Brewery effluent – Fuel for algae, vegetable and fish production

Cliff Jones

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1: "Waste"

The utilization of "waste"

…"waste" is not actually waste at all – it has <u>real, potential value</u>

2:

… an opportunity to

"bridge the chasm"

between research and implementation

The story I'm going to tell could be applied to any organic effluent:

- **Brewery**
- **Food processing**
- **Abattoir**
- **Sugar mill**
- **Feed lot**
- **Fish farm**
- **etc… etc… etc…**

Currently – effluent treatment is financial <u>liability</u> to most companies… in some industries an environmental liability too

Introducing “Project Eden”

Brewery effluent is treated at cost to the brewer, to reduce impact on the environmental

- **environmentally sustainable,**
- **water and nutrient recovery process**
- **an alternative to conventional methods of effluent treatment**

Introducing “Project Eden”

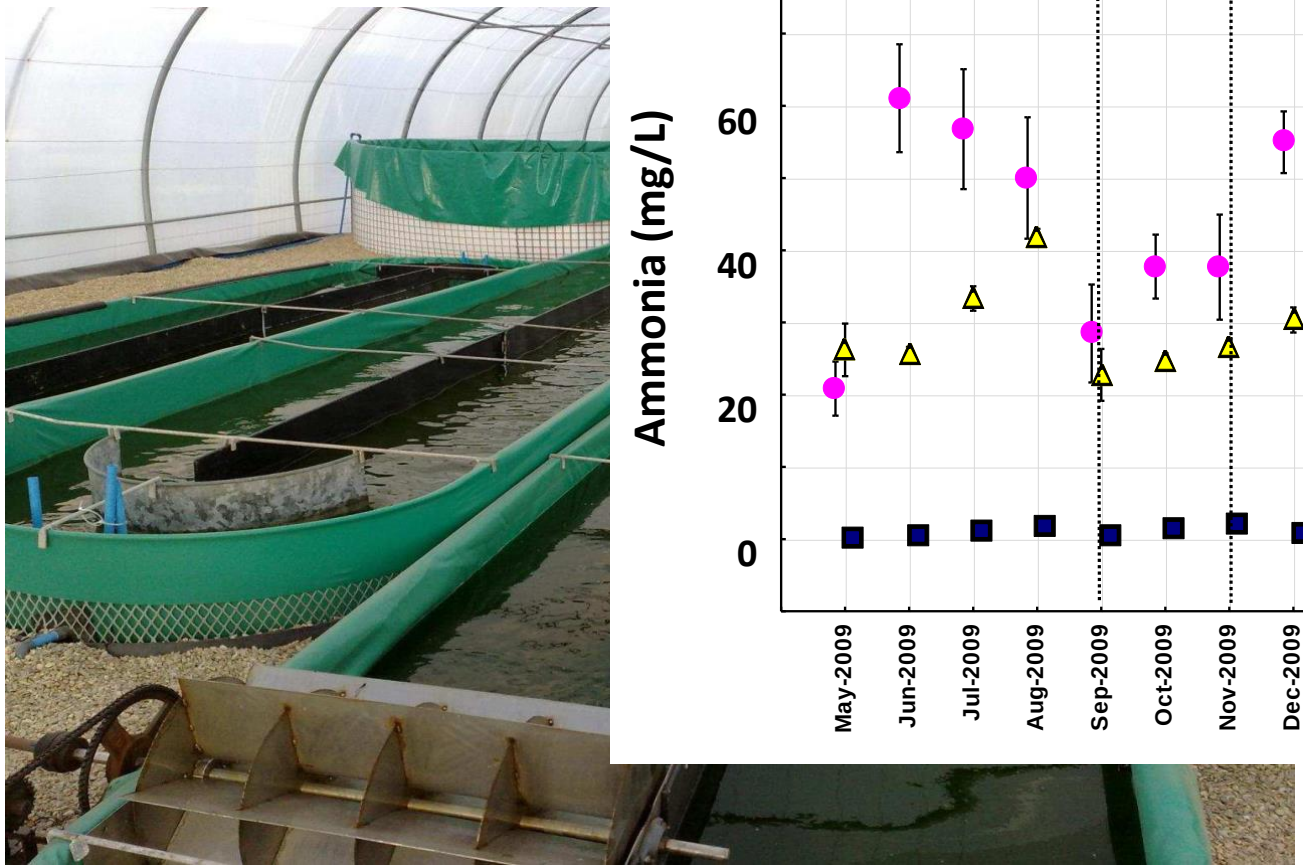
- Brewery effluent subject to anaerobic digestion (AD)
- Integrated algal ponding system (IAPS):
  - primary facultative pond (PFP)
  - high rate algal ponds (HRAP)
- Constructed wetland (CW)

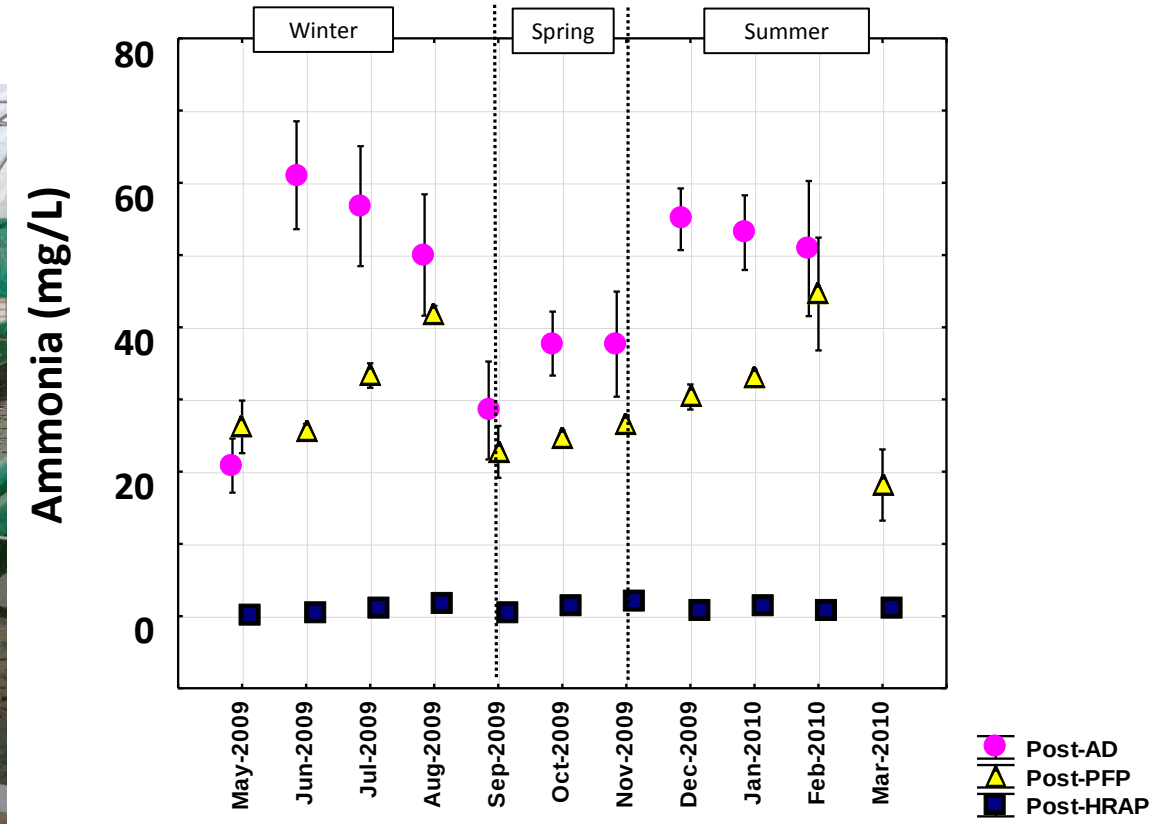
- Discharge ⟶ Bioassay: - hydroponics - fish culture

All this using largely sun’s energy: photosynthesis

Nothing new – unique approach

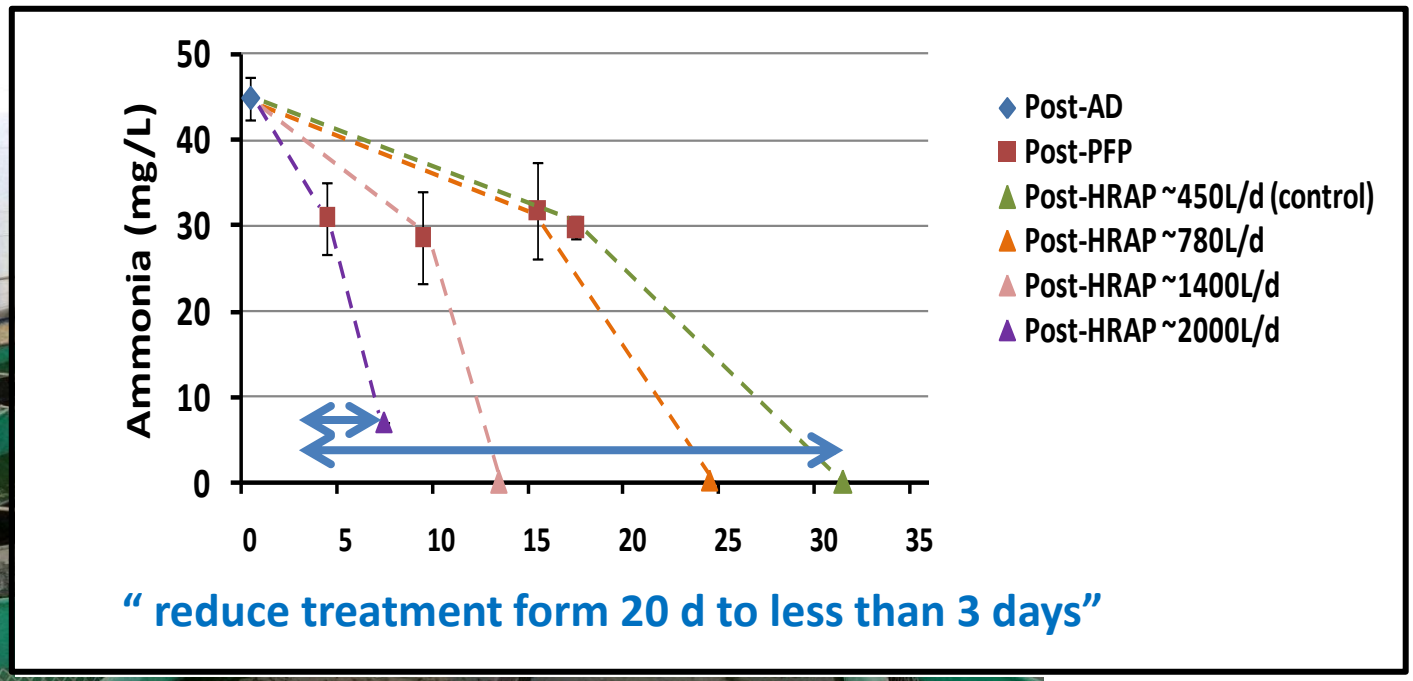
Nutrient removal – High rate algal pond



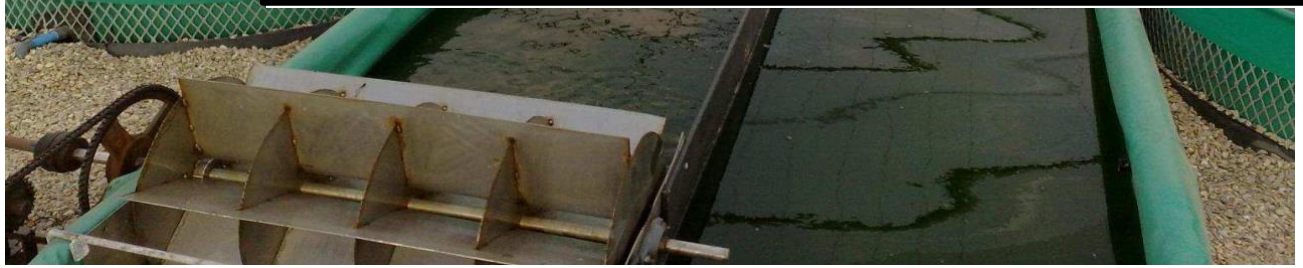


Cilliers 2012 MSc thesis

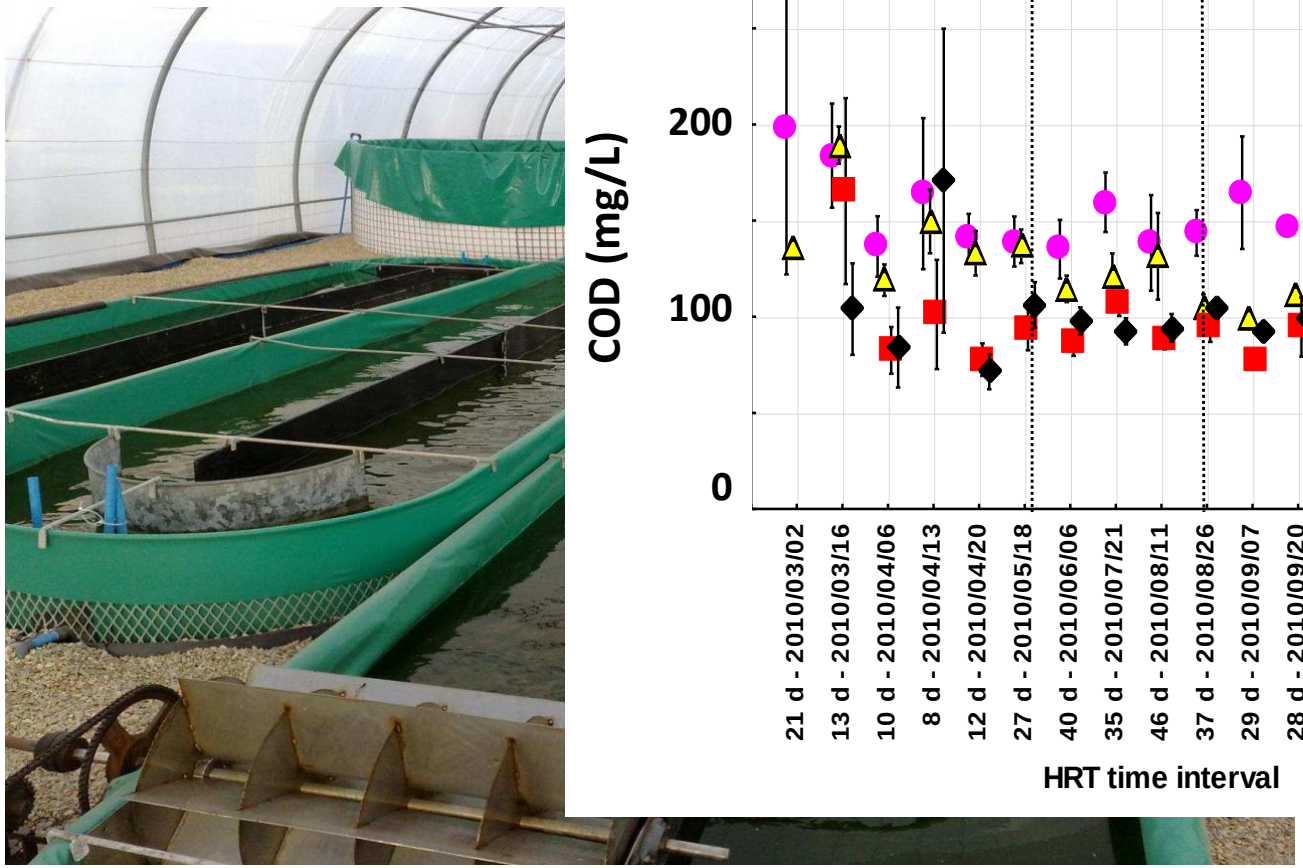
Nutrient removal – High rate algal pond



" reduce treatment form 20 d to less than 3 days"

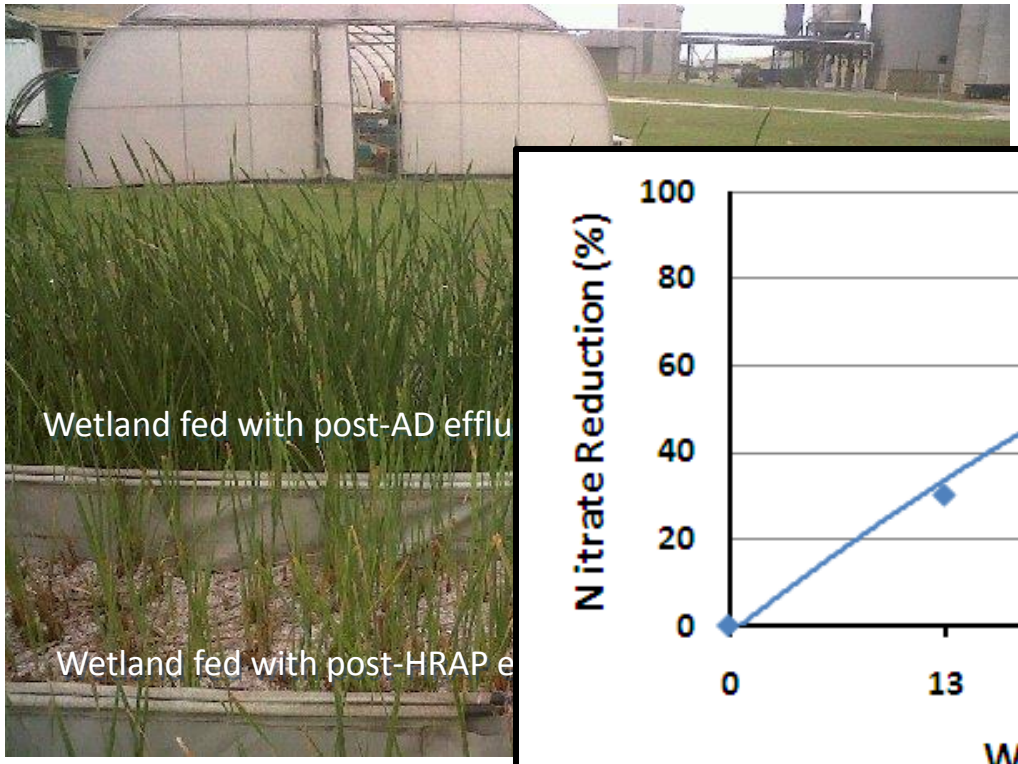


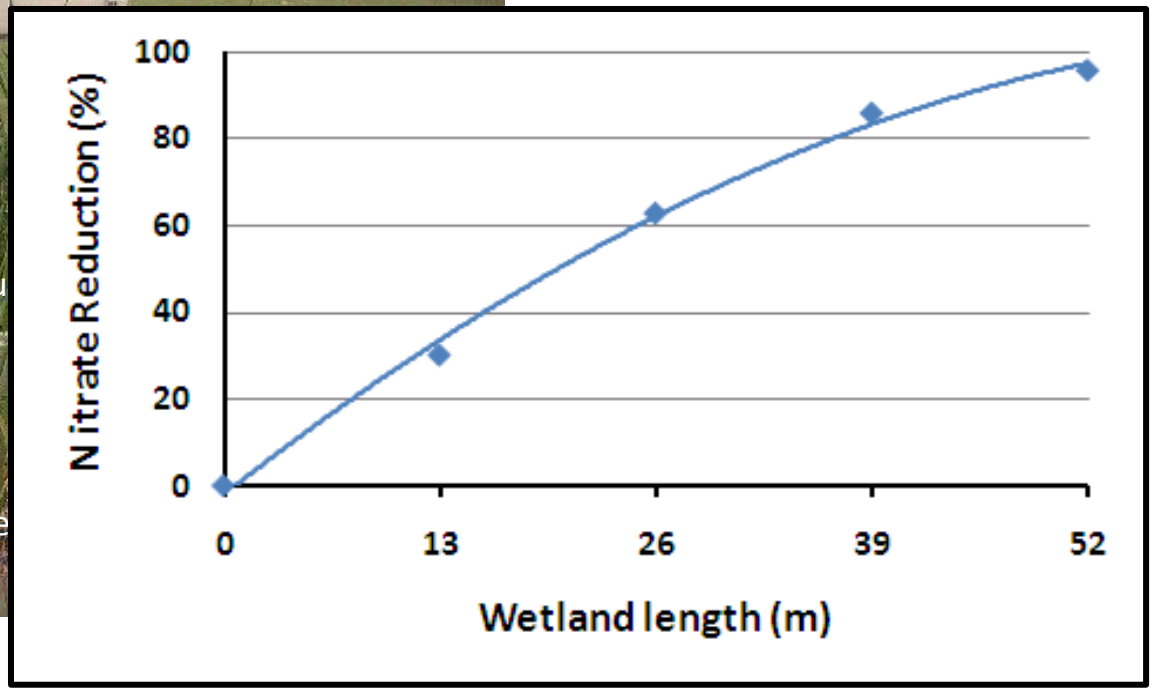
Nutrient removal – High rate algal pond



Cilliers 2012 MSc thesis

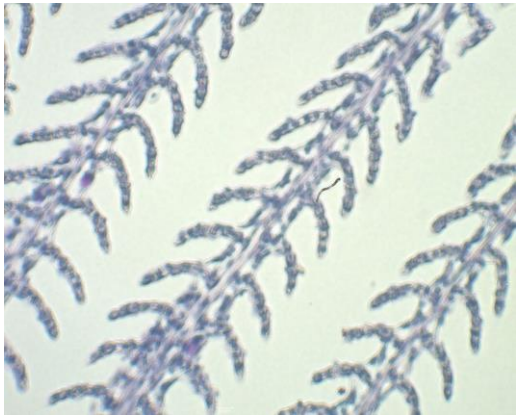
Nutrient removal – Constructed wetland





Fish production: ornamentals, tilapia
Fish feed production: tilapia and abalone feed

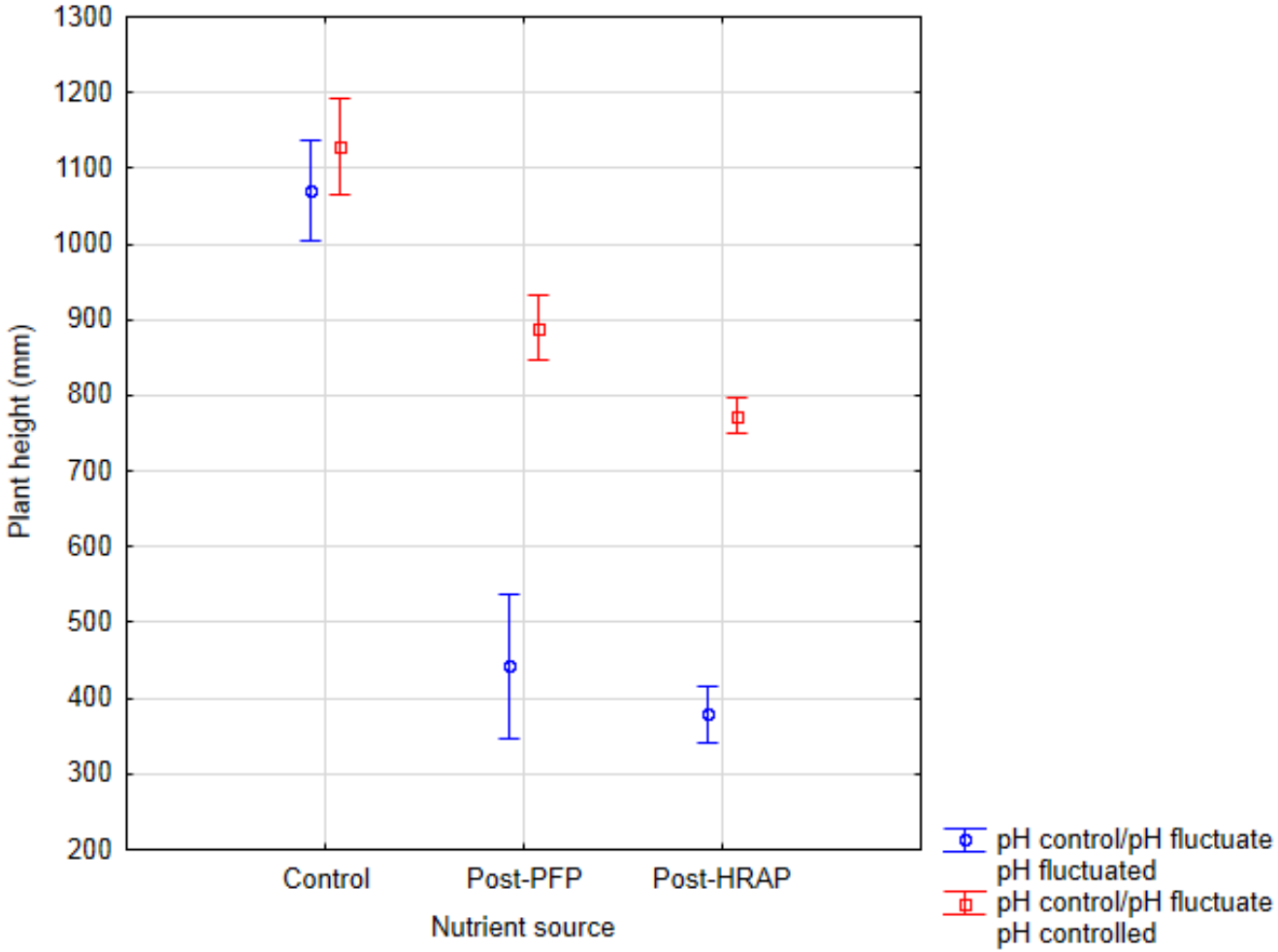
Fish production: ornamentals, tilapia



Fish feed production: algae incorporated in tilapia and abalone feed

Hydroponics – lettuce and tomato production

Hydroponics – lettuce and tomato production



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Conclusion

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Organic effluent

Cleaned using low cost – sustainable technologies

Potential income generating

"down stream" activities

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"Waste"

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The utilization of "waste"

…"waste" is not actually waste at all – it has <u>real, potential value</u>

<u>In the future all "waste" will be sold or used to generate revenue</u>

"Appropriate technology" for SA:

- Uses sunlight – driven by photosynthesis

  (we have plenty of that in SA, and its not expensive!)
- Water reuse
- Low tech.
- Enviro. sustainable
- Job creation
- Food security in rural areas

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Why have I not been able to "bridge the chasm" between research and implementation

Why have I not been able to "bridge the chasm" between research and implementation ?

- My role as a researcher?

Why have I not been able to "bridge the chasm" between research and implementation ?

- My role as a researcher?
- How do we bridge this gap?

We've learned that:

1. "black sheep" are prepared to operate "on the edge of chaos"

2. It is only when you operate on the "edge of chaos" that you increase your chances of becoming world leader

Who is responsible for creating an environment where our leading industries are prepared to adopt the "black sheep" approach?

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