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Byerlee, D. and Collinson, M. et al., 1984. Planning Technologies Appropriate to Farmers-Concepts and Procedures. CIMMYT, Mexico.

Byerlee, D. et al., 1986. Increasing Wheat Productivity in the context of Pakistan's irrigated cropping systems: A view from the farmers' field.

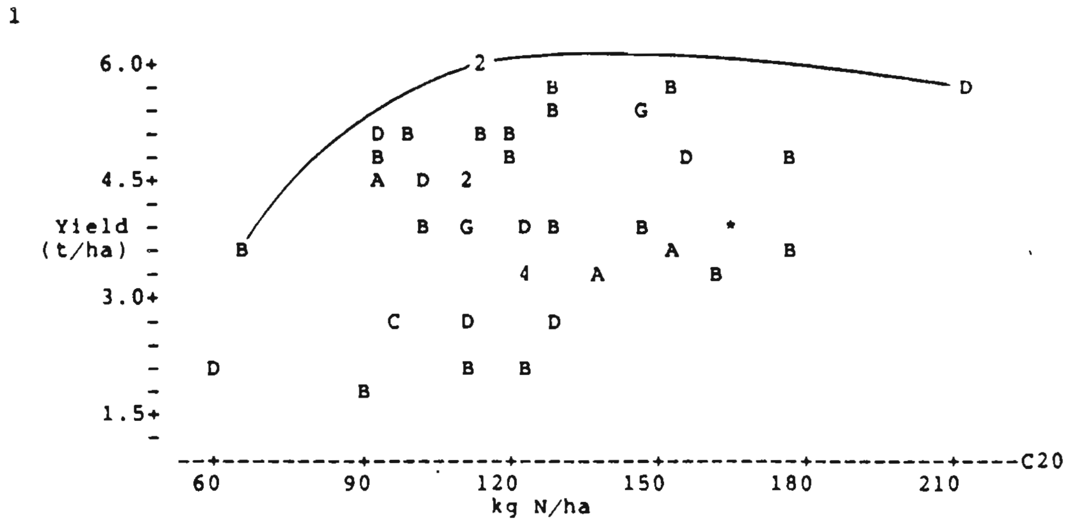

Figure 1. Yield responses in farmers fields versus kg N/ha applied. (A= Salamanca, B= Pavon 76, C= Mexico 82, D= Zacatecus, E= Toluca, F= Triticale).

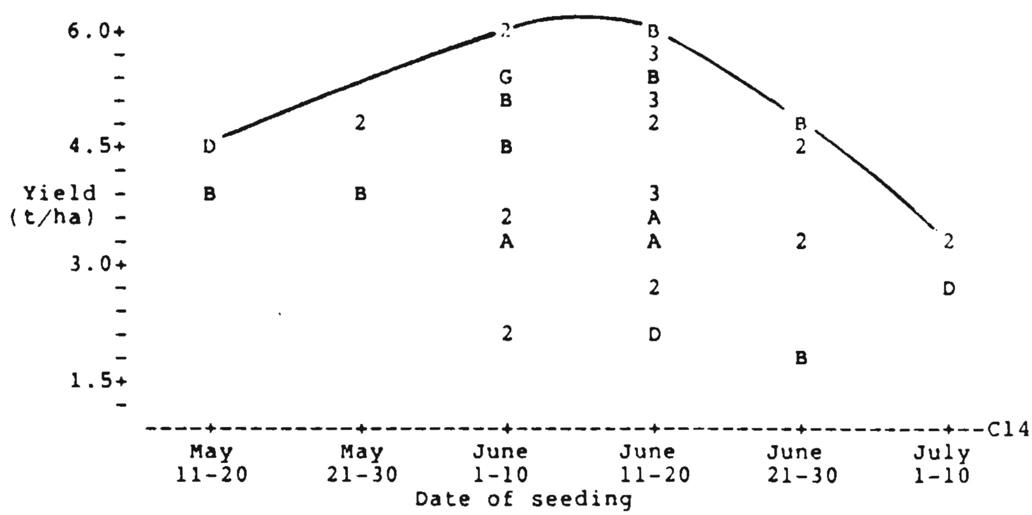

Figure 2. Yield responses in farmers fields versus date of sowing (A= Salamanca, B= Pavon 76, C= Mexico 82, D= Zacatecus, E= Toluca, F= Triticale).

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Nieto-Taladriz, M. T. and P. Brajcich

Dual-purpose durum wheat. The purpose of producing durum wheat with good pasta and bread-making quality is 1) to provide growers an alternate market in years of high production and 2) to provide durum wheat germplasm with improved bread-making quality for countries where durum wheat has traditionally been used for bread type products.

In order to develop dual-purpose durum wheat, a project was started in 1987 to study the inheritance of endosperm protein genes (Glu-1 and Gli-1) in terms of number of loci with allelic differences, linkage relationships and maternal/paternal effects. Another objective was to relate the allelic variation at those loci to bread-making quality, pasta quality and interactions between both.

Two tetraploid wheats, Kharkov 5 and Tetraprelude, that were identified as having good bread-making quality, were crossed with two durum wheats which differ in pasta quality, as measured by the SDS-microsedimentation test: Chen's/Drom's (CD61044-6Y-8B-1Y-2M-OY), with very good quality and Sterna's//Huitle's'/Somorgujo's' (CD66589-J-1M-2Y-1B-OY), with very poor quality.

The electrophoretic analyses of the parents showed that the superior bread-making quality of Kharkov 5 and Tetraprelude can be due to the presence of high-molecular glutenins, normally not present in durums. They are coded for by the Glu-A1 locus: band 1 in Kharkov 5 (coded by allele Glu-A1a) and band 2* (coded by allele Glu-A1b) in Tetraprelude, combined with 7+8 (coded by allele Glu-B1b), from the Glu-B1 locus in both lines. Chen's'/Dra's' and Stn's'//Hui's'/Somo's' have null at the Glu-A1 locus and 7+* (Glu-B1b) and 20 (coded by allele Glu-B1e) respectively at the Glu-B1 locus. For gliadins, at the Gli-B1, all the genotypes had band 45, except Stn's'//Hui's'/Somo's' which had band 42.

The electrophoretic analyses of the F_1 seeds showed that all glutenin and gliadin components from each parent were present regardless of the direction of the cross. However, there were differences in the intensity of the bands depending on which genotype was used as the maternal parent. This appeared to be due to the triploid nature of the wheat endosperm reflected by the dosage effect of genes controlling its synthesis. BC1 and F_2 analyses are in progress.

<u>Identification of high-yielding, stable lines in the CIMMYT Durum Wheat Program</u>. One of the major objectives of the CIMMYT Durum Wheat Program is to develop advanced lines that are well adapted to a wide range of environments.

High-yielding, stable genotypes in international trials conducted under differnt environmental conditions were identified using the spatial method (Wescott, 1987).

Data were analyzed from the 18th International Durum Wheat Nursery (IDYN) and the 16th Elite Durum Yield Trial (EDYT), with 30 entries each. The IDYN included released varieties from various countries, CIMMYT advanced breeding lines, a local durum check cultivar as well as a triticale and a bread wheat check. The EDYT included only CIMMYT advanced lines and the three checks. Local checks as well as the triticale and the bread wheat checks were not included in the analysis.

The number of locations from which data were analyzed are listed in Table I.

The high-yielding, stable lines identified across locations are listed in Table II. From the 18th, Chagual was represented by an outlying point in 21 of the 40 sites, Karpasia in 20, Yavaros's' in 37, Carcomun's' in 30 and Aix's' Yavaros 79 and Altar 84 in all the 40 sites. From the 16th EDYT Aix's' was represented by an outlying point in 40 of the 47 sites, Wulp's' in 38, the two sister lines Egreta's' 43 and 42, Yavaros 79 in 41 and Altar 84 in 43.

Seed is available upon request.

Table I. Number of locations from which data were analyzed for high yield and stability in the 18th IDYN and the 16th EDYT.

Region	18th IDYN	16th EDYT
Africa	11	10
Asia	3	6
Europa	10	14
Middle East	5	7
North America	4	4
Oceania	2	2
South America	5	4
Total	40	47

Table II. High-yielding, stable lines identified across locations in the 18th IDYN and the 16th EDYT.

Line	Origin	Yield(*)	Nursery
Chagual	Chile	5380	18th IDYN
Karpasia	Cyprus	5270	18th IDYN
Yavaros 79	Mexico	5660 5280	18th IDYN 16th EDYT
Altar 84	Mexico	5622 5310	18th IDYN 16th EDYT
Yavaros 'S' CM 9799-126M-1M-5Y-0M-8AU-0Y	Mexico	5460	18th IDYN
Carcomun 'S' CD24831-E-3Y-5M-1Y-0Y	Mexico	5510	18th IDYN
Aix 'S' CD31119-B-1Y-1Y-2M-2Y-0M	Mexico	5520 5220	18th IDYN 16th EDYT
Wulp 'S' CD40509-A-1M-3Y-1M-0Y	Mexico	5290	16th EDYT
Egreta 'S' CD42213-A-1M-1Y-1M-1Y-0M	Mexico	5270	16th EDYT
Egreta 'S' CD42213-A-1M-1Y-1M-2Y-0M	Mexico	5300	16th EDYT

(*) yield mean (kg/ha) across locations.

Reference

Wescott, B. 1987. A method of assessing the yield stability of crop genotypes. J. Agric. Sci. 108:267-274.

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D. A. Lawn

Soilborne Pathology. A research program was initiated at CIMMYT headquarters in El Batan Mexico, where cereals have been grown continually without rotation for over 20 years. This program assesses germplasm response to soilborne pathogens and measures the effects of agronomic management practices on disease incidence. Predominant root pathogens identified included *Bipolaris sorokiniana* (common root rot) and *Pratylenchus* sp. (lesion nematode).

The effects of crop rotation, tillage and straw management on the incidence/severity of common root rot were evaluated on bread wheat, cultivar Kauz "S" from 1986-1988. Treatments included conventional vs. reduced tillage; burn straw vs. chop and incorporate straw; and 4 rotation schemes. Rotations were Summer 86/Winter/Summer 87/Winter/Summer 88 and included:

#1) Bread Wheat (BW); Oats (O); Durum Wheat (DW): (O); (BW);
#2) (BW); Rape (R); (DW); (R); (BW);
#3) (BW); Vetch (V); (DW); (V): (BW);
#4) (BW); (V); Maize; (V): (BW).

Data from the Summer of 1988 indicated that *B. sorokiniana* was the predominant root pathogen at 6 and 12 weeks after planting (WAP). *Fusarium graminearum* and *F. culmorum* were isolated from <10% of sampled plants. There were no significant differences on root rot incidence/severity or yeild due to tillage or straw management. Subcrown internode infections were significantly lower in rotation #4 at 6 and 12 WAP. Spikes/m^2, yield and test weight were highest in rotation #4 and significant differences are presented in Table 1.