



Does limited data availability prevent adequate water use estimates on farm scale?

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Increasing food production for a growing world population and at the same time mitigating climate change as well as adapting to its consequences is one of the key global challenges. Therefore producing crops with fewer resources such as water and fertilizers and less emissions of greenhouse gases is an important question that has to be answered on farm scale.

The cool farm tool (CFT) is a farm scale emission calculator and was developed in 2010 to help farmers to reduce their carbon footprint. In order to adapt to future climate change an easy to use and at the same time robust water footprinting tool is needed for the CFT to take a more holistic approach on environmental sustainability.

However data on farm level is often scarce. We investigated the effect of limited data on actual evapotranspiration using the FAO56 standard to assess the quality of farm water footprint estimates. Calculations are based on various agricultural sites from the Fluxnet database and estimates are compared to eddy covariance measurements.

Results show that higher data availability is not directly linked to more accurate estimates of actual evapotranspiration. Estimates based only on temperature and relative humidity are still able to reproduce daily patterns. However cumulative values over one growing season show a considerable offset to eddy covariance observations for all data input levels.

Finding the optimum between data requirements and an accuracy that fulfills farmer needs is crucial. Engagement of farmers and using a global network as the Fluxnet database will help to achieve this goal.