

INFLUENCE OF MINERAL NUTRITION ON RUTIN BIOSYNTHESIS BY ARTICHOKE
PRICKLY

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On the base of conducted research authors consider that cultivation of artichoke prickly at average provision of soil with phosphorus against a background of ammonium sulphate, which is the best form of nitric fertilizer, promotes strengthening of rutin and luteoline biosynthesis in medicinal plant raw material of artichoke prickly.

Authors also note that in purpose of increasing content of rutin and luteoline in plant raw material (over ground part of artichoke prickly) rising its biomass it is reasonable to apply into the soil ammonium sulphate in dose of 150 kg/ha.

Objective. It is known that nitric, phosphoric and potassium nutrition plays important role in cultivation of agricultural, medicinal and other plants. In this connection in agricultural practice special attention is paid to them in growing of these plants[1,2,4,]. Taking into consideration the above-stated we aimed to study the influence of various forms of nitric fertilizers, and also degree of provision the soil with phosphorus to biomass of artichoke prickly and content of rutin in its raw material.

Materials and methods of research. Experimental work was carried out during 2012 – 2016 years on the experimental lot of the Tashkent pharmaceutical institute.

In over ground part of plant content of rutin was determined in accordance with SP XI of edition[2]. Mineral fertilizers were used in following forms: nitrogen in the form of ammoniac salt petre, urea and ammonium sulphate, phosphorus—in the form of superphosphate and potassium in the form of potassium chloride.

Results. The results of conducted by us research ascertained that with increasing of provision the soil with phosphorus, regardless of nitric fertilizers forms, content of biologically active substances in medicinal plant raw material of artichoke prickly is being increased (Table 1).

Table 1

Influence of different forms of nitric fertilizers on content of rutin in over ground part of artichoke prickly in % per dry substance

Variant's name	Buds	Flowers	Fruits	Leaves
1. Control (without fertilizers)	10,2	11,2	12,5	12,8
2. P + K (ground)	12,4	13,5	17,5	15,4
3. NH ₄ NO ₃ + ground	19,6	14,8	19,8	18,7
4. (NH ₄) ₂ S0 ₄ + ground	23,6	25,9	23,7	21,3
5. CO (NH ₂) ₂ + ground	20,6	21,6	22,1	19,7

But it should be noted that increasing content of biologically active substances in raw material of artichoke prickly depending on degree of provision the soil with phosphorus in the range of «average» and «high» is not considerable, according to the amount of this nutrition element in the soil. It testifies to the fact that further rising provision of soil with phosphorus from «average» to «high» doesn't lead to notice able in creasing rutin content in raw material of artichoke prickly. As show results of our research from all variety of used nitric fertilizers when applied into the soil of urea and ammonium sulphate it is more activated synthesis of biologically active substances in medicinal plant raw material of artichoke prickly than in applying ammoniac salt petre. Researchers [6] mention that synthetic processes and outflow of these substances from leaves into other organs of plant organism are related to oxidative-reducing potential. For example, intensification of oxidation activity promotes acceleration of substances outflow from leaves into other organs and

vice versa, that leads to increasing intensity of synthetic processes. That is why with rising provision of soil with phosphorus it is observed displacement intensification of oxidative-reducing potential of leaves cells of artichoke prickly to prevalence of reducing reactions overoxidative.

Table 2

Influence of different doses of ammonium sulphate on rutin content in different organs of artichoke prickly in % per dry substance

№	Variant's name	Buds	Flowers	Fruits	Leaves
1.	Control(without fertilizers)	11,1	10,2	10,8	12,6
2.	P + K (ground)	12,8	11,6	14,8	14,9
3.	(NH ₄) ₂ S0 ₄ 100 kg/ha	16,3	14,8	15,1	16,6
4.	(NH ₄) ₂ S0 ₄ 125 kg/ha	18,8	18,2	18,8	20,7
5.	(NH ₄) ₂ S0 ₄ 150 kg/ha	23,6	20,2	23,5	24,8
6.	(NH ₄) ₂ S0 ₄ 200 kg/ha	23,7	20,4	23,4	25,1

Perhaps it explains direct correlation between pH, Eh, and H₂ from one side and rutin content in raw material of artichoke prickly from another side, which occurs under influence of mineral fertilizers (N.P.K.). Research conducted by us ascertained that, increasing the dose applied into the soil of ammonium sulphate the content of rutin is increased (Table 2).

But when applying ammonium sulphate in doses of 150 and 200 kg/ha according to rutin content the reliable noticeable differences between the mare not revealed. In this regard, from economical point of view we consider reasonable to apply sulfur-containing nitric fertilizer of ammonium sulfate in doses of 150 kg/ha.

Conclusion.1. Cultivation of artichoke prickly at average provision of soil with phosphors against a background of urea, particularly ammonium sulphate, which are the best forms of nitric fertilizers promote intensification of rutin biosynthesis in medicinal plant raw material.

2. In purposes of rising content of rutin in raw material, (in overground part of artichoke prickly) and increasing its biomass it is reasonable applying into the soil ammonium sulphate in a dose of 150 kg/ha.

References

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