



*Advancing for a
better tomorrow*

2019 SOUTH EAST ASIA SUGARCANE SUMMIT

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***Advancing for a
better tomorrow***

The changes we as an industry need to address

Robert Quirk

75 years **AUSTOFT**

CASE IH
AGRICULTURE

The topics for today

- Changing climate and how we will have to learn to deal with it
- Changing weather patterns will require a different approach than we have had in the past
- We will require better drainage even on elevated land
- Irrigation will become more necessary, and the effective use of our water will become more critical
- We can expect longer periods without effective rainfall and more intense rainfall when the rains come
- Changing CO₂ levels?
- The mechanization of the industry

Living with a changing climate

- The predictions of how quickly the climate is changing
- In the 1990's some predictions were made of where the climate / temperatures would be in 2030 these have already been reached
- Some areas around the globe will go from 3-5 days a year above 40°C to over 30 days. Last year some parts of Australia and India registered days up to around 50°C

Effects of heat on field workers and cane cutters

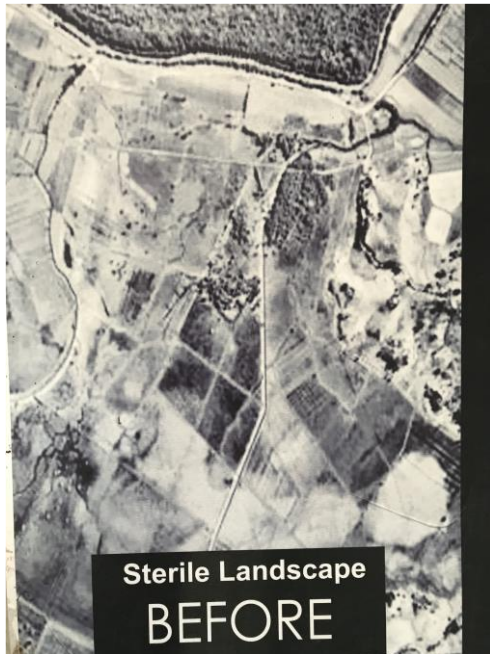
- Central America 20,000 cane cutters have died in the last 10 years
- The La Isla foundation. Developed the Water Rest and Shade program
- An Australian cane cutter went to CA to train cutters to use less energy to cut the cane by using an Australian designed knife. He had previously worked in South America where he lifted their daily harvest from 10TPD to 15

More on heat and workers

- It is estimated that to cut ten tons of cane per day takes the same energy as to run a marathon
- Another analogy is that it takes the same energy as American soldiers on a three day patrol in the middle east would use
- Over 50% of the global crop is still harvested manually Brazil
- This will reduce, while some cane on slopes and rocky country will not be possible to harvest with machines

More on heat and workers

- Though difficult It will always be possible for men and women to cut cane manually and do the weed control and planting in a warming climate
- Water rest and shade will be the key to achieving and maintaining their health
- The American heat index for workers indicates that at 40C workers should stop work
- Changing to a mechanized system will alleviate some of these problems





Sometimes...
...Sugarcane can be dangerous!



Current Situation: Climate Variability on the Farms

- Longer dry periods
- Hotter days and in some areas colder nights
- More intense rainfall
- Sea level rise
- Acid sulphate soils

Building Carbon Content

- Minimum Input Oats
- OM Incorporation
- Urea Application



Calculation of baseline

- Whole farm measure of C stocks with error margins alculation of baseline
- SOC stocks ($\pm$ standard error)
- Whole farm measure of C stocks
17,478 tonnes $\pm$ 132.2
(0 - 30cm depth)

Carbon tests

- The latest test indicate 20,000+ tons of carbon down to minus 1mt. On the 100ht property.
- This equates to 77,000 ton of CO2 equivalents accumulated in the last 20 years, this appears to be taking an experiential upward trend. Science says the property is just one and a half tons of saturation.

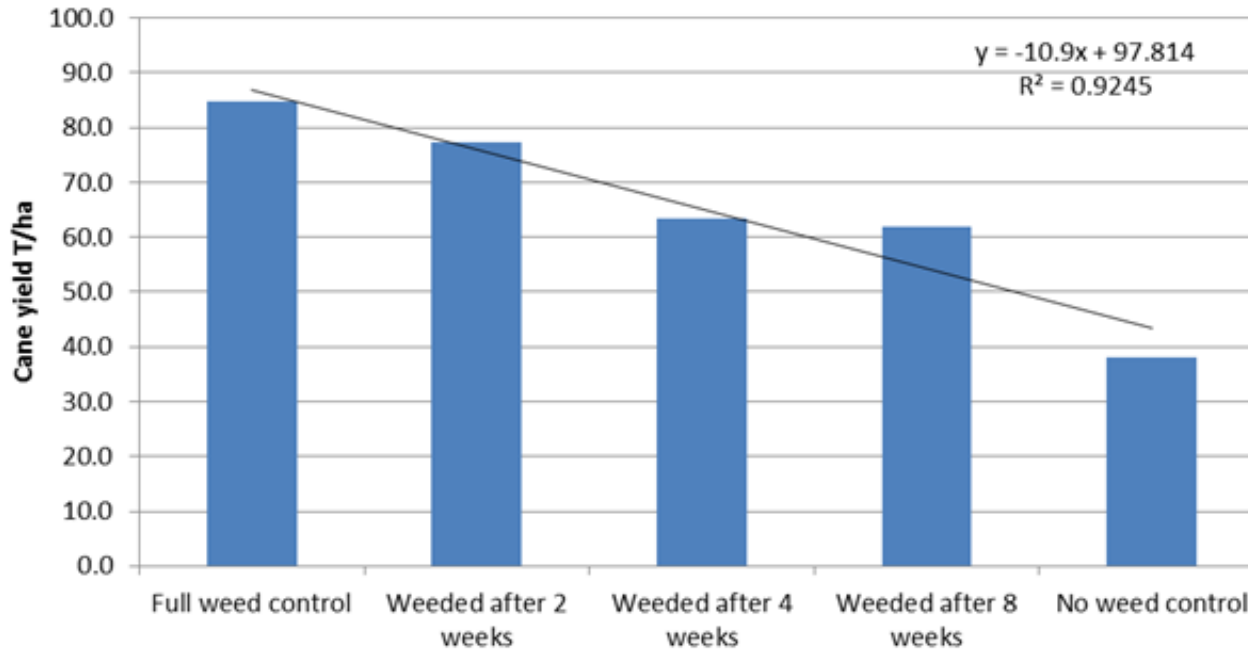
What increasing OC can mean to your cost of production and profitability

- Cost of production varies widely from country to country and even from farm to farm.
- 120,000L of rainfall penetration for every 1% OC increases
- Availability of nutrients greatly increased especially the micro nutrients
- My cost of production US\$ 12 per ton of cane including harvesting

Weed Control



Effect of weed competition on cane yield (T/ha)



Quirk Farm Characteristics

- Northern NSW, Australia, 28 Degrees South
- 106 Hectares
- 0.5 Metre above Mean Sea Level
- Average Rainfall 1600mm
- Marine Mud overlaid with 100mm Peat
- 16 km Drains / Reduced to 10 km
- 11.75% Average CCS
- Average production 7-9,000 tons



The importance of Building soil carbon

- For every 1% soil carbon increases the soil can absorb an extra 120,000lt per hectare per rain event
- The drainage is also improved
- Nutrient and irrigation inputs is reduced, while achieving the same production
- Sugar cane takes up around 40% of its N from the break down of organic matter. If there is no or little organic matter this has o be chemically applied

French and other Governments program

- 4 per mill
- Aim to increase soil carbon by 0.4% per annum
- 570 million farms and 3billion rural inhabitants we can make a difference.
- Visit www.4p1000.org

What we have changed



Some practices that will help adjust to a changing climate. What we did ...

- Poor weed control, can cause losses of over 50% of your production
- Adopt a controlled traffic system
- Stop pre and post harvest burning, spray the residue with 5kg of urea in 300L of water immediately after harvest to encourage fungal growth in the residue
- Adopt a minimum till program



The changing climate and the challenges summery

- Better water use efficacy
- OC will add this
- Weed control, weeds take water and nutrients from the cane
- Redesign estates to suit harvesters
- Work with your harvester company to ensure your setting are optimum.
This can and will move you to success.

Thank you and Questions.