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Cross-Testing between Four Varieties: HD 1220 (HIDHAB), ARZ, MAHON X DEMIAS and ANZA of Constantine Wheat

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Abstract

Inter-varietal crosses were made between 4 varieties: HD 1220 (HIDHAB), ARZ, MAHON X DEMIAS and ANZA of BREAD wheat with 2 repetitions while following their cycle of development.

The principals components analysis: A.C.P. variety: HD 1220 (HIDHAB) shows that the number of grains per square meter (37.15%) contributed the most to the formation of the axis F1 while the number of spike per square meter (51.90%) as the most axis F2. That of the ARZ variety shows that the number of grains per square meter (43.41%) contributed the most to the formation of the F1 axis otherwise the number of grains per spike shape as the axis F2 (55.86%).

Measuring the pH of our soil is estimated at 7.47. It is slightly alkaline and this is a heavy and highly calcareous is soil. It is also a mineral soil because the percentage of the organic material is 1.81.

Keywords: HD 1220; ARZ; MAHON X DEMIAS; ANZA; Intra varietal crosses; Soil analysis

Introduction

The contribution of cereals for ten thousand years to the nourishment of man has been crucial and has contributed greatly to the development of civilizations.

Around one billion tons of cereals are produced annually worldwide. Wheat and rice are the most important equally [1].

Among the cereals, wheat, and especially soft wheat, is by far the most important food in the human diet, either in the form of bread or in the form of biscuits or rusks [2].

However, four varieties of soft wheat: ARZ, ANZA, HD1220 (HIDHAB) were the subject of our study by successive inter-varietal crosses with analyzes of the field of experimentation.

Materials and Methods

The sowing plan consists of our 4 plots: HD 1220 (HIDHAB), ARZ, MAHON X DEMIAS and ANZA of soft wheat arranged in different ways each year to avoid the effect of borders with 2 blocks while following their cycle Development.

The castration is followed by pollination. The ears of the male parent will be introduced into the cut pouch which contains the female parent by gently rubbing on the ovary.

A.C.P.: Overall Principal Component Analysis on our data.

Hydrogen potential, limestone dosage and the percentage of organic matter in the soil are also part of our analysis.

Results and Discussion

Breeding patterns

During 12 years of testing, it was possible to carry out all inter-varietal crosses knowing that they were difficult to carry out.

- The crosses are said to be: stranded if the sachets are empty.
- The crosses are said to be successful if the bags have ears of corn.
- It would be desirable to analyze the offspring: from F1 to F12 in order to establish their genetic variability.

The causes of obtaining the sachets of empty crossovers are:

- Pollination poorly done (Auto pollination).
- Castration badly done (Residues of some stamens).
- Unfavorable weather conditions (Sun, Rain, Wind ...) (Table 1).

Experimental soil analysis

The measurement of the potential Hydrogen: pH of a soil makes it possible to define its state of acidity or of alkalinity (or acid-basic status). In general, the pH is measured on a scale of 1 to 14.

An agricultural soil has a pH of between 4 and 9 with exceptions and varies according to the nature of the soil.

The pH of our test was estimated to be 7.47; It is therefore weakly alkaline and it is also a heavy soil because its pH is between 6.80-7.50.

Our soil has a percentage of limestone estimated at 37%. It is a strongly calcareous soil because it is between 25 and 50%.

Years	Male	Female	Seeds	Years	Male	Female	Seeds
1999/2000	ANZA	HD	10	2008/2009	HD	ARZ	17
	MD	ARZ	8		MD	HD	13
2000/2001	HD	ARZ	16		ARZ	ANZA	11
	ARZ	ANZA	14		ARZ	MD	16
	ANZA	ARZ	10		HD	ARZ	12
	ARZ	HD	15		MD	ANZA	15
2001/2002	ANZA	ARZ	14		ANZA	ARZ	11
	ARZ	ANZA	12	2009/2010	MD	ANZA	28
2002/2003	ARZ	HD	10		HD	MD	23
	ANZA	ARZ	9		HD	ARZ	21
	MD	ANZA	12		ANZA	HD	27
	ANZA	HD	8		MD	ARZ	25
	ARZ	HD	13		ARZ	MD	22
	HD	MD	10		MD	HD	26
2003/2004	MD	HD	16		HD	ANZA	33
	ARZ	MD	7		ARZ	HD	26
	HD	ANZA	8		ANZA	MD	30
	MD	ANZA	9		ARZ	ANZA	23
2004/2005	ARZ	ANZA	12		ANZA	ARZ	32
	ARZ	ANZA	13	2010/2011	ANZA	HD	54
	HD	MD	9		ARZ	ANZA	66
2005/2006	ANZA	MD	7		MD	ANZA	57
	ARZ	MD	16		ARZ	HD	52
2006/2007	MD	ANZA	12		ANZA	MD	59
	ANZA	HD	16		ANZA	ARZ	56
	MD	ARZ	11		HD	ARZ	60
2007/2008	ARZ	HD	14		HD	MD	64
	ANZA	MD	13		ARZ	ANZA	61
2008/2009	ANZA	HD	15		HD	ANZA	50
	ARZ	HD	12		MD	HD	53
	ANZA	MD	14		MD	ARZ	65
	HD	ANZA	18		ANZA	MD	70
	ARZ	MD	10		ARZ	MD	55

Table 1: Breeding pattern.

Soils are called mineral soils when the percentage of organic matter is less than 30.

- Organic matter covers very different fractions=fresh organic matter (roots, straw, green fertilizers buried ...), intermediate

(stabilizing) or stable=humus (humic substances, amino acids, microbial biomass ...).

- Humus+Clay=Argilo-Humic Complex (C.A.H.).
- Conditioning soil structure and soil nutrient power [3].
- The soil of our experiment is mineral because its percentage of organic matter is estimated at 1.81.

Conclusion

The essential facts which commit some element of answer to the problem of our varieties: HD 1220, ARZ, MAHON X DEMIAS and ANZA of soft wheat:

It was possible to carry out all inter-varietal crosses knowing that they were difficult to carry out.

It would be desirable to analyze the offspring: from F1 to F2 in order to establish their genetic variability.

A.C.P.: Overall Principal Component Analysis shows that the variability for the F1 axis is 51.39% and it is 26.36% for the F2 axis. The cumulative percentage of variables is 77.75% on the F1 and F2 axes.

The number of grains per square meter (48.18%) contributes the most to the formation of the F1 axis while the height of the plant (66.44%) forms the most axis F2.

The graph of the observations shows that each variety has certain similarities of plants with respect to variables. Our test soil is heavy and it is weakly alkaline. It is also strongly limestone and mineral.

References

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