

Creating Impact in Wheat Breeding Programs Across the World

IWYP was founded to address the global challenge of facilitating wheat yield increases by contributing novel trait improvements into public and private breeding programs around the world. A metric used to evaluate the success of IWYP is the number of high yielding lines containing IWYP-enhanced traits that are requested, evaluated and used by wheat breeders worldwide to accelerate their yield gains. All 3 IWYP Hubs deliver novel IWYP-enhanced germplasm to breeders. The largest delivery route is from the IWYP Spring Wheat Hub at CIMMYT which utilizes the International Wheat Information Network ([IWIN](#)) established by CIMMYT. Using this system over 100 sets of IWYP trait-improved lines have been requested annually by public and private breeders globally and evaluated as the Wheat Yield Consortium Yield Trials (WYCYT). These lines are special and new to existing breeding programs because they are high yielding due to unique traits and contain many chromosomal segments from wild accessions and land races. IWYP's pipelines in all 3 Hubs are primed to continue releasing novel, yield-enhanced lines based on trait-enhancing discoveries made within the IWYP Program.

What has been delivered?

- Since 2014, >300 IWYP-improved lines selected for WYCYT trials have been sent to collaborators at 877 sites worldwide. ~75% of the recipients are National Agricultural Research Systems partners (NARS) in “developing” countries. Each annually created germplasm set contains 25-30 new trait-advanced IWYP lines, carrying year-on-year yield improvements.
- Since 2020, >700 early generation IWYP lines have also been distributed from requests by private and public wheat breeders in Spain, France, India, Pakistan, Zimbabwe and South Africa.
- During 2022/23, lines for the most recent WYCYT were distributed through IWIN to 111 collaborators in 38 countries. The potential impact of IWYP is therefore extensive.
- IWYP lines have been taken up by the breadwheat breeding program at CIMMYT that serves many global spring wheat breeding programs with lines suited to be assessed as potential varieties.
- Some IWYP lines have already been released as varieties including in Pakistan, Afghanistan and Egypt. (e.g., Pakistan-13, Borlaug-16, Kohat-17 and Misr-7).
- The *average* annual yield improvement of IWYP lines delivered from 2017-2021 across approximately 28 diverse sites around the world is 2.3% per year and 2.8% in higher yield potential environments.

IWYP's Impact in Wheat Improvement

- Because IWYP established from its initiation a seed delivery system into breeding programs around the world, it has been able to generate impact within breeding programs on a scale greater than other organizations focused on discovering novel sources of trait enhancement.
- If breeding programs continue to exploit the advances and novelty within the IWYP-improved lines it is certain that IWYP will fulfil its goal of creating significant impact on wheat supplies around the world.
- As the IWYP lines that have been released as varieties are grown widely by farmers, IWYP will have started to contribute to increased wheat production in several countries where the needs for more wheat are substantial.

