



NEW VARIETIES OF DURUM WHEAT (*TRITICUM DURUM* DESF.) IN SICILY: EVALUATION OF GENOTYPE-ENVIRONMENT INTERACTION

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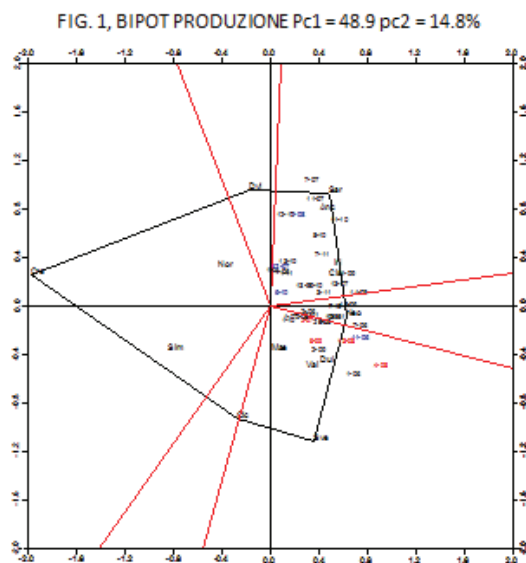
Introduction

Durum wheat (*Triticum durum* Desf.) is the typical cereal crop in semi-arid Italian environments, and Sicily, once considered the "granary of Italy", is one of the regions of southern Italy where the cultivation of durum wheat is widespread, even today, thanks to the pedological characteristics (soil composition, soil structure and position), generally fertile conditions and capability for the cultivation of this crop (Noto et al., 1998).

Nevertheless, its growth, since 2005, has suffered a significant decline in term of cultivated area. This reduction is to be found in the economic-commercial and agro-technical factors and among these the selection and spread of genotypes with good technological and production characteristics, and well adapted to these environments.

Materials and Methods

An effective strategy proposed, in order to correct the problem, has been the varieties of



durum wheat comparison, in different environments, coordinated by the Research Unit of the Qualitative enhancement for Cereals of the CRA. We studied 14 genotypes located in 11 locations typical of the Sicilian cropland in the years 2006-2011.

Results and Discussion

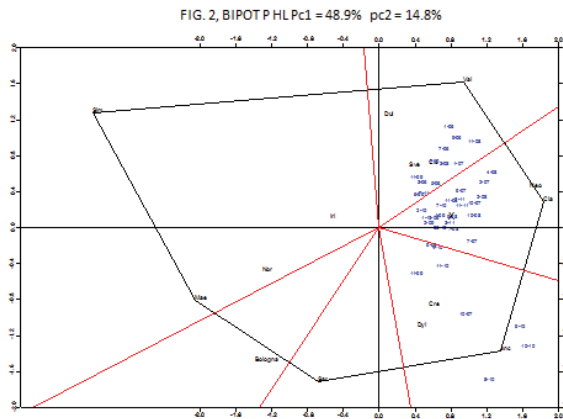
The average yield of varieties in trial was 4.33 t ha⁻¹ with extremes ranging from 1.09 t ha⁻¹ for the variety Svevo at Castel J. location, in the year 2006, to 8.73 t ha⁻¹ for Iride at Libertinia location in the 2008.

The most productive varieties,

on average, were Anco Marzio, Claudio and Neolatino with values higher than 4.55 t ha⁻¹, while Ciccio Simeto and Creso showed values lower than 4.14 t ha⁻¹ (Fig. 1).

The average hectolitic weight was 81.3 kg hl⁻¹, Maestrale showed the lowest value in Castel J. in 2006 amounted to 69.2 kg hl⁻¹, while the highest value was recorded for

Neolatino (88.0 kg hl⁻¹) in Libertinia in 2008. The highest hectolitre weight was recorded for Claudio, Neolatino and Anco marzio with values higher than 82.2 kg hl⁻¹, while the low stand less than 80.2 kg hl⁻¹ were recorded for Norman Maestrale and Simeto (Fig. 2).

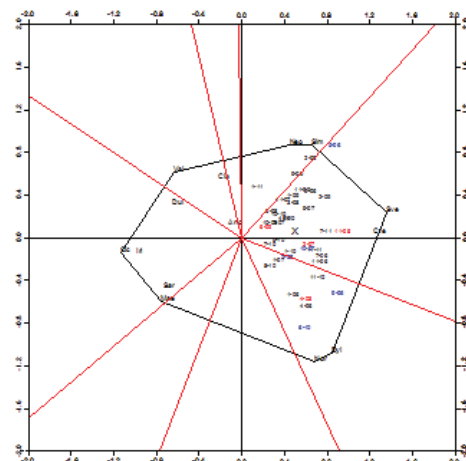


The average protein content detected was 13.0%, with extremes ranging from 8.4% recorded in Gela for Saragolla in 2010 and 20.4% for Dylan in Cammarata in 2007.

Svevo, Creso and Dylan presented the highest average protein content among the genotypes in the test and higher than 13.3%, while values on average lower and of less than 12.6% were recorded by Maestrale, Iride and Ciccio (Fig. 3).

The analysis of the interaction between genotype and environment, as proposed by Yan et al. (2000), has revealed that Neolatino showed high yield and good productive stability, together with Claudio and Anco Marzio, that also showed the highest hectolitre weight. The protein content of the grain was inversely correlated with the productive potential of the genotypes tested and only Neolatino showed values higher among the most productive varieties.

Fig 3, BIPOT PROTEINE, Pc1 = 29.0% pc2 = 21.1%



Conclusions

The analysis of the results has allowed to study the productive and qualitative behavior of the tested genotypes. In addition, the study of interaction genotype-environment, has allowed to verify the yield stability in quantity and the quality of the grain by the individual genotypes.

References

Noto F., Poma I. e Davi A. 1998. Effetti della tecnica colturale sulle caratteristiche qualitative e merceologiche del frumento duro (*Triticum durum* Desf.). Atti XVIII Congresso Nazionale di Merceologia. 1-2-3 ottobre 1998, Verona. 509-516
 Yan, W., L.A. Hunt, Q. Sheng, and Z. Szlavncs. 2000. Cultivar evaluation and mega-environment investigation based on the GGE biplot. *Crop Science* 40: 597-605.