

# Origin of germplasm in Australian trials



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PROFITABLE PERENNIALS™ FOR AUSTRALIAN LANDSCAPES



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# Germplasm

- \* The Australian program is the beneficiary of the generosity and hard work of others
- \* Derivatives from crosses between wheat and perennial relatives
  - \* Wheatgrass species: especially
    - \* *Thinopyrum ponticum* (10x)
    - \* *Th. intermedium* (6x)
    - \* *Lophopyrum elongatum* (2x)
- \* *L.elongatum* derivatives from Washington State Uni
- \* *Th.intermedium* derivatives from The Land Institute
- \* Amphiploids from Russia, USA and China involving
  - \* *Th.intermedium*,
  - \* *Th.ponticum*
  - \* *Ag.scirpeum*
  - \* *L.elongatum*
- \* True wheats imported from Megawheats Argentina by AWB Seeds

Stan Cox, The Land Institute





# Washington State University lines

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- ✦ Stephen Jones, Kevin Murphy
- ✦ 30 lines
- ✦ *Lophopyrum elongatum* ( $2n=14$ , EE) / Chinese Spring // Madsen



Wedgetail



235a



236b



244a



244a



244a



# The Land Institute

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- \* Stan Cox, Lee DeHaan
- \* 50 lines (not all made it through Q'tine)
- \* Various pedigrees
  - \* *T.carthlicum* / *Th.intermedium* // *T.aestivum*
  - \* *T.aestivum* / *Th.intermedium* // *T.aestivum*
  - \* *T.carthlicum* / *Th.intermedium*
  - \* *T.carthlicum* / *Th.intermedium* // *T.aestivum* /3/ *T.aestivum*
  - \* *T.carthlicum* / *Th.intermedium* // *Th.intermedium*



*Th. intermedium*  
cv Luna



257a



258b



280b



# Otrastayuschaya 38 (2n=56)

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- \* Main Botanical Garden of Acad of Sci of Soviet Union  
Dept of Distant Hybridization
  - \* Vera Lyubimova (1906-2002) under Nikolai Tsitsin (1898-1980)
  - \* Crosses from 1930s to 1950s
  - \* A grain and graze perennial, released cultivar
  - \* Pedigree information from Paul Kroupin and VI Belov, Moscow

**Bezenchukskiy**

**hybrid Milturum 25 X *Th. intermedium***



**F1 free pollinating**



**F2...F4 self-pollinating**



**Hybrid 1489/69 (selected)**

**X**

**Lutescens 329 X *Th. intermedium***



**F1 X Eritrospermum 46/131**



**F1... F2 self-pollinating**



**M2**



**Otrastayuschaya 38 (2n=56)**



# Otrastayuschaya 38 (2n=56)

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*Thinopyrum  
intermedium*

Ot38



Ot38



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## OK7211542 ( $2n=56$ )

- ✦ OK7211542 was produced by the Sando program (Okla., U.S.A) in 1950s
- ✦ Described as *Agropyron*–wheat (Ag–wheat) hybrid
- ✦ Fedak (2000) showed the parent was *Th. ponticum*
- ✦  $2n=56$ , Synthetic extra genome





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# OK7211542 ( $2n=56$ )



*Th.ponticum*  
cv Tyrell



OK7211542



Wedgetail



OK7211542





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## Other amphiploids

From N.E. Normal Uni, Changchun, China

- \* Wheat / *Th.intermedium*,  $2n=56$ 
  - \* Zhong1
  - \* Zhong2
  - \* Zhong4
  - \* Zhong5
  - \* Summer1

From CHEN Peidu, Nanjing Ag Uni

- \* ABV, *T. durum* / *Haynaldia villosa*,  $2n=42$

From CIMMYT

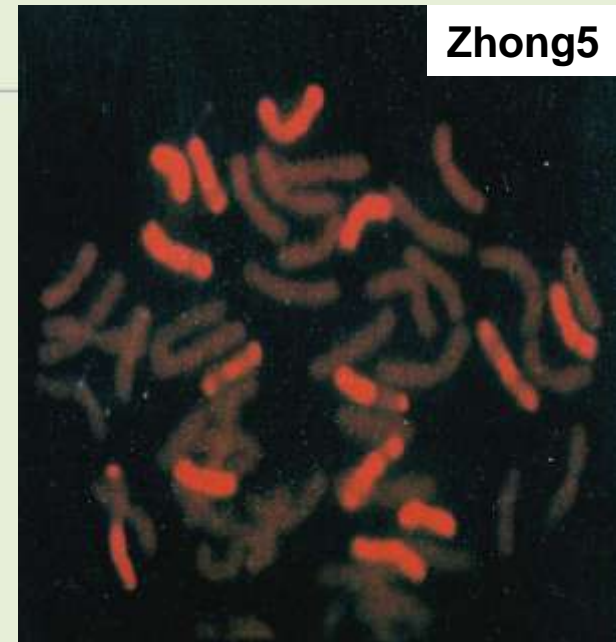
- \* B84-994 wheat / *A.scirpeum* // wheat,  $2n=56$

From Yvonne Cauderon, INRA, France

- \* TAF46 wheat / *Th. intermedium*,  $2n=56$

From UC, Davis

- \* CS-Le amphiploid, wheat / *L.elongatum*





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summer1 Zhong5



B84-994  
scirpeum  
amphiploid

*Th. intermedium*  
cv Luna



Ot38

Zhong1



Zhong2

Wedgetail



Zhong4



# New germplasm not yet tested

## From The Land Institute

- \* Complex intercrosses involving
  - \* Wheat or *carthicum*, *intermedium*, *junceum*, triticale
- \* *Th intermedium* selected for increased seed size

## From Russia

- \* “Russian perennial” - amphiploid based on *turgidum*
- \* Ostankinskaya (similar pedigree to Ot38)
  - \* Wheat / *Th intermedium* derivative
- \* Zernokormovaya 169
  - \* (Wheat / *Th. intermedium*) x (wheat / *Th. elongatum*) selection
- \* Istra-1
  - \* About 1990 release; much improved bread making quality
  - \* Grain yield 75% of elite annual winter wheat