

*Fonds de soutien à l'Obtention Végétale*



Blé tendre



Blé dur



Orge



Seigle



Avoine



Triticale



Riz



Épautre



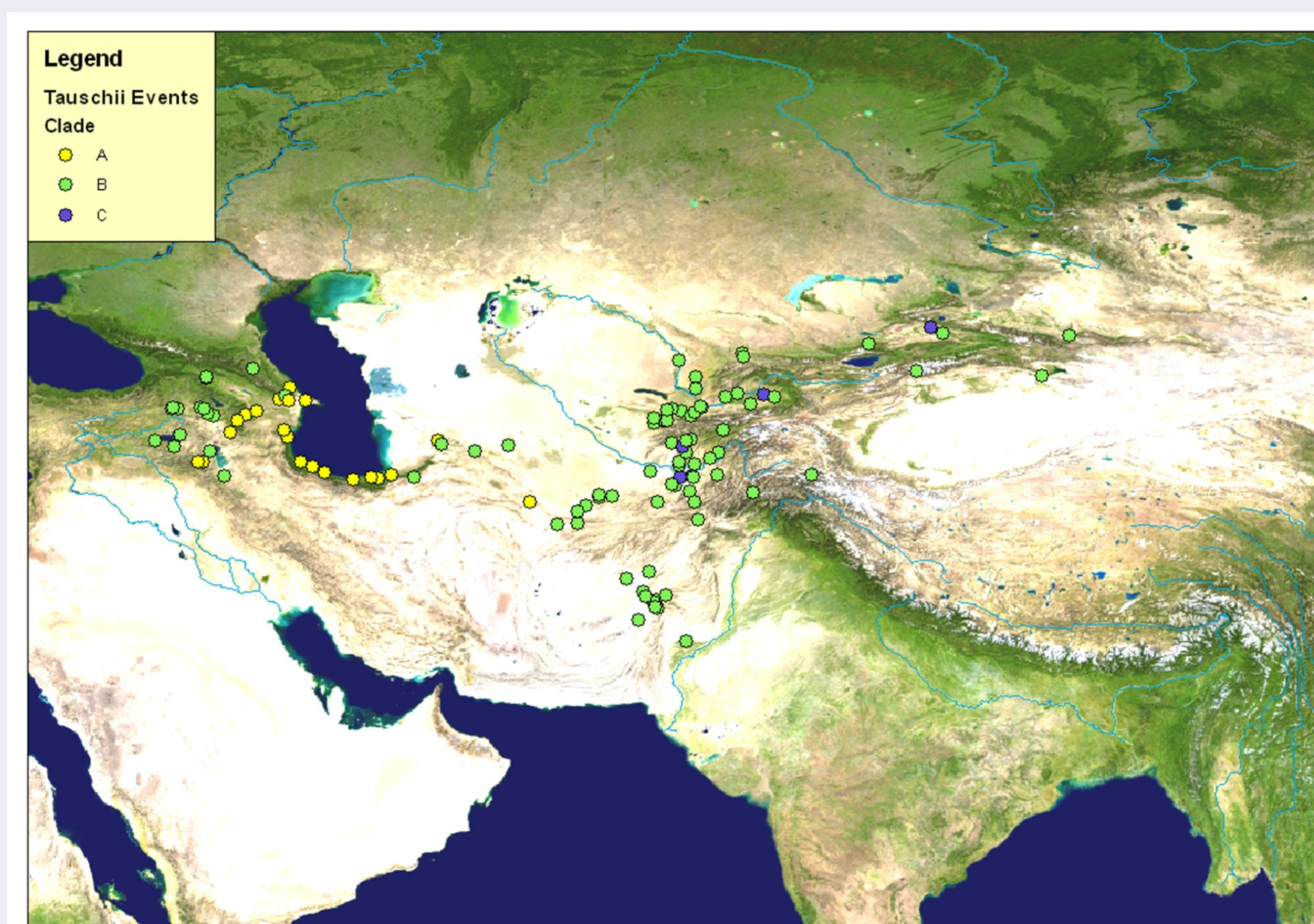
## Integrating New Diversity to improve Yield Stability (INDYS)

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- Wheat is hexaploid with AABBDD genomes. Wheat breeders require access to increased genetic diversity, especially for the D-genome, which is 3 to 4 times less diverse than the A and B-genomes.
- Accessions of *Aegilops tauschii*, the carrier of the D-genome, were originally collected from these regions:

|              |            |            |
|--------------|------------|------------|
| China        | Kyrgyzstan | Georgia    |
| Turkmenistan | Turkey     | Tajikistan |
| Iran         | Armenia    | Uzbekistan |



Geographic diversity of captured D genomes

- At NIAB (Cambridge, UK), pollen from *Aegilops tauschii* (1) is transferred onto AB-genome durum wheat (2), to mimic the rare cross that gave the first hexaploid wheat 10 000 years ago.
- With care, this produces 'resynthesised' wheat lines or Synthetic Hexaploid Wheat (SHWs) (3), which capture unexplored D-genome variation.
- NIAB then crossed 30 SHWs, each tracing different *Ae. Tauschii* accession, with two French varieties (4) to produce unique breeding material for INDYS.
- CETAC breeders have grown this material in breeding nurseries (5) in France and selected the best lines for diseases, plant and ear aspect, adaptation to stresses, to test again more thoroughly.



- BC1F4 lines are under multiplication in 2016-17 and will be tested in yield trials in 2017-18.
- All lines selected by INDYS breeders will also be screened with genetic markers. This will identify any regions of the genome that appear to bring beneficial variation from the SHWs, will assist with QTL mapping, and will allow the breeders to carry out marker-assisted selection in future crosses.
- This is a pre-breeding project – we do not expect to see varieties until the next cycle of crossing and selection.

NIAB SHWs were generated as part of a UK public wheat pre-breeding project 'WISP', funded by the BBSRC

