



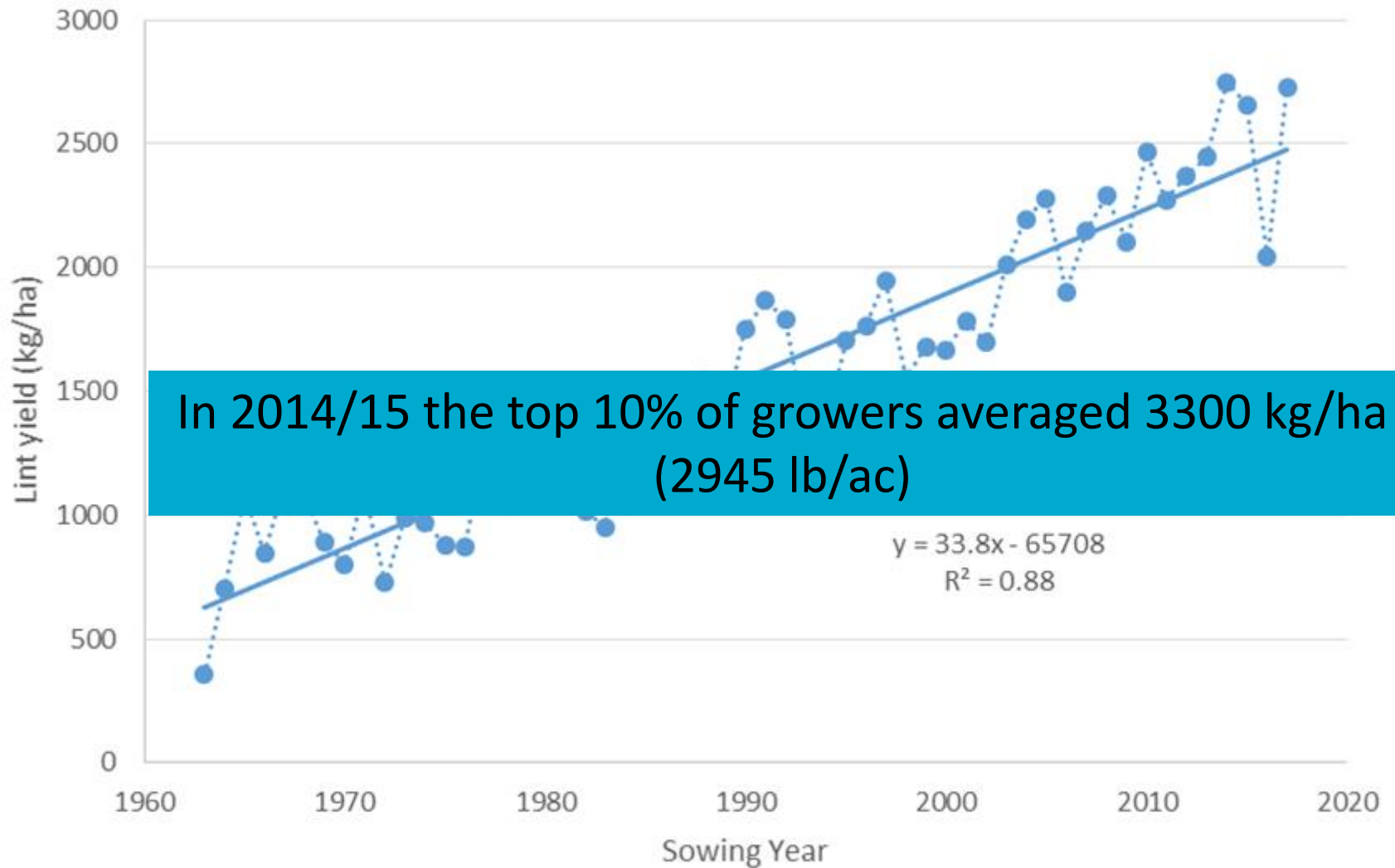
# Seed quality traits – the Australian experience

July 2019

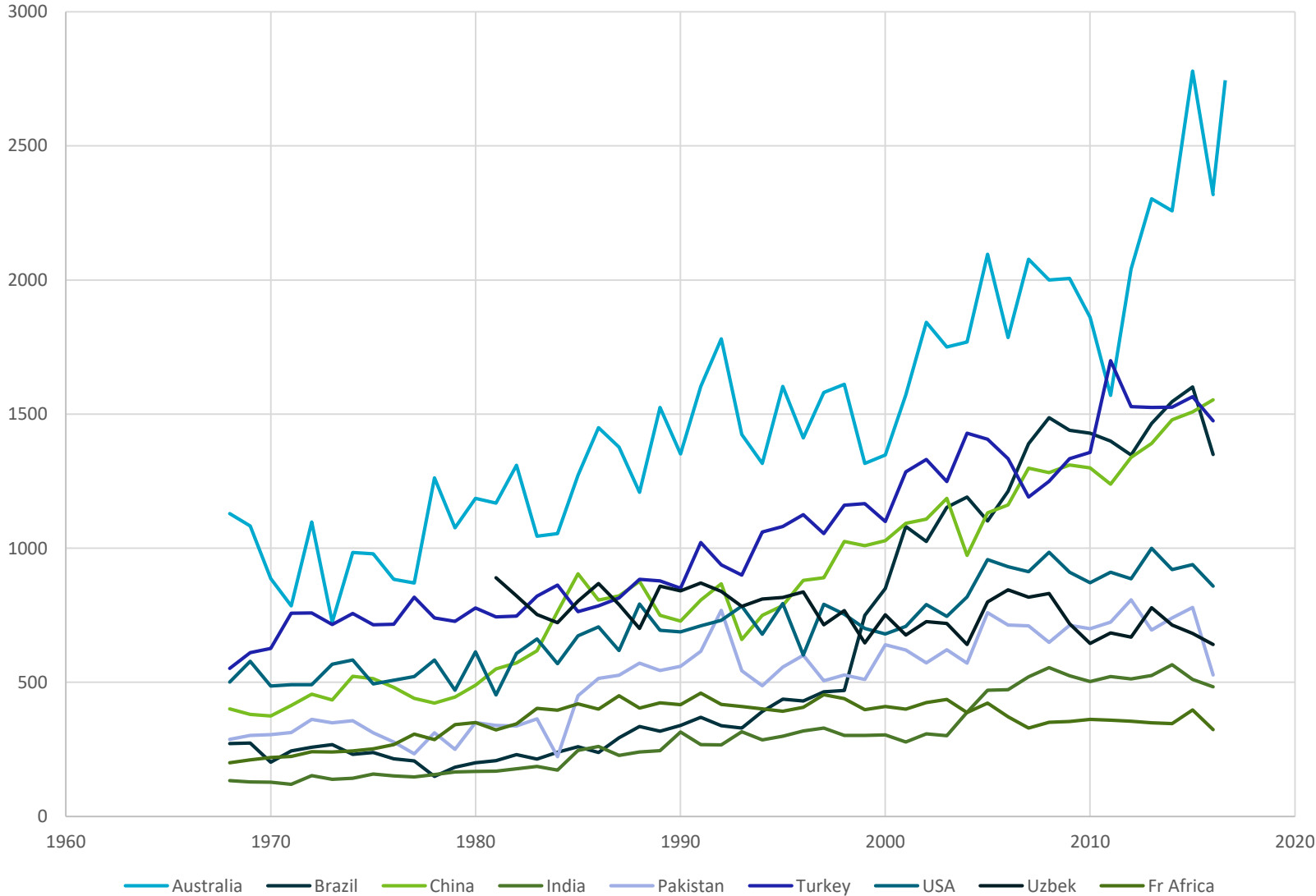
WARWICK STILLER  
[www.csiro.au](http://www.csiro.au)



# Australian Irrigated yield

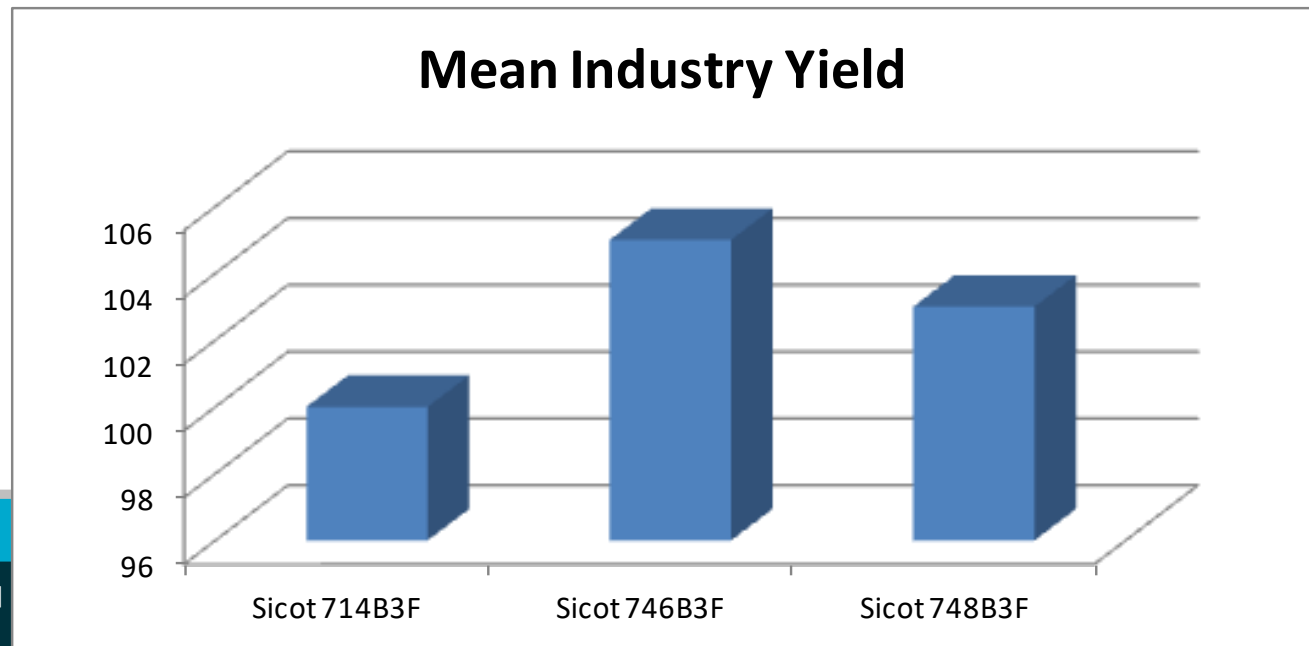


# Global trends in Cotton Yield

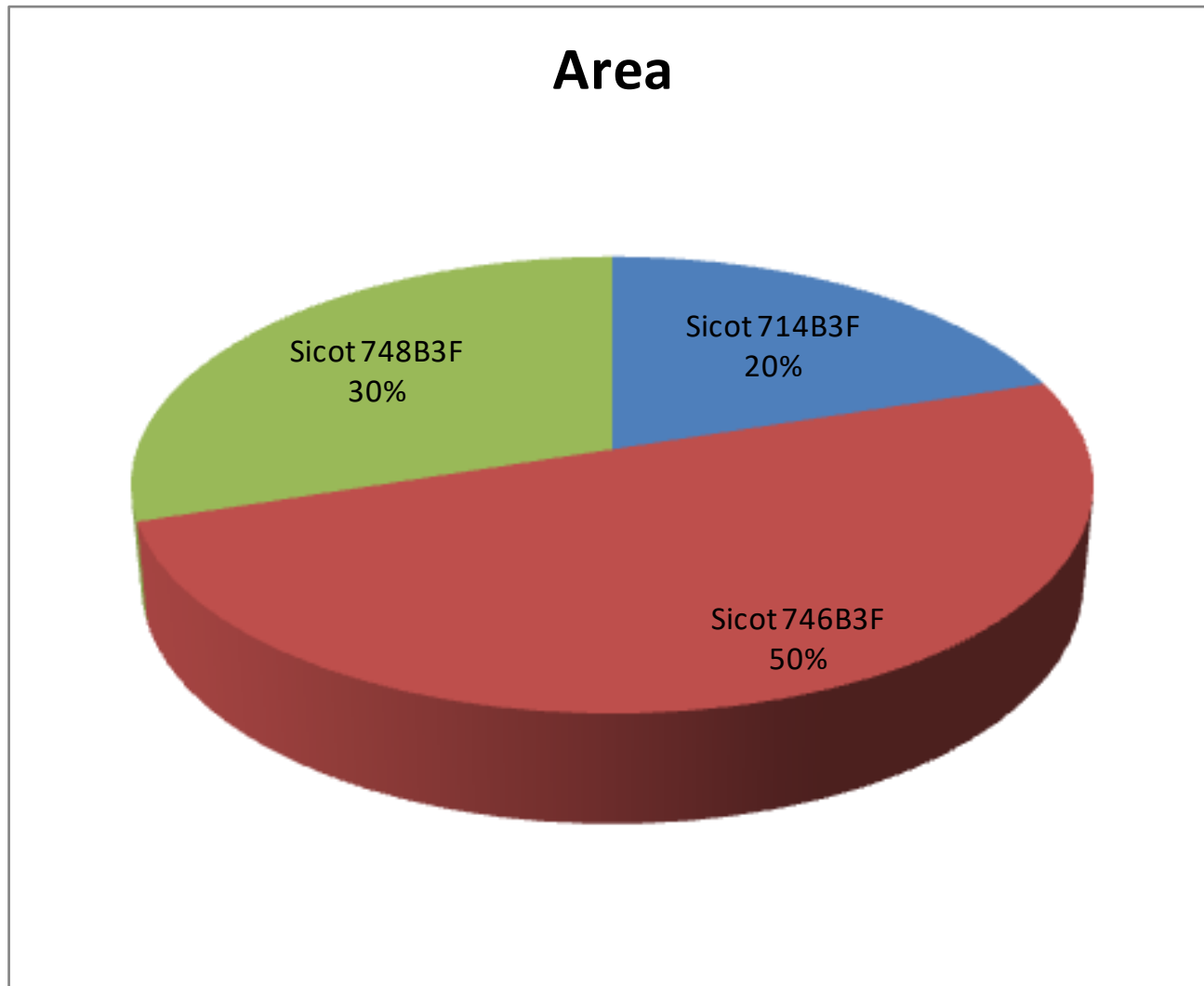


# Gin turnout and seed size (density)

	<b>Gin turnout</b>	<b>Seed Index</b>	<b>seeds/kg</b>
<b>Sicot 714B3F</b>	40.8	10.8	9300
<b>Sicot 746B3F</b>	44.4	8.3	12040
<b>Sicot 748B3F</b>	43.0	9.0	11140



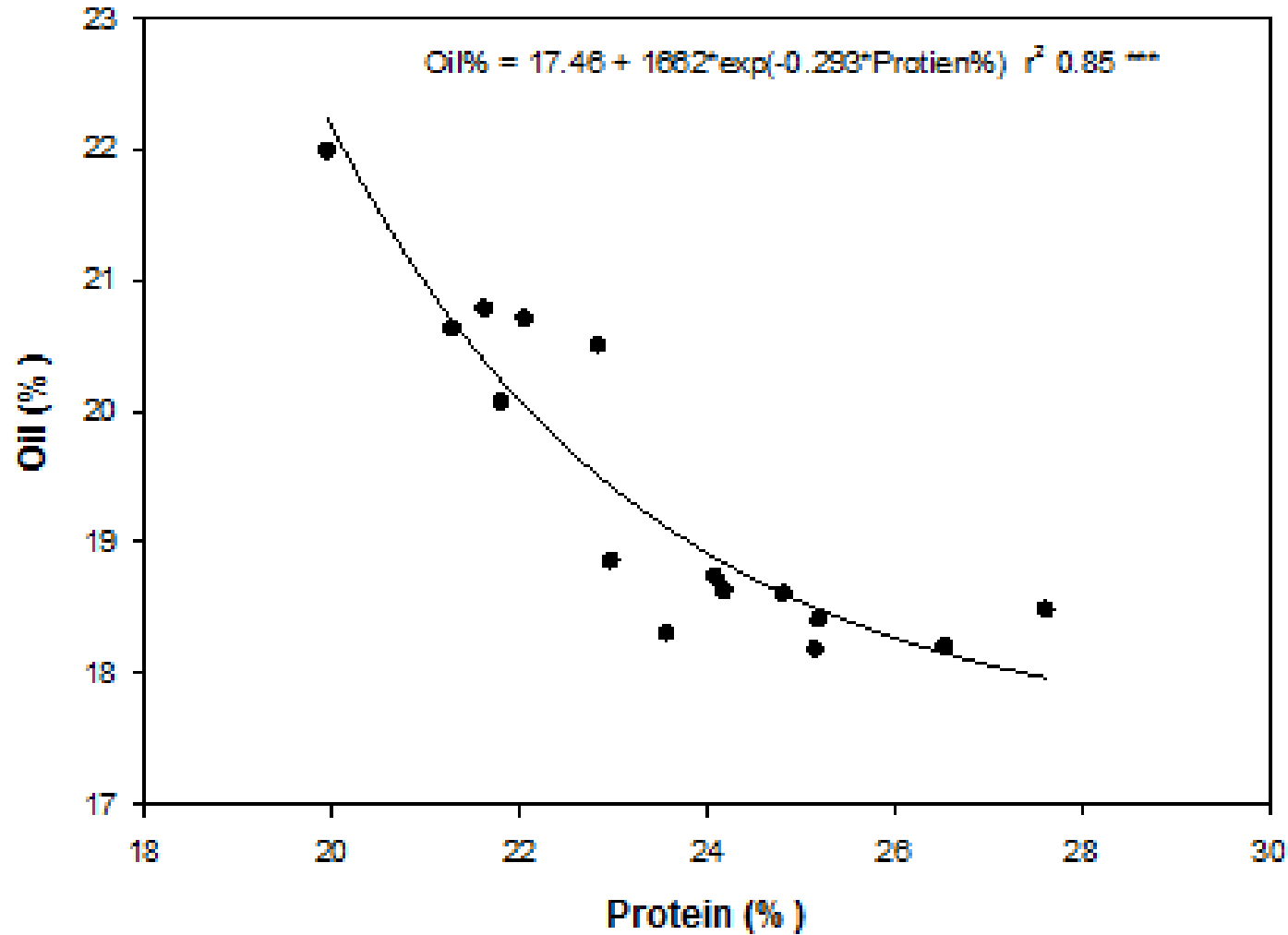
# Gin turnout and seed size (density)



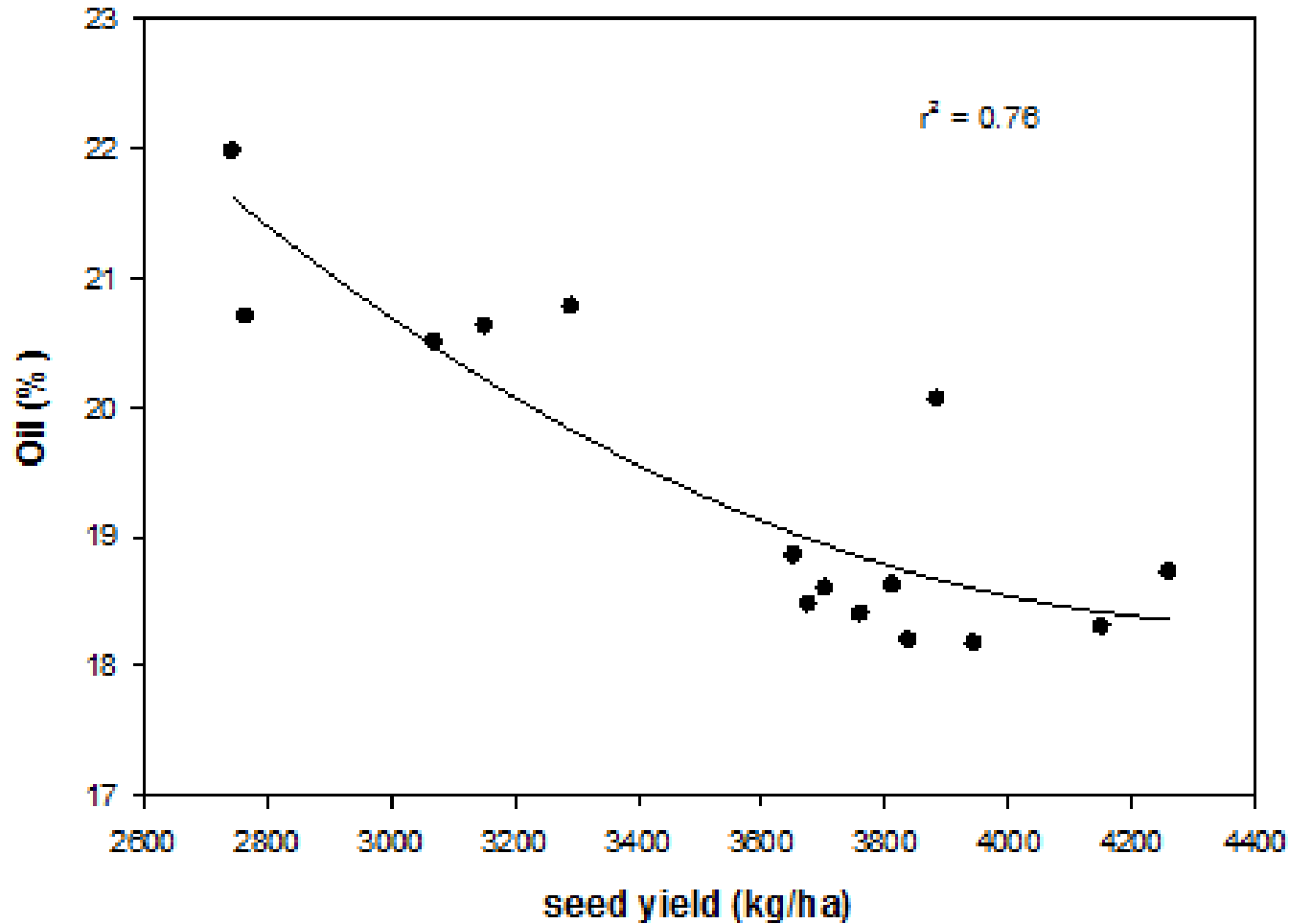
# Seed size

- Increased gin turnout has resulted in reductions in seed index (size vs density)
- When first introduced, some difficulties with establishment, but largely overcome with education.
- We did offer to withdraw the varieties, which almost caused a revolt in the industry.
- Given a choice, growers will always choose yield.
  - If an Australian farmer plants cotton they will always aim for the highest productivity (no Farm Bill).
- Significant discussions around increased oil – highest value commodity will win every time.

# Relationship between oil and protein



# Relationship between oil and seed yield





# What is Australian cottonseed used for

		<b>Domestic</b>	<b>Domestic</b>	<b>Export</b>
<b>Year</b>	<b>Crushing</b>	<b>Feedlot</b>	<b>Grazing</b>	<b>Feedlot</b>
2016	20%	40%	10%	30%
2017	15%	40%	25%	20%
2018	10%	35%	40%	15%
2019	-	50%	40%	10%

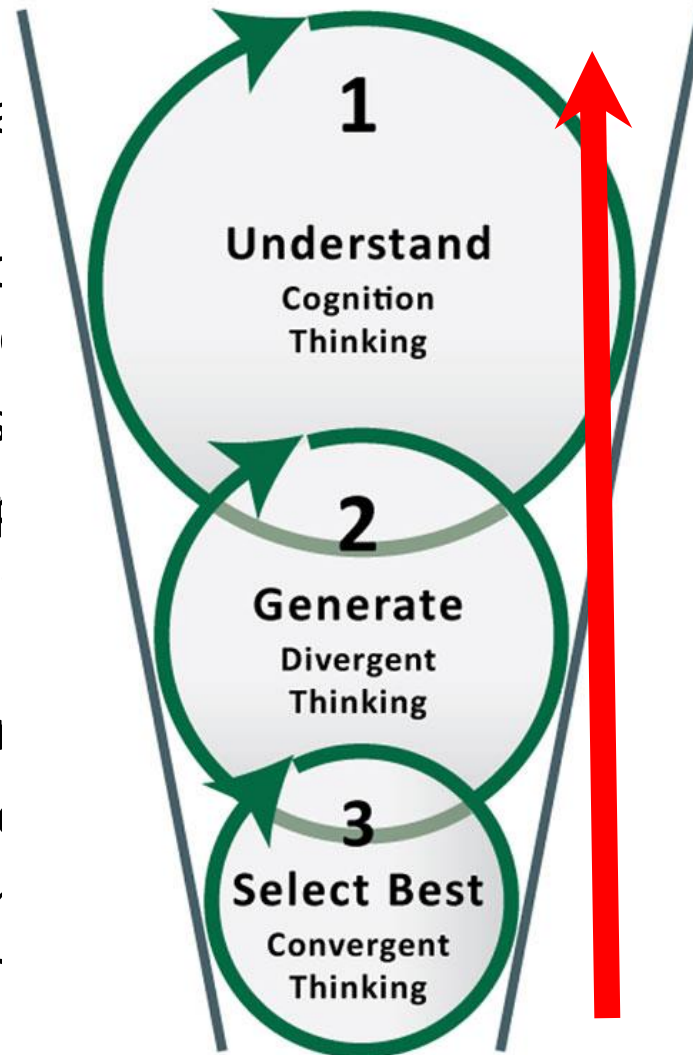
# What is Australian cottonseed used for

## Wholesale price of oil in \$AUD

- Soybean – BASE
  - Canola + \$200
  - Cottonseed + \$400
- 
- Although landscape has changed regarding consumers ie healthy oils, cottonseed oil still commands a premium in the market.

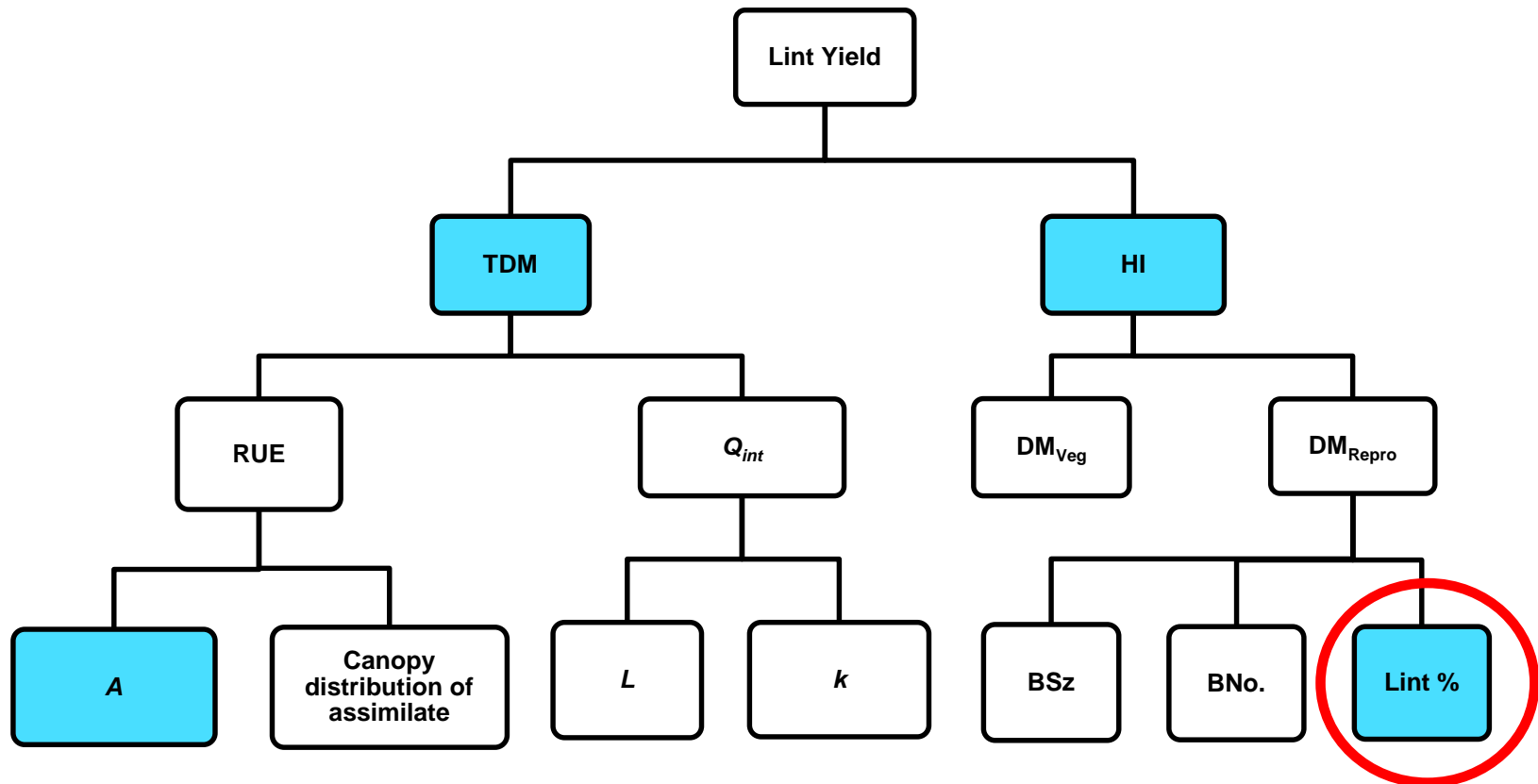
# Case study - Modified cottonseed oil

- Between 1994 and 2000, a new GM cottonseed oil - MonoCott
- low in saturated fatty acids and high in oleic acid
- Aimed at food sector
- Assuming 10% of the industry would be required
- Due to significant regulatory hurdles, a national approach would be required
- Marketing – two years of work
- Project was terminated due to commercial parameters



a new GM cottonseed oil  
low in saturated fatty acids, high in oleic acid  
opportunity in stockfeed market  
added ~3% to gross value  
national approach  
not a commodity  
of interest by possible

# Case study – analysis of 20 years of varieties



# Summary

1. Lint yield will drive variety uptake and industry profitability.
2. Care must be taken when continually selecting for increased turnout.
3. There is some evidence that gin turnout can be increased while maintaining seed index – but it is difficult.
4. No evidence that oil and lint yield can be simultaneously improved (yet)
  - Will require step change in Assimilation, Canopy distribution of assimilate and Assimilate partitioning.

# Thank you

Dr Warwick Stiller

CSIRO Agriculture and Food



# Cotton Breeding – Objectives

**Through novel research and applied plant breeding develop Australian cotton varieties with the package of:**

- increased yield**
- fibre quality preferred by international spinners**
- resistance to all important diseases**
- widely adapted**
- with GM traits of importance.**

**Achieved through the integration of traditional breeding and modern tools**

