessible to producers.

Modelling methods

Consistency of the model with the goal and scope of the tool	Consistent - calculation of GHG emissions for a number of farm activities which helps identify hotspots
Transparency and quality of documentation	Guidance document: Yes - A guidance document for the online tool is available online: https://app.coolfarmtool.org/static/doc/CFT_Online_Manual_-_beta.pdf Methodology document: Not publicly available
Conformity of the methodology with the current state-of-the-art agronomic and environment sciences	Consistent - "use of site sensitive empirical models built from hundreds of peer-reviewed studies" and "sits between calculators using simple emission factor approaches (IPCC Tier 1) and Process-Based models that require a greater level of data input and training to interpret (IPCC Tier 3)"
Methodology	Based on peer-reviewed models (not specified) and IPCC Tier 1 emission factor approaches and Tier 3 process-based models - GHG emissions: Scope 1: fuel and energy use, livestock enteric fermentation, livestock manure management/storage, soil management practices, incorporated crop residues, fertilization and biomass inputs, carbon sequestration, land use changes Scope 2: electricity production Scope 3: production of fertilizers, primary processing, primary distribution - Accounts for CO2, N2O and CH4
Dataset sources used for modelling	Broad range of published data sets Fertilizers: EFMA (published in ELCD database for 2006 and 2011), ecoinvent (2002), Kongshaug (1998), Tompkins (2005), Smith et al (1997), International Fertilizer Industry Association Livestock: IPCC

Outputs / Results

Results	☑	Detailed summary of results in tables	☑	Detailed summary of results in graphs
Analysis	☑	Summary of main hotspots	☑	Comparison with alternative scenarios

Limits of the tool/model

No default values for input data to guide users