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INFLUENCE OF POTASSIUM FERTILIZATION IN PLANT OF POTATOES

NDIKIMI I PLEHRIMIT POTASIK NE BIMEN E PATATES

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Abstract: *Potatoes are plant with a high concentration of starch. It is distinguee for high nutritious and curative capacity with wide range of usage. Its productivity is influenced by: soil type, its fertility, technology of cultivation. Optimal bases of K_2O (K2SO4) are primary depended by soil type as well as the parameters of technology of cultivation. The absence symptoms of potassium can be observed by a dark brown colour in leaf, curl of apex and the necrosis. Leaf fertilization is recommended when absences of potassium is very high and caused by a long dryness or grow of plant in alluvial argil soil. Traditional fertilization methods are applied. Potassium doses influence the altitude of plant, number of shoot, contents of plant residue starch and its productivity. Influence of potassium fertilization of plant potatoes was carried during the 2002-2004 period, near the IPPT (Institute of Vegetable-Potatoes in Tirana). Experiments were repeated four times in five different variants with different levels of fertilization (0, 50, 100, 150, 200 kg/ha a.s.) in soils with medium concentration of nitrogen and potassium. Was evaluated: technology of plant, penology, growth dynamics, number of shoot, number of tuber root, resistance to diseases, indication of production, economic evaluation and starch content. Based on this indication it concludes that the best recommendation doses is 150-200 kg/ha active material potassium.*

Permbledhje: *Patatja është bimë me permbajtje të lartë amidoni. Ajo dallohet për aftësi të lartë ushqyese dhe kuruese, Në rendimentin e saj ndikojnë: tipi i tokës, pjelloria e saj dhe kushtet agroteknike të kultivimit. Baza optimale e K_2O (K2SO4) varet nga tipi i tokës dhe nga teknologjia e kultivimit. Simptoma e mungesës së potasit është shfaqja e ngjyrës kafe të errët tek gjethet, majat e tyre përdridhen dhe nekrotizohen, kurse gjethja qëndron e mbyllur. Plehrimi gjethor këshillohet kur mungesa e potasit është serioze dhe e shkaktuar nga thatësira e tejzgjatur ose nga rritja e bimës në toka argjilore. Doza e potasit ndikon në morfologjinë dhe fiziologjinë e bimës. Ndikimi i plehrimit potasik në bimën e patates u studiua gjatë periudhës 2002-2004 pranë IPPT. Eksperimenti u ngrit në pesë variante me nga katër përsëritje në toka me pjellori mesatare të përmbajtjes konstante të fosforit dhe azotit dhe me doza të ndryshme të potasit. U vlerësuan tregues të ndryshëm mbi bazën e të cilëve u arrit në përfundimin se doza më e mirë e rekomanduar është 150-200 kg/ha lëndë aktive potas.*

Key words: *Potatoes, potassium fertilizer, starch, nitrogen, technology of cultivation;*
Fjalët kyçe*: Patate, plehrim potasik, amidon, azot, teknologjia e kultivimi*

INTRODUCTION

Potatoes are starch production plant. It is mainly cultivated in sandy soil, for normal growth of tuber. Soil cultivation depends on structure, climax and plants that were cultivation before potatoes. Optimal quantity of organic and an organic fertilization depend on productivity, soil fertility and biological needs. Potash fertilization is very important in the

quality of potatoes production. This paper is based in the two years study. Within increasing the doses of the potash fertilization we have improvement of production indicator of potatoes. Using of 150 -200 kg/ha potash is fruitful for all indicators. Optimal quantity of organic fertilization depended: concentration of organic matter in soil, productivity and economical conditions. In soils with low concentration of phosphor we have to use doses with 200 kg/ha of phosphor quantity [12]. Most suitable of potash fertility is potassium sulphate that contains 45-52% potash and 18% sulfur according to indication the company that producing the fertilizer, HAIFA in Israel. Absences of potash in soil conduct a decrease of concentration of starch in tuber. Leaf fertilization is recommended when absences of potassium is very high and caused by a long dryness or grow of plant in alluvial argil soil [13].

MATERIALS AND METHODES

Experiment was carried out in constant concentration fertilizer of nitrogen, phosphor and different doses potash. Experiment was set-up near the Institute of Vegetable-Potatoes in Tirana (IPPT) during the 2002-2004 period, [1,2]. Experiments were established in five different variants with different levels of fertilization potash (0, 50, 100, 150, 200 kg/ha a.s.) in soils with standard concentration of nitrogen and phosphor with repeated four. Total area of experiment was 550 m^2 and area of each variant was 21 m^2. Quantity of chemical fertilizer [3,4,5] is done according to table 1. Distribution of chemical fertilizer was done by centrifugal fertilizer broadcaster NARDI type with capacity of 6 kv and with a maximum jet distance of 12m. Distribution of organic fertilizer was done by a wagon distributor TERRA 300 DD with carrying capacity 2.5 ton and registry 50-200 kv/ha .

Tabel 1

	Phosphor (kg/ha)	*Nitrogen (kg/ha)*	*Potash (kg/ha)*
Variant I	*150*	*150*	*0*
Variant II	*150*	*150*	*50*
Variant III	*150*	*150*	*100*
Variant IV	*150*	*150*	*150*
Variant V	*150*	*150*	*200*

Indicators that were evaluated:

a. Phenology and biometric indicators: plant period, growth dynamics, plant height, number of shoot/plant [6, 7,11].

b. Productivity indicators: productivity, product/plant, number of tuber/plant [8,9,10].

c. Chemical analyses: concentration of dry matter, starch concentration.

RESULTS AND DISCUSIONS

a. *Phenology and biometric indicators*

Experiment was carried out during the 2002-2004 period [1, 2]. According to the used methods are analyze all indicators. Variation of plant period is presented in figure 1.

From data comparison results that plant period change according to potash fertilizer. Is in according plant period is in accordance correlation within increase of potash fertilizer. Growth dynamics of shoot was not influence in the interval 0-50 kg/ha potash. Within the increase of potash, increase shoots height. Furthermore that nitrogen, phosphor and potash, have an important role in growth of shoot (figure 2).

Number of shoot is important indicators in production. Analyzing the figures 3, 4, 5 we can observed that a correlation between quantity of potash and number of tuber, leaf surfaces number of shoot. Potash fertilizer has positive influence in growth of shoot.

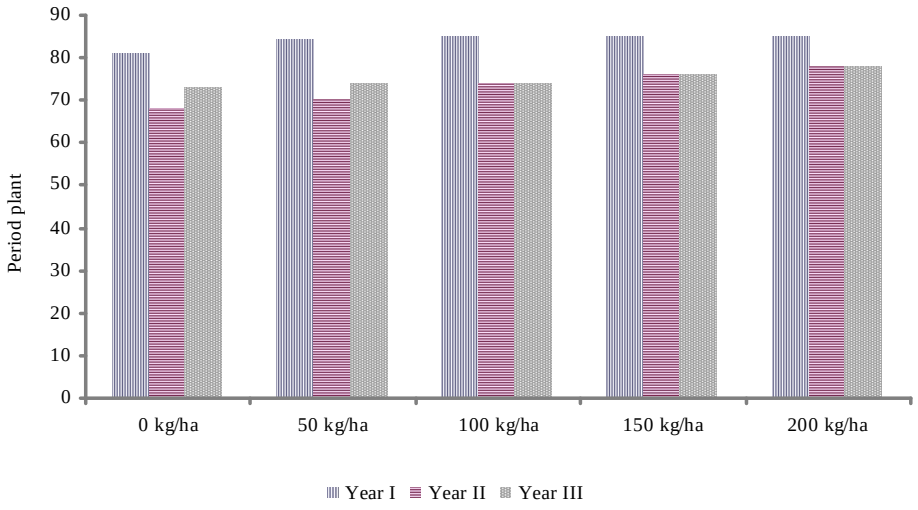

Figure 1. Variation of plant period during three years

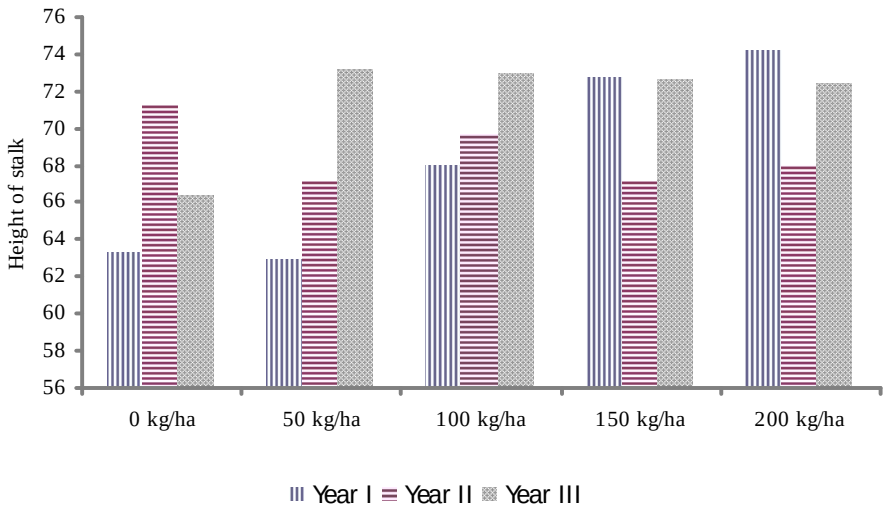

Figure 2. Variation of height of shoot drying three years

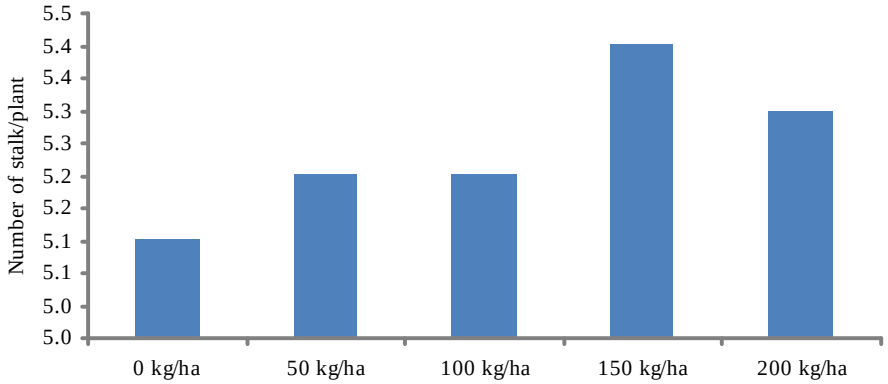

Figure 3. Influence of potash fertilizer in number of stalk.

Potash have a little effect in plant period and height plant shoot, and high effect in number of shoot/plant. The highest value of shoot/plant was determined in doses 150 kg/ha a.s. potash. Within the increase of doses this effect will decrease.

b. **Indicators of production**

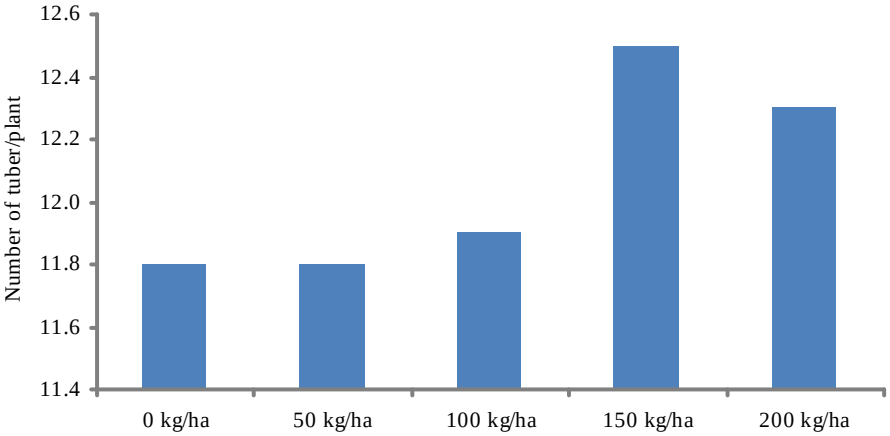

Figure 4. Influence of potash fertilizer in number of tuber/plant

The number of tubers/plant is influenced from the increasing of potash fertilizer, in a non- rhythmic form. The high number of tuber/plant is appeared during the application of 150 kg/ha potash, (figure 4). Production of tubers/plant express more clearly influence of potash fertilizer. Increasing of doses of potash, increase weight of product/plant. Between fourth (150 kg/ha a.s. potash) and fifth (0 kg/ha a.s. potash) variant increase of plant production is 60%, (figure 5).

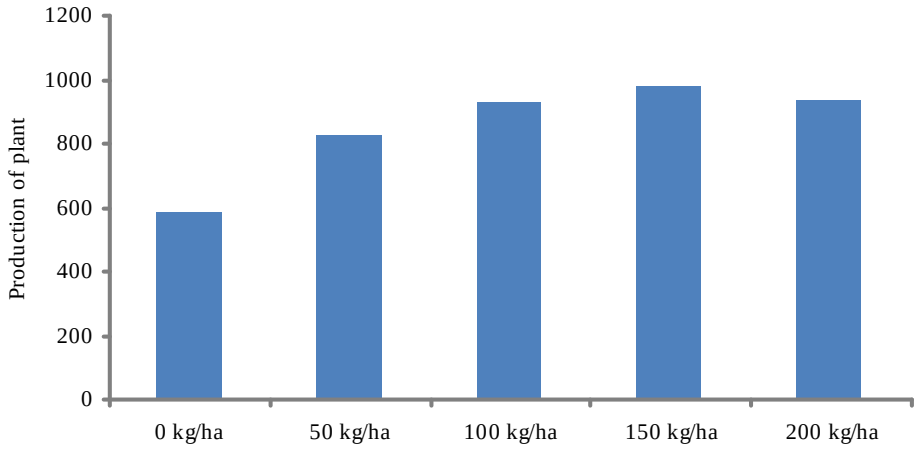

Figure 5. Influence of potash fertilizer in production/plant (gr/plant)

Productivity of potatoes is influenced by increase of potash fertilizer. Fourth and fifth variant have the highest productivity and they have 25% more than other variant (figure 6).

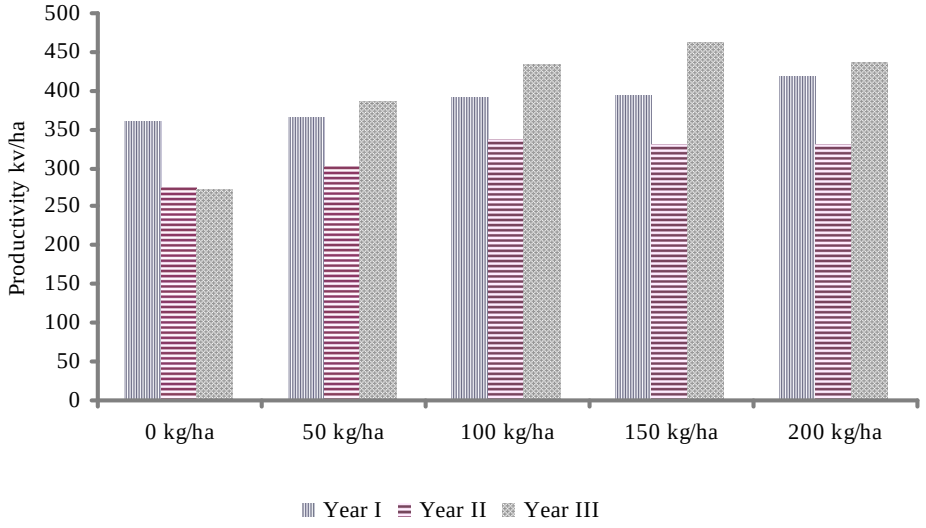

Figure 6. Average production drying three years

a. Chemical analyses

As you can see in table 2, the increase of potash fertilizer lead to an increase of dry matter and starch. The highest quantity of dry matter it's found during the application of 200 kg/ha doses.

Table 2.

Concentration of dry matter and starch

	Concentration of dry matter			Concentration of starch		
Quantity of potash	Year I	Year II	Year III	Year I	Year II	Year III
0 kg/ha	15,22	18,24	21,42	11,87	13,23	15,87
50 kg/ha	16,09	19,12	22,71	11,96	14,27	16,38
100 kg/ha	18,08	21,14	24,47	12,51	15,32	16,84
150 kg/ha	18,88	21,57	24,41	12,99	15,44	19,78
200 kg/ha	19,22	22,35	24,69	13,4	16,36	19,91

CONCLUSION

Potash fertilizer influence in important and differently in potatoes indicators. Most influenced are product indicators and chemical composition.

General analyses of data show that potash fertilizer has an important role in potatoes product. With increase of potash fertilizer, we can improve the product potatoes indicators. Use of 150 -200 kg/ha a.s. potash is more important for all agronomic production and economic indicators. Furthermore use of 150-200 kg/ha a.s. potash is more efficient for better productivity.

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