

## INFLUENCE OF PRE- PLANTING TREATMENT OF SEEDING MATERIAL ON POTATO TUBER YIELD

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*Influence of pre-planting treatment of seeding material on plant biometric indices and potato tuber yield has been considered. Influence of using preparations Vympel and Fumar on formation of crop productivity has been established. Application of both of these preparations which are used before planting potatoes significantly increases crop yield.*

Spreading potato in production greatly depends on crop yield and is influenced by many factors such as soil and climatic conditions of the growing region, complex of agrotechnical measures and biological characteristics of varieties.

According to scientists [3] breeding new potato varieties of different economic purpose, well-established and with rapid reproduction is among the determining factors that contribute high crop productivity. The scientist also states that the potential of potato as a biological object under current production conditions of Ukraine is used only to 10-15% and sometimes even to 10%. In addition, the genetic potential of Ukrainian selection varieties allows to get the industrial productivity of 300 kg / ha, i.e. the world level.

Many research papers, articles and publications were devoted to the problem of potato cultivation over the past decades. But, as we believe, study of biologization of potatoes cultivation was paid little attention to. That is why we think that this problem is the most important and not enough studied in order to get an ecologically safe vegetable production.

For obtaining high, stable and high quality potato yield it is necessary, along with improvement of growing crops technology elements, pay more attention to pre-planting treatment of seeding potato material with physiologically active substances of biological origin [1, 5]. Simplicity of using these substances, low rate of consumption and relatively low price attract these substances in potato growing.

**Research methods.** Field experiments were conducted during 2011-2013 in production conditions of the private farm of Poltava region. In order to study the influence of different preparations on forming potato tuber yield the experiment with potato table variety Slovyanka was conducted. Variants of the experiment were: Variant 1 - control ( without treatment of tubers ), variant 2 - treatment of tubers with preparation Vympel, variant 3 - treatment of tubers with preparation Fumar, variant 4 - treatment of tubers with both preparation by recommended doses.

The task of the research was to determine the biometric indices of potato plants and tuber yield calculation depending on using preparations.

Predecessor is winter wheat. The size of plot of land is 25 m<sup>2</sup>, repetition is triple. Farming equipment in the experiment is generally accepted for this zone, except the variants for studying. Tubers of medium fraction with weight of 50-60g were used for planting. Observations, calculation and analyzes were made according to the accepted methods [2, 4].

**Research results.** Formation of potato productivity is determined by biometric indices of plants that significantly varied depending on the measures of pre-planting treatment of seeding material (Table 4.2).

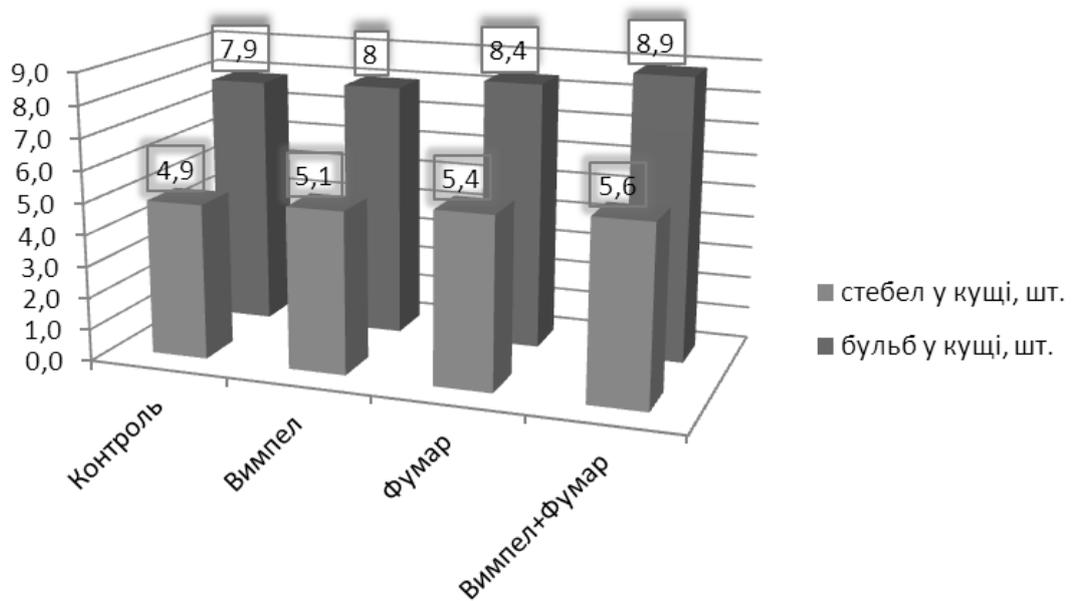
On average during three years of research on the variants where preparation Fumar was used in comparison with the control variant a significant increase of stems ( 0.5 items ), tubers in the bush ( 0.6 items. ) and average weight of tubers from the bush ( 262, 7 g ) has been recorded. Application of preparation Vympel had no significant influence on the change of biometric indices of potato plants, except average weight of tubers from the bush.

On the variants where both preparations were used the highest number of stems and tubers from the plant and the greatest weight of tubers from the bush were recorded (Table).

#### **Biometric indices of potato plants depending on using preparations in pre-planting treatment of tubers, average during 2011-2013**

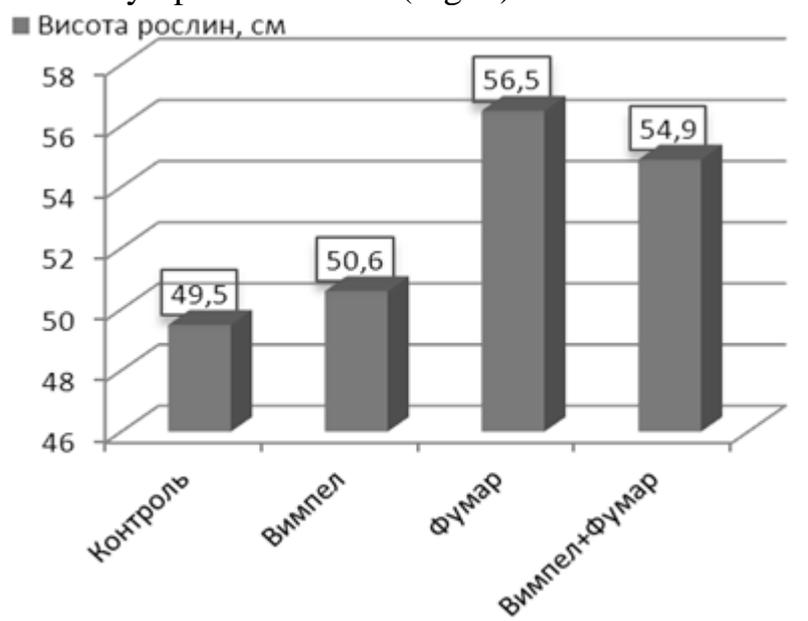
Variants	Quantity		Average weight of tuber from bush, g
	stems in the bush, items	tubers in the bush, items.	
Without treatment (control)	4,9	7,9	1021,4
Vympel	5,1	8,0	1127,2
Fumar	5,4	8,5	1284,1
Vympel+Fumar	5,6	8,9	1378,8
HIP <sub>05</sub>	0,15	0,71	3,28

According to the investigations the number of tubers and average weight of potato plants, along with weather and climatic factors and technology of growing crops vary depending on the variety characteristics and depend on the size of planting tubers. Number of stems largely determines the number of tubers formed under the bush. These conclusions were confirmed in our researches (Fig. 1).



**Figure 1. Biometric indices of potato plants of variety Slovyanka depending on using preparations in pre-planting treatment of tubers, average during 2011-2013**

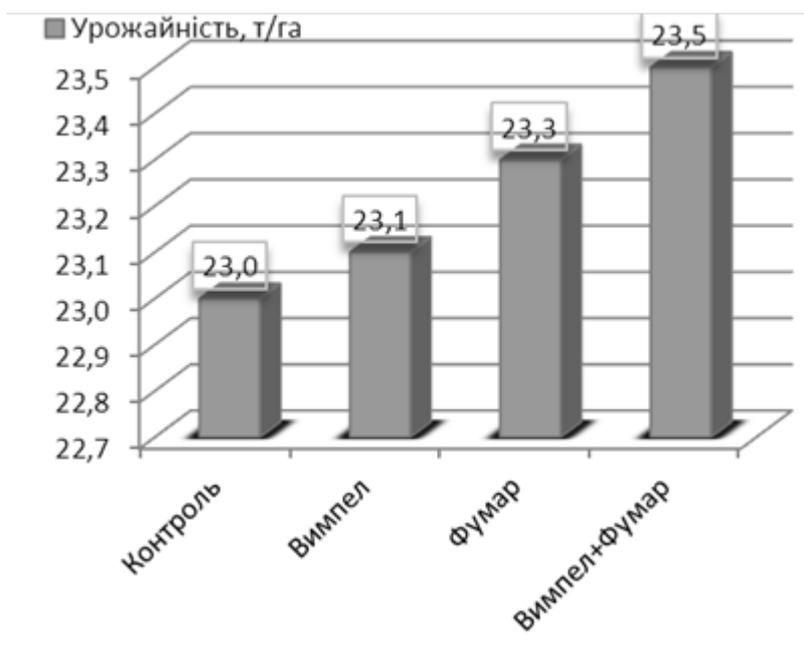
Mixed influence on plant height was noted after treatment of potato tubers by preparations Vypmel and Fumar (Fig. 2).



**Figure 2. Height of potato plants of variety Slovyanka with using preparations, average during 2011-2013**

Pre-planting treatment of potato tubers with preparations Vypmel and Fumar definitely improved biometric potato indices. Plant height was highest when preparation Fumar was used (56.5 cm) and when both preparations were used plant height was 54.9 cm.

According to research results compatible treatment of planting material with preparations had significant influence on yield of potato variety Slovyanka (Fig. 3).



**Figure 3. Potato yield of variety Slovyanka depending on using preparations, average during 2011-2013**

On average during the years of research treatment of potato seeding material of Slovyanka variety with preparation Fumar significantly increased yield of tubers to the level of 23.3 t / ha, which is higher than the control on 0.3 t / ha when NIR05 0.23 t / ha. Application of preparation Vympel had no significant influence on yield increase. Variant where both preparations were used was the best among the investigated variants. On this variant yield was the highest - 23.5 t / ha and significantly higher than the control (without treatment) on 0.5 t / ha.

### Conclusions.

1. Compatible using preparations Vympel and Fumar in pre-planting treatment of potato seeding material resulted in improvement of biometric indices such as increasing height of plants, number of stems, and the average weight of tubers from the bush.

2. Yield of potato tubers in comparison with control variant and variants where only Vympel or only Fumar was used was the highest on the variant with compatible using these preparations.

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