

RESEARCH REGARDING THE INFLUENCE OF THE AGEING AND TREATMENTS WITH FUNGICIDE ON THE VIGOUR POTENTIAL(COLD TEST) AT THE CORN SEEDS DERIVED FROM THE MAIN HYBRIDS CULTIVATED IN TRANSYLVANIA

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Abstract: The paper deals with the study of the influence of the ageing and treatments with fungicide on the corn seeds cold test from different calibers. The purpose of this study started from the fact that during the ageing of the seeds important changes are produced, starting with the accumulation of turnoff substances of the raising, the metabolic putrefaction of the substituted substances, the denaturation of the proteins and lipids, likewise the fact that the seeds carry on their surface, under the coating or even inside them a lot of pathogens or pestiferous that continue the evolutive cycle and this fact could influence the values of the vigour potential, appreciated through cold test. To improve the health of the seed using seed treatment with different physical means, chemical or biological The research was conducted under controlled conditions of growth (fitotron), and the seeds were treated with the product Topsin least 70 concentration 2gr/10l water. The cold test exposes the corn seeds, derived from three hybrids(T-201, T-200, T-165) from four calibers(LL, LR, ML, MR) at 10o C for 7 days in fertile soil at an absorbing capacity of the water of 60-70%, after that, before they were exposed to some rasing period for 6 days at a temperature of 25o C. Germ was made after assessing the 13th day from the germinated. The work is prezentete experimental results obtained in the years 2007-2008, and biological material hand machines was created to resort Turda Research and Development in 2004. 2005, 2006. Following research it was found that the most favorable size for obtaining vigorous germ is large widescreen size (LL) and fungicide treatments Topsin 70 PU not significantly change their values from any of the hybrids tested.

Key words: corn, age, treatment, cold-test

INTRODUCTION

The seeds ageing is an important factor on which depends the vigor potential, appreciated through cold test. The notion measures the age of the seeds, starting from the moment when they reach the physiological maturity; in this moment the vitality of the seeds is maximum.

During the ageing of the seeds important changes are produced, starting with the accumulation of inhibitory substances of raising, of the metabolic putrefaction of the substituted substances, deterioration of proteins and lipids; meanwhile the number of abnormal germs raises, the germination capacity is reduced and can finally lead to the death of all the germs.

The seeds carry on their surface, under coverings or even inside them, numerous pathogens or pestiferous that continue the developmental cycle, being transmitted throughout the seeds next year. Besides them, there are pathogens and pestiferous which live in the soil, attacks the seeds and germs thus compromising the culture (CERNEA et colab.,2008).

To improve the sanitary state of the seeds and to avoid the decrease in production and the deterioration of the quality due to the attack of the diseases and pestiferous, it has been used for a long time to some species and it has been generalized quickly with better and better

results the treating of the seeds through different physical, chemical or biological techniques (BUCURESCU, și colab., 1992).

The cold test was the first vigor analyze and for a long time the only one for the corn seeds. This analyze has become necessary because of the early insemination of the corn, in less favorable conditions.

The result of the determination permits the classification of the seeds lots into resistance groups, giving the possibility to choose the best period of insemination for every lot (DUDA et colab., 2003).

Likewise, the cold test gives us valuable indications regarding the order of the corn hybrids at insemination that will always start with those hybrids that have the value of the cold test of over 60-70%, following that the hybrids with a value under 50% to be inseminated at the end of the best period of insemination, when the temperature inside the soil raises. The cold test is a compulsory determination at the corn hybrids from the seeds lots remained from the previous years at which the accomplishment of the seeds germination capacity is also compulsory (MUNTEAN et colab., 2008)..

The cold test analyze is also useful in amelioration works for the lines selection with high resistance to freezing temperature and to the fungus attacks after the insemination.

MATERIALS AND METHOD

The right choice of the biological material, respectively of the hybrid, represents the basic element for the accomplishment of the experiences on the field and in the laboratory.

The hybrid can influence the vigor through its biological particularities: the type of the hybrid, the group of maturity and the type of the grain.

The biological material studied was created la SDCA Turda from the hybrids that were in production and on perspective and namely: : Turda 201-trilinear hybrid, semi early, created at SCDA Turda, group FAO 340, Turda 200 double hybrid, early, registered in 1976, put back in The Official Catalogue in 2000 and Turda 165-trilinear hybrid, early, belonging to group FAO 270.

The size of the seeds has a particular importance for the agricultural practice, because comparing with the medium seeds and particularly the large seeds, having an increased content of nutritive substances and better developed embryos, they succeed to give plantlets with a better beginning, with a superior power of covering, better raising and development and , as a consequence a quicker development of the vegetative apparatus that finally leads to a better production.

The calibers used within the present study are those used in selection and sorting stations for companies in Romania.

LL- large wide

LR – large round

ML – average wide

MR – average round

The last changes at the determination of the cold test take into consideration the ranging of the methods to the European norms.

Basically the cold test method exposes the seeds at 10o C for 7 days in a fertile soil at an absorbing capacity of the water of 60-70% after that previously they were exposed to a raising period for 6 days at a temperature of 25o C. The humidity and the temperature from this test stimulate the conditions that seeds would encounter during the early insemination, conditions that were favorable to the attack of the microorganisms in the soil.

For the appliance of the cold test method, the laboratory technique was the following:

- on a strip composed of 2 paper roles of industrial filter, wet, with a dimension of 60/21 cm a third strip of 60/30 cm is put, which overlaps the first two at downside on 10 cm from its width; on the strip, inside of a metallic frame of 50/15 cm a mixture of soil and sand is put into a uniform layer of about 0,5 cm.

- on the mixture strip 100 seeds are evenly disposed, which are covered with a thin layer from the same mixture and after that with the downside of the third piece of paper which is available; the whole assembly is carefully rolled; the four roles are introduced in a plastic bag and put in germinator at the values of temperature and humidity previously described

- the appreciation of the germs was made after the 13th day since it had been put at germination; the resistance mark at hatching is given by the numerical percent of the germs normally developed in these conditions.

For the treating of these seeds it was used TOPSIN 70 PU in a concentration of 2gr/10l water.

Table 1

Influence of corn seed age in interaction with genotype upon the values of cold test in the two experimental years

Experimental year	Year of seed obtaining	Viguros germs		
		T-201	T-200	T-165
2007	2004	76,75 a	76,13 a	72,75 a
	2005	73,50 a	66,75 a	70,50 a
2008	2005	71,00 ab	73,69 a	65,13 b
	2006	67,56 a	69,81 a	59,25 b

Table 2

Influence of seed age and experimental seed size upon vigorous germs in the two experimental years

Experimental year	Seed obtaining year	Viguros germs			
		LL	LR	ML	MR
2007	2005	76,08a	71,42b	76,00a	64,00c
	2006	74,08a	71,92a	64,00b	71,00a
2008	2006	74,25a	67,42b	69,42b	68,67b
	2007	66,58a	68,17a	61,92b	65,50ab

LL – mare lat (large wide)
 LR – mare rotund (large round)
 ML – mediu lat (average wide)
 MR – mediu rotund (average round)

RESULTS AND DISCUSSION

As a consequence of the cold test analyzes, made on corn seeds derived from two production years among experimented hybrids, there have been established differences, statistically assured, concerning the value of the vigorous germs. Thus the vigorous germs have the biggest value at hybrid T-201 followed by hybrids T-200 and T-165 in 2006 and the hybrid T-200 followed by hybrids T-201 and T-165 in 2007, this one having smaller values, depending on the experimental year and the production year of the seeds (table 1).

Following the values of the vigorous germs, derived from the seed obtained in 2005, resulted from the four calibers, we notice a significant decrease between the round medium caliber (MR) and wide large calibers (LL) large round (LR) medium large (ML) and between medium large caliber (ML) and the other calibers in the case of the seeds produced in 2006 (table 2).

Influence of age and treatment with antifungal agents upon vigorous germs in maize hybrids experimented in the two years

Experimental year	Seed obtaining year	Treatment	Viguros germ		
			T-201	T-200	T-165
2007	2005	Not treated	70,38 ab	74,50 a	72,75 a
		Treated	73,13 a	77,75 a	72,75 a
	2006	Not treated	71,88 a	65,25 a	74,38 a
		Treated	75,13 a	68,25 a	66,63 a
2008	2006	Not treated	65,13 bc	72,38 ab	60,13 c
		Treated	76,88 a	75,00 ab	70,13 abc
	2007	Not treated	62,50 bc	62,25 abc	58,13 c
		Treated	72,63 ab	74,38 a	60,38 c

Thus the smallest size of the seeds represented by the medium large calibers (ML) and medium round(MR) is directly correlated with the smallest values of the vigorous germs.

The values of vigorous germs in the case of the experimental year 2007 shows significant differences between the large wide caliber (LL) with the seed produced in 2005 and the other calibers with the same correlation previously mentioned.

In both experimental years it seems that the most favorable caliber to obtain vigorous germs is wide large caliber (LL). In cases of sufficient quantities of seed, the wide large calibration fraction(LL) may bring a significant contribution to the raising of the seeds vigor through the significant number of the vigorous germs (table 3).

The seeds derived from three corn hybrids and from different years, that were and were not treated with TOPSIN 70 PU were tested regarding the cold resistance (cold test) according to the present technology.

There have been made determinations regarding the vigorous germs in the interaction of the experimental factors: the year when the seeds were obtained, the corn hybrid and the treatments of the seed in those 2 experimental years.

From the information presented in chart 3 it results that the seeds that produce vigorous germs, the treatments of the seeds don't significantly change their value at any of the tested hybrids or there has been noticed a tendency of stimulating the vigorous germs as a consequence of the treatment with TOPSIN.

This observation strengthens the value of the treating methods of the corn seeds with TOPSIN, its influence being beneficial to the seeds vigor (table 3).

CONCLUSIONS

The cold test, as the most significant mark of the corn seeds vigor appreciated through the percent of the vigorous germs, is mostly determined by the cultivated hybrid and the seeds caliber.

The vigorous germs have the highest values at hybrids T-201 and T-200 in both experimental years for all the proveniences of producing the seeds.

The most favorable caliber for obtaining vigorous germ is the wide large caliber (LL). In the case of sufficient quantities of seed, this wide large calibration fraction (LL) can bring a significant contribution to the raising of the seeds vigor through the significant number of vigorous germs.

The smallest size of the seeds represented by the medium large caliber (ML) and medium round (MR) is directly correlated with the smallest value of the vigorous germs.

At the seeds from which are obtained vigorous germs, the treatments with TOPSIN don't significantly change their value at any of the tested hybrids, on the contrary it is noticed a tendency of stimulating the vigorous germs as a consequence of the treatments with TOPSIN.

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