Accuracy of genomic prediction of purebreds for crossbred performance in pigs

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EAAP, Warsaw, 3rd September 2015

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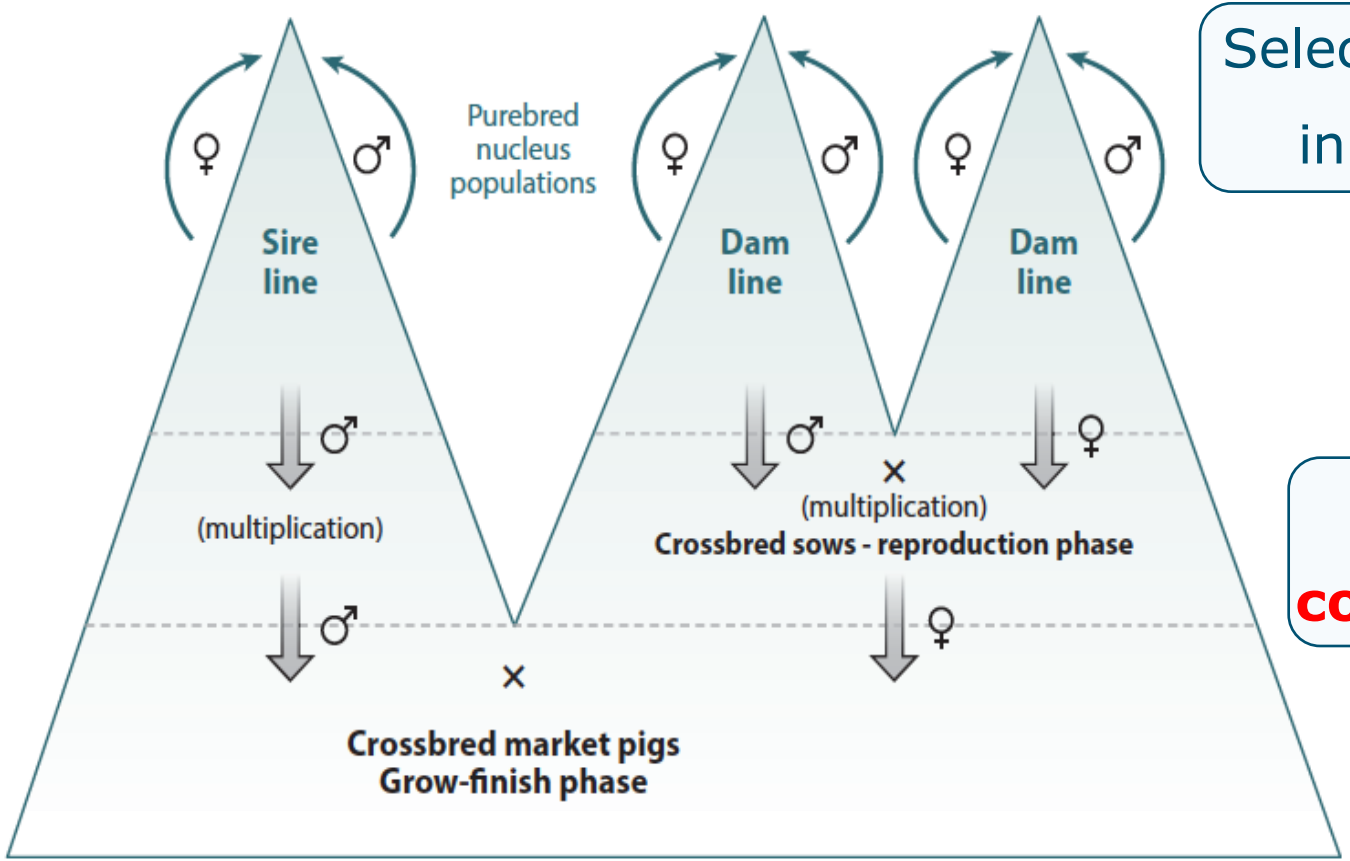
Topigs Norsvin PROGRESS IN PIGS

BREED4FOOD

Typical pig breeding program

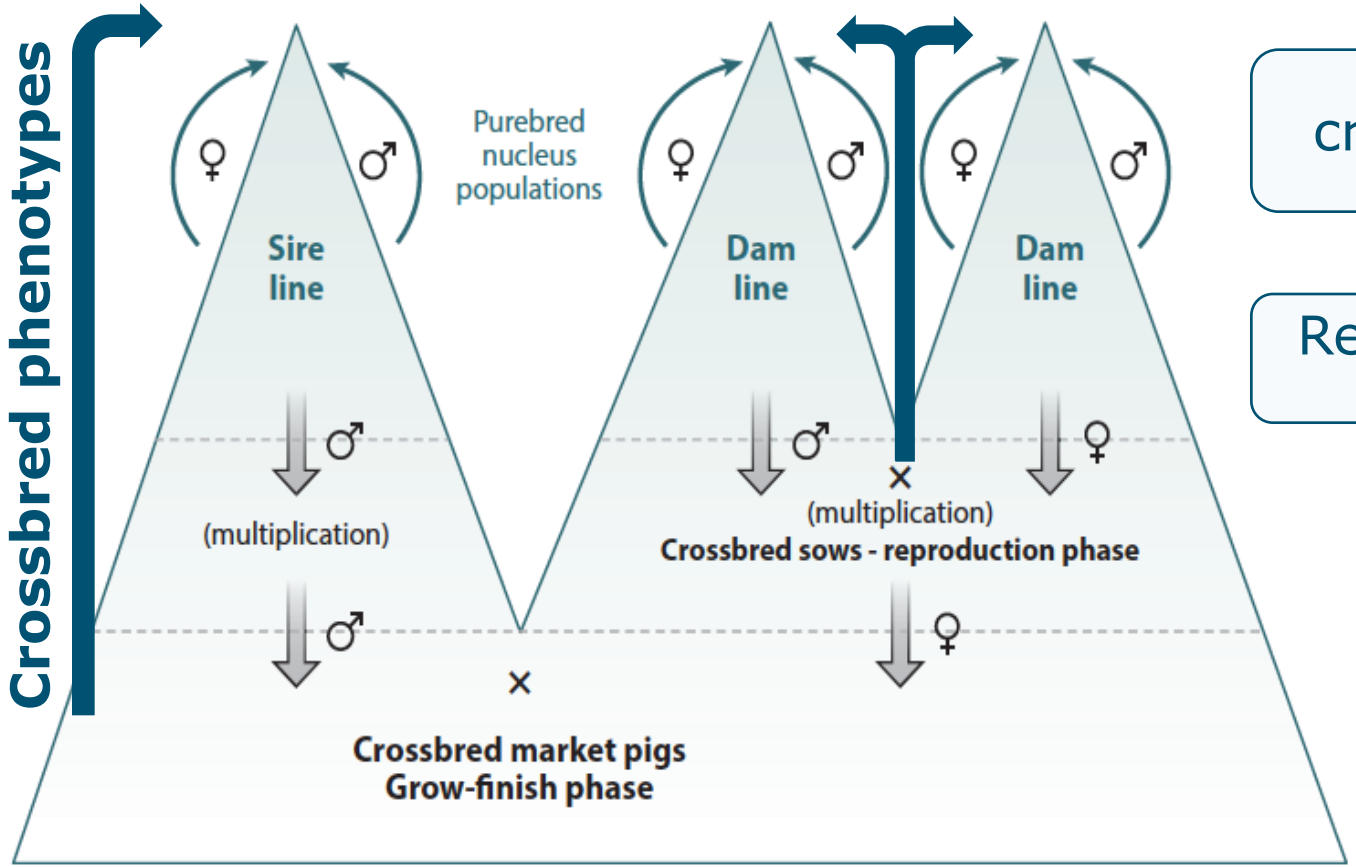


Selection on **purebred** performance in **nucleus** farms

$r_{pc} < 1$

Crossbred performance in **commercial** farms

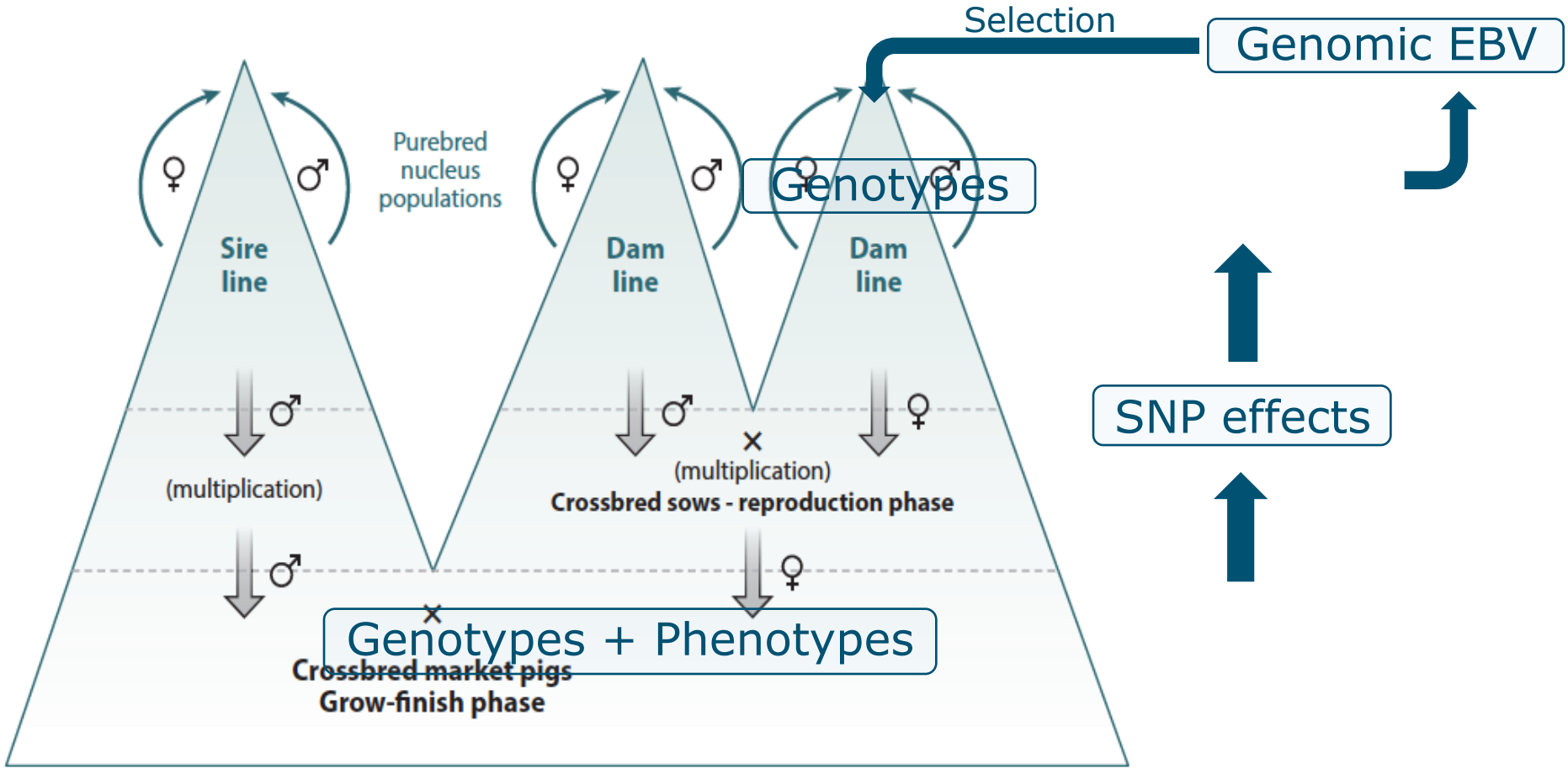
Solutions



Combined crossbred-purebred selection

Reciprocal recurrent selection

Genomic selection



Objective

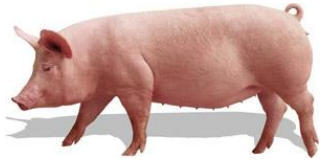
Assess the accuracy of prediction using crossbred or purebred training data

Material & methods

- Three populations:
  - Dutch Landrace (1,668)
  - Large White (2,003)
  - F1 cross (914)
- Traits:
  - Gestation length
  - Total number of piglets born

Material & methods

- All individuals genotyped using 60K SNPChip
- 42,139 SNPs
- Training: pre-corrected phenotypes
- Validation: DEBV for crossbred performance

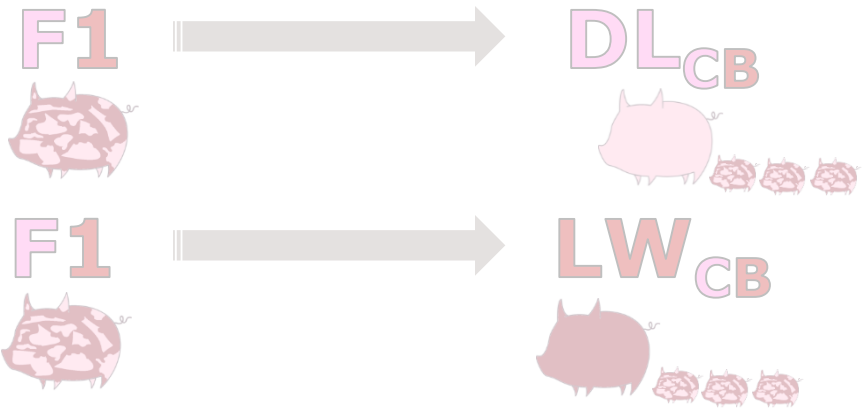


Material & methods

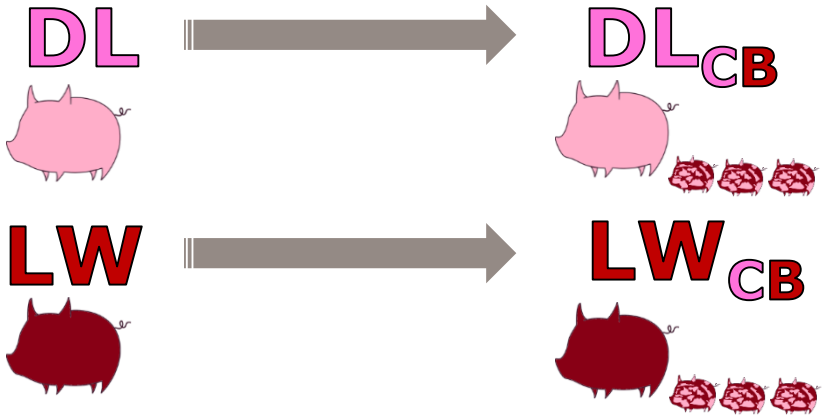
- GBLUP

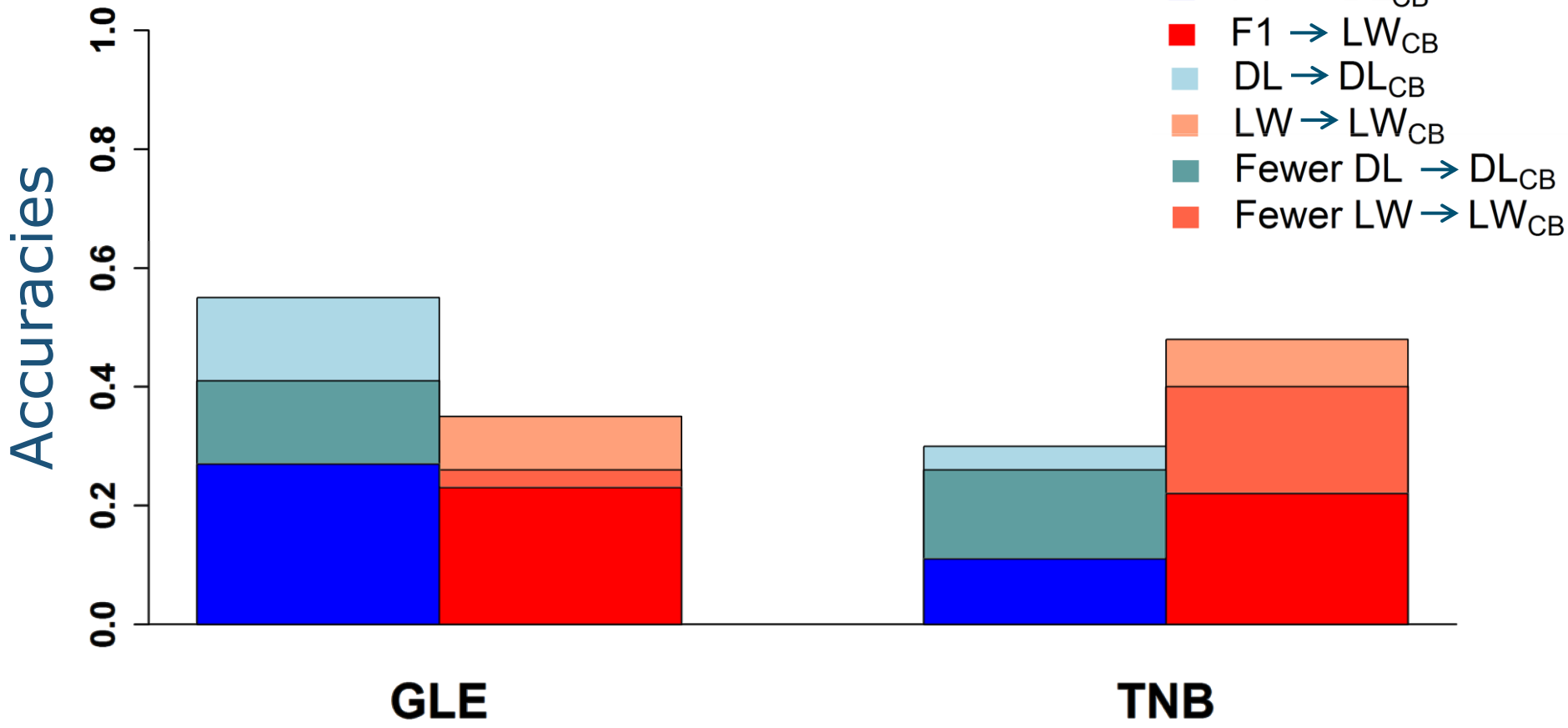
$$accuracy = \frac{r_{(debv,gebv)}}{\sqrt{r^2}}$$

- Crossbred training



- Purebred training




Accuracies
0.0
0.2
0.4
0.6
0.8
1.0
GLE
TNB
F1 → DL$_{CB}$
F1 → LW$_{CB}$
DL → DL$_{CB}$
LW → LW$_{CB}$
Fewer DL → DL$_{CB}$
Fewer LW → LW$_{CB}$

Conclusions

- There is predictive ability
- Purebred training was more accurate
- Different traits
- Different models

Thank you!