

ASSESSING ON-FARM ENERGY USE AND GHG EMISSIONS.

AUTHORS Sandell G.R.¹ | Baillie C.P.¹ | Chen G.¹ | Szabo P.M.¹
Woodhouse N.P.¹ | Khabbaz B.G.¹
ORGANISATION 1. National Centre for Engineering in Agriculture

Prepared by CRDC on behalf of the 17th Australian Cotton Conference

www.australiancottonconference.com.au

Further Information

Gary Sandell BEng(Agric.)
07 4631 5396
gary.sandell@usq.edu.au
www.ncea.org.au

Acknowledgements

We would like to sincerely thank all the co-operators in this project and the CRDC.

While the National Centre for Engineering in Agriculture and the authors have prepared this document in good faith, consulting widely, exercising all due care and attention, no representation or warranty, express or implied, is made as to the accuracy, completeness or fitness of the document in respect of any user's circumstances. Suppliers, companies and their products mentioned in this document do not infer endorsement by the NCEA. Users of the report should undertake their own quality controls, standards, safety procedures and seek appropriate expert advice where necessary in relation to their particular situation or equipment. Any representation, statement, opinion or advice, expressed or implied in this publication is made in good faith and on the basis that the National Centre for Engineering in Agriculture, its agents and employees, and the Cotton Research and Development Corporation (the commissioning Agency) are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

Question/issue being addressed?

Continued pressure on oil price affects cotton production because it is a highly mechanised and high-input crop that relies heavily on diesel, fertilisers, chemicals and water. Increased greenhouse emissions and global warming places further limits on water, land, energy and other resources and meeting the demands of an expanding world population is becoming increasingly difficult. There is scientific certainty that climate change is real; the exact impacts of this are not fully understood.

Key results and findings?

To address these concerns, a CRDC-funded project entitled 'A protocol for assessing on farm energy use and associated greenhouse gas emissions' investigated how the cotton industry can identify and reduce their energy use. The project has a range of outcomes, including:

- A protocol for measuring energy use in cotton production,
- a library of energy use benchmarks for various operations
- an upgraded version of EnergyCalc, an on-line software that enables a novice person to quickly estimate energy use on their farm.

The project found that pumping, which consumes 50 to 70% of all energy used directly on-farm, has a potential for up to 30% energy savings. A pump check is a worthwhile investment. The project also identified that fertiliser and chemical account for much larger amounts of energy, which are used in-directly on-farm. Other potential areas for energy, cost and GHG gas savings include water application efficiency and tillage efficiency.

What impact will this have on the Australian cotton industry?

Once adopted, these will result in a cotton industry that is more viable economically and better placed to meet the increasing demands of rising energy costs. Any reductions in energy use will also reduce the carbon footprint of the industry, which, as most cotton is exported, adds to the 'clean and green' image of Australian cotton production.



1.



2.



3.



4.

1. ENERGYCALC provides a simple interface to estimate your energy use.

2. THE PROJECT used sophisticated systems to measure pump performance.

3. TRACTION and engine management systems, and especially depth control reduce fuel use.

4. ENERGY assessments can be a simple process with very low data requirements.



Australian Government
Cotton Research and Development Corporation



NCEA
National Centre for Engineering in Agriculture