



## **Ag2030 – Reaching \$100 billion agricultural production in Australia**

Tropical is Logical

### **Introduction:**

The Australian agricultural industry is a dynamic and thriving industry due to its multitude of natural resources. However, ‘the climate, water availability, soil type and proximity to markets’ (Department of Agriculture, Water, and the Environment 2021) continue to restrict the agricultural industry from reaching \$100 billion in production. This report aims to propose realistic strategies and plausible solutions to reach the Ag2030 target of \$100 billion in agricultural production in Australia. It will focus on the areas of biosecurity, emerging markets, and efficiency.

The slogan ‘Tropical is Logical’ has been chosen as Tropical Australia has fertile soils, an established agricultural industry (banana, sugar cane, avocados, cattle, dairy, etc.), endemic native species, and the potential to expand its industry and productivity.

### **Considerations:**

- The distance and access limitation in the Tropics is overridden by the high value products that will be produced.
- ‘Supply chain distributions, higher fertiliser prices and heavy rainfall will continue to be challenges’ (Cameron et al. 2021).
- While intensification is a productive option, Australia’s reputation of producing quality meats could be damaged by highly contentious ethical issues which decrease profit.
- Proposals must be capable of withstanding extreme weather events and recovering in a financially viable time-period.
- Food waste costs the economy \$36.6 billion annually (Food Bank 2021).

### **Assumptions:**

- Consumerism will continue to increase.
- Significant investment will be made by the Australian Government to increase agricultural profit.

### **Proposed solutions:**

1. Combating Panama disease to increase banana production
  - Create an Australian Research Centre for Combating Disease in Agricultural Crops
2. Australia partnering with neighbouring countries to create products of high value
3. Extract and produce native ingredients for the beauty industry
4. Material production for the fashion industry
5. Kelp and fish farming
6. Genetically modified organisms (GMOs)

### **Proposals: Biosecurity**

#### **1. Combating Panama disease to increase banana production**

##### **Panama disease**

Panama disease is 'one of the most severe threats facing the banana industry worldwide' (Cook et al. 2015) and poses a serious threat to Australia's banana industry which contributed \$1.3 billion to the economy in 2016/17 (Australian Banana Growers' Council Inc. n.a).

I have three hypotheses' of how Panama disease can be overcome:

- Find a fungus that fights the Panama fungus. This fungus would create a mutualistic relationship with the banana plant as it protects it.
- Use the Panama fungus to build up immunity in the banana population.
- Place a fungus in the same environment of the banana crops to inhabit the plants. While not attacking the Panama fungus, it could deter it from seeking out the plant.

A long-term solution could also be to farm multiple species of banana crops, to avoid monoculture farming, reducing susceptibility to disease. This would involve a change in marketing to the Australian consumers to ensure banana profits continue.

#### **Create an Australian Research Centre for Combating Disease in Agricultural Crops**

Due to Australia's diverse environments, we can be a leader in the research, mitigation, genetic modification, and solutions towards disease in plants. Plants would be able to be bred in their ideal climates and studied appropriately. This would allow Australia to sell these modified plants and information, excelling Australia's reputation in the fields of STEM and agriculture.

## Emerging markets

### 2. Australia partnering with neighbouring countries to create products of high value

- Given Australia is a mass producer of sugar and wheat, we could partner with countries such as Papua New Guinea or Indonesia to create highly valuable products such as chocolates, Milo, etc.
- Strengthen international relations with these partnered countries as they receive a profit from these products.
- Increase Australia's agricultural profit by increasing value rather than using intensification.



**Figure 2:** a) Cocoa fruit growing in Papua New Guinea (Sam 2015), b) Daintree Estates chocolate made in Australia from Australian milk and sugar (Osborn 2021).

### 3. Extract and produce native ingredients for the beauty industry

#### Native flora and marine plants used as highly valuable extracts

The International beauty industry is worth \$532 billion (Danziger 2019). Australia can produce native extracts for highly valuable products. Kelp and seaweed can be used in restaurants and beauty as it is highly versatile. Bath oils, eye masks, eye gels, moisturiser, lip balm, and hairspray are already using kelp, algae and seaweed in their products due to its 'anti-inflammatory, anti-bacterial and anti-ageing effects' (Scott 2018). Seaweed's bioactive compounds and uses were confirmed in a review article by Jesumani et al. in 2019, published in the Marine Drugs journal.



**Figure 3:** High value beauty products containing algae and kelp **above left:** Dr. Dennis Gross Hyaluronic Marine Dew It Right Eye Gel \$68/ 15mL (MECCA), **above right:** La Mer Crème de la Mer \$715/ 100mL (MECCA).

#### 4. Material production for the fashion industry

##### Crocodile skin

Crocodile skin is a luxury commodity and is farmed to ensure crocodiles' natural population is protected and the market's productivity and efficiency increase.

French label MJZ uses crocodile skin to produce highly valuable products that cost up to \$160,000 (Cantrell 2019).

By-products from crocodile skin production are (Brann et al 2020):

- Oil from fat
- Meat
- Blood and bones which can be made into organic fertiliser

Overall, crocodile farming is a versatile market which can pivot to specific market demands. Another opportunity for Australia is to tan the skin here. This would increase profit and provide sustainable jobs.

##### Fibrous material (e.g paperbark, cotton)

'Northern Australia has enormous potential as a cotton production region.' (Cotton Info 2021).

Cotton is a profitable commodity especially for international exports. Additionally, the cotton seed produced is a valuable by-product of cotton production that can provide significant benefits for local livestock industries (Cotton Info 2021).



**Figure 4:** MJZ crocodile cropped leather jacket and skirt (Cantrell 2019).



**Figure 5:** Cotton is a crucial crop for the global market (Barnhardt Natural Fibers 2016).



## 5. Kelp and Fish farming

The kelp industry within Australia could generate over \$100 million (GVP) by 2025, while also creating jobs and reducing greenhouse gas emissions (Kelly 2020).

Australian consumers currently consume more seafood than domestically available which indicates there is a demand for aquacultural products. This is shown by the 12% increase in real gross value since 2002/3 now valued at over \$1 billion.



**Figure 6:** Kelp forests known to be highly productive (Tong 2020).

## Efficiency

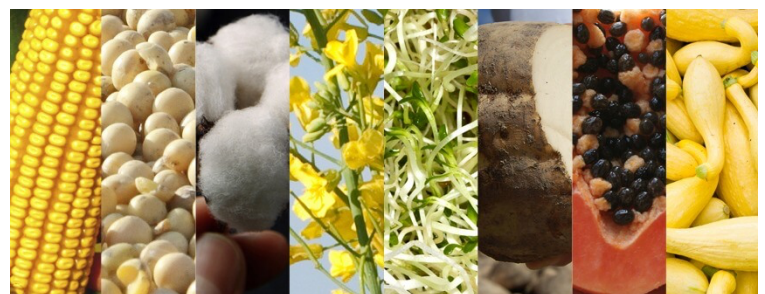
### 6. Genetically modified organisms (GMOs)

GMOs are defined 'as organisms (i.e. plants, animals or microorganisms) in which the genetic material (DNA) has been altered in a way that does not occur naturally by mating and/or natural recombination,' (World Health Organisation 2014).

While altering genes through breeding has predominately been used in the past, genetic engineering allows genetic changes to be precisely controlled which results in optimised agricultural yields (Phillips 2008). This is because 'virus resistance [achieved through gene-alteration] makes plants less susceptible to diseases caused by such viruses, resulting in higher crop yields.' (World Health Organisation 2014).

Examples of common GMOs grown in the United States of America and equate to a large percentage of that crop grown (U.S. Food & Drug Administration 2020) are: Soybeans, corn, sugar beets, canola, cotton.

**Conclusion:** These practicable and feasible solutions would greatly assist Australia reaching \$100 billion agricultural profit by 2030. As emphasised earlier, 'Tropical is Logical'.



**Figure 7:** GMO's grown in the USA (Smyth 2018).

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