

Biodiversidad de trigo: el camino para afrontar la seguridad alimentaria y el cambio climático

Wheat biodiversity: the way to face food security and climate change.

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Climate change and the rapidly growing human population trigger the demand to explore and unlock unutilized genetic resources for feeding future generations. In wheat, undomesticated wild species, crop wild relatives, and landraces represent sources of new variation for cultivar improvement. However, their resilience and adaptive capacity mechanisms remain largely untapped and poorly understood. The Seeds of Discovery initiative, a pioneering project led by CIMMYT and aiming to unlock and utilize novel genetic diversity held in genebanks, has performed the largest crop genotyping effort and biggest diversity analysis ever done in any species using DArTseq™ technology in more than 80,000 genebank accessions. The analysis was divided into three biological categories: 4,206 wild relatives, 20,000 tetraploid and 60,000 hexaploid accessions. Our analysis has identified more than 300,000 filtered high-quality DArTseq-SNPs and SilicoDArT markers. All markers generated were aligned to three reference maps: the IWGSC RefSeq v1.0 reference genome, the durum wheat genome (cv. Svevo), and the DArT consensus map. On average, 72% of the markers align uniquely on the reference genomes and 50% are linked to genes. The study shows that breeding programs have greatly reduced diversity of wheat, although a few elite lines explore a wide range of the diversity found among landrace materials and indicates that 2.6% of hexaploid and 15% of tetraploid accessions are mislabeled, and genebank management can now correct this information. To date this represents a unique and great resource for the global research community to underpin the breakthroughs necessary to develop the crops of the future.