characteristic may influence grain-filling quality and yield. Reductions in grain yield and 1,000-kernel weight across treatments and cultivars followed a similar trend as observed for the traits above they were between 15 and 20 % were at 12.5 dS/m for the check cultivars Yecora, Galvez, and PBW 34; whereas the three superior entries Kharchia, Shorawaki, and Chinese Spring exhibited this reduction at the highest salinity test level of 20.5 dS/m.

In general, all the tester entries reported to be salt tolerant were indeed so at the 12.5 dS/m EC level. The performance of the checks showed highly pronounced reductions at this level. The best lines performed well and demonstrated reduction trait levels observed for the checks at 12.5 only at the highest EC level of 20.5 dS/m. We suggest that a level of 12.5 dS/m may be ideal for future field screening of germ plasm and breeding populations.

The above germ plasms also are being tested under controlled conditions in hydroponics (50 mM NaCl) in order to determine their K:Na discrimination trends.

Conclusions. 1. The evaluation of the tester-set that we accumulated from different locations may provide information that will facilitate the development of a common ground, from which inferences relative to salinity tolerance can be made by its global testing.

2. Promising lines identified by colleagues could be added to this tester set, with new sets possessing reasonable number of entries made available for evaluations.

3. Breeding populations could be screened initially at 12.5 dS/m and then tested stringently under in vitro conditions and at higher EC levels for comparisons with the best three wheats identified at this stage (Chinese Spring, Kharchia, and Shorawaki).

4. The most superior entries in the current set in addition to Kharchia 65, Shorawaki, and Chinese Spring are WH-157 and KRL 1-4 based upon their performance at 12.5 and 20.5 dS/m

Identification of four bread cultivars tolerant to salinity following sea-water field evaluations as varietal candidates for Baja California, Mexico

J. L. Diaz De Leon*, R. Zavala*, R. Escoppinichi*, and A. Mujeeb-Kazi.
(* Universidad Autónoma de Baja California Sur, Department of Agronomy, Apdo. Postal 19-B, 23054 La Paz, Baja California Sur, México).

Several elite bread wheat lines from CIMMYT's bread wheat program were screened under in vitro conditions in an MS medium supplemented with NaCl levels of 50, 100, 150, and 200 mM. Seed of the lines were soaked in distilled water for 24 hours and the embryos excised and plated in the above medium. The control had no NaCl. After 50 % germination in the controls, further growth was allowed for 10 days, and then a final germination count and seedling height were recorded. The seedling performance was estimated similarly to the mutation-breeding radiosensitivity determinations for estimating LD_{50} levels. Using this as a basis, and also observing other phenology parameters, we identified a few lines that showed a minimum degree of growth reduction at a NaCl level equal to 12.5 dS/m EC, a level that we have proposed allows selection of tolerant lines.

With the in vitro selections made and some promising lines identified, we advanced this germ plasm for field tests using sea-water dilutions of 12.5 dS/m, following the experimental design, observation, and inference protocols identical to those described in the preceding article. The germ plasms evaluated included four promising lines from the in vitro tests, the tolerant land races Kharchia and Shorawaki, and the susceptible durum wheat PBW 34 (Table 14).

Table 14. Salt-tolerant bread wheat comprising the elite nursery.

Name	Pedigree	Cross number
Cochimi	Seri *3//BUC 'S'	CRG 68
Mepuchi	BUC/BJY//PRL	CM95521
Pericu	CHIL/PRL	CM92803
Calafia	PFAU//ALD/PVN/3/Myna/VUL	CM91926
PBW 34	*Triticum turgidum*	
Kharchia 65	*Triticum aestivum*	Land race
Shorawaki	*Triticum aestivum*	Land race

Leaf area, plant height at maturity, 1,000-kernel weight, and yield showed a general trend of reduction between 10 and 15 % at 12.5 dS/m EC. Reductions in these parameters for the susceptible PBW 34 were around 25 % and less than 15 % for the two tolerant land races. In our valley, the salinity levels approach a maximum of 6.0 dS/m where wheat is grown. Thus, the simple approach of acquiring a bread wheat screening nursery from CIMMYT, testing lines in the valleys where wheat is cultivated, and identifying the best performers may lead to new varieties for this area. However, growers often erroneously associate the best wheat performers in valley cultivation locations with salt tolerance. However, salinity tests, if not made over stringent EC levels, cannot classify the best lines as salt tolerant. We are aware of this discrepancy in advanced line performance and have gathered data that do not correlate the best high yielding lines in our location with salinity tolerance; i.e., in tests where stringent EC levels are maintained and are within the desired tolerant discrimination range over 12.5 dS/m.

The four lines that we are reporting here do possess salinity tolerance and are adapted to the local growing conditions. We have named them Cochimi, Mepuchi, Pericu, and Calafia. They are high yielding and capable of release as varieties in the near future. The germ plasm has been distributed for agronomic testing, and we will include at least two (Mepuchi and Calafia) in the tester set mentioned in the previous article. Currently, we are testing these four lines at higher EC levels in order to ascertain if their tolerance is as good as some of the best from the tester set.

Current progress in assessing the long-term implications of conservation-tillage cropping systems on wheat and maize root diseases and yield in six trials at CIMMYT, Mexico.

Monica Mezzalama, Julie M. Nicol, Ken Sayre, and Peter Grace.

Six management trials have been assessed for root rots caused by soilborne fungi and nematodes. These trials represent two separate megaenvironements (ME) as defined by CIMMYT. The ME1 is at the CIMMYT field station in the NW of Mexico, Obregon, which is the favorable, irrigated, low-rainfall environment. The ME2 is found at two CIMMYT field stations in the high valley of central Mexico, Toluca, and El Batan and is a high summer rainfall environment (> 500 mm rainfall during the crop cycle). The soils at all sites have medium to high clay content.

Work has been conducted on the survey of various root pathogens at these sites, and the results are summarized in Table 15. The presence of the different pathogens seems to be correlated with environmental conditions. A higher incidence of *G. graminis tritici* was found in Toluca than at the other locations, most likely associated with higher rainfall. Other soilborne pathogens commonly found in our survey were *Fusarium* spp. and the root lesion nematode *P. thornei.*

Table 15. A summary of the soilborne fungi isolated from wheat roots and *Pratylenchus thornei* extracted from soil and at CIMMYT field locations, 1998–99.

	Batan	Toluca	Obregon
Fungal Pathogens	*Fusarium sambucinum*	*Gaeumannomyces graminis tritici*	*F. culmorum*
	F. graminearum	*F. graminearum*	*F. sambucinum*
	F. oxysporum	*F. avenaceum*	*F. equiseti*
	F. subglutinans	*Pythium spp.*	*F. moniliforme*
	Bipolaris sorokiniana	*B. sorokiniana*	*F. oxysporum*
	Pythium spp.		*F. subglutinans*
	Alternaria spp.		*B. sorokiniana*
Plant-parasitic nematodes	*Pratylenchus thornei*	*P. thornei*	

A 1–3 year (1997–99) program has been undertaken to monitor the dynamics of such pathogens under different crop management systems (including rotation, tillage, nutrition, and straw management). A summary of the results is presented in Table 16.