Energy Efficiency Information Grants

Reducing Farm Energy Costs

Improving Energy Efficiency on Irrigated Australian Cotton Farms

The Improving Energy Efficiency on Irrigated Australian Cotton Farms project aims to deliver an industry-wide awareness campaign that provides tailored energy efficiency information and tools to irrigators and their advisors. This activity received funding from the Department of Industry as part of the Energy Efficiency Information Grants program.

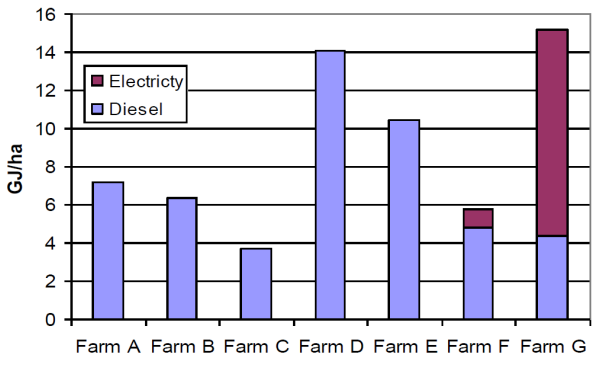
Summary

Machinery contributes around 54% of the cotton farm input costs. Research conducted by the National Centre for Engineering in Agriculture (NCEA) into on farm energy efficiency has found that for cotton production:

- There is significant variation in energy use between cotton enterprises and this is largely due to irrigation.
- Energy usage was 3.7 to 15.2 GJ/ha at a cost of $80 to $310/ha.
- 275 to 1,404 kg CO_2 equivalent/ha of greenhouse gas emissions are generated.

Results

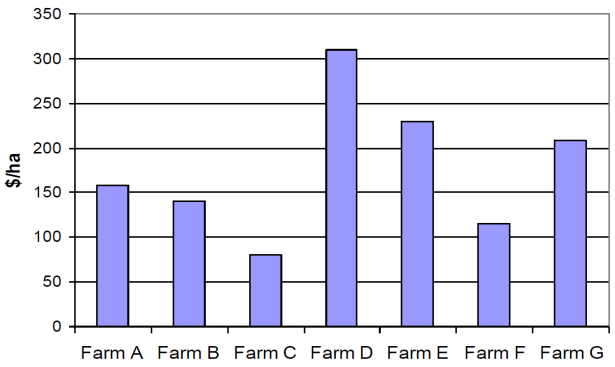
- Irrigation is the key driver of energy use; 40 to 75% of total energy use.
- Irrigation energy use includes pumping from rivers, bores, tail water and pressurised application systems.



Direct energy use of case study farms.
D, E & G use ground water.

- **Target energy improvement by auditing energy use.**
- **Improve the set up of pumps and tractors.**
- **Reduce the number of farming operations .**

- Picking accounts for around 24% to total energy.
- Pumping from bores increases energy demand and consumes around 75% of total energy.
- There is significant opportunity to improve irrigation performance in application efficiency and in pump and motor efficiencies through better selection of pumps and motors.
- There is opportunity to reduce tractor fuel consumption by reducing the number of passes, throttling back and the use of traction and engine management systems.
- Fertilizers and chemicals are very energy intensive to produce and have a high indirect energy use.



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Australian Government
Department of Industry

University of Southern Queensland
NCEA National Centre for Engineering in Agriculture
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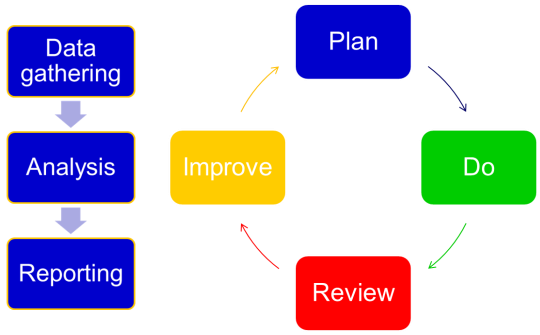
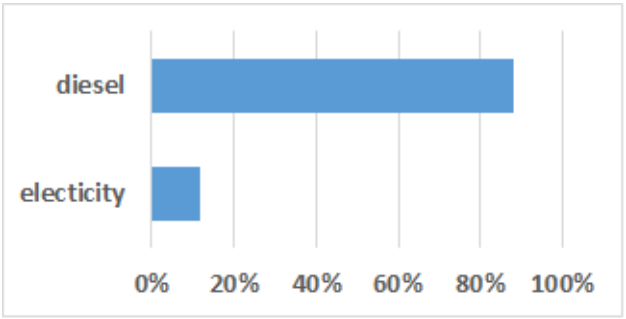
	Energy (GJ/ha)	Energy (GJ/Bale)	GHG (kg CO_2/ha)	GHG (kg CO_2/Bale)	Energy Cost ($/ha)	Energy Cost ($/Bale)
Irrigated	10.9	1.18	1,091	119	310	34
Supplementary	3.6	0.43	247	30	101	20
Dryland	3.1	0.71	212	49	87	12

Plan - Do - Review - Improve





88% of energy directly consumed is provided by diesel.

For further information on Reducing Farm Energy Costs or the Improving Energy Efficiency on Irrigated Australian Cotton Farms project please contact the Cotton Research and Development Corporation on 02 6792 4088 or the CottonInfo Team member in your area.

- Reducing farm energy is part of a Plan—Do—Review—Improve cycle.
- The planning phase involves measuring or estimating your current energy use and identifying a plan to reduce energy costs.
- Once the plan is implemented the benefits are quantified and new savings sought.

Opportunities

By itemising farm energy usage, farmers can identify where the most energy is consumed and therefore explore ways to reduce energy use. Examples include:

- Measure the performance of your pump. Recent work has shown savings of 5% to 30% are achievable in most cases.
- Modify practices - research has identified that moving from a conventional tillage to a minimum tillage farming system reduces energy demand by at least 10 to 20%.
- Gear Up & Throttle Back - in studies monitoring tractor performance, the NCEA has found that by changing gear selection up and engine speed down, you can reduce energy use by about 30% for the same power requirements.
- Identifying ways to reduce energy consumption can pay for itself in real dollar terms and is one of the cheapest and fastest ways to reduce greenhouse gas emissions.

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