Our contention is that once the desired transgene or the futuristic 'clean' transgene events have been obtained, the practical utilization of the material can be integrated with conventional breeding procedures mediated by the homozygosity DH protocol. Inheritance studies considered crucial for basic information can be pursued independently.

Performance of advanced bread wheat x synthetic hexaploid derivatives under reduced irrigation.

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The annual increase in genetic potential in drought environments is only about half (0.3–0.5 %) of that obtained in irrigated, optimum conditions. Attempts by many researchers to produce wheat adapted to semiarid environments have had limited success. At CIMMYT, we follow a system for drought tolerance in which yield responsiveness is combined with adaptation to drought conditions.

The T1BL·1RS translocation wheats have a demonstrated advantage in dryland wheat areas, and the search for other diverse sources to exploit continues. One such unique gene pool resides in the primary Triticeae diploid *Ae. tauschii*. We have combined this diploid grass with elite durum cultivars to produce synthetic hexaploids. Field testing under reduced irrigation over the past several years has led to the identification of some synthetics classified as drought tolerant. The best five of these SHs have been crossed with a drought susceptible cultivar Opata, and the resulting F_1s are being used to develop doubled haploid mapping populations.

Utilizing a few drought-tolerant synthetics, some crosses with Opata were advanced beyond the F_1, and the performance of these advanced derivatives was studied in Obregon, Mexico. Very little rainfall was recorded during the 1998–99 crop cycle, resulting in good evaluation for drought tolerance (Table 11). A number of synthetic derivatives yielded more than Baviacora, the long-term check used in drought trials sown in Obregon. These synthetic derivatives are free threshing with large, bold white grain. From the five SH-based advanced derivatives, 25 doubled haploid derivatives per entry have been produced in anticipation that complete homozygosity may have a beneficial contribution in future evaluations of this germ plasm in Mexico and globally.

In order to combine drought tolerance with late heat tolerance, replicated trials of the candidates for HTWYT and WAWSN were sown under drought with the purpose of identifying potential parental material for the crossing

Table 11. Mean yields of the highest yielding entries sown with one preseeding irrigation in Obregon, Mexico, during the 1998–99 crop cycle. Yield data of lines is derived from different replicated trials.

Pedigree	Yield (t/ha)	% of Baviacora
PRL/VEE #6//Choix CMSS93Y01738S-54Y-010Y-010M-010Y-10M-0Y-0SY	4.256	114
Croc 1/*Ae. tauschii* (224)//Opata CMBW91Y00935S-80Y-11KBY-1KBY-010M-1Y-2M-0Y-0SY	5.197	111
TSI/VEE#5//Kauz ICW91.0295-3AP-0TS-0BR-1AP-0L-0AP-0SY	4.094	106
Croc 1/*Ae. tauschii* (224)//Opata CMBW91Y00935S-80Y-11KBY-1KBY-010M-1Y-3M-0Y-0SY	4.916	105
Chen/*Ae. tauschii*//2*Opata -41SSD-0Y	3.790	104
Altar 84/*Ae. tauschii*//2*Opata -76SSD-0Y	4.330	104
Croc 1/*Ae. tauschii* (224)//Opata CMBW91Y00935S-80Y-11KBY-1KBY-010M-1Y-1M-0Y/0SY	4.837	103
KAUZ/5/PAT10/ALD/PAT72300/3/PVN/4/BOW CMSS93B01334S-70Y-010M-010SY-010M-2SY-0M-0SY	4.067	100

Table12. Mean yields of entries selected from the CHTWYT and CWAWSN sown using a single preseeding irrigation in Obregon, Mexico, during the 1998–99 crop cycle.

Pedigree	Yield (t/ha)	% of Baviacora
BCN//Sora/*Ae. tauschii* (323) CASS94600121S-1Y-2B-1PR-0B-0HTY	3.838	123
BCN//Sora/*Ae. tauschii* (323) CASS94Y00121S-1Y-2B-2PR-0B-0HTY	3.697	118
Oasis/Kauz//4*BCN CMSS93Y04048M-1M-0Y-0HTY	3.694	118
BCN/RABI//GS/CRA/3/*Ae. tauschii* (895) CASS94Y00160S-40Y-7B-1PR-0B-0HTY	3.660	117
HP1716 (Kauz derivative)	3.618	116
BCN//SORA/*Ae. tauschii* (323) CASS94Y00121S-1Y-2B-3PR-0B-0HTY	3.536	113
ATTILA/3*BCN CMBW90Y4399-0TOPM-1Y-010M-010M-010Y-1M-015Y-0Y-0HTY	3.518	113

program. Surprisingly, a number of lines, primarily synthetic derivatives, performed well under moisture stress (Table 12). A possible relationship between drought and late heat tolerance selected under optimally irrigated conditions is indicated. Table 12 shows the performance of these Bacanora derivatives in relation to Bacanora itself. The derivatives yield up to 23 % higher than Bacanora. This relationship needs further examination and will be handled by our physiology program.

A sea-water based salinity testing protocol and the performance of a tester set of accumulated wheat germ plasms.

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Abiotic stresses are static mechanisms that tend to be more durable due to the absence of pathogen influence. Three stresses of significance are heat, drought, and salinity, and all still pose a major challenge. Focusing on salinity with wheat as the main crop, we have accumulated a number of land races and cultivars from global collaborators to form a tester set. We have developed a field-screening protocol using a dilution of sea water as the irrigation source. This setup was initiated in 1996 and initially reported by us in 1997. We are now providing an update after several investigations, particularly after we implemented the use of a well-designed field layout and were able to make projections for discriminating saline-tolerant germ plasm under our conditions at this stage.

The tester set is comprised of 12 bread wheat cultivars and one durum wheat (PBW 34) cultivar. The bread wheat cultivars include land races (Kharchia 65 and Shorawaki); conventional cultivars (KRL 1-4, Lu 26 S, Sakha 8, SNH-9, and WH-157); a wheat cytogenetic-stock parental line (Chinese Spring); an intergeneric hybrid-derivative cultivar (Pasban 90); and the elite bread wheat lines Oasis, Galvez, and Yecora as checks. The test saline regimes were 0, 8.0, 12.0, 16.0, and 20.0 dS/m with observations recorded for leaf area, plant height, days-to-anthesis and physiological maturity, and 1,000-kernel weight.

Germ plasm details. Details of the 13 entries included in the tester set are given in Table 13. The durum wheat PBW 34 is a susceptible line, whereas Oasis, Galvez, and Yecora are the three wheat check cultivars. Oasis and Yecora are separated by Oasis in having the *Lr19* gene. Both are dwarf and high-stress levels readily influence this trait. Kharchia and Shorawaki are tolerant but rust susceptible, tall land races from India and Pakistan, respectively. The cultivar Chinese Spring is a line used in intergeneric hybridization primarily because of its superior crossability with alien Triticeae species and is notable for its superior salt tolerance. Chinese Spring is a tall, awnless, facultative winter wheat and susceptible/highly susceptible to leaf/stem rust. Pasban 90, a variety released in Pakistan for irrigated agricultural