

## **DIFFERENT QUALITY OF SEEDS OF THE SWEET SORGHUM BY THE SIZES AND PROPERTIES**

*The issue highlights research results of seed diversity of quality, field germination and seedling height of sweet sorghum. It is established that the plants which have been grown up from seeds of large and average fraction have high viability*

**Keywords:** *different quality, seeds, sorghum, fractions, field viability, seedlings*

**Introduction.** Different quality of seeds by the sizes and its influence on sowing qualities and fruitful properties of crops interest researchers ago.

Different quality of seeds is the result of many causes, including hereditary qualities of the variety, weather and agronomic growing conditions. However, regardless of these conditions, there is always different amount of seeds by the size and weight in grain heap, depending on the place of formation of grains per spica, panicle or head.

The analysis of references allowed to establish that the consensus about influence of different quality of seeds on its field viability and crop doesn't exist. However some researchers consider that large seed has high sowing properties that is the key to obtaining optimum density of standing of plants and their high efficiency [1, 3]. Scientists [2, 3, 4] point to direct link between the size of seeds and their laboratory and field viability, and for receiving a quality sowing material it is necessary not to select large seeds, but to remove small seeds.

The purpose of our research was to establish the influence of the size and weight of sugar sorghum seed on its sowing properties.

**Experiments with seeds were made** on standard (STATE STANDART OF UKRAINE (SS of Ukraine) 2240-93 and SS of Ukraine 4138-2002) and the standard scientific techniques in 2010-2012 on Veselopodilskiy and Ivanovo EBS [5, 6]. Experience included the following options: 1) seeding mixture (control), 2) sowing by large seeds (weight of 25-30 g), 3) sowing by middle weight seeds (20-25 g), 4) small seeds (weight of 15-25 g). Variety Sylosne 42. Frequency of experience – quadruple.

The methods of quantitative and high-quality comparison, abstract - logical, analytical were applied during the researches.

**Results of research and their discussion.** Data of phenological observations show that shoots in areas with a large fraction of sowing seeds appear, as a rule, earlier in comparison with small seeds. It should be noted that the most significant difference in the time of germination is observed between large and small seeds, while between average and big seeds differences in emergence of shoots less contrast. On sites with crops of large seeds shoots appear for 2-3 days earlier in comparison with sites where sowed small fractions of seeds, however further the difference after phenophases is graded.

Daily calculation of quantity of plants which came up within 7 days, since day of emergence of shoots showed that large seeds sprout more intensively and already for the 2nd day from the beginning of emergence of shoots, the quantity of the sprouted seeds reaches 64,3%, while for seeding of small seeds only is 40%. The same tendency was observed and for the seventh day – field viability of seeds of small fraction was lower for 34,6%. As for the seeding mixture, field

viability for the seventh day was higher for 14,3% than by small seeding and for 20,3% less than seeding by large seeds (tab. 1).

Table 1

**The dynamics of germination and field viability of sugar sorghum seeds depending on the weight of 1000 seeds , 2009-2012**

№	Version	Weight of 1000 seeds, g	The number of plants that came up from the beginning of germination by days ,%				
			the first	the second	the fifth	the seventh	full sprouting
1	sowing: mixture	17-20	40,2	53,1	59,2	61,4	85,7
2	large	25-30	57,6	64,3	74,3	81,7	90,3
3	medium	20-25	51,4	58,6	67,1	68,6	89,1
4	small	15-20	14,3	40,0	42,9	47,1	79,1
LSD <sub>0,05</sub>							4,6

For receiving big crops important not only receiving full-fledged sprouting, but also providing conditions for preservation of plants by the vegetation end in order to have the optimum quantity of plants per unit area. The research found that the plants which have been grown up from large and average fractions of seeds have steady viability. The quantity of surviving plants by sowing seeds of large and medium fractions makes 89-94%, while on sites with crops of small seeds - no more than 84%, and a mixture of 86,1%.

For the purpose of deeper and full studying of the reasons causing distinctions in field viability of seeds of various fractions, we conducted the researches concerning opportunities of sorghum to form the maximum length of sprouts [3, 4].

Table 2

**Influence of the size of fraction of seeds of sugar sorghum for germination on the length of sprouts**

№	version	Weight of 1000 seeds, g	maximum length of coleoptile and mesocotyle, cm			
			Years			
			2009	2010	2011	Average
1	sowing: mixture	17-20	19,4	20,3	20,9	20,2
2	large	25-30	22,7	21,9	22,6	22,4
3	medium	20-25	20,2	19,8	20,2	20,1
4	small	15-20	18,1	18,5	18,3	18,3

Phenological observations revealed that different size seed fractions form the sprouts of different maximum length. Longer sprouts (22.4 cm) formed seeds of large fractions, due to the large amount of nutrients in reserve. Accordingly, small seeds had shorter seedlings – only 18,4 cm. But, neither a seed, nor fractions did not give seedlings with a total length of coleoptile and mesocotyle more than 23 cm.

**Conclusions:**

1. Seeds of sugar sorghum of large and medium fractions has field viability (68,6-81,7) therefore they are more valuable sowing material, than seeds of small fraction.

2. The maximum length of sprouts (22,4 cm) forms seeds of large fraction (mass of 1000 grains is 25-30 g).

3. The plants which have been grown up from large and medium fractions of seeds have viability within 87-94% against 84%, grown up from small fraction and 86,1% – in control.

## References

1. Реймерс Ф.Э. Проростание семян и температура / Ф.Э. Реймерс, И.Э. Илли. – Новосибирск: Наука, 1978. – 168 с.
2. Кожевников А.Р. Семеноводство зерновых культур // А.Р. Кожевников, С.И. Леонтьев, Г.И. Попова. – М.: Колос, 1970. – 211 с.
3. Казакова А.С. Рост проростков зернового сорго и использование веществ семени в условиях полного мезотрофного питания / А.С. Казакова // В кн.: Селекция и семеноводство сорго. – Зеленоград, 1985. – С. 48-56.
4. Физиология семян / [К.Е. Данович, А.И. Соболев, Л.П. Жданова и др.]. – М.: Наука, 1982. – 318 с.
5. Насіння сільськогосподарських культур, сортові та посівні якості. Технічні умови: ДСТУ 2240-93. – [Чинний від 1994-01-01]. – К.: Держспоживстандарт України. 1994. – 73 с. – (Національний стандарт України).
6. Насіння сільськогосподарських культур. Методи визначення якості. ДСТУ 4138-2002. – [Чинний від 2003-01-01]. – К.: Держспоживстандарт України. 2003. – 173 с. – (Національний стандарт України).

## Аннотація

**Сторожик Л.І.**

***Різномісність насіння сорго цукрового за розмірами та властивостями***

*Наведені результати досліджень щодо різномісності насіння, польової схожості та висоти проростків сорго цукрового. Встановлено, що високу життєздатність мають рослини, які вирощені з насіння крупної та середньої фракції.*

**Ключові слова:** *різномісність, насіння, сорго, фракції, життєздатність, паростки*

## Аннотация

**Сторожик Л.И.**

***Разнокачественность семян сорго сахарного по размерам и свойствам***

*Приведены результаты исследований разнокачественности семян, полевой всхожести и высоты проростков сорго сахарного. Установлено, что высокую жизнеспособность имеют растения, выращенные из семян крупной и средней фракции.*

**Ключевые слова:** *разнокачественность, семена, сорго, фракции, жизнеспособность, проростки*