

Queensland Communities in transition

CQ Compost Circular economic benefits of compost

CQ Compost, in Central Highlands region, take organic waste streams from their farming property 'Tinkelara' and surrounding properties and turn them into products that replace the nutrients and carbon back into the soil.

These high quality composts and soil conditioners improve soil and reduce the amount of synthetic fertilisers that are required in the agricultural, horticultural and degraded land rehabilitation markets.

Organic by-product streams from their own farming process, including hay, straw and stubble, are combined with other organic streams such as cotton gin and woodchips. The streams are combined in windrows which are regularly turned by windrow tractors to control the composting process. Liquid wastes are added to the windrows to provide moisture and nutrients for the microbes involved in breaking down the organic matter.



HIGHLIGHTS

- Reusing farm and industry wastes
- Converted 8000 tonnes of waste into compost in 2018

Benefits to soil health from using the organic products include:

- Source of N, P, K and trace elements
- High organic carbon content, increasing water and nutrient holding capacity
- Trace content of non-labile carbon
- Source of beneficial soil microbes
- Improved soil structure



The composting process logistics

Some waste streams are purchased by CQ Compost, such as the cotton gin waste, while others, generally from other producers, are taken away for free. CQ Compost mostly arranges transport or pays for transport to their site. Their feedstock is sourced from locations as far as 250km from their site.

The organic matter is piled into long rows called windrows. These piles are balanced with different feedstocks to provide the right consistency of carbon, nutrients, moisture and bulk matter to allow oxygen to penetrate and provide aerobic conditions. The windrow tractor is an important part of the process as it turns the organic matter within the pile to allow air to penetrate and to mix hot and cold zones to provide a more even composting process.

Microbes within the pile decompose the organic matter into compost. This process generates heat within windrows which are maintained above 55°C for a minimum of 3 days as per the Australian Standard AS4454-2012. CQ Compost generally find that temperatures of between 65-75°C are reached. This kills off any pathogens and stops seeds from germinating. The compost is then screened to remove any large items or potential contamination and stockpiled for 3-6 weeks to mature before use.

The main markets for CQ Compost are cotton growers and horticulture industry, for example macadamia and citrus trees. The products are currently being sold to locations within a 100km radius of Emerald.



CQ Compost converted over 8,000 tonnes of waste organic material in 2018 into compost and soil conditioning products. They currently produce two main products, Ag Compost and Rapid Rehab, which allow their customers to reduce synthetic fertiliser use.

Ag Compost has been designed for the agriculture and horticulture industries and return carbon, nitrogen, phosphorus, potassium and other trace elements back into the soil. The increase in carbon content to the soil increases water retention and nutrient holding capacity. This reduces the irrigation quantity required for the same level of crop growth. It also improves soil structure and is a source of beneficial soil microbes which all contribute to better soil health for farmers.

Rapid Rehab has been designed for land rehabilitation sites, such as mine sites, which are common around the Central Highlands region. This product has been designed for plant establishment with added clay and soil mineralogy added into the compost.





Challenges of drought

The current drought has meant less cotton is being produced which in turn means less cotton waste to turn into compost, and a reduction in demand for compost from farmers. In addition, some previous waste streams such as hay are being (understandably) diverted to animal feed.

CQ Compost are investigating new waste streams and new products. Green waste (or biomass) from Local Councils is one source which could be mixed with compost and used for mine site rehabilitation through an eco-blanket.

Composting of new material takes time to get the balance of feedstock right to ensure the resulting compost has the right mix of carbon and nitrogen. Council sourced biomass tends to make a product high in Nitrogen so needs to be mixed with another feedstock, such as hay stubble, to bring up the carbon levels. The main problem with biomass from Local Councils is the high contamination rate of items such as plastic bags, aluminium cans and even garden chairs. Improving the input materials will make a better outcome but requires the generators (mostly residents) of the biomass is to see it as a valuable material rather than a waste. Education is needed to help reduce levels of contamination.

This case study is part of a series of case studies that have been developed as part of the Queensland Communities in Transition Program. Prepared by The Ecoefficiency Group as part of Clean Growth Choices Consortium with funding from Queensland Department of Environment and Science, 2019 For further information, visit www.cleangrowthchoices.org

