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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 intervarietal 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%.

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MD	Years	Male	Female	Seeds	Years	Male	Female	Seeds
MD	1999/2000	ANZA	HD	10	2008/2009	HD	ARZ	17
2000/2001 ARZ ANZA 14 2008/2009 ARZ MD 16 ANZA ARZ 10 HD ARZ 12 ANZA ARZ 14 MD ANZA 15 2001/2002 ANZA ARZ 14 ANZA ARZ 11 ARZ ANZA 12 ANZA ARZ 10 ANZA 28 ANZA ARZ 9 MD ANZA 12 ANZA 10 ANZA ANZA ANZA ANZA ANZA AN		MD	ARZ	8		MD	HD	13
ANZA ARZ 10 15 MD ARZ 12 12 MD ARZ 12 15 MD ANZA ARZ 14 MD ANZA ARZ 11 MD ANZA ARZ 11 ANZA ARZ ANZA ARZ ANZA ARZ ANZA ARZ ANZA ARZ ANZA ARZ ANZA	2000/2001	HD	ARZ	16		ARZ	ANZA	11
ANZA ARZ 10 15 MD ARZ 12 MD ARZ 12 MD ANZA 15 MD ANZA 15 MD ANZA ARZ 11 MD ANZA 28 MD ANZA ARZ 21 MD ANZA 42 MD ANZA 22 MD ARZ 21 MD ARZ 21 ANZA HD 27		ARZ	ANZA	14		ARZ	MD	16
ANZA ARZ 14 ANZA ARZ 14 ANZA ARZ 12 ANZA ARZ HD 10 ANZA ARZ 21 ANZA ARZ 21 ANZA ARZ 21 ANZA ARZ 21 ANZA HD ANZA 22 ANZA HD ANZA 42 ANZA HD ANZA ARZ ANZA ARZ ANZA A		ANZA	ARZ	10		HD	ARZ	12
ARZ ANZA 12 HD 10 MD 23 ANZA 28 ANZA ARZ 9 HD MD ANZA 28 ANZA ARZ 9 HD ANZA HD 27 ANZA HD 27 ANZA HD 27 ANZA HD 27 ANZA HD 28 ARZ MD 22 ANZA HD 28 ANZA HD 28 ANZA ARZ 33 ANZA ARZ ANZA ARZ 33 ANZA ARZ ANZA ANZA 33 ANZA AN		ARZ	HD	15		MD	ANZA	15
ARZ	2001/2002	ANZA	ARZ	14		ANZA	ARZ	11
ANZA		ARZ	ANZA	12		MD	ANZA	28
MO	2002/2003	ARZ	HD	10	2009/2010	HD	MD	23
ANZA HD 8 ARZ HD 13 ARZ HD 10 ARZ HD 10 ARZ BMD 10 MD HD 16 ARZ HD ANZA 33 ARZ HD 26 ARZ ANZA 30 ARZ ANZA 23 ARZ ANZA 23 ARZ ANZA 23 ARZ ANZA 32 ARZ ANZA 32 ARZ ANZA 32 ARZ ANZA 13 ARZ ANZA ARZ 32 ARZ ANZA 13 ARZ ANZA ARZ 32 ARZ ANZA 13 ARZ ANZA BMD 7 ARZ MD 16 ARZ MD 59 ARZ MD 16 ARZ MD 59 ANZA HD 52 ANZA MD 59 ANZA BD 66 ARZ ANZA 57 ARZ HD 52 ANZA BD 59 ANZA BD 69 ANZA BD 69 ANZA ARZ 56 ANZA ARZ 60 ANZA 61 ANZA MD 64 ANZA MD 64 ARZ ANZA 61 ANZA 61 ANZA 61 ANZA 61 ANZA 61 ANZA 65 ANZA 65 ANZA 66 MD ARZ 65 ANZA 66 A		ANZA	ARZ	9		HD	ARZ	21
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HD MD 10 10 10 MD 10 MD HD 26 MD ANZA 33 33 MD ARZ MD 7 ANZA MD 30 ARZ ANZA 23 ANZA ARZ ANZA 23 ANZA ARZ ANZA ANZ		ANZA	HD	8		MD	ARZ	25
HD MD 10 16 HD 26 HD ANZA 33 ARZ HD 26 HD ANZA 3 ARZ HD 26 HD ANZA 8 ANZA MD 30 ARZ ANZA 12 ANZA ARZ 32 ARZ ANZA 13 ANZA HD 54 ARZ ANZA MD 57 ARZ ANZA MD 7 ARZ MD 16 ANZA HD 52 ARZ MD 16 ANZA ARZ 56 ANZA HD 14 ANZA MD 13 ANZA MD 13 ANZA ANZA ARZ 56 ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA ANZA		ARZ	HD	13		ARZ	MD	22
ARZ MD 7 HD ANZA 8 HD ANZA 9 ARZ ANZA 23 ANZA ARZ ANZA 23 ANZA ARZ 32 ANZA ARZ ANZA 12 ANZA ARZ ANZA 13 HD MD 9 ANZA MD 54 ARZ ANZA 66 ARZ ANZA 66 ARZ ANZA 12 ANZA HD 52 ANZA BD 66 ARZ ANZA 66 ARZ ANZA 12 ANZA MD 7 ARZ MD 16 ANZA HD 52 ANZA MD 59 ANZA MD 59 ANZA HD 52 ANZA MD 59 ANZA HD 66 ANZA HD 62 ANZA HD 66 ANZA MD 69 ANZA HD 16 ANZA ARZ 66 ANZA ARZ 66 ANZA ARZ 66 ANZA ARZ 60 HD ANZA 61 HD ANZA 66 ANZA ARZ 65 ANZA 65 ANZA MD 13 ANZA MD 14 HD ANZA 65 ANZA MD 70		HD	MD	10		MD	HD	26
HD	2003/2004	MD	HD	16		HD	ANZA	33
HD		ARZ	MD	7		ARZ	HD	26
ARZ ANZA 12 ANZA ARZ 32 ANZA HD 54 ARZ ANZA 66 ARZ ANZA 57 ARZ MD 16 ANZA HD 52 ANZA MD 59 ANZA MD 69 ANZA ARZ 60 HD ARZ 60 HD ARZ 60 HD ARZ 60 ARZ ANZA 61 HD MD 64 ARZ ANZA 61 HD ANZA 50 MD ANZA 50 MD ARZ 65 MD ANZA 65 MD ANZA 65 MD ANZA 65 MD ANZA 66 ANZA MD 63 ANZA 66 MD ANZA 66 ANZA 66 MD ANZA 66 MD ANZA 66 MD ANZA 66 MD ANZA 66 ANZA MD 70		HD	ANZA	8		ANZA	MD	30
2004/2005		MD	ANZA	9		ARZ	ANZA	23
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ARZ MD 16 MD ANZA 12 ANZA HD 16 ANZA HD 16 MD ARZ 11 2006/2007 ARZ HD 16 MD ARZ 11 2010/2011 ARZ HD ARZ 60 HD MD 64 ARZ ANZA 61 ARZ ANZA 61 HD ANZA 61 ARZ ANZA 61 HD ANZA 50 MD HD 53 ANZA MD 14 HD ANZA 50 MD ARZ 65 ANZA MD 14 HD ANZA 50 MD ARZ 65 ANZA MD 70	2005/2006	ANZA	MD	7		MD	ANZA	57
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ANZA MD 13 ANZA HD 15 ANZA HD 15 ARZ HD 50 ANZA 50 MD HD 53 ANZA MD 14 HD ANZA 65 ANZA MD 70	2007/2008	ARZ	HD	14		HD	MD	64
ARZ HD 12 MD HD 53 2008/2009 ANZA MD 14 MD ARZ 65 HD ANZA 18 ANZA MD 70		ANZA	MD	13		ARZ	ANZA	61
2008/2009 ANZA MD 14 MD ARZ 65 HD ANZA 18 ANZA MD 70	2008/2009	ANZA	HD	15		HD	ANZA	50
HD ANZA 18 ANZA MD 70		ARZ	HD	12		MD	HD	53
		ANZA	MD	14		MD	ARZ	65
ARZ MD 10 ARZ MD 55		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

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(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.

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