



# 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

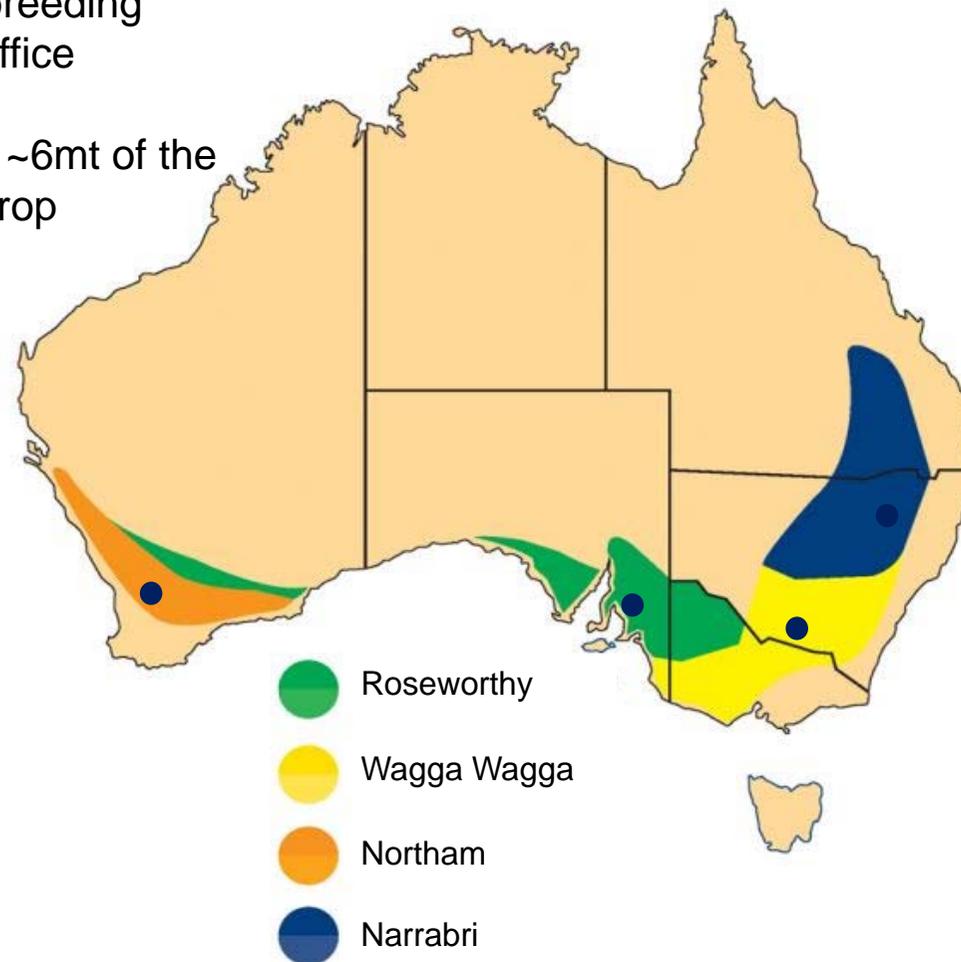
- Dini Ganesalingam
  - Based at Northam, WA
  - Phd in plant breeding and statistics
  - Background in Biometrics analysis of NVT trials



## 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

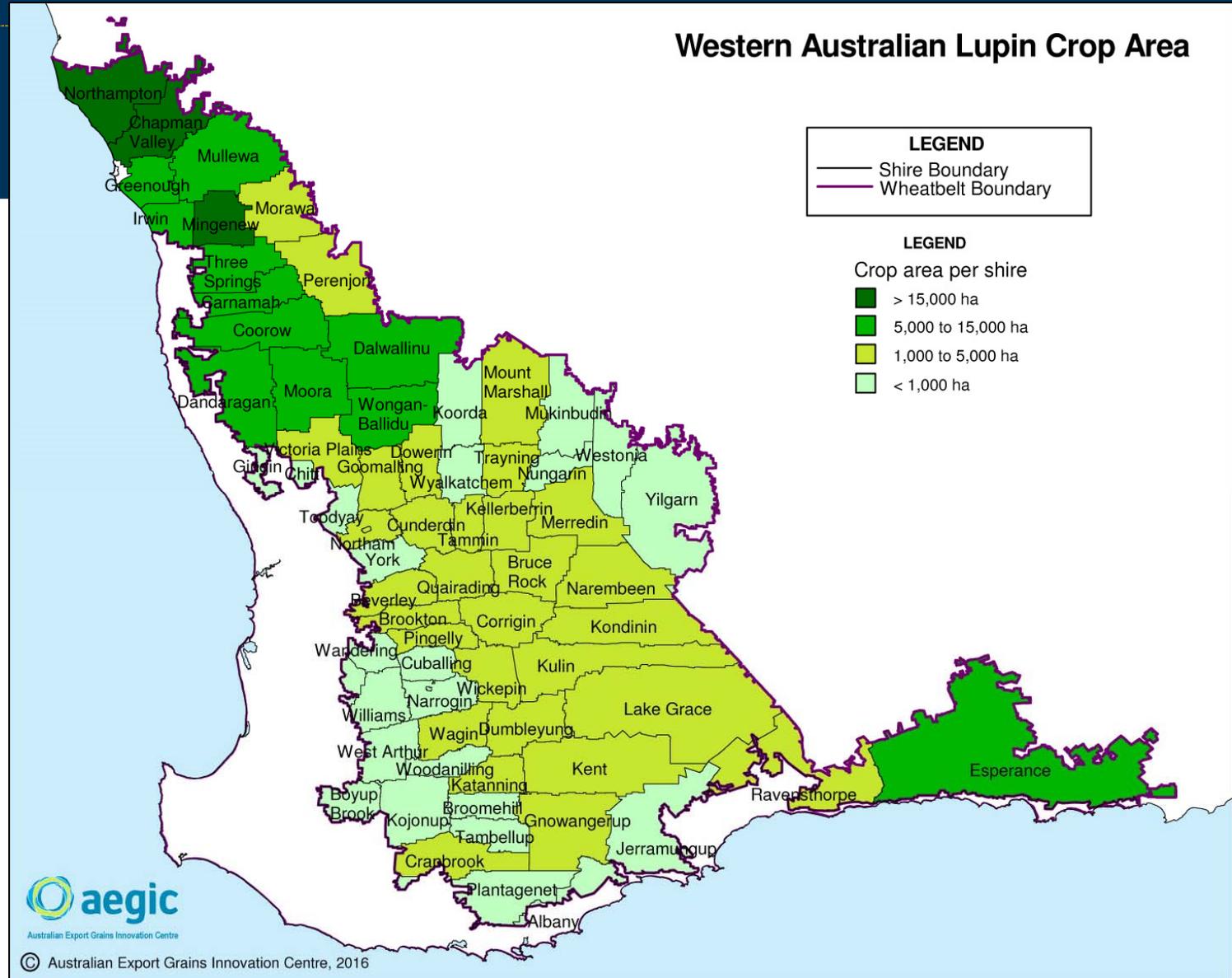


- Narrow leaf (Australian Sweet lupin) *Lupinus angustifolius*
  - Major production
- Albus lupins *Lupinus albus*
  - Minor crop. What role does AGT have in this space?

# 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
<b>total</b>	<b>553,935</b>	<b>1.12</b>

Australian Crop Forecasters 2016  
Pulse Australia estimates 2016



**Slide 8**

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**AG1**

Canola 1,168 000

Field Pea 31,000

Crop area est

Aanandini Ganesalingam, 4/08/2016

## Breeding ideotypes for environments?



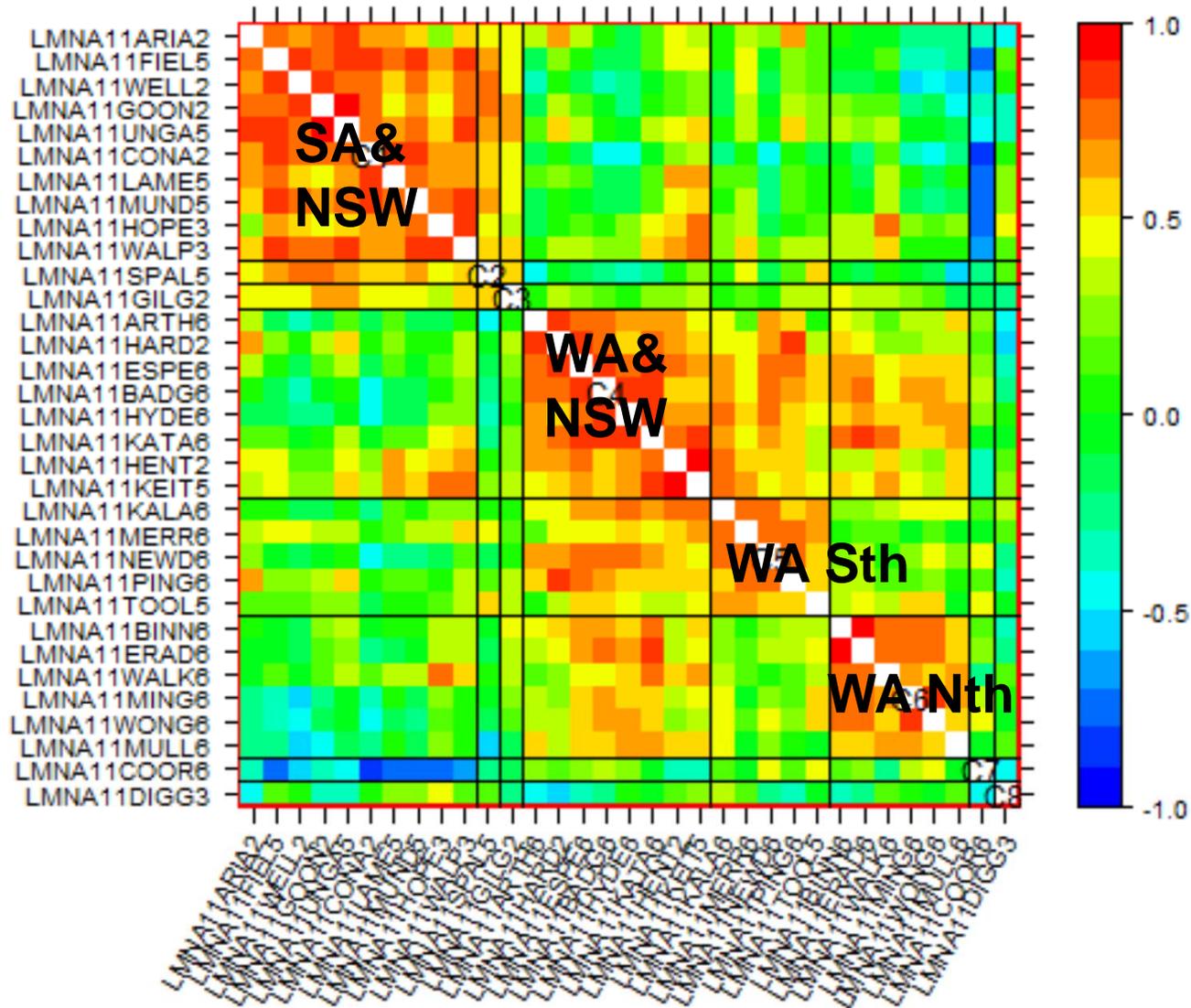
### WA – northern sandplains & SA

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

### Southern WA, VIC & NSW

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

2011





### 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



- 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

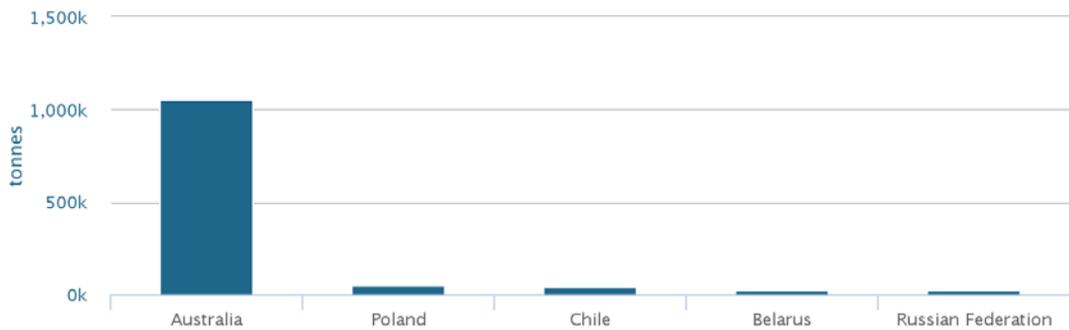
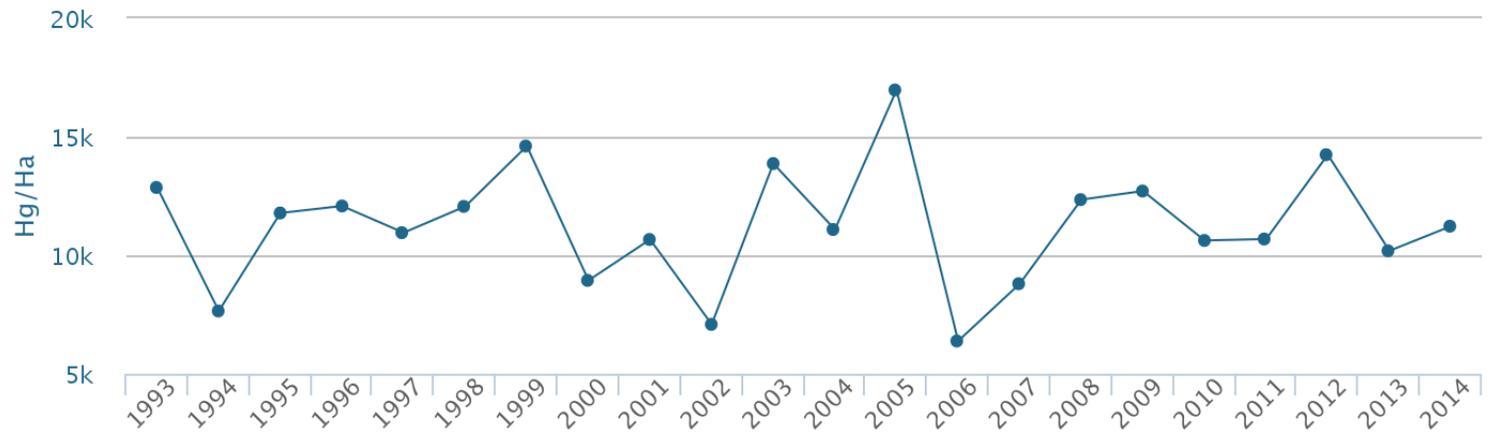


- High protein
- Non-GM
- Cheaper source of protein
- Low GI
- Health benefits
  - Improve blood lipids – cholesterol
  - Lower hypertension
  - Improve bowel health
  - Metformin
- Is considered an allergen



- 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



● Australia

M = Million, k = Thousand

■ Lupins