



GROWTH AND DEVELOPMENT OF *ECHINACEA PURPUREA (L). MOENCH* PLANT IN MIRZACHUL OASIS

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ABSTRACT

The order of sowing the seeds of perennial herb Echinacea purpurea L. belonging to the family Asteraceae in open fields in Mirzachul region of Uzbekistan, seed germination, plant growth and information on developmental biology, flowering biology and seed yield, plant irrigation and cultivation, yield harvesting rules.

Currently, herbal medicines are widely used in world practice. Biologically active substances and extracts of plant origin are most popular in such developed countries as Japan, France, Germany, Italy. In many developing Asian countries (India, Sri Lanka, Mali), herbal medicines are of paramount importance.

In connection with the growing need for obtaining medicinal products from plants, there is an urgent need for the cultivation of many species, especially considering that the collection of raw materials from wild plants is often not profitable for economic reasons. There is a need for industrial production of medicinal plant materials [1]. The problem of increasing the immunity of the human body to various diseases is one of the most acute today. Work is underway to identify plants with immunomodulatory and antiviral properties. One of these plants is *Echinacea purpurea (L). Moench* known to many flower growers [2].

Echinacea purpurea L. Moench is native to North America, first entering European countries and then Central Asia in various ways. In some countries it has been introduced as an ornamental plant, and in some cases echinacea seeds have become widespread as a weed among the seeds of agricultural crops [3]. 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 [4]. *E. purpurea* is recommended for use in patients with depression and during periods of 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. tadi [5]. The surface parts of *E.*



purpurea contain polysaccharides, essential oils, flavanoids, additives, saponins, echinocside glycosides, organic acids, the roots and rhizomes of the underground parts contain inulin, glucose, essential oil, phenolic carbonic acid betaine and resins [6,7]. Given that *Echinacea purpurea* L. is a valuable medicinal plant, in order to meet the demand for raw materials in the pharmaceutical industry of Uzbekistan, it is necessary to plant this plant in different regions of the country, to study its eco-biological properties warming up.

E. purpurea planted in experimental plots around Gulistan, Syrdarya region. Before sowing, the seeds were stratified overnight in an aqueous solution of ash. *Echinacea* seeds are adapted to the weather and soil conditions for planting. The seeds were sown in 2 variants. In Option 1, seeds were sown in rows on prepared plots, and in Option 2, seeds were sown in nests. 3-4 seeds were sown in each nest. It is known that in the treatment of red echinacea used above-ground and underground parts. Therefore, if option 1 provides for a large mass of the plant from the above-ground parts - stems, leaves and flowers, then option 2, which is planted in the nest, should get more mass from the underground parts, ie rhizomes and roots designed. The distance between each nest is 10-15 cm, which allows the plant to grow better in the underground parts. The biological feature of red echinacea is that during the 1st year of vegetation, only the pre-root buds form, ending their vegetation, and the generative phase begins in the 2nd year of vegetation. At the end of the first year of vegetation, 15-20 root balls are formed, and the plant completes its vegetation and enters the winter. In the first year of vegetation, 2 seeds germinate in seeds sown in early spring and last for 35-40 days. The leaves of the plant germinate 9-10 days after sowing and perform assimilation functions together with the seeds, the average length of the seed pods is 5.5 mm and the width is 3.5 mm, the first chin the leaf is on average 10.5 mm long and 6 mm wide, with ovoid, oval edges with straight teeth. Our observations on the experimental site showed that every 10 days, the first, second and third order leaves appeared on the grass. The growth and development of plants has changed dramatically since the introduction of agro-technical measures, such as mowing, grazing, watering, fertilizing. In the first year of vegetation, weeding, mowing, watering after each mowing, feeding with local and mineral fertilizers were carried out 2-3 times a month. More local fertilizers were used in the feeding, as the use of local fertilizers (manure) for medicinal plants is of great ecological and pharmacological importance. As mentioned above, at the end of the first year of vegetation, *E. purpurea* produces 15-20 pre-rooted leaves, in which case the plant completes its vegetation and enters the winter. During the second year of vegetation of *E. purpurea*, in both variants, the period of flower stem formation, weeding and flowering period and duration is from May 5 to June 10, flowering lasts until August 12, seed ripening It runs from August 13 to October 15. It should be noted that when *Echinacea purpurea* L. is planted in rows and nests, the height of the seedlings and the size of the flower are slightly different, so the height and flowers of echinacea in the row planting variant are slightly smaller than those planted in the nest. The main reason for this is that when planted in rows, the seeds and sprouted seedlings are placed close to each other, resulting in the seedlings are slightly smaller in height and flowers than in the nested options, the seedlings in the nested area are tall and the flowers are large, which is related to nutrient content As a result, there are more opportunities for nutrition and development in nested areas. *Echinacea* seedlings, which germinate in early April, form flowering stems in late April



and early May and enter the flowering phase from May 5. The total flowering occurs in the tenth of June. The flowering period of echinacea in both variants begins in early May. corresponds to. In the experimental plot, the general flowering occurs on June 30, and in early August the flowering ends, the duration of flowering is 60-65 days. The ripening of echinacea seeds lasts from the first ten days of August to mid-October. The ripening of the seeds depends on the time of flowering of the echinacea, usually large balls of flowers appear at the main part of the stem, i.e. at the tip, and then the stalks on the lateral branches of the stem bloom, the branches on the stems are arranged in series, the seed They ripen earlier in these first- and second-stage inflorescences and produce quality seeds. Therefore, when preparing raw materials from the surface of the echinacea, it is recommended to first collect the seeds formed in the inflorescence. Then they start collecting raw materials for medicines. It is usually advisable to harvest the raw material during the general flowering period, as this is the period when the plant has the maximum amount of biologically active substances. In order to prepare enough seeds for the next year, the farm needs to set aside separate areas. At the end of the second year of the echinacea vegetation, medicinal raw materials can be prepared from the surface of the plant, so that the seeds ripen when the plants are in full bloom or because of the farm's need for red echinacea seeds. raw materials can be prepared. In the planted area of the experimental plot, one third of each variant was allocated a test area of 1 m², the plant parts were harvested and dried separately in the shade, with an average of 3.1 kg of wet raw material from the row variant. was obtained, and the dried mass was 785 grams. The average wet yield from the nesting area was 2.9 kg per 1 m², and when dried it was 735 grams. The differences between the two types of raw materials are negligible. Calculations show that 3 tons of wet raw material can be prepared from 1 hectare of red echinacea area, which is 760 kg dry. Depending on the type of drug produced in the pharmaceutical industry, red echinacea can be used both wet and dry. Seed productivity. In order to determine the seed yield of the Red echinacea 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 echinacea plant grown in the experimental field varied in different amounts depending on the method of sowing and years of cultivation. Of the variants studied, relatively high seed yields were obtained in 3-year-old plants. The seed yield from this variant averaged 2.34 s / ha. The lowest seed yield in the experimental field was observed in 1 variant, ie in the first year when sowing from seed (0.32 s / ha). In the second variant of the experiment, 0.84 s / ha was obtained from plants sown in the first year, and 2.05 s / ha from the variant sown in the second year (3 variants). In general, by studying the seed yield of *Echinacea purpurea* L., it can be concluded that it is possible to obtain a seed yield of 2.34 s / ha higher than that of 3-year-old plants after sowing. At the first observation of seeds (July 28) the seeds are small, incomplete, light green (0.6-0.6 mm), the seeds are firmly attached to the branches, the seeds are brittle when squeezed by hand, the humidity is high It was noted that When the degree of ripening of seeds is determined on August 10 (15 days), their average size is 1-1.2 mm, brown, the seeds are lightly clinging to the branches, not crushed when squeezed with a hard hand, dry moisture level is not noticeable . When the ripening rate of the seeds was determined on August 15, 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 Red echinacea plant 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. After this period, it is observed that 30-40% of them can be spilled. In the study of seed germination of the Red echinacea plant 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 period of full seed germination and the number of seeds formed during flowering ratio (in%), weight of seeds in one plant and weight of 1000 seeds were determined. During the full flowering phase of the plant, the number of flowers in a basket increased from 80 to 258. The weight of 1000 seeds in the first year of flowering is relatively low mass - 0.75 g, in the second year of flowering the weight of 1000 seeds is relatively heavy - 0.86 g. formed. To determine the purity of the seeds of the red echinacea plant, add 4.0 g of each variant. 3 samples were taken and each seed sample was examined using a separate magnifying glass and fully ripened, all the seeds into one piece, damaged, brushed, crooked, into the second piece, the straw between the seeds, The broken seed pieces were divided into a third piece. Each seed sample was weighed on a separate scale to determine its weight and the percentage of the total sample weight (4.0 g) [7]. From the results it can be concluded that the production of abundant and high-quality seeds depends on the type of crop, the biological characteristics of the cultivated variety, the applied agro-technological measures (tillage, sowing method, duration, norms, row spacing) , fertilization, irrigation, weed, pest and disease control), timing of harvest, techniques and technologies, seed cleaning, storage. The choice of area is important in the cultivation of red echinacea. This plant grows well in fertile soils with light mechanical composition. Therefore, it is desirable that the selected area soils have a high moisture content and fertility of sand. The terrain of the selected area should be as flat as possible, easy to irrigate, free from root weeds. It should be noted that in the vicinity of the fields of red echinacea should not be sources of pollutants - landfills, storage of chemical fertilizers, pesticides and other chemicals. Areas planted with red echinacea should be plowed in the fall and cleared of weeds. In early spring, after plowing, the field should be chiseled, leveled with a harrow, and ready for planting. As mentioned above, red echinacea is mainly propagated by seeds, it is recommended to sow 5-6 kg of seeds per 1 ha of land. The best time to plant red echinacea is the last 10 days of March. The seeds are sown in rows or in clusters. In the first, second and third years of vegetation, depending on the moisture content of the soil, irrigation is repeated for 10-15 days during the growing season, after the seeds are harvested at the expense of moisture generated by spring precipitation, the process will be completed by the end of August. During the growing season, echinacea is watered 5-6 times. Before each irrigation, the field is cleared of weeds and the soil is enriched with local fertilizers to produce more phytomass.

Conclusions: *Echinacea purpurea L. Moench* plant seeds have high germination rates under laboratory conditions, with up to 68% recorded in all variants. *Echinacea purpurea L. Moench* seeds are sown in open ground in late spring.



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