



# Energy Efficiency

## #1 FRUIT PRODUCTION - GRADING & PACKING

**This farm grows tree and vine fruit on the Great Dividing Range in southeast Queensland. The farm takes advantage of the red loamy soils and subtropical climate to grow about 600 avocado trees.**

This business is a complex operation featuring grading lines, packing operations and supporting facilities. The packing operation also takes produce from other farms, catering to growers as far away as Bundaberg. The grading and packing operations are the focus of this case study.

The grading and packing facilities are contained within a 1,440m<sup>2</sup> shed that also contains the cold rooms. While the cold rooms consume the most power within the packing shed (about 55 per cent - see case study #2), there is considerable scope for energy savings in the grading and packing lines.

Within the produce washing area, electricity is used to power lighting, battery chargers, an air compressor, and motors to drive the conveyors and bin tipper.

The single biggest user of power is one of the battery chargers used for the electric forklifts, consuming about 65 per cent of the electricity for the area. The collection of 16 fluorescent lights and 4 flood lights contribute 3,295kWh (14 per cent), while the collection of motors contributes just under 9 per cent. While the motor that powers the hydraulics for the bin tipper is large (7.5kW), it is only required to operate for about 30 minutes each day and has a relatively small effect on the total (about 2.5 per cent).

The main grading line, with motors, lights, dryers and conveyors, consumes 13,391kWh. Just over half of this total is for lighting. The 65 40W fluoro lights, six 400W bay lights and single 500W flood light consume 6,864kWh.

Based on this information, the lighting within the packing shed is an obvious cost-effective target for efficiency gains.

### Natural light

Capitalising on natural light is a good way to save electricity during daylight hours. Windows, sky lights and polycarbonate roof sheeting can help provide more indoor light. However, it will be important to consider the balance between light and heat gain which can depend on the local climate and building design. Tinting of windows can help control heat while allowing light to enter the work space.

### Light bulbs

Many different types of light bulbs are available which differ in efficiency, brightness, colour and lifespan. These varying qualities mean that they suit different applications. High Intensity Discharge (HID) lamps such as high pressure sodium vapour lamps can be very efficient but can take minutes to warm up and emit a yellow tinted light which can impede colour recognition. Light Emitting Diode (LED) lamps are very efficient but expensive (although costs are coming down as they become more common). Whatever the type of bulb used, replacing light fittings is likely to be an expensive exercise requiring the use of an electrical tradesperson. As a result, the most economical option will usually be to make a change when fittings need to be replaced anyway. The Growcom fact sheet on lighting includes a detailed table of the qualities and benefits of the common lamp types.

### Timers, light sensors & motion sensors

These devices can be a very cost-effective way to achieve localised lighting, where workspaces are lit only when and where required. These are much more convenient and reliable than switching lights on and off manually.

### Keep it clean

For all light sources, keeping them clean will increase the amount of light.

### Replacement and refurbishment

Much of the equipment in the packing shed is now 10 years old. When this older equipment fails or becomes expensive to service, this provides a perfect opportunity to replace old inefficient items with new efficient ones while keeping costs to a minimum.

### More information

Further details are contained in Growcom Energy Efficiency factsheets, available from the Growcom website.

*Disclaimer: The examples in this fact sheet are provided for general information and do not constitute financial advice. We encourage growers to seek specialist financial advice before making significant investments.*

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