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Paper Authors:

Nilufar Ergasheva¹, Tagayeva Dilnoza², Abdurashidova Maloxat³



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FLOWERING AND FERTILIZATION BIOLOGY OF *ECHINACEA PURPUREA L.* IN MIRZACHOL OASIS.

Nilufar Ergasheva¹, Tagayeva Dilnoza², Abdurashidova Maloxat³

Lecturer, Department of «Medicinal plants and botany» Gulistan State University, Uzbekistan^{1,2,3}.

E-mail: nilufar.ergasheva.78@inbox.ru

Abstract: Perennial herb of the family Asteraceae - medicinal *Echinacea purpurea L.* Flowering and fertilization biology in the biology of growth and development of the plant when grown in open fields in the Mirzachul region of Uzbekistan, seed yield, information on the rules of harvesting.

Keywords: Mirzachul oasis, medicinal plant, seed germination, growth and development biology, flowering biology, seed yield, biomorphological features, ontogeny, phenospector.

Introduction

Today, *Echinacea purpurea L.* is widely used not only in folk medicine but also in scientific medicine, its underground and surface preparations are included in the state pharmacopoeias of many European countries, the Russian Federation, Belarus and Ukraine, rich in biologically active substances is a medicinal plant [1]. *Echinacea purpurea L.* is recommended for use in patients with depression and mental and physical stress, as well as in improving the body's immune system, metabolism, colds, diabetes and liver disease, as well as disease prevention [2, 3]. *Echinacea purpurea L.*, belonging to the family Asteraceae, is of great scientific and practical importance for the study of growth and development characteristics in Uzbekistan, evaluation of its introduction, determination of phytochemical composition, reproduction and development of recommendations for plantations.

During the generative period, the growth of flower twigs, budding, flowering, fruit formation and ripening were observed. In the study of plant flowering biology, daily and seasonal flowering dynamics, A.N. Ponomarev [4], Ashurmetov O.A., Karshibaev X [5] methods were used.

Seed yield of *Echinacea purpurea* was determined in Mirzachol conditions. In order to determine the seed yield of the *Echinacea purpurea* plant in the experimental

field, the seeds in the plant baskets of each variant were harvested with full ripening and the average seed yield was determined. According to the data obtained, the seed yield of the medicinal plant *Echinacea purpurea* grown in the experimental field varied in different amounts depending on the method of sowing and the years of cultivation. Of the variants studied, relatively high seed yields were obtained in 3-year-old plants. Seed yield from this variant averaged 2.34 s / ha. The lowest seed yield in the experimental field was observed when sowing from seed in the first year (0.84 s / ha). Seed yield was 2.05 s / ha in the second year of the experiment and 2.34 s / ha in the third year (Table 1).

By studying the seed yield of the red echinacea plant in general, it can be concluded that this medicinal plant can produce a seed yield of 2.34 s / ha higher than 3-year-old plants after sowing.

Table 1
Seed yield of *Echinacea purpurea L.* (s / ha)

Opti on (year)	Repetitions			Avera ge %
	I	II	III	
2018 y	0, 89	0, 83	0, 80	0,84
2019 y	2, 10	2, 05	2, 0	2,05
2020 y	2, 30	2, 35	2, 38	2,34

Accurately determining the ripening period of the seeds of *Echinacea purpurea* L. is an important factor. Harvesting before the seeds are fully ripe has many negative consequences, including a sharp decrease in seed germination, when harvesting raw seed they are crushed, leaves, flower petals, nodules are mixed with the seed and they pollutes.

Delaying the ripening of the seeds can lead to shedding by the wind, as well as excessive scattering during the harvest, resulting in reduced seed yields.

In order to determine the ripening time of the seeds of the red echinacea plant in the experimental field, the condition of the seeds of plants in options 2 and 3 of the experiment from July 20 to August 15, ie once every 4-5 days (seed size, color, degree of adhesion of seeds to branches, degree of moisture content of seeds) were studied. The results of the obtained experiments are given in Table 2 below. According to this table, the seeds ripen from July 20 to August 12. When the seeds were first observed (July 20), the seeds were incomplete, light green (0.6-0.6 mm) in color, the seeds clung tightly to the branches, the seeds were brittle when squeezed by hand, and the humidity was high. It was noted that When the degree of ripening of seeds is determined on August 5 (15 days), their average size is 1-1.2 mm, brown, the seeds are lightly clinging to the branches, do not crush when squeezed by hard hands, dry, moisture level not noticeable.

When the ripening level of the seeds was determined on August 12, the color of the seeds turned dark brown and became very hard, and most of the seeds were spilled on the branches.

In general, observations on the maturation of the seeds of the plant *Echinacea purpurea* L. showed that its seeds are fully mature within 14-16 days after emergence.

During this period, the seeds turn brown, the seeds are 1.0-1.2 mm in diameter, lightly clinging to the branches, and are not crushed when compressed, allowing the seeds to be harvested. It is estimated that 30-40% of them can be spilled after this period.

Seed characteristics of *Echinacea purpurea* L. Abundant and high-quality seeds are obtained in many respects depending on the type of crop, the biological characteristics of the sown variety, the applied agro-technological measures (tillage, sowing method, duration, rate, row spacing, fertilization, irrigation, weed, pest and disease control), timing of harvest, techniques and technologies, seed cleaning, storage.

Table 2.
***Echinacea purpurea* L. seed ripening time.**

Option №	Seed collection period	Seed condition	Seed size, (mm in diameter)
1	20 July	The seeds are small, light brown in color, and the moisture is high when the seeds are firmly attached to the flower stalks.	0,6-0,8mm
2	23 July	The seeds are small, light green, firmly attached to the flower stalk, and the moisture is noticeable when the seeds are squeezed by hand	0,8-1,0mm

3	27 July	The seeds are larger than the previous observation, light brown in color, clinging to the flower stalk, no moisture is felt when the seeds are squeezed by hand, but the seeds are easily crushed.	0,8-1,0mm
4	5 August	Seeds are unchanged, brown, lightly clinging to the branch, not crushed when squeezed by hand, dry, hard	1-1,2mm
5	12 August	The seeds are relatively small, dark brown, shed quickly, the seeds are hard	1,0mm

period of full maturity and the number of seeds formed flower ratio (in%), weight of seeds per plant, and weight of 1000 seeds were determined.

In conclusion, the flowering biology of *Echinacea purpurea* L. grown in the experimental field of Mirzchul region, begins on May 12-15 and lasts until late autumn (October 25-30), the general flowering is in July. The ripening of the seeds takes place from July 22 to August 15. Therefore, it is recommended to collect the full seeds in the 2nd decade of August.

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In the study of seed germination of *Echinacea purpurea* L. in the experimental field, the number of flowers in the baskets during the period when the plant entered the full flowering phase, the number of seeds in the