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**VERSATILITY OF PLANT SEEDS IN LABORATORY AND FIELD CONDITIONS****Pulatov Sarvar Mustafoevich,****Najimova Dilafruz Nabijonovna**

Tashkent branch of Samarkand state university of veterinary medicine,

animal husbandry and biotechnology

**Annotatsiya.** So'nggi yillarda global iqlim o'zgarishi tufayli yangi agroekologik zonalarda ko'proq issiqlikni yaxshi ko'radigan ekinlardan foydalanish imkoniyatlar kengaydi. Sabzavot mahsulotlarining biologik xilma-xilligini oshirish, mahalliy sharoitga moslashtirilgan nav va duragaylar ishlab chiqarish muammosi asosan bir vaqtning o'zida baholash bilan, noan'anaviy o'simlik turlarini joriy etishga bog'liq iqtisodiy foydali maqsadlarda foydalanish va yaratish uchun manbaa material bo'lib xizmat qiladi. Shu munosabat bilan bir yillik dorivor o'simliklardan kunjut (*Sesamum L.* va *Linum L.*) noyob o'simlik turlaridan biri hisoblanadi. Bu mamlakatlardagi eng mashhur ekinlardan biridir. Biologik jihatdan faol birikmalar va noyob dorivor xususiyatlar ega bo'lgan o'simlik keng doiraga, xususan O'rta yer dengizi va Markaziy Osiyoda ko'plab uchraydi. Ushbu maqolada zig'ir va kunjut o'simliklari urug'larining laboratoriya va dala sharoitida unuvchanligi bo'yicha tadqiqot ishlari amalga oshirilganligi to'g'risida ma'lumotlar keltirilgan.

**Kalit so'zlar.** O'simlik, dorivor, zig'ir, kunjut, murtak, laboratoriya, unuvchanlik, urug', ontogenez.

**Abstract.** In recent years, due to global climate change, the use of more heat-loving crops in new agro-ecological zones has expanded. The problem of increasing the biodiversity of vegetable crops, the production of varieties and hybrids adapted to local conditions, mainly depends on the simultaneous assessment and introduction of non-traditional plant species, which serve as source material for the use and creation of economically beneficial purposes. In this regard, sesame (*Sesamum L.* and *Linum L.*) is one of the rare plant species of annual medicinal plants. It is one of the most popular crops in these countries. The plant, which has biologically active compounds and unique medicinal properties, is widely distributed, especially in the Mediterranean and Central Asia. This article presents information on the research work carried out on the germination of flax and sesame seeds in laboratory and field conditions.

**Keywords.** Plant, medicinal, flax, sesame, safflower, laboratory, fertility, seed, ontogenesis.

For the cultivation of each new introduced plant, it is important to study the laws of its individual development (ontogenesis). There is not enough information in the literature on the ontogenesis of sesame and flax.

Flax seeds are obovate, smooth in shape. As a result of studying the ontogenesis of sesame and flax, it became clear that their seeds have a high germination capacity, and scarification and stratification are mandatory before sowing.

Sesame seeds begin to germinate in laboratory conditions at a temperature of  $+5+7^{\circ}\text{C}$  on the 8th day. All seeds germinated on the 15th day of the experiment. As the temperature increased, seed germination accelerated, i.e. at  $+15^{\circ}\text{C}$  on the 5th day, at  $+20^{\circ}\text{C}$  on the 4th day, at  $+30^{\circ}\text{C}$  on the 3rd day. At a temperature of  $+15+20^{\circ}\text{C}$ , 78% of the seeds germinated in two days, and at  $+25+30^{\circ}\text{C}$ , 92% in two days.

As the temperature increased further, the germination capacity of the seeds decreased, that is, at  $+35^{\circ}\text{C}$ , only 55% of the seeds germinated.

Thus, the germination of seeds in laboratory conditions began at a temperature of  $+5^{\circ}\text{C}$ , and as the temperature increased ( $+20^{\circ}\text{C}$  to  $30^{\circ}\text{C}$ ), their germination capacity increased.

This indicates that their seeds belong to the eurytherm group. Seed germination begins with the growth of the ovule inside the seed (Table 3.2).

**Table 3.2**

**Growth and development of the ovule organs during the period of seed germination**

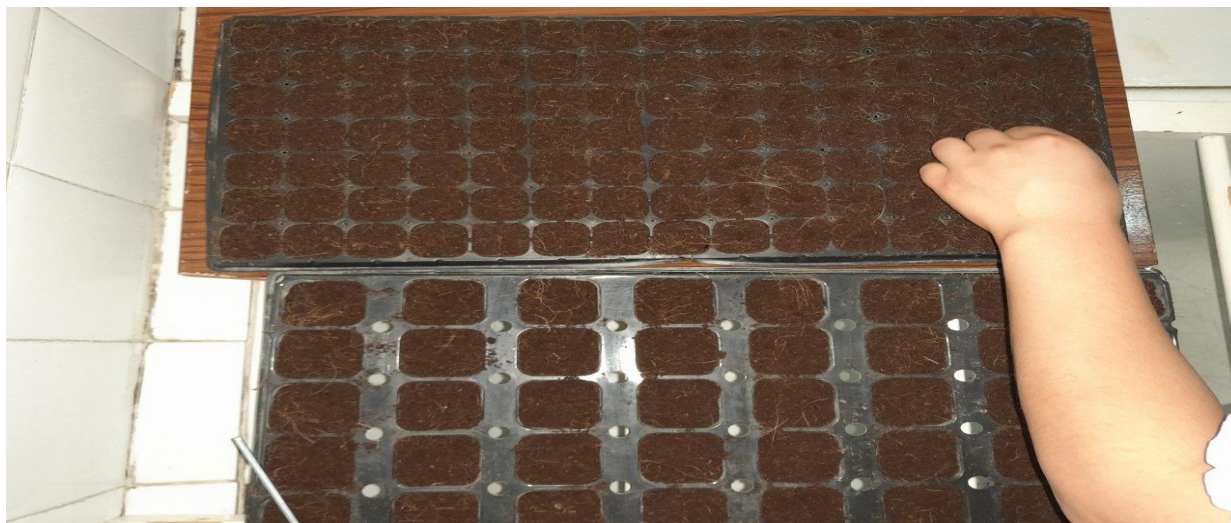
| Time of measurement | Length, mm     |                |                       |
|---------------------|----------------|----------------|-----------------------|
|                     | Bud            | Cotyledon      | Hypocotyl and radicle |
| 13.X                | $1,3\pm 0,02$  | $0,4\pm 0,01$  | $0,87\pm 0,04$        |
| 16. X               | $3,02\pm 0,05$ | $1,03\pm 0,03$ | $2,6\pm 0,03$         |
| 19. X               | $3,1\pm 0,24$  | $1,3\pm 0,02$  | $4,8\pm 0,19$         |
| 22. X               | $3,8\pm 0,03$  | $2,4\pm 0,02$  | $6,5\pm 0,03$         |
| 25.X                | $4,1\pm 0,04$  | $3,06\pm 0,04$ | $6,7\pm 0,3$          |
| 28. X               | $4,2\pm 0,02$  | $3,0 \pm 0,03$ | $6,9\pm 0,3$          |

As can be seen from the data presented in the table, when the total length of the shoot reaches 1.9 cm, the shoot root has a length of 0.7-1.7 cm and breaks through the seed coat and emerges into the body. The plant shoot is very small (0.16-0.19 mm), and in the first days of the experiment, the growth of the shoot organs is not noticeable. The intensive growth of the shoot organs begins on the fourth day of the experiment.

When the total length of the shoot reaches 1.3 mm, the buds of the primary leaves begin to appear on the third shoot. The intensive growth of the shoot organs begins on the 9th day of the experiment and gradually slows down on the 12th day. On the 15th day, the growth of the cotyledon leaves stops, and the growth of the root and hypocotyl accelerates.

The experiments conducted show that certain selected varieties of *Sesamum* L. and *Linum* L. showed good germination in field experiments in the first ten days of March. Seeds of the spring flax variety

germinated well when sown in the field between March 23 and March 30. Our seeds of the Bakhmalsky 2 variety did not germinate in field conditions, but showed 68.75% germination in laboratory conditions.0



**Figure 3.2.1. The process of sowing seeds in cassettes in laboratory conditions.**

In the study of the elements of seed productivity, a fairly stable idea has been formed about the contradiction between morphogenetic constraints and the adaptive needs of the population, which is well demonstrated by the well-known phenomenon of evolutionary compensation: the reduction of some elements. the increase of others (Stebbins, 1950).

The most characteristic is the negative correlation between the number of seeds formed per plant and the size of the seed, which is observed in the population, variety, as well as in individual development. Such correlations usually indicate competition for metabolic material and manifest themselves in the form of compensation for the development of crop elements. However, such relationships may be specific only to certain breeding systems with a specific pollen regime, since in some species, in experiments, the replacement of self-pollination by cross-pollination leads to the formation of more full-weight seeds without reducing their number. (Galen et al., 1986).

In such species, as noted by the above authors, the relationship between the number of seeds and their size should be determined by the existence of a balance between the total amount of pollen received and the probability of fertilization.

**Table 3.3**

**Table of phenological observations of germination of Sesasum L. and Linum L. varieties in field and laboratory conditions. 2023**

| № | Varieties | Field | In the laboratory |
|---|-----------|-------|-------------------|
|   |           |       |                   |

|   |                  | Planted | Germinated | %    | Planted | Germinated | %     |
|---|------------------|---------|------------|------|---------|------------|-------|
| 1 | Qora shahzoda    | 500     | 324        | 64,8 | 80      | 80         | 100   |
| 2 | Tashkentskiy-122 | 500     | 210        | 42,0 | 80      | 80         | 100   |
| 3 | Bahorikor        | 500     | 0          | 0    | 80      | 55         | 68,75 |
| 4 | Baxmalskiy 2     | 500     | 0          | 0    | 80      | 32         | 40,0  |

From the experiments, it can be observed that our local varieties have relatively good germination rates in the field, while the introduced varieties have only germinated in the laboratory. In conclusion, it is worth noting that in March, their local varieties can be sown in rows in the field. We can say that this method will reduce seed consumption and provide an additional benefit of 10-15% to economic efficiency. By reducing seed consumption in the field, it is possible to achieve higher economic efficiency by using a certain number of seed sowing rows.

The following experiments were mainly conducted by observing the phenological phases of the planted plant.

An area of 30 m<sup>2</sup> was selected for sowing sesame seeds. Seed sowing was carried out in five periods: in the fall - October and November, and in the spring - February, March, and April (Table 3.3).

In the first year of vegetation, irrigation was applied three times in May, June, and July, and from the second and third years, twice in June and September. In all experimental plots, the plants were cultivated, the soil was loosened and mulched. The experimental plots were cleared of weeds and cultivated.

**Table 3.4**

### Germination of sesame seeds in field conditions

| Sowing time | Number of seeds sown (pieces) | Germinated seeds per 1 m |    |        |    |
|-------------|-------------------------------|--------------------------|----|--------|----|
|             |                               | april                    |    | may    |    |
|             |                               | Pieces                   | %  | Pieces | %  |
| 20.03.2023  | 100                           | 75                       | 75 | 78     | 78 |
| 25.03.2023  | 100                           | 70                       | 70 | 79     | 79 |
| 30.03.2023  | 100                           | 65                       | 65 | 60     | 60 |
| 10.04.2023  | 100                           | 60                       | 60 | 56     | 56 |
| 20.04.2023  | 100                           | 40                       | 40 | 54     | 54 |

The data presented in the table show that sesame seeds have a very high germination rate in the field. Regardless of when they are sown, the germination rate of the seeds differs little from each other in

both experimental plots. The germination rate of seeds sown in March is 78% in the field, which is 15-16% lower than that of seeds sown in April.



**3.2.2. Fig. The process of sowing seeds in field conditions**

The main reason for the low germination of seeds sown in April was the rapid warming of the air, which led to an increase in soil temperature, which led to the rapid drying of the seeds. The viability of grasses depends on the adaptability of the plant to the growing conditions and their density. The density of grasses in a given area varies relative to the seeding rate, which affects the viability of grasses. In addition, the viability of plants depends on how well they adapt to the habitat. The results of the experiment showed that when 6 kg of seeds were sown per hectare, the germination rate was 85%, and the viability was 79.3%. In the remaining options, the viability of grasses and then plants was much lower. When sowing 8 kg of seeds per hectare, 77% of the seeds germinated. The germination rate of seeds at the sowing rates is almost the same (75-77%), but the viability of the plants is much lower, that is, when the air temperature rises in June-July, most of the plants wither.

Experiments have shown that when sowing 6 kg of seeds per hectare, the survival rate of the grass was 60%. In both conditions, the high summer temperatures (June, July) affect the decrease in plant viability.

The depth of sowing is also one of the important factors affecting the germination of sesame seeds. In order to study this, the seeds were sown to a depth of 1 cm, 2 cm, 3 cm, 4 cm, 5 cm, starting from sowing in the upper layer of the soil.

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