



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

FV 383

Energy efficiency case studies
for field vegetables enterprises

Final Report 2011

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Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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HDC is a division of the Agriculture and Horticulture Development Board.

Headline

- Farm enterprises can make energy savings of 10 to 15% with little or no capital investment.

Background

Increasing energy prices, new energy legislation and customer demand for produce with a low carbon footprint are all factors which are contributing to increased energy costs for growers of field vegetables.

Whilst energy costs currently only account for between 3% and 7% of the current farm gate value of vegetable crops grown in the UK, any increase in energy prices in the future will reduce margins and potentially threaten the viability of production. Even the most modest predictions are suggesting energy price increases of 75% or more by 2030, so clearly growers need to take action to reduce the impact of these increases on their business.

So that they can implement practical and cost effective energy saving technologies, growers need impartial information about the effectiveness of the various options available to them. This project uses the information gathered from six field vegetable producers to assess the current standards of energy management and energy efficiency in the sector. The findings are also used to provide guidance on the best ways that growers can make improvements and implement commercially proven energy saving technologies.

Summary of the results and main conclusions

Energy assessments were carried out on six representative businesses covering the major outputs from the UK field vegetables sector. These assessments established the current levels of energy use for each site and determined the scope for making energy savings.

The findings from the surveys have determined the current standards of energy management and energy efficiency of the participating sites. The information gathered has also been used to identify where energy saving measures can be used to reduce energy consumption and cost.

Despite the varied nature of the businesses that were surveyed, several universal energy processes were identified. These were:

- Produce cooling – including ventilation, air movement, refrigeration etc. for short, medium and long term storage and in packhouses
- Tractors and vehicles – including cultivations, chemical / fertiliser application, harvesting and transport.
- Irrigation
- Lighting – this is of particular importance in the packhouse, cold store / crop store and in employee facilities / accommodation

All growers should use these areas as the focus for their energy saving efforts as they present the best opportunities for implementing cost effective technologies and securing reliable savings.

Financial Benefits

It is believed that producers of field vegetables in the UK currently consume 1,850 GWh/year of energy, which at current energy prices has a value of around £50 million/year. This project suggests that growers can easily reduce the current consumption levels by 10 to 15%. If these levels of savings are achieved by all growers, the sector will save in excess of £5 million /year.

For the businesses assessed in this project the average energy consumption was 4,500,000 kWh/ year costing £296,600. If the predicted savings are achieved, these sites will each save an average of £44,500/ year.

Action Points for Growers

The following guidelines should be used as the starting point for implementing energy efficiency on a field vegetable enterprise:

- Monitor your energy use and track consumption against production / output levels. Where appropriate break down to individual fuel types and / or end uses (e.g.

kWh/tonne stored, kWh/mm irrigation water applied etc). Use the data you collect to set realistic but challenging improvement targets for the future.

- Implement a simple turn it off / close it / turn it down campaign. Communicate the importance of energy saving to all your staff.
- Check the insulation and sealing of your crop stores / cold rooms etc. Repair any damaged insulation, door seals etc and close of gaps around pipe or cable entry points etc. If current insulation standards do not achieve the current minimum requirements (typically a U value of between 0.3 and 0.4 W/m²/°C) install some upgraded insulation.
- Check, clean and maintain all fans, ducts, air distribution components etc.
- Calibrate control sensors, place sensors in the best position for taking accurate readings and check the function of store controls.
- Maintain refrigeration equipment regularly; pay particular attention to refrigerant levels and the airflow over the evaporator and condenser coils. When making refrigeration equipment purchases ensure that new equipment uses advanced capacity control technologies such as variable speed drive compressors, electronic expansion valves and floating heat pressure control.
- Clean lights regularly (including both the bulb and the fitting). When repairing or upgrading lights consider upgrading to the energy efficient option including electronic fluorescents, discharge lights or even LED's.
- Match tractor and implement combinations for optimum output. Pay particular attention to the detailed points including maintenance, tyre pressure setting and ballasting.
- Repair water leaks in irrigation pipes and carefully control pump settings and operation. Consider installing variable speed drives on pump sets.
- Use simple automatic controls such as time switches, occupancy sensors and thermostats on energy consuming equipment in worker facilities.