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Study of Mineral Fertilizer Requirements of Geranium Sanguineum L Plant in Mirzachul

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ABSTRACT

*In the work of this study, the plant Geranium sanginum L. was grown and analyzed in 3 regions of the Mirzachol zone of the Republic of Uzbekistan (Boyovut district, Khovos district and Yangiyer city). In conducting this research, the chemical composition, pharmacological properties and growth indicators of the Geranium sanginum L. plant were studied and analyzed. Based on the data, the plant Geranium sanguineum L. adds nitrogen mineral fertilizer (NH4NO3), potassium nitrate mineral fertilizer (KNO3), Supperphosphate mineral fertilizer (Ca (H2 PO4)2) to these soils. *H2O*H2SO4) without solution and the development of the plant was monitored. During the observation, the length of the plant, the length of the plant leaf, the number of leaves, and the number of branches were monitored, and the obtained results were analyzed for 4 months.*

Introduction.

Since ancient times, people have widely used plants in medicine. By studying its composition, it is proven that many diseases can be treated today. This causes an increase in interest in medicinal plants (Rates, S.M.K., 2001). Geranium sanginum L. is one of such medicinal plants.

The plant Geranium sanguineum L. grows in the European part of the globe, including the Crimea in the western part of Russia and the Caucasus, Scandinavia, Central and Southern Europe, the Western Mediterranean Sea, and the Balkan Peninsula. It is often found in sparse forests, lawns, forest edges, and among bushes. A long-stemmed vegetative plant, new leaves form each season. At the end of the autumn season, the leaves and stems turn reddish, so it is called "Red blood flower" in some literature. In the winter season, the stem itself remains, and the leaves fall off [Zomfler, B., 1994.].

Geranium sanguineum L. is a rhizome perennial plant. The stem is long-branched, 20-50 cm high, covered with long, dense and coarse hairs. The stem and lower leaves often turn red by autumn. Leaves long hairy, leaf blade kidney-shaped or rounded, distinctly deeply lobed, deeply divided into 5-7 lobes, hairy leaves in turn divided into other 3-5 linear or lanceolate lobes, below covered with long white hairs. The peduncle is long, the flowers are single, common marigold, marigold, marigold and five stamens each. Petals are oblong-ovate and end with spines. The petals are purple. Sepals are twice as long as sepals and end with toothed edges (15-20 mm). Ovary five-celled, five-lipped, with five filiform stigmas. The fruit is divided into fractional, one-seeded parts. It blooms in June-July, bears fruit in July-September.

Today, there are about 400 species of the Geranium genus, which are widely distributed mainly in

mountains, temperate and tropical regions (Zomfler, B., 1994.). Geranium plants usually spread on short, thick rhizomes, but some have rhizomes or fast-spreading rhizomes, with flowers in shades of blue or pink. This plant is mainly planted as an ornamental flower in Europe (Klett, J.E., Cox, R.A., 1995.).

Herbs (stems, leaves, flowers), flowers and roots are harvested for medicinal purposes. Grass and flowers are harvested in June-August, roots - in September-October. The whole plant contains a large amount of tannins (up to 16% of fresh flowers), carotene, vitamin C, bitter, resinous and mucilaginous substances and other compounds.

Preparations of Geranium sanguineum L have astringent, analgesic, anti-inflammatory, antiseptic, hemostatic effects and have the ability to dissolve salt deposits in nephrolithiasis. Geranium sanguineum L tinctures are used for diarrhea, nephrolithiasis, rheumatism, gout in adults and children, as well as a hemostatic agent for uterine, lung and nosebleeds, in inflammatory processes of the mucous membrane of the oral cavity. and used in the treatment of skin diseases (Baytop, T., 1984.). In folk medicine, decoctions made from the root of the plant are used for internal bleeding, as well as for washing bleeding gums and purulent wounds, as an anti-inflammatory and pain reliever for sore throats.

The roots of Geranium sanguineum have been proven to have an astringent and anti-inflammatory effect in bronchitis, pulmonary tuberculosis, diarrhea, gastrointestinal diseases, and dysentery. Geranium sanguineum L is prescribed externally for bleeding. For example, when bleeding from the nose (in the form of a tincture for tampons), from skin diseases, fistula, itchy skin inflammation, purulent cuts, wounds and skin diseases accompanied by itching, local baths, washes, lotions and tinctures from plant organs are used in the form of compresses . A decoction of Geranium sanguineum is used for baths for broken bones, gargles for sore throats, and head washes for hair loss.

In ancient Japan, Geranium leaves were used as an anti-diarrheal agent (Fujiki, H. et al. 2003) and have been found to have strong anti-influenza effects (Sokmen, M. et al. 2005).

When the polyphenols contained in the plant Geranium sanguineum L were analyzed, the presence of free radicals in its composition (Haslam, E., 1966.) and their antioxidant activity, the effects of vitamins A and E were studied (Rice-Evans, 1977.).

In addition, plant extract contains active antioxidants (Aruoma, O.I. 1996), flavanoids (Habtemariam, S., 1997.), tannins (Haslam, E., 1966.), polyphenolic acids (Rice-Evans, C.A., 1977.) , catechins and proanthocyanidins (Plumb, G.W.,1998).

Research in mice showed that the polyphenolic complex contained in the extract prepared from Geranium sanguineum L. protected them from the influenza virus (Serkedjieva, J. and Manolova, N., 1992.).

Laboratory analysis of the polyphenol complex revealed that it contains 11.02% tannins, 0.14% flavonoids, 2.1 mg/kg catechins and proanthocyanidins (Ivancheva, S., 1992).

Another study on Geranium sanguineum extract identified the following components: caffeic acid (1.30 mg/g), caffeic acid (2.41 mg/g), hyperoside (1.64 mg/g), isoquercitrin (2, 58 mg / g), rutin (1.71 mg). / g), quercitrin (0.42 mg / g), quercetin (0.82 mg / g), kaempferol (0.19 mg / g) (C. Manach et al. 2004).

Phenols are not in the same chemical form in food products and biological fluids, because they are first of all converted into glucuronides, sulfates or methylated forms in the body (R.F. Guerrero et al., 2009, S. Scholz, G. Williamson, 2007). Phenolic compounds have many biological effects and have antioxidant properties (B. Yang, et al., 2001, D.E. Pratt, 1992, D.E. Pratt, 1992).

The occurrence and number of aglycones in flavonoids (flavonoid glycosides) play an important role in their antioxidant activity, since aglycones are stronger antioxidants than glycosides [S. Kumar,

A.K. Pandey, 2013].

Materials and methods

Research Soil samples from 3 regions of the Mirzachol region of the Republic of Uzbekistan (Yangiyer city, Boyovut and Khovos districts) were taken according to the established procedure for laboratory analysis, and the results of laboratory analysis were conducted. According to the results of the analysis, the soil of Boyovut district is not saline (electrical conductivity 0.134 mS/cm), the soil of Yangiyer city is weakly saline (electrical conductivity 0.9 mS/cm), and the soil of Khovos district is average salinity (electrical conductivity 1.72 mS/cm) and soil moisture (moisture level of 100 g of soil is 18% in Boyovut district, 20% in Yangiyer city, 16.5% in Khovos district).

After that, Geranium sanguineum (L) plants planted in soils with different salinity levels were treated with solutions with different concentrations of mineral fertilizers, and observation, comparison, ecological morphological, ontogenetic and experimental methods were experimented with.

Results

Subtitle

Based on the obtained results, the rhizomes of the Geranium sanguineum (L) plant were treated with organic fertilizer in the ratio of 1:1 to the soil samples of each district and planted through the planting scheme. Geranium sanguineum L plants were treated with mineral fertilizers at certain concentrations and the effect on the growth rate was studied. Solutions made from mineral fertilizers were prepared in the following concentration. Potassium fertilizer with 0.1%, potassium fertilizer with 0.01%, potassium fertilizer with 0.001%, nitrogen fertilizer with 0.1%, nitrogen fertilizer with 0.01%, nitrogen fertilizer with 0.001%, phosphorus fertilizer with 0.1%, phosphorus fertilizer with 0.01%, phosphorus fertilizer with 0.001% and normal. The first samples of our planted plants started to germinate on 9.03.2022. After that, the results of the plants were recorded every 10 days (decade). The following table shows the seasonal results of the plants planted in the soil of Boyovut district and Yangiyer city. None of the plant samples planted in the soil of Khavos district came out. It can be seen that Geranium sanguineum (L) cannot grow in medium salinity soil. (Tab. 1).

Table 1. Growth parameters of Geranium sanguineum plant as a result of the influence of mineral fertilizers.

Mineral fertilizer	Concentration policy	Every 10 days (Decade)	The length of the plant		Leaf length		Number of leaves		Horn number	
			Boyovut district	Yangiyer city	Boyovut district	Yangiyer city	Boyovut district	Yangiyer city	Boyovut district	Yangiyer city
Nitrogenous	0.01%	1st decade	1 sm	1.4 sm	0.4 sm	0.8 sm	1 ta	3	1	5
		2nd decade	2.3 sm	3 sm	1.5 sm	2.1 sm	8	6	4	7
		3rd decade	3.2 sm	4.1 sm	2.2 sm	2.8 sm	12	8	7	9
		4th decade	3.9 sm	4.2 sm	2.5 sm	3 sm	14	10	8	11
		5th decade	4.3 sm	4.5 sm	2.9 sm	3.5 sm	14	13	9	13
		6th decade	4.7 sm	5 sm	3.5 sm	4 sm	15	15	11	14
		7th decade	5.3 sm	5.5 sm	4.1 sm	4.5 sm	17	18	13	16
		8th decade	5.5 sm	5.7 sm	4.3 sm	4.7 sm	18	19	13	17
		9th decade	6.5 sm	6.6 sm	4.6 sm	4.8 sm	18	19	13	17

		10th decade	7.6 sm	8 sm	4.7 sm	4.9 sm	18	19	13	17
Phosphorous	0.001%	**1st decade**	1.8 sm	0.8 sm	0.8 sm	0.4 sm	2	-	2	1
		2nd decade	2.3 sm	1.2sm	2.1 sm	1 sm	8	3	4	5
		3rd decade	3.4 sm	2 sm	2.7 sm	1.3 sm	12	7	5	9
		4th decade	4.2 sm	3 sm	3.2 sm	1.8 sm	14	9	7	11
		5th decade	4.8 sm	3.5 sm	3.7 sm	2.3 sm	15	11	9	13
		6th decade	5.5 sm	4.2 sm	4 sm	2.8 sm	16	14	11	14
		7th decade	5.7 sm	4.4 sm	4.1 sm	3.2 sm	17	15	12	15
		8th decade	6.3 sm	5.3 sm	4.5 sm	3.8 sm	18	16	14	17
		9th decade	7.2 sm	6.5 sm	5 sm	4.4 sm	18	16	14	17
		10th decade	8.5 sm	8.3 sm	5.4 sm	5 sm	18	16	14	17
Normal	0,00%	**1st decade**	1 sm	1.5 sm	0.3 sm	0.8 sm	2	1	2	3
		2nd decade	3.2 sm	3.3 sm	1.9 sm	1.8 sm	6	3	5	5
		3rd decade	3.8 sm	4.2 sm	2.8sm	2.5 sm	12	7	10	11
		4th decade	5.8 sm	6.1 sm	3.5 sm	3.9 sm	12	8	11	12
		5th decade	7.6 sm	7.8 sm	4 sm	5.2 sm	14	11	14	13
		6th decade	8.3sm	8.5 sm	4.3 sm	6 sm	15	13	15	15
		7th decade	9.5 sm	10.3 sm	5.5 sm	6.9 sm	16	17	17	17
		8th decade	10.7 sm	11.4 sm	6.1 sm	7.5 sm	17	17	18	18
		9th decade	11.7 sm	12.6 sm	6.6 sm	7.8 sm	17	17	18	18
		10th decade	12.3 sm	13.2 sm	6.8 sm	8 sm	17	17	18	18
Nitrogenous	0.001%	**1st decade**	1.3 sm	1.1 sm	0.3 sm	0.4 sm	3	4	3	7
		2nd decade	1.8 sm	2.7 sm	1.2 sm	1.3 sm	5	7	5	11
		3rd decade	3.2 sm	3.6 sm	2.5 sm	2.4 sm	10	11	10	15
		4th decade	3.5 sm	4.2 sm	3 sm	2.8 sm	11	12	11	15
		5th decade	4 sm	4.6 sm	3.7 sm	3.5 sm	13	14	12	17
		6th decade	4.2 sm	5 sm	4 sm	3.8 sm	13	15	13	18
		7th decade	4.6 sm	5.5 sm	4.2 sm	4.2 sm	15	16	15	18
		8th decade	5.3 sm	6.2 sm	4.6 sm	4.5 sm	16	17	16	18
		9th decade	6.5 sm	7.2 sm	4.8 sm	4.7 sm	16	17	16	18

		10th decade	6.8 sm	7.5 sm	4.8 sm	4.7 sm	16	17	16	18
Potassium	0.1%	**1st decade**	0.8 sm	1 sm	0.3 sm	0.3 sm	3	3	3	5
		2nd decade	3.8 sm	3.1 sm	1.8 sm	1.5 sm	15	8	4	11
		3rd decade	5 sm	4.8 sm	2.9 sm	2.2 sm	24	15	10	17
		4th decade	5.8 sm	5.9 sm	3.3 sm	2.9 sm	24	16	14	17
		5th decade	7 sm	7.2 sm	4 sm	3.5 sm	24	18	17	20
		6th decade	7.8 sm	8 sm	4.5 sm	4.3 sm	24	18	18	21
		7th decade	8.3 sm	8.5 sm	4.9 sm	4.8 sm	24	19	19	21
		8th decade	9.3 sm	9.5 sm	5.5 sm	5.6sm	24	20	20	21
		9th decade	9.8 sm	10.3 sm	5.8 sm	6.1sm	24	20	20	21
		10th decade	10.5 sm	10.8 sm	6 sm	6.3sm	24	20	20	21
Phosphorous	0.01%	**1st decade**	0.5 sm	1.5 sm	0.5 sm	-	3	1	2	2
		2nd decade	1.6 sm	1.8 sm	1.3 sm	0.8 sm	4	3	3	5
		3rd decade	2.2 sm	2.4 sm	1.9 sm	1.4 sm	7	6	6	6
		4th decade	2.9 sm	2.9 sm	2.5 sm	2 sm	9	7	7	8
		5th decade	3.7 sm	3.6 sm	3.1 sm	2.5 sm	11	8	9	10
		6th decade	4 sm	3.8 sm	3.3 sm	2.8 sm	13	9	10	11
		7th decade	4.7 sm	4.6 sm	3.8 sm	3.3 sm	13	9	10	11
		8th decade	5.2 sm	5.3 sm	4.3 sm	3.8 sm	13	9	10	11
Potassium	0.001%	**1st decade**	1 sm	1 sm	0.8 sm	0.3 sm	1	3	1	5
		2nd decade	3.8 sm	3.1 sm	2 sm	1.5 sm	13	9	12	12
		3rd decade	4.1 sm	4.3 sm	2.4 sm	2.2 sm	14	15	13	17
		4th decade	4.8 sm	4.5 sm	2.8 sm	2.5 sm	15	18	13	17
		5th decade	5.5 sm	5.2 sm	3.3 sm	3.2 sm	18	19	15	17
		6th decade	5.9 sm	6 sm	4 sm	3.8 sm	19	21	16	18
		7th decade	6.6 sm	6.7 sm	4.6 sm	4.5 sm	21	23	18	18
		8th decade	6.8 sm	7 sm	5 sm	4.8 sm	22	24	19	18
		9th decade	7.4 sm	7.6 sm	5.4 sm	5.2 sm	22	24	19	18
		10th decade	7.9 sm	8.1 sm	5.5 sm	5.8 sm	22	24	19	18
Phosphorous	0.1%	**1st decade**	1 sm	1.5 sm	0.5 sm	0.7 sm	1	4	1	6

		2nd decade	1.9 sm	2.8 sm	1 sm	1.4 sm	6	9	5	10
		3rd decade	2.8 sm	3.2 sm	1.8 sm	2.2 sm	10	11	7	13
		4th decade	3 sm	3.6 sm	2.2 sm	2.8 sm	12	13	18	15
		5th decade	3.5 sm	4.2 sm	2.8 sm	3.4 sm	13	14	18	16
		6th decade	4 sm	4.8 sm	3.4 sm	4 sm	15	16	18	18
		7th decade	4.5 sm	5.3 sm	4.1 sm	4.5 sm	17	18	19	19
		8th decade	5.1 sm	5.9 sm	4.8 sm	4.8 sm	18	18	19	20
		9th decade	5.5 sm	6.4 sm	5 sm	5 sm	18	18	19	20
		10th decade	6.6 sm	7 sm	5.3 sm	5.5 sm	18	18	19	20
Nitrogenous	0.1%	**1st decade**	1.3 sm	1.5 sm	0.5 sm	0.8 sm	1	2	1	3
		2nd decade	2.5 sm	3 sm	1.4 sm	2.3 sm	4	5	5	7
		3rd decade	2.9 sm	3.3 sm	2 sm	2.8 sm	7	9	7	10
		4th decade	3 sm	3.6 sm	2.2 sm	3.5 sm	9	11	9	10
		5th decade	3.5 sm	4.2 sm	2.8 sm	4.1 sm	11	13	11	12
		6th decade	4 sm	4.8 sm	3.4 sm	4.6 sm	12	15	12	14
		7th decade	4.7 sm	5.3 sm	4.1 sm	5 sm	15	17	16	17
		8th decade	5.6 sm	6.2 sm	4.8 sm	5.3 sm	16	18	17	18
		9th decade	6.1 sm	6.5 sm	5.1 sm	5.3 sm	16	18	17	18
		10th decade	7.6 sm	7.8 sm	5.7 sm	5.3 sm	16	18	17	18
Potassium	0.01%	**1st decade**	0.8 sm	1 sm	0.5 sm	0.8 sm	1	2	1	3
		2nd decade	2 sm	2.2 sm	1.4 sm	2.3 sm	4	5	5	7
		3rd decade	3. 2 sm	3.5 sm	2 sm	2.8 sm	7	9	7	10
		4th decade	3.3 sm	3.5 sm	2.2 sm	2.8 sm	8	9	8	10
		5th decade	3.8 sm	3.9 sm	3.1 sm	3.3 sm	11	12	10	11
		6th decade	4.5 sm	4.5 sm	3.7 sm	4 sm	13	15	13	14
		7th decade	5 sm	5.2 sm	4.3 sm	4.5 sm	15	16	16	15
		8th decade	5.6 sm	5.5 sm	4.5 sm	4.9 sm	16	17	17	17
		9th decade	7 sm	6.8 sm	5.5 sm	5.9 sm	16	17	17	17
		10th decade	8.4 sm	8.7 sm	6.1 sm	6.5 sm	16	17	17	17

Discussion

Fertilization of Geranium sanguineum seeds formed in weak, moderate and strong salinity increased with increasing temperature and reached the maximum value (87.7-94.6% on average) at 24-28 ^{o}C. A high (30-34 ^{o}C) increase in temperature had a negative effect on Geranium sanguineum seed germination, causing it to drop to 15.6-25% on average.

Geranium sanguineum seeds formed in bushes grown in strong, weak and medium salinity soils differed significantly in all indicators of germination.

Conclusions. The results of the experiment showed that Geranium sanguvineum L. when treated with mineral fertilizers 0.1 Plant samples treated with % solutions gave good results. When treated with 1%, 0.1%, 0.01% solutions of KNO3, plant samples treated with 0.1% solution gave good results. However, it was observed that the growth rate of plant samples treated with Ca(H2 PO4)2 *H2O*H2SO4 was low.

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