UDC 635.1:635.11:632.93:631.532.2
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SEED PRODUCTION OF TABLE BEET QUEEN DEPENDING ON FRACTION OF ITS TREATMENT AND GROWTH REGULATORS

The article shows the results of studies on the performance of table beet depending on the fraction of mother roots and prepare them for planting (by treatment before planting with growth regulator of organic origin bioglobin) in the northern steppe of Ukraine.

It was determined the relation between the performance of table beet seed grown of all fractional composition, and preparing it for planting.

Keywords: *Beet, royal root, fraction regulator of growth, productivity, yield, seed*

Introduction. Successful production of table beet seeds is largely dependent on the area of seed maintenance. The transfer of pollen and pollination process during the flowering phase of table beet is best in the conditions of high temperature and moderate humidity [1].

Seed production is mainly caused by technological and meteorological conditions of cultivation, although the features of hereditary class also play certain role [2-4].

The researches conducted by V.I. Ovcharuk and P.V. Bezvikonniy determined a positive effect of growth regulators in the cultivation of the first year table beet [5].

The studies of table beet mother roots processing by growth regulators did have not taken place. The treatment of roots with growth regulators is applied to sugar beet (although only in order to improve storage for further processing) [6].

Thus the purpose of presented research was to investigate the potential performance of table beet seed variety 'Bordeaux Kharkiv' [7], which provides a high yield of seeds in low moisture areas of the northern steppe of Ukraine.

Materials and methods. The study was conducted in the area of low moisture on DRS IVM NAAS in the northern steppe of Ukraine during 2012–2013 years. Experimental plots were placed on the third terrace of river Samara. The soil of test sites is an ordinary black soil with low content of humus, prepared on loamy soil of forest. The mono-humus layer depth was of 40–45 cm, the transition level was of 45–80 cm, the depth of applied HC1carbonates was of 63–75 cm, and the capacity – 30 cm. The arable layer of silty lumpy with humus content was of 2.6 to 3.6% (by Turina). The hydrolytic acidity of it is 0,84–1 40 mh-ekv./100 g soil (by the scale of Giedroyc). The level of groundwater was of 8–9 m.

The sown area was of 20 m^2, the accounted area was of 10 m^2. The research had four time reoccurrence. The accounting was performed on ten plants. The study used different mother roots fractional composition of table beet variety 'Bordeaux Kharkov': 50–60 mm fraction (shtekling) fraction 61–100 mm (control) and 101–120 mm fraction. The studies were done with applying the growth regulator bioglobin of organic origin [8]. Bioglobin containes amino acids, polysaccharides, polypeptides and micro elements in a balanced level to living organisms, that provides protein synthesis in plants, accelerates its speed, which accelerates the transport process in the cells and in the plant as a whole. Before planting the mother roots were treated with bioglobin solutions of different concentrations: 0.25% (variant 2), 0.5% (variant 3), 0.75% (variant 4) the exposition treatment was for 3 minutes. The control variant of mother roots was treated with water (variant1). Accounting and monitoring were conducted in accordance with the recommended methods [9-11].

Results and discussion. Analyzing the weather conditions during the study should note the following: the weather conditions of 2012–2013 years were characterized by lack of rain and high maximum temperature (40°C) and soil that reached 57°C. The lack of moisture in April contributed to the reduction of mother root engraftment regardless of faction.

However, the timings of the onset of the main phase of growth and development of table beet depended on the cells of fractions: the earliest stage of flowering plants was recorded for plants planted with mother root crops fraction 101–120 mm, while the plants grown from cells of fraction 61–100 mm (C) entered a phase of flowering 1–2 days later, and the latest were the mother roots of 'shtekling' variety (50–60 mm). This trend persisted in other phases of plant growth and development. It is obvious that the passage of table beet plants through the second year, was influenced by the growth regulator concentration of the solution, regardless of the mother fraction of root. Namely, for the treatment of mother root crop 0.5% m water solution of bioglobin the plants entered a phase of flowering 2–3 days before (2012), depending on the fraction of cells of mother root. When compared to other options - 1–3 days earlier (Table 1 – 2).

Table 1

The timings of phenological stage* occurrence in plants of table beet variety 'Bordeaux Kharkov', depending on the mother root fraction and preparation of it for planting in 2012

Phases of Growth and Development	Mother root fraction, mm	Variant 1	Variant 2	Variant 3	Variant 4
Flowering: beginning	50–60	10.06–17.06	10.06–16.06	09.06–15.06	11.06–17.06
	61–100	07.06–14.06	06.06–15.06	05.06–16.06	07.06–14.06
	101–120	05.06–11.06	05.06–11.06	04.06–10.06	06.06–12.06
end	50–60	26.06–02.07	24.06–01.07	23.06–01.07	25.06–02.07
	61–100	21.06–27.06	20.06–28.06	18.06–27.06	21.06–29.06
	101–120	19.06–23.06	18.06–23.06	17.06–21.06	19.06–24.06
Formation of seeds	50–60	04.07–10.07	03.07–11.07	03.07–10.07	05.07–12.07
	61–100	01.07–06.07	01.07–07.07	01.07–06.07	04.07–10.07
	101–120	29.06–04.07	28.06–05.07	26.06–04.07	28.06–05.07
Ripening of seeds	50–60	10.07–05.08	08.07–04.08	07.07–03.08	09.07–06.08
	61–100	07.07–01.08	06.07–02.08	05.07–01.08	05.07–03.08
	101–120	04.07–01.08	03.07–02.08	02.07–04.08	04.07–03.08

** The planting of seeds was conducted in 10.04, the collecting of seeds – in 20.08*

Table 2

The timings of phenological stage* occurrence in plants of table beet variety 'Bordeaux Kharkov', depending on the mother root fraction and preparation of it for planting in 2013

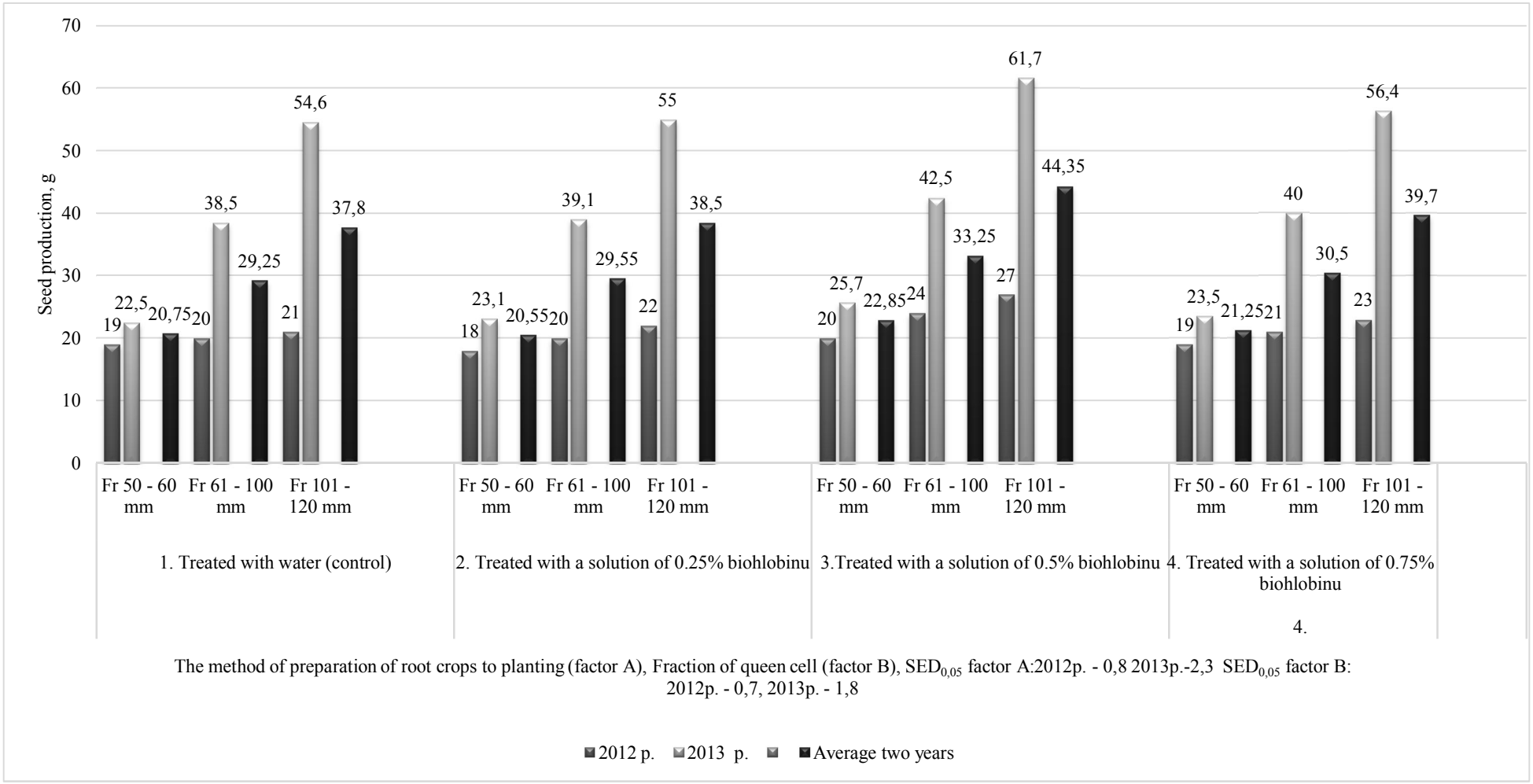
Phases of Growth and Development	Mother root fraction, mm	Variant 1	Variant 2	Variant 3	Variant 4
Flowering: beginning	50–60	10.06–24.06	11.06–24.06	09.06–22.06	10.06–24.06
	61–100 (к)	08.06–20.06	08.06–19.06	07.06–18.06	09.06–21.06
	101–120	07.06–18.06	06.06–19.06	06.06–15.06	08.06–19.06
end	50–60	24.06–30.06	24.06–29.06	23.06–27.06	25.06–30.06
	61–100 (к)	23.06–30.06	23.06–30.06	22.06–28.06	22.05–30.06
	101–120	20.06–30.06	21.06–29.06	20.06–27.06	20.06–29.06
Formation of seeds	50–60	23.07–28.07	24.07–29.07	22.07–27.07	24.07–27.07
	61–100 (к)	20.07–27.07	21.07–26.07	20.07–24.07	20.07–26.07
	101–120	19.07–25.07	18.07–24.07	16.07–21.07	20.07–24.07
Ripening of seeds	50–60	29.07–12.08	29.07–13.08	26.07–10.08	29.07–13.08
	61–100 (к)	28.07–11.08	28.07–12.08	25.07–08.08	28.07–10.08
	101–120	26.07–09.08	25.07–10.08	22.07–06.08	27.07–08.08

** The planting of seeds was conducted 12.04, the collecting of seeds – in 23.08*

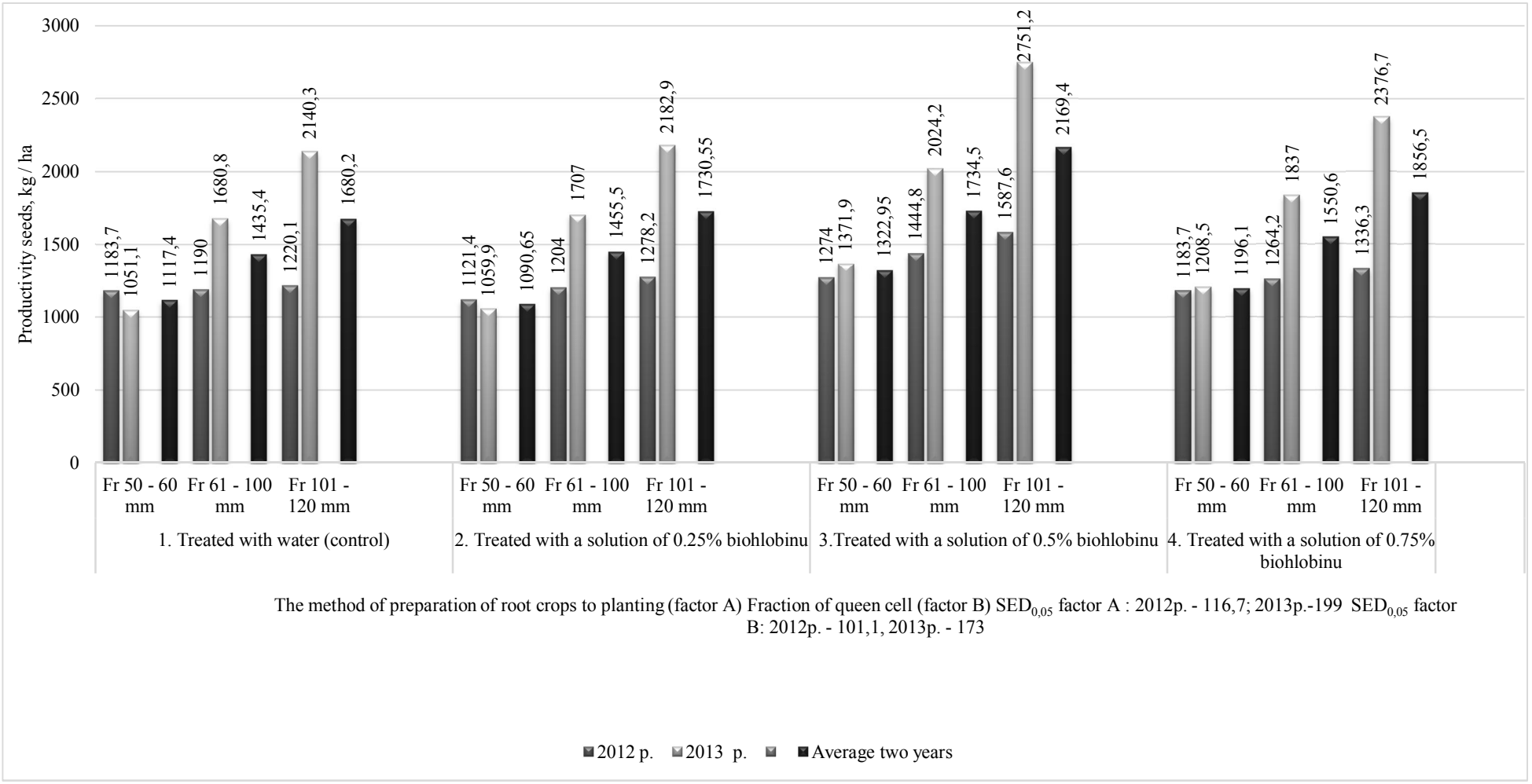
The seed productivity per plant of table beet root crops was influenced by mother root preparation before planting with 0.5% solution of bioglobin in average of two years, the performance of a seed plant formed from the roots of ‘shtekling’ variety (fraction 50–60 mm) exceeded the control values by 2.1 gram, the control cells of fraction (fraction 61–100 mm) - by 4.0 grams, with cells of fraction 101–120 mm - by 6.55 grams (pic. 1).

The conducted researches showed regular increase of yield seeds from plants grown from mother root crops of all fractional composition depending on their treatment before planting with 0.5 % water solution of bioglobin. In average during the years of research, the indicators of this variant significantly exceeded the control: by 205.5 kg per ha of seed plants, formed from the mother root fraction 50–60 mm (‘shtekling’), by 299.1 kg per ha of seed plants, formed from the mother root standard fractions 61–100 mm and by 489.2 kg per ha of seed plants, formed from the mother root fraction 101–120 mm (pic. 2).

The effects of growth regulator treatment of different fractional composition table beet cells for sowing seed quality were not discovered. All received seed crop of years 2012–2013 met the requirements of DSTU 7160:2010 current [12].



Pic. 1. The performance of table beet plants variety 'Bordeaux Kharkov' depending on processing of mother roots fractional composition by different growth regulators



Pic. 2. The productivity of seeds of beet plants variety 'Bordeaux Kharkov' depending on processing of different mother root fractional composition by different growth regulators.

Conclusions. It was determined that the main factor in increasing of productivity per plant and yield of table beet seeds are: mother roots fraction and its preparation for planting, namely: the most powerful seed bushes of type III and IV with high seed productivity of roots were formed from mother root fraction 101–120 mm. Treatment of mother root crops with 0.5% water solution of growth regulator bioglobin ensures the increase of seed productivity.

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Анотація

Семенченко О.Л.

Насіннєва продуктивність буряка столового залежно від фракції маточника та обробки його регулятором росту

У статті висвітлено результати досліджень по вивченню продуктивності буряка столового залежно від фракції маточних коренеплодів та підготовки їх до висаджування (шляхом передсадивної обробки регулятором росту органічного походження біоглобіну) в умовах північного Степу України. Встановлено взаємозв'язок між продуктивністю насінників буряка столового, вирощених з маточників різного фракційного складу, та підготовкою його до висаджування.

Ключові слова: *буряк столовий, маточний коренеплід, фракція, регулятор росту, продуктивність, урожайність, насіння.*

Аннотация

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Семенная продуктивность столовой свеклы в зависимости от фракции маточного корнеплода и обработки регулятором роста.

В статье отражены результаты исследований по изучению семенной продуктивности столовой свеклы в зависимости от фракции маточного корнеплода и подготовки его к высаживанию (путем предпосадочной обработки регулятором роста органического происхождения) в условиях северной Степи Украины. Установлена взаимосвязь между семенной продуктивностью столовой свеклы, выращенной из маточных корнеплодов разного фракционного состава и подготовкой их к высаживанию.

Ключевые слова: *свекла столовая, маточный корнеплод, фракция, регулятор роста, продуктивность, урожайность, семена.*