



Lupin Breeding AGT

November 2016

Lupin Breeding



- Breeding program previously based in WA and run by DAFWA now privatised and AGT is the breeder
- AGT had no history or particular expertise in Pulses, but is a large and successful plant breeding company.

Lupin Breeder

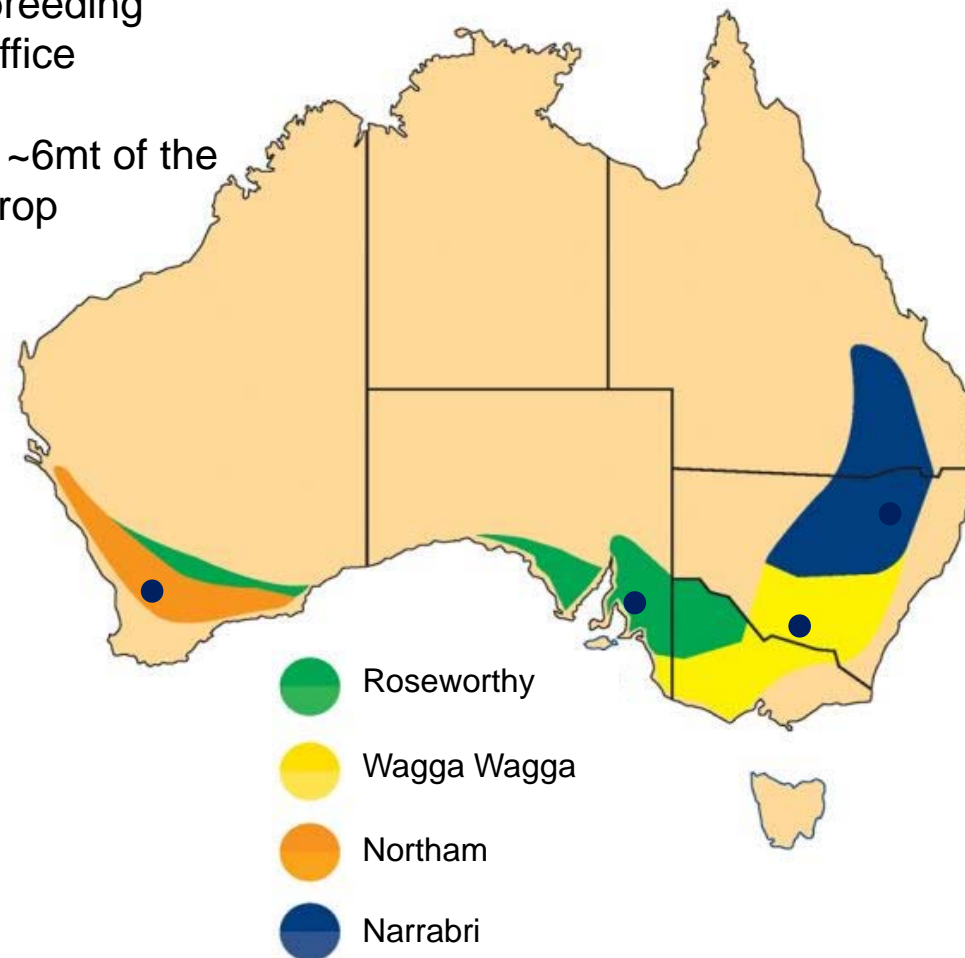
- Dini Ganesalingam
 - Based at Northam, WA
 - Phd in plant breeding and statistics
 - Background in Biometrics analysis of NVT trials



AGT's breeding structure



- 50 Staff across 4 breeding locations & head office
- Each node targets ~6mt of the Australian wheat crop





Scale is important

One of our breeding sites
80 hectares
100,000 F4 lines in head hills
60,000 yield plots
40t of pure breeder's seed

End Point Royalties



Breeding Targets

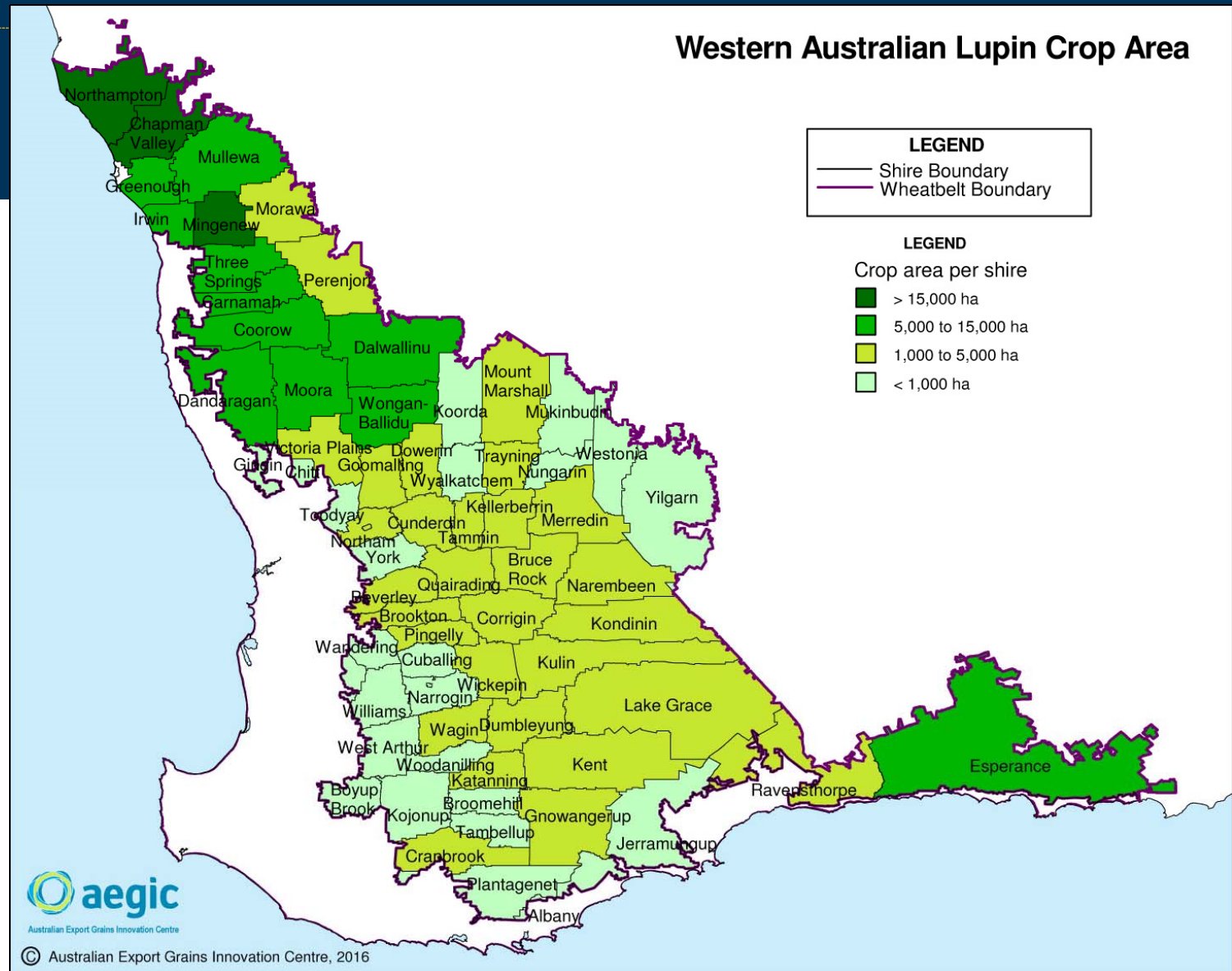


- Narrow leaf (Australian Sweet lupin) *Lupinus angustifolius*
 - Major production
- Albus lupins *Lupinus albus*
 - Minor crop. What role does AGT have in this space?

Lupin Production

	Area(ha)	Yield (t/ha)
NSW	80,079 (1/2 = albus)	1.1
VIC	35,900	0.96
SA	53,573	1.22
WA	384,383	1.13
total	553,935	1.12

Australian Crop Forecasters 2016
Pulse Australia estimates 2016



Slide 8

AG1

Canola 1,168 000

Field Pea 31,000

Crop area est

Aanandini Ganesalingam, 4/08/2016

Breeding ideotypes for environments?



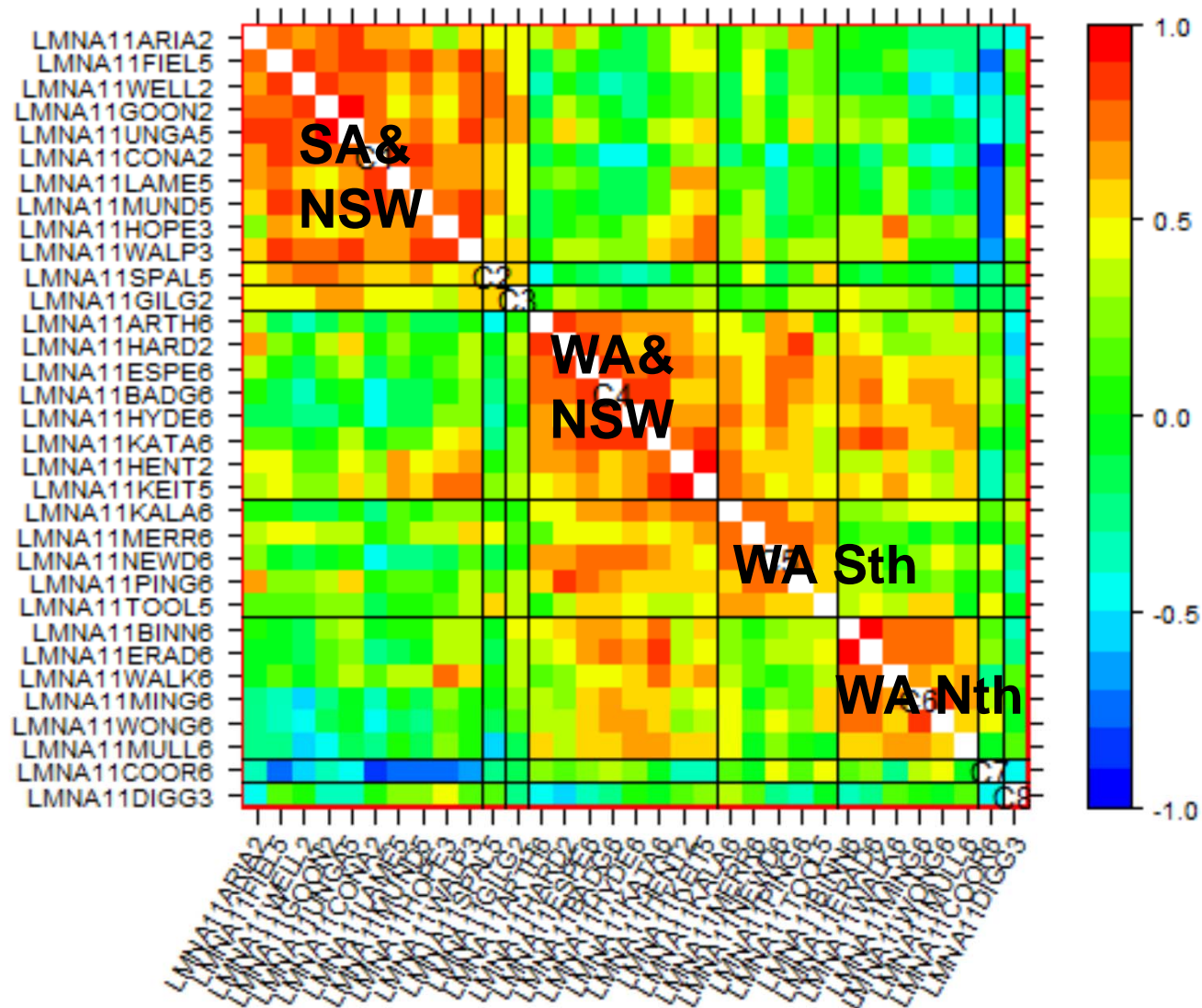
WA – northern sandplains
& SA

- Deep sandy soils/Acidic (+/-)
- Low rainfall
- Short season

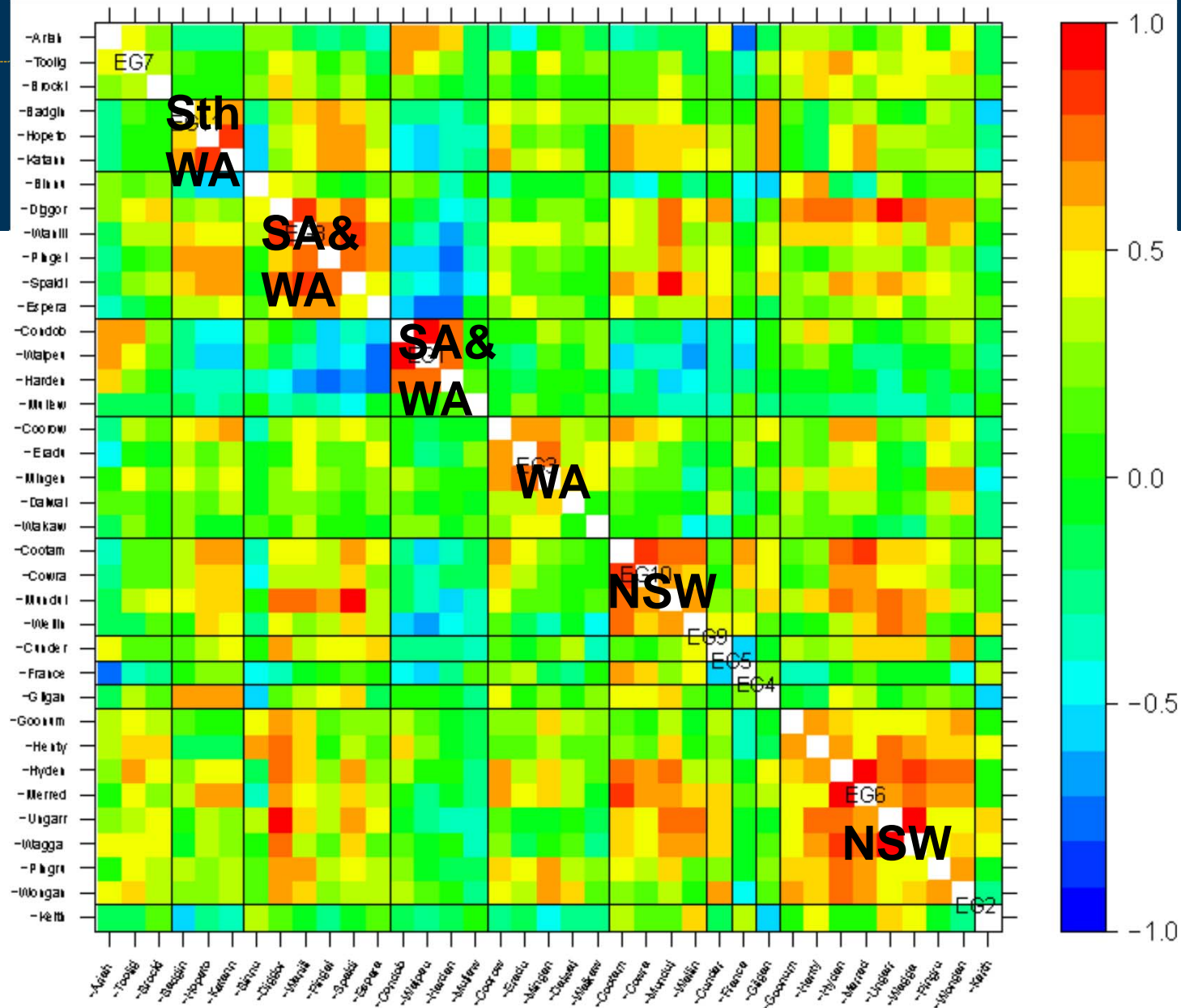
Southern WA, VIC & NSW

- Heavy brown soils ~acidic?
- High rainfall
- Non-Vernalisation & late photoperiod

2011



2013



WA – northern sandplains & SA

- Yield
- Herbicide options
- Shattering
- Early vigour
- Agronomy

Southern WA, SA & NSW

- Yield
- Maturity type
- Herbicide options
- Disease package
 - CMV
 - BYMV
 - Brown Spot
 - Phytophthora root rot
 - Phomopsis

Quality traits



- Protein $\geq 35\%$
- Alkaloids $<0.02\%$
- Low Phomopsis levels



Markets



- Cattle feed
- Aquaculture
- Human Consumption



Markets – Stock feed



- Excellent source of crude protein
 - Range of 27-42%
 - Ave 34%
- Digestibility extremely high
 - Ave 20%
 - Wheat 3%
 - Peas 9%



Markets – Aquaculture



- Same as stock
- Doesn't cause enteritis in salmon compared to soy
- Protein not damaged by heat processing
- Cheaper source of protein
- Non-GM
- Increase in pellet sink rates



Markets – Human consumption

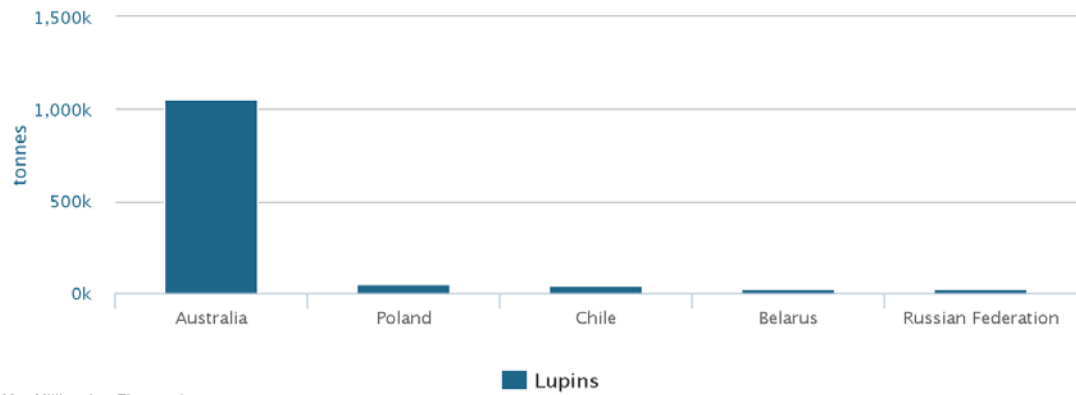
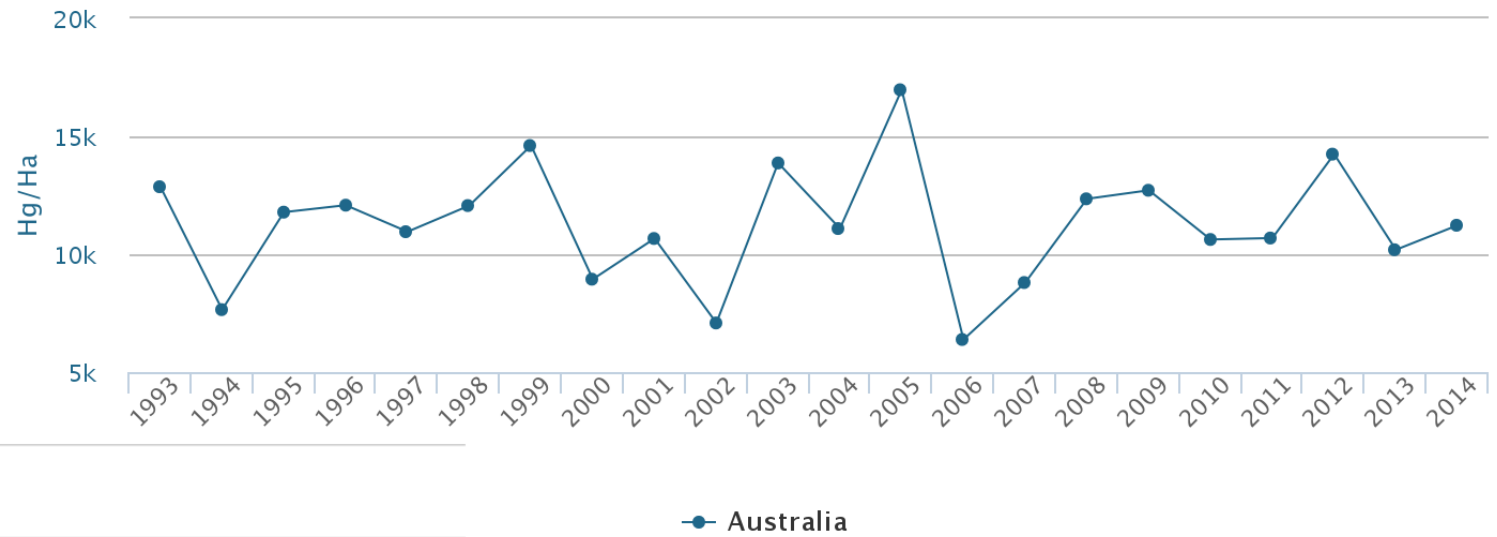


- High protein
- Non-GM
- Cheaper source of protein
- Low GI
- Health benefits
 - Improve blood lipids – cholesterol
 - Lower hypertension
 - Improve bowel health
 - Metformin
- Is considered an allergen



- Anthracnose
 - Quarantine disease in NSW & Vic
 - Go through quarantine stage when bringing seed from WA to NSW/Vic – limits amount and adds time to breeding process

FAO stats 1993-2014



M = Million, k = Thousand