IWYP International Wheat Yield Partnership
Research to Deliver Wheat for the Future

IWYP SCIENCE BRIEF

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A "Super Hub" Concept to Maximize Efficiency, Speed and Impact

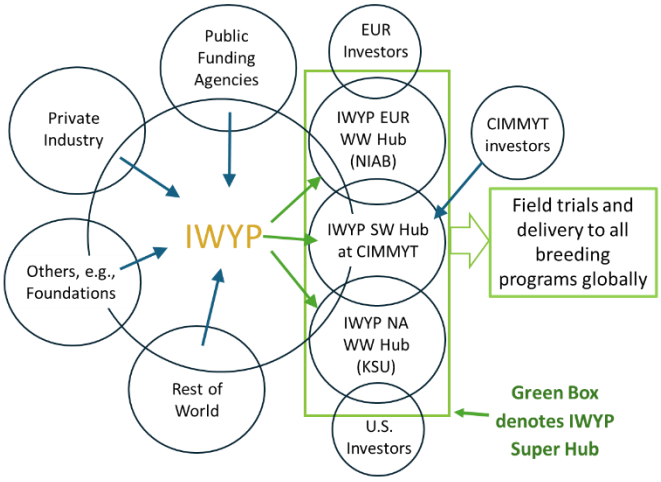
Multi-national public-private partnerships can create significant value and magnify returns on investment. The International Wheat Yield Partnership (IWYP) was formed in 2014 to address the urgent need for global food and nutritional security based on research and translational breakthroughs in physiology, genetics, genomics and phenomics. Its remit has expanded to include climate resilience.

For research discoveries to have broad impact on global food security, it is necessary to generate impacts on a large portion of the major breeding programs around the world. This is why the three Hub translation system created by IWYP has proven so valuable. These Hubs operate at CIMMYT, Kansas State University (KSU) and the National Institute of Agricultural Botany (NIAB) in the UK. Each of these IWYP Hubs is very experienced in wheat-based research and translation. They reach directly into breeding programs, public and private, that develop varieties for farmers for the most important wheat growing environments across the globe by teaching and providing new germplasm, tools and assays to build new trait improvements into locally adapted germplasm. The North American (KSU) and European (NIAB) Hubs focus on winter wheats whilst the Hub at CIMMYT develops only spring wheats to serve very different stakeholder groups.

Each Hub has its own array of technologies, facilities and intellectual strengths. Such differences can be seen as complementary. Knowledge of the best technical practices, operational systems, germplasm, genetic markers and strategic insights across the three Hubs could be pooled more than at present to generate a virtual "Super Hub", to enhance efficiencies and speed to impact. Additional Hubs could also be assimilated into the system. Such an IWYP "Super Hub" would be optimized so that each constituent Hub would be more efficient in translating its own priorities while sharing knowledge and breakthroughs having wider applications.

- Global network of experts from academia coordinating research on wheat genetic improvements
- Validation and translation of promising discoveries in realistic breeding contexts
- Dissemination of novel technologies as international public goods

WW = winter wheat
SW = spring wheat
KSU = Kansas State University
NIAB = National Institute of Agricultural Botany
CIMMYT = International Maize and Wheat Improvement Center



As new priority targets emerge from anywhere in the world, Super Hub teams could consider how translation and impact can be most efficiently achieved based on the "Super Hub" system *per se*. This could include, for example, carrying out early testing of ideas/hypotheses for winter wheat in spring wheat and the rapid translation of trait improvements into other genetic backgrounds for other parts of the world. Operationally, this would require generation of detailed protocols and discussions of sharing and outsourcing opportunities to explore how operations could boost potential efficiency gains. Partitioning and sharing would enable all individual Hubs to share in the total successes of the "Super Hub" while importantly serving their regional customers and stakeholders. Such a virtual translational "Super Hub" would be visionary, the first of its kind in the world and a model to be adopted for other crops, given the miserably low uptake of innovations from academia into breeding programs.

Wheat science and breeding groups around the world are invited to consider joining the IWYP "Super Hub" scheme in the interests of achieving greater impacts on wheat breeding that the world acutely needs. Details of IWYP can be found at https://iwyp.org/ where its latest Annual Report can be viewed or downloaded.