Re-inventing bread wheat

Plant breeders cross the best varieties together, and seek new variation e.g. overseas varieties, wild relatives, mutants or even genetic modification. Breeding starts by crossing different parents together. The offspring are then tested and the best lines are kept.

Testing is based upon appearance, disease resistance, DNA markers, yield and nutritional value. The very best performing lines may become future crop varieties.

- Bread wheat has three ancestors: A, B and D.
- Genes from each ancestor allow wheat to grow in different environments.
- NIAB scientists have ‘re-synthesised’ the original ABD hybrid.

Ancestor D = wild ‘goat grass’ Ae. tauschii, still found across central Asia. NIAB plant breeders have used several different goat grass D ancestors to introduce novel, natural diversity into ‘resynthesised’ wheat.

Ancestor AB = emmer and durum (pasta) wheat. We see variation in AB ancestors. Seed size and shape are important for yield and milling. Better water use and photosynthetic efficiency may be useful when climate changes.

NIAB’s ‘re-synthesised’ wheat is crossed with modern varieties and the offspring are tested in the field. Good lines are kept for more testing. The best lines may be used by other plant breeders and researchers.