



BIOECOLOGICAL ASPECTS OF SAFFRON ECO-FORMS (*CROCUS SATIVUS* L)

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ABSTRACT

This article discusses the growth and development indicators, bio-ecological features of sowing saffron in the first year of the growing season from different eco-forms. These initial conclusions in subsequent scientific studies are once again confirmed and the optimal variant of ecoforms is selected for organizing a plantation in the soil and climatic conditions of our republic.

KEYWORDS- medicinal, introduction, seed, flower, saffron, eco-form, bioecological properties.

INTRODUCTION

With the growth of the world's population, naturalization of all consumed food products and medicines, the implementation of the basis of these products from natural raw materials has become a large-scale global task. Much work is being done in this direction in Uzbekistan. The government of the republic has taken a number of decisions on the development of this industry. To ensure the implementation of these decisions, a lot of research has been conducted in the field of innovation, and a procedure has been created for the application of their results in production.

One such promising food and medicinal plant is sown saffron (*Crocus sativus* L.). It should be noted that saffron is grown in more than 15 countries around the world and its valuable raw materials are exported.

On the basis of chemical analysis, the adaptation process and bioecological properties of saffron under the conditions of introduction, changes in the anatomical structure of tissues, the chemical composition of raw materials (pollen grains), i.e., the characteristics of dyes (crocin) were studied. According to the results of scientific research, high results are obtained by intensive introduction of large-scale plantations of saffron, which accelerates

the acclimatization of mountain, fertile, water-supplied territories of the country to soil and climatic conditions.

Analyzing the results of introduction and climatic studies, as well as all the data available in world practice on the organization of plantations and the cultivation of raw materials for this plant, since 2017 large-scale maternal saffron plantations have been created in the country with the scientific advice of Scientific Research Center Saffron LLC and the practical participation of LLC "Brand Investment Group".

As a continuation of scientific and practical activities in 2018-2020. the implementation of the state research project BV-A-KX-2018-23 "Organization of collections of eco-forms of saffron (*Crocus sativus* L.) and selection of promising forms of resistance to pests and diseases" is planned, and accordingly, in July 2017, a collection was created eco-forms (Afghanistan, Uzbekistan, Azerbaijan, Holland) of saffron (*Crocus sativus* L.), planted from ready-made corms.

Greening of the corm was observed after 20-22 days in the eco-form of Uzbekistan, after 25-28 days in the eco-form of Azerbaijan, after 35-40 days in the eco-form of Afghanistan and after 17-20 days in the eco-form of Holland. The greening rate

was 100% in the Dutch eco-form, 90-92% in the Uzbek eco-form, 80-85% in the Azerbaijani eco-form, or 25-30% in the Afghan eco-form. Plants entered the generation phase after 45-50 days in the Dutch eco-form, after 55-60 days in the eco-form of Uzbekistan, or after 60-65 days in the eco-forms of Azerbaijan and Afghanistan. The flowering process lasted 5-6 days in plants belonging to all ecoforms. It was observed that the size of the flower and the length of the relative pollinators were significantly better in the eco-shaped plants of the Holland and Uzbekistan.

On 1 August 2018, the saffron corms were dug out of the harvest area and the plant corms were simultaneously planted in the experimental fields.

Soil samples were taken from the field before the experiments were performed. According to agrochemical analyzes, the soil has a quality score of 63 (average fertility), and light gray - sandy. Groundwater is located at a depth of 4-5 m. The soil of the experimental field belongs to the type of soils with moderately heavy mechanical composition and is compacted during cultivation. The water permeability and ion retention structure of the soil is moderate. The first watering was carried out on August 7-8, so that the finished corm after planting fits well into the soil.



Experimental area based on sowing saffron ecoforms and initial irrigation measure (Fig.1).

The first changes in saffron corms were observed on 13–14 September. By this time, on the average, 7-8 white colli 1-2 cm in size appeared on the corms planted in the eco-form of Uzbekistan, and in the eco-forms of Azerbaijan and Holland - 4-5 pieces of white colli 1-2 cm in size. These figures are not recorded in the corms of the Afghan eco-form. In the third decade of September, white roots 10-12 cm high appeared on the saffron bulbs belonging to the

eco-forms of Uzbekistan, Azerbaijan and the Netherlands, and even the first stigmas appeared on the eco-forms of Uzbekistan and Azerbaijan. However, in the eco-forms of Uzbekistan and Holland, the strength and length of the roots were relatively high. When analyzing Figure 2, it turns out that the corm, belonging to the eco-form of Afghanistan, consists of slightly thinner roots and is less numerous.



Uzbekistan

Azerbaijan

Afghanistan

Holland

The initial stage of the rooting and emergence of saffron corms belonging to different ecoforms (Fig. 2).

The most intense phase of the growing process was observed in early October (1-5.10.2018), when it

was noted that 20-21% of corms belonging to the eco-form of Uzbekistan, 30-33% of the eco-form of

Azerbaijan, 60-62% of the eco-form of Holland, or 15-16% of the eco-form of Afghanistan, sprouted and formed a bunch of leaves.

So, when planting saffron in the first decade of August, it turned out that the corms were dormant underground for 50-55 days, and then the growing season began.

Also, if we continue the analysis of the indicators mentioned in our observations, from each bulb or 1 bush: 7-8 stems with green or white tips appeared in the eco-form of Uzbekistan, a leaf blade 4-5 cm long; in the eco-form of Azerbaijan, on average, 6-7 with green tips, the length of the leaf plate is 3-5 cm; in Holland's eco-form 8-9 with green tips, leaf blade length 5-6 cm; and the Afghan eco-form has 3-4 with green tips, a leaf blade 2-3 cm

long, a bunch of leaves on the ground. In the underground parts of the plant, it was found that the bulbs in the eco-form of Uzbekistan have medium and large 55-60 large roots, their length is 15-18 cm. It was noted that on 1 flower shoot 18-20 cm long, thickened to the surface from the core of the bulb, and on a spherical leaf there were 17-18 leaves, or on average 7-8 female shoots 6-8 cm long. The average number of roots in the bulbs of the Azerbaijani ecoform is 40-45, the length is 12-15 cm. From the core of the bulb 1 flower thickened, 14-15 cm long, and 5 female shoots 6-8 cm long. In the Holland ecoform, these figures were 35-40, 25-30 cm, 1 flower stalk 15-17 cm long and 5 female shoots 7-8 cm long, respectively (Figure 3).



Uzbekistan

Azerbaijan

Holland

Afghanistan

The third stage of the process of rooting and sprouting of saffron bulbs belonging to different ecoforms (Fig. 3).

1 of them has a ball of leaves protruding from the ground, the third part of the thorn has 2-3 petals. In the Afghan eco-form, the number of bulbs is low, with 20-25 roots with an average of 8-10 cm per bulb. The roots are thin, gray in color, the length of the flower stalk coming out of the stem of the finished bulb is 4-5 cm and not thickened. In the third part of the thorn protruding from the surface there are 8-10 leaves, the ball is located on the leaves. It was observed that 4 to 4-5 cm of female shoots were formed around the bulbs and were in the process of emergence (Fig. 3).

The budding and flowering stage of the plants was observed from 15 to 20 October. In the eco-form of Uzbekistan, on average, 5-6 bulbs or twigs of each bulb consist of 12-13 petioles. It was noted that the plants belonging to this ecoform have an average of 16-17 buds per return. In the eco-form

of Azerbaijan, these figures are close to the plants of the eco-form of Uzbekistan, the average germination rate of bulbs is 88.9%, and the number of leaf stalks from each bulb is 3-4. In this ecoform, there are an average of 14-15 buds per return. Although the level of germination in plants in the Holland ecoform did not change compared to the previous figure, the surface growth of stem cones was accelerated. In each bulb, the stems have an average of 4-5 petals, 12-13 leaves, and they are 12-13 cm long. It was also observed that an average of 1 bud per initial bulb or flowering period was observed during the observation period. From October 18 to 25, an average of 60 flowers were collected from plants grown from bulbs planted in the Dutch eco-form.



Uzbekistan

Azerbaijan

Holland

Afghanistan

The stage of budding and flowering of bulbs of saffron bulbs belonging to different ecoforms (Fig. 4).

The growth and development of plants belonging to the Afghan ecoform is relatively low, with an average of 2.4 coniferous stems formed on each ending bulb. On the petals 9-10 leaves 8-9 cm long. It was observed that one out of every 10 finished onions entered the budding stage (Figure 4).

It was noted in the experiments that the plants were going from the budding stage to the mass flowering stage. The flowering stage of plants belonging to different ecoforms averaged 10-15 days. During this period, the flowering stage of plants belonging to the eco-form of Uzbekistan is 2-3 days later, but it takes a short time (8 days) to reach the flowering stage and averages 1.57 per plant, an average of 0.77 per plant, a longer onset or longer duration of flowering in Dutch ecopharyngeal plants, and an average of 1.17 per plant, and a longer and shorter flowering period in Afghan ecoform plants. an average of 0.14 flowers were observed.

After the end of the flowering phase, the growth rate of the above-ground and underground organs of the plant accelerates. From this point on, with the formation of roots under the flower stalks formed in the bulbs, the mother begins to see the new

maiden onion, clinging to the bulb. At the top of the ground the leaves on the ball grow longer. On days 120-122 of the growing season, the average length of leaves on the petals of plants belonging to the ecoform of Uzbekistan is 17.6 cm and the average number is 13.6, in the ecoform of Azerbaijan it is 16.7 cm and 10.7, in the Holland ecoform 20.3 cm and 12.0 and 15.7 cm and 10.0 in the Afghan ecoform.

Thus, in the soil and climatic conditions of the republic, the growth rate of saffron plants belonging to the eco-forms of Uzbekistan and Holland and, according to a number of indicators, Azerbaijan, is high, and it can be noted that this process is much slower among eco-formers in Afghanistan. That is, it is observed that the growth of vegetative organs of plants at the stage of flowering or at the end of the stage differs significantly from each other. In the ecoforms of Uzbekistan, the Holland and Azerbaijan, the process of plant growth and the generative stage are more rapid, or, conversely, in the ecoform of Afghanistan, these figures are slightly lower.



Biometric indicators and productivity of vegetative organs in the period from the Table

Eco-forms	Greening, pcs		Number of bulbous stems on whole corm or ground, pcs.		Number of leaves on petioles, pcs	The length of the leaves on the petioles, cm	Number of flowers, pcs		Productivity, kg / ha
	1 m	ha	1 m	ha			1 m	ha	
Uzbekistan	5.27	52700	35.8	358000	13.6	17.6	8.27	82667	0.41334
Azerbaijan	5.53	55330	28.3	283000	10.7	16.7	4.27	42667	0.21334
Afghanistan	4.27	42661	21.2	212000	10.0	15.7	0.60	6000	0.03000
Holland	5.06	50666	29.9	299000	12.0	20.3	5.93	59333	0.29667

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