RESEARCH REGARDING THE INFLUENCE OF FRUITS' SIZE AND AGE ON CORIANDRUM SATIVUM L. GERMINATION FEATURES

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Abstract: *For the study performed by us Sandra seeds have been used, type of seeds cultivated in our country since 1987, in all areas favorable to this species. Among other morphologic characteristics, we have studied the influence of the mass of one thousand seeds over the energy and the germination capacity and also over the breakthrough capacity. The variants taken into account have been the seed having thousand seeds mass under 6 grams and those over 7 grams. Seed from the harvest of 2012 and also 3-years old and 6-years old seeds have been used in the study. Determinations regarding the germination energy and capacity have been performed using Polikeit – Halle germinator, at $25^0 – 28^0$C, repeated four times, and for the determination of the breakthrough power we have used ceramic recipients of 10 cm diameter and 15 cm height. Sand has been used as germination bed, humidified at 60-70% of the maximum water capacity. Determination of the germination energy has been performed after 7 days, determination of the germination capacity after 14 days, and of the breakthrough power after 16 days. The results of the determinations regarding the germination energy have revealed average values ranging from 56.7% at the 6-years old materials to 71.7% in the case of the 2012 harvest material. The germination capacity has ranged between 85.2% at the witness variant (seeding material form 2012) to 77.4% at the 3-years old material and to 67.4% at the 6-years old material.The breakthrough power has been assessed after 16 days and, depending on the age of the seed, the values ranged from 69.6% for the witness material to 62.3% for the 3-years old seeds and only 51.8% to the 6-years old material. The thousand seeds mass has influenced the analyzed physiological characteristics, the values being higher for the seeds having thousand seeds mass over 7 grams, compared to the values for seeds having this feature under 6 grams. The results of the study have revealed that the seeding material obtained in 2012 is 1^{st} class, and the 3-years and the 6-years old lots are included in the 2^{nd} class. In conclusion for the Sandra type, only seed from the latest harvest shall be used.*

Key words: *Coriandrum sativum, seeds' germination*

INTRODUCTION

The seed represents a very important biological factor for the increase of the crops in case of all cultivated plants due to the fact that its embryo contains all valuable features of either the soil or the hybrid. Moreover, for a more even and quicker emergence of the vigorous, healthy flowers with strong roots, the seed must comply with a series of other features, some of them being presented in the following.

Seeds' age represents an inner factor influencing seeds' germination. The study presents data regarding their "economic life", referring especially to the percentage of germinated seeds after 3 or 6 years from harvesting and not to data regarding their "biological life". *Coriandrum sativum* L, a species cultivated for its fruits (Coriandri fructus), contains 0,15 – 2,1% essential oils, 20%fat oil, 12 – 16% proteins and aproximately 20% glucides. During seeds storage a phenomenon of metabolic decomposition of fund substances takes place and of proteins and lipids' degeneracy, reducing thus their germination capacity.

The seeds of pomace start to lose their germinal capacity and, as compared to grain crops, there is a higher spoiling risk. (MUNTEAN and his collaborators 2003) high quality

seed should germinate faster and evenly, which requires the necessity to determine germinal energy, more specifically, its germination speed.

Their germinal capacity and energy represent features which go together and cannot be separated. Both features emphasizes on the quality of the seeds prepared for sowing, respectively their cultural value This scientific paper also provides the results regarding the influence on their penetration capacity of both one thousand seeds mass and the age of seeds.

The targeted thick and vigorous layers can be obtained only with the help of healthy seeds with 98% purity (minimum 94%) and 80% germinal capacity (minimum 65%).

MATERIAL AND METHODS

The research has been performed on Sandra type, belonging to Alef seeds family.

This type of seed has registered a 10 – 15 q/ha production capacity. Its fruits contain between 0,9 – 1,18% essential oil, being also rich in linalool.

Their energy and germinal capacity has been determined with the help of the Polikeit Halle germinator, repeated four times.

The researched variants have been the following:

- the age of the seeds classified as: seeds from the last harvest; 3 years old seeds and 6 years old seeds;
- the one thousand seeds mass classified as: seeds with MMB smaller than 6 grams and MMB over 6 grams.

The seeds have been germinated at 26 – 28^{0}C.

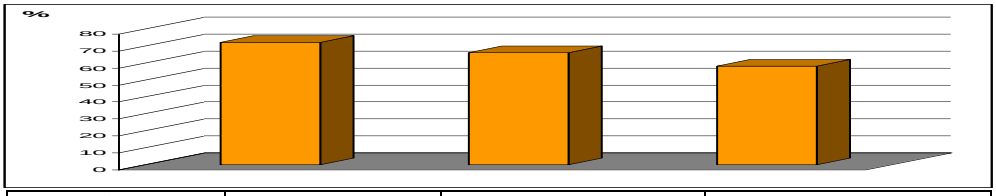
Their germinal energy has been determined after 7 days while the germinal capacity has been determined after 14 days. The analysis of the seeds' penetration capacity has been performed in 15 cm height ceramic recipients, using as germinal bed, sterilized and humidified sand at 60-70% maximum water capacity.

The experiment has been repeated four times while the results have been read after 16 days. The results represent the arithmetic mean of all 4 repetitions.

The full fruits of coriander (dhania) have been perceived as a single unit.

RESULTS AND DICUSSIONS.

The figure 1 presents the results regarding the influence of the age of seeds on their germinal energy.

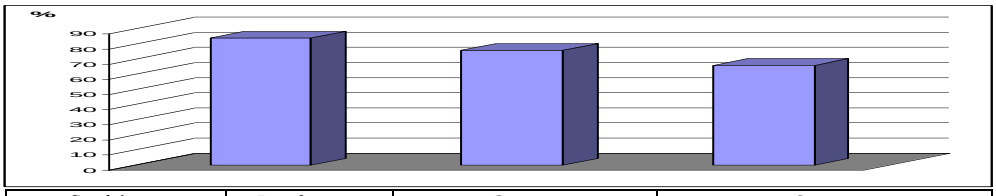


Seeds' age	Last harvest	3 years	6 years
Germinal energy %	72	66	58
Difference %		- 6	- 14

Figure 1. Percentage of germinal capacity according to the seeds' age

The above figure demonstrates that germinal energy decreases according to the seeds' storage period. Moreover, as compared to a 72% germinal energy of the seeds registered during the last harvest, after 3 years storage period, their germinal capacity reduced to 66%, while after 6 years storage, their germinal capacity reduced to 58%.

Figure 2 presents the results of the research performed on the seeds' germinal capacity.

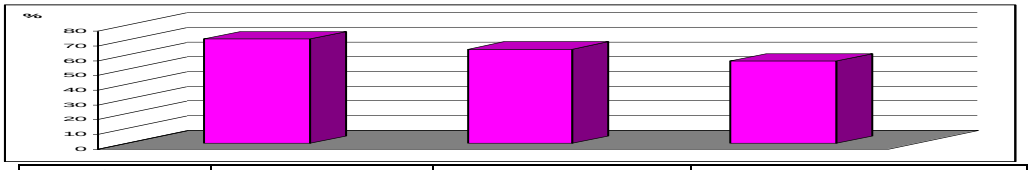


Seeds' age	Last harvest	3 years	6 years
Germinal capacity %	84	76	66
Difference %		- 8	- 18

Figure 2. Germinal capacity according to seeds' age

Seeds germinal capacity has been satisfying, over 80% in case of seeds from the last harvest. Important to notice is the fact that the samples with 3 to 6 years germinal capacity have exceeded the minimum admissible threshold of 65%.

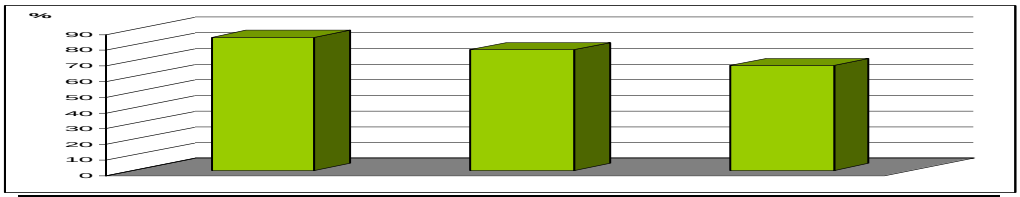
Figure 3 shows the results regarding the germinal energy according to the one thousand seeds' mass and their age



Seeds' Age	Last harvest		3 years		6 years	
MMB g	< 6	> 6	< 6	> 6	< 6	> 6
EG %	70	72	62	66	54	58
Average mean %	71		64		56	

Figure 3 Influence of both MMB and of the age of seeds on their germinal energy

Demonstrates that the use of seeds with high MMB, over 6 grams, has positively influenced their germinal capacity, registering thus, an increase of 2- 4%, in case all age categories. he influence of one thousand seeds' mass and seeds' age on the germinal capacity has been presented in Figure 4.



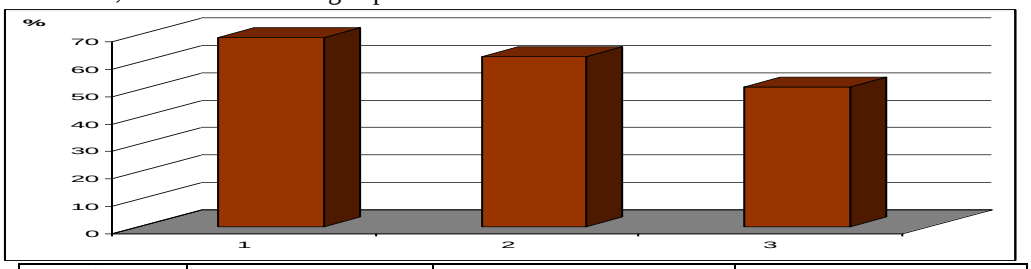
Seeds' age	Last harvest		3 years		6 years	
MMB g	< 6	> 6	< 6	> 6	< 6	> 6
EG %	84	87	76	78	66	68
Average mean %	85		77		67	

Figure 4. Influence of both MMB and age of the seeds on their germinal capacity.

The results obtained represent motivate specialists to use big size seeds for sowing.

Moreover, it has been demonstrated that the germinal capacity of seeds over 6 grams has registered positive values, increasing thus with 3% in case of fresh seeds and with 2% in case of 3 and 6 years old seeds.

Figure 5 presents results referring to the penetration capacity of the seeds according to their MMB, with a 3 cm seeding depth.



Seeds' age	Last harvest		3 years		6 years	
MMB g	< 6	> 6	< 6	> 6	< 6	> 6
EG %	67	71	60	64	50	52
Average mean %	69		62		51	

Figure 5. Influence of both MMB and age of seeds on their penetration capacity.

The results of the analysis regarding their penetration capacity emphasize on the importance of two researched factors, respectively, the age of seeds and the mass of the one thousand seeds. It has been noticed that the process of seeding registered positive values in case of big size seeds from the last harvest.

CONCLUSIONS

The results of the analyses performed on Coriandrum sativum L., Sandra type, regarding the way in which the age of the seeds and their germinal capacity may influence their penetration capacity, provided important information for agricultural practice.

The age of the seeds has influenced the germinal capacity which reduced to 72% in case of seeds from the last harvest, to 66% in case of 3 years old seeds and to 58% in case of 6 years old seeds. Seeds germinal capacity, under the mentioned conditions, has reduced to 84% in case of seeds from the last harvest and to 76% in case of 3 years old seeds and to 66% in case of 6 years old seeds.

The one thousand seeds' mass over 6 grams has favorably influenced the germinal capacity and energy with 2 to 3% as compared to seeds smaller than 6 grams, irrespective of the specific age of the seeds.

The penetration capacity has registered positive values in case of fresh seeds, more specifically, their penetration capacity was 7% higher than in case of 3 years old seeds and respectively, and 18% higher than in case of 6 years old seeds.

The mass of the one thousand seeds over 6 grams proved to influence their penetration capacity as compared to seeds with MMB and smaller than 6 grams.

ACKNOWLEDGEMENTS

This work was published during the project "DOCTORAL STUDIES FOR RESEARCH IN TRAINING", POSDRU /107/1.5/S/80127, co-financed by the European Social Fund through the Sectorial Operational Programme for the Human Resources Development 2007-2013.

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