PRELIMINARY RESULTS ON GERMINATION AND VELOCITY OF KELVEDON WONDER PEA SEEDS VARIETY

REZULTATE PRELIMINARII PRIVIND GERMINAŢIA ŞI VELOCITATEA SEMINŢELOR DE MAZĂRE LA SOIUL KELVEDON WONDER

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Abstract. *The seed is an important factor of production that ensures the biological material necessary for the establishment of agricultural and horticultural crops. The seed of a cultivation will faithfully pass the characteristics determined by the genome if it has a higher cultural value, a primordial value determined by germination, purity and state of health. In the case of seed produced in the year 2016, the germination index varied from 84.0% determined to five days, up to 93.5% (on the ninth day). Germination speed is maximum at first determination (21.0%) and decreases to 8.5% when seed germination has reached the highest value during the 12 days. The velocity coefficient of germination has descended values, the lowest value of 8% registering on day 12, which can be genetically influenced, but also by storage conditions.*
Key words: pea seed, germintion rate, velocity germination.

Rezumat. *Sămânța este un factor important de producție care asigură materialul biologic necesar înființării culturilor agricole şi horticole. Sămânța unui cultivar va transmite în mod fidel caracteristicile determinate de genom dacă aceasta are o valoare culturală cât mai ridicată, valoare determinată în mod primordial de germinație, puritate şi starea de sănătate. În cazul seminței produsă în anul 2016, indicele de germinare a variat de la 84,0% determinat la cinci zile, până la 93,5% (in a noua zi). Viteza de germinare este maximă la prima determinare (21,0%) şi scade până la valoarea de 8,5% când germinația seminței a atins cea mai ridicată valoare, pe parcursul celor 12 zile. Coeficientul velocității de germinare a avut valori descendente, cea mai scazuta valoare de 8 % înregistrându-se în ziua 12, valoare care poate fi influențată genetic dar şi de condțiile de păstrare.*
Cuvinte cheie: semințe de mazăre, germinație, viteza de germinare.

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INTRODUCTION

Seed is a morpho-anatomic and functional structure proper to superior flower plants, resulting from the fertilization process of the ovule and plays a role in the reproduction and multiplication of plants.

For agriculture, seed is an important factor of production that provides the biological material necessary for the establishment of agricultural and horticultural crops (Stan *et al.,* 2003). Its importance as a factor of production is also reinforced by the fact that it is the carrier of the characteristics that will give agronomic value and the use of the new cultivation, characteristics that are determined by the specific genome of the biological population from which it was formed, population called cultivar or variety (Munteanu and Falticeanu, 2008).

The seed of a variety will faithfully convey the characteristics of the genome if it has a higher cultural value, a value primarily determined by germination, purity and health, that is to say, the most important quality indicators of a seed (Chaux and Foury, 1996).

The high values of these quality indicators represent the ultimate goal of any seed producer (Atanasiu and Atanasiu, 2000; Bârcă *et al.,* 2012).

The germination velocity, as a major indicator for the evaluation of seed germination vigor, varies considerably depending on the cultivar (Voicu *et al.,* 2017; Voicu, 2017) and the experimental conditions (Chugh and Sawhney, 1996; Campbell *et al.,* 2011; Butnariu and Butu, 2014; Ipătioaie *et al*., 2016; Ipătioaie, 2017).

The purpose of the paper was to evaluate the germination rate, the velocity and the pea seed speed index after two years of storage.

MATERIALS AND METHODS

From total mass of pure seeds well-homogenized, 400 seeds are randomly counted – 8 repetitions of 50 seeds each, placed at a sufficient distance in order to ensure the necessary space needed for the germs' growth and nutrition, as well as for the protection of the seeds that are not contaminated by diseases. In the case in which the seeds are strongly infected, it is necessary for the paper substrate to be changed, at an intermediate count. As a method of germination, the germination between-paper (BP) was used, in controlled temperature (20 ^{o}C), humidity (80 %) and lack of light.

The seeds are placed to germinate between strips of paper, rolled and uniformly distributed (fig. 1). The placement of the seeds on the paper is done manually because the pea seeds are big enough to allow the proper development of the germs. The repetitions of placing the seeds in between stripes of paper are rolled and put into plastic bags, in order to maintain a constant level of moisture, and then they are placed in the germinator (Sanyo MLR), in a horizontal position.

Taking into account that the germination analysis is applied to a great number of species, in order to render uniform the methods used, the standard SR 1634/1999 establishes the requirements of each specie.

Fig. 1 Germination pea seeds stage

After determining the physical purity, which was between 99,6 and 99,9%, the seeds were prepared in order to determine the germination, for the seeds obtained in 2016. According to standard SR 1634/1999, the minimal germination for the pea seeds must be of 80%

RESULTS AND DISCUSSIONS

Regarding the Kelvedon Wonder cultivar, the germination index ranged from 84.0%, determined at five days, to 93.5%, determined on the ninth day and kept within the same limit until the last determination (fig. 2). The highest daily growth rate was between fifth and seventh, when the value increased to 90.0%.

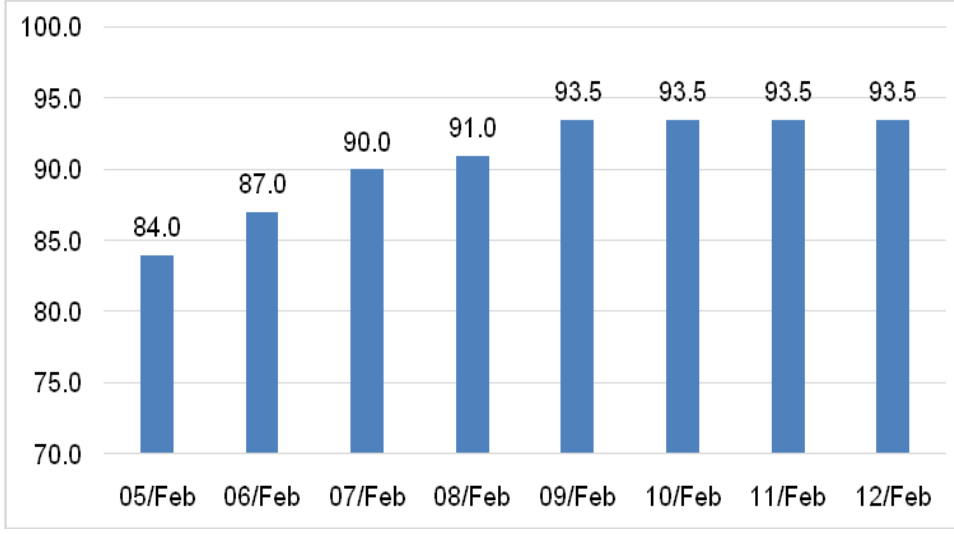

Fig. 2 Germination rate in dynamics for the Kelvedon Wonder variety (%)

The germination velocity on the Kelvedon Wonder cultivar is maximal at first determination (21.0%) and decreases to 8.5% when germination of seed has reached the highest value over the 12 days. Daily, the greatest difference in germination rate was between fifth and sixth day, with a difference of 2.6%, demonstrating a good germination capacity of the Kelvedon Wonder cultivar (fig. 3).

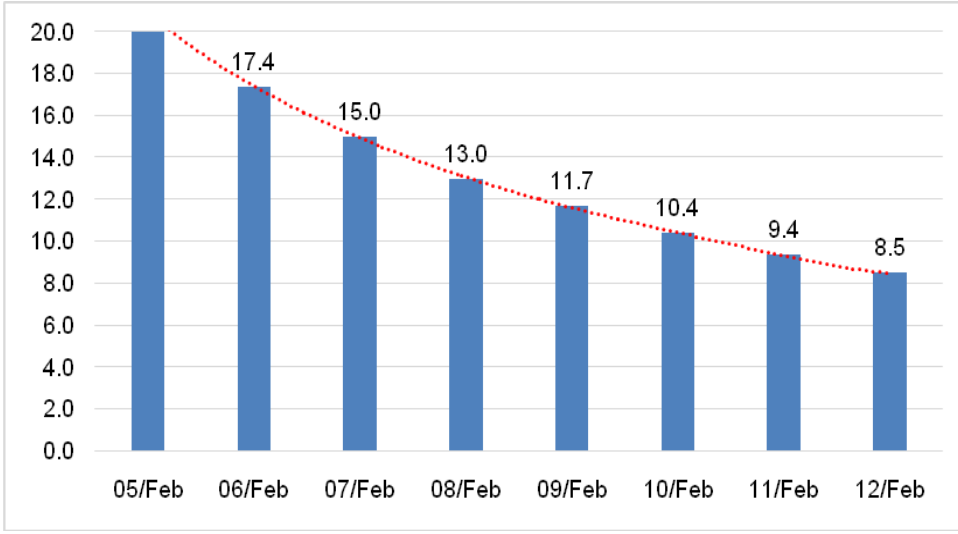

Fig. 3 Germination velocity for Kelvedon Wonder variety (%)

Kelvedon Wonder sprouting rate coefficient ranged from 8.0% to 17.1%. The highest percentage was recorded on the first day of determining the number of normal germs when the highest germination rate was recorded (fig. 4). The lowest germination rate was recorded at the last determination when the highest germination index for the Kelvedon Wonder cultivar was recorded.

Voicu's 2017 results highlighted that the 2012 seed (after four years of storage) begins with a germination index of 60.3% and ends after 5-6 days with a germination index of 70, 1%, which qualitatively disqualifies it from being marketed.

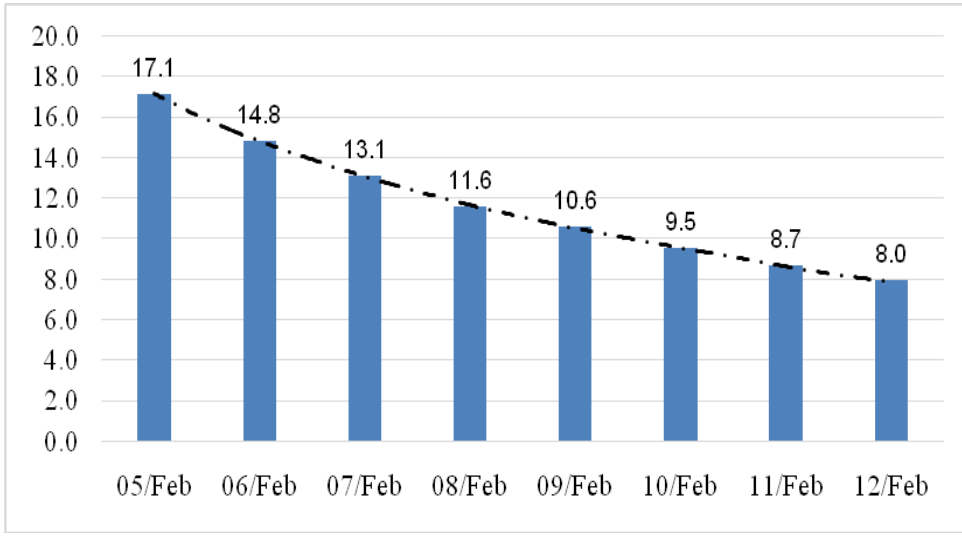

Fig. 4 Velocity germination coefficient and emergence
for the Kelvedon Wonder cultivar (%)

CONCLUSIONS

1. After two years of storage, seeds from cultivar Kelvedon Wonder retained quality indices, so they can be used to set up crops.

2. The highest germination rate is recorded on the fifth day when germinating most seeds, but it decreases to the 12th day of determination.

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