

EFFECT OF THICKENING OF WATERMELON SOWING ON YIELD AND SEED QUALITY

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The results of a two-year study of effects of thickeners on the yield of watermelon seeds in the Northern Steppe of Ukraine are presented. Different methods of obtaining watermelon seeds, depending on thickeners and their placement in plantations were studied. The watermelon seed productivity and quality at high air and soil temperatures during fruit formation and ripening were studied.

Key words: *watermelon, seeds, sowing thickening, thickener, crop, sowing design, yield.*

Introduction. The effective seed production is a basis for the introduction of released domestic gourd varieties and hybrids in production. At present, the Ukrainian seed market is experiencing the expansion of foreign seeds, so there is an unmet need for domestic gourd seeds. Recently, in the Northern Steppe of Ukraine, the June–August period has been hot (the air temperature is 32–38°C, and on the soil surface temperature amounts to 40–45°C) and dry. It is during this period gourds bloom and form fruits. Under such conditions, some flowers remain unfertilized, and later, when fruits grow and ripen, there are significant sun scalds on fruits (≥ 25 –30%), leading to a decrease in watermelon yield and seed productivity.

Therefore, it is necessary to develop and implement farming techniques for growing watermelon seed plants, which will reduce the negative effects of adverse abiotic factors and increase the yield and quality of watermelon seeds.

Literature review. The protection of gourd plants, including watermelon, against harmful effects of high temperatures and dry winds during anthesis, fruit formation and ripening by thickening seed plantations with other domestic crops, which will create better conditions for the growth and development of watermelon seed plants and increase yields of top-grade seeds, may be one of such techniques.

High air temperatures (above 32–33 C) and low relative humidity (below 50%) during anthesis decrease the pollen viability and some female flowers remain unfertilized, as fruit setting is reduced and the first ovaries are aborted [1]. Further, under such conditions, during fruit growth and ripening, there are significant sun scalds on plants (up to 25–30%), resulting in deformed seed fruits, decreasing their yield and reducing yield of grade seeds [2].

Thickened plantations are the simultaneous cultivation of two or more crops on the same area during the warm period of the year. Here, the main crop is sown at the full rate, and its thickener(s) is(are) sown in its interrows or in rows together with the main crop, or within various timeframes. The main crop is called thickened and additional one – a thickener [3].

Coulisse planting is another type of thickening. Long-stemmed plants such as corn, sunflower, bean and other agricultural plants are used as coulisses. At high daytime temperatures, coulisses help reduce the air and soil temperatures in the intercoulisse space by 1.8–2.5°C and protect the main plants against the negative effects of adverse weather conditions. Coulisse planting is justified in cucumber, gourd and other plantations [4].

Self-thickening is another type of thickening, i.e. increasing the plant density of intertilled crops (to a certain limit) [5]. Nedbal RF grew parsley seeds with interrows thickened with lettuce, spinach, coriander and proved the economic feasibility of this method, as it allowed for additional

products in the amount of 95,700–71,200 UAH/ha [6]. Cultivation of corn thickened with green bean allowed obtaining high yields from the main crop (3.7 t/ha) and the thickener (2.2 t/ha) with a profit of 16,900 UAH/ha and profitability of 121.5% [7]. The use of green bean as a thickener of late white cabbage, early potato, tomato and cucumber in the Eastern Forest-Steppe of Ukraine demonstrated the effectiveness of thickening of plantations, where the yields from the main crops increased by 2.6–6.5% compared to the control (plantations of main crops alone) and an additional bean yield of 1.0–1.3 t/ha was received [8].

Corn sowing between rows of the main plants (squash, cucumber, watermelon, melon, pumpkin) is a way to protect seed plants of pumpkin, vegetables and gourds during their anthesis and fruit formation against harmful effects of high temperatures and dry winds. When cucumber and squash were grown for seeds in corn-thickened plantations in the Odeska Oblast, the yields of seeds from the main crops (cucumber and squash) increased by 17.8–11.6%, respectively, in comparison with the control. In addition to robust seeds of cucumber and squash, 0.6–2.0 t/ha of ripe corn cobs and 1.8–4.9 t/ha of vegetative mass of corn were harvested from the experimental plots [9]. Studies on the cultivation of cowpea, as the main crop thickened with melon and corn, showed that melon was the best component in co-cultivation [10]. When cassava was grown with corn or melon, its yield was found to decrease to 31%. However, the total yield was higher than individual yields from each crop separately [11].

The effect of corn in co-plantations on the yields of different vegetables (radish, spinach, carrot) was studied in 2010–2011 in India [12]. In the same country, the effect of different doses of nitrogen on the growth, development and yield of broccoli thickened with other vegetable plants was later studied [13]. Salaw A.W et al. assessed the microclimate in okra plantations thickened with pepper and in melon plantations thickened with watermelon [14]. Nigerian researchers Toluwase S.O. and Owoeye R.S. proved a high profitability of watermelon production for commercial and seed purposes in compatible and thickened plantations [15].

Thickening of interrows of direct-seeded tomato and red beet with short-season green crops can be considered as a method of biological and agrotechnical protection against weeds in cultural agrocenoses [16].

The literature review found few studies on growing gourds (watermelon, melon) for seeds in thickened plantations. Therefore, the development of technological methods for growing watermelon and melon seeds at high air temperatures (above 32–38°C) and low relative humidity (below 50%) in thickened plantations is relevant for the Northern Steppe of Ukraine.

Purpose. To study the effect thickening plantations of watermelon seed plants on seed yield and quality, using different thickening designs in the Northern Steppe of Ukraine.

Materials and Methods. The experiments were carried out in the Department of Vegetable and Gourd Breeding and Cultivation Technologies of Dnipropetrovsk Experimenta Station of the Institute of Vegetable and Melon Growing NAAS in 2019–2020. The field experiments were two-factor (factor A – thickener, factor B – thickener layout).

We evaluated the effect of thickening of watermelon seed plants (variety Favoryt) with sweet corn at the milky-wax stage of ripeness (variety Delikatesna) and with green bean grown for grain (variety Hotyka). The thickeners were grown in accordance with traditional technologies with the following layouts: 1.4 x 1.0 m and 2.8 x 1.0 m (sugar corn) and 1.4 x 0.5 m and 2.8 x 0.5 m. (green bean). Thickening crops were sown according to the experimental design in interrows and or in watermelon rows as follows:

- 1) No thickeners (control);
- 2) Watermelon + sweet corn (1.4 m x 1.0 m in the same row with watermelon);
- 3) Watermelon + sweet corn (2.8 m x 1.0 m in the same row with watermelon);
- 4) Watermelon + sweet corn (1.4 m x 1.0 m between watermelon rows);
- 5) Watermelon + sweet corn (2.8 m x 1.0 m between watermelon rows);
- 6) Watermelon + green bean (1.4 m x 0.5 m in the same row with watermelon);
- 7) Watermelon + green bean (2.8 m x 0.5 m in the same row with watermelon);
- 8) Watermelon + green bean (1.4 m x 0.5 m between watermelon rows);

9) Watermelon + green bean (2.8 m x 0.5 m between watermelon rows).

The experiments were carried out in four replications. The watermelon plant density was 10,200/ha; the sweet corn density – 7,000 and 3,500/ha; the green bean density – 15,000 and 7,500/ha.

The study was performed in accordance with conventional methods of field experimentation [17]. The farming techniques for growing and harvesting watermelon seed plants were in accordance with the State Standard of Ukraine DSTU 5046: 2008 [18]. The significance of differences was determined by analysis of variance [19]. The sowing qualities of watermelon seeds were evaluated in accordance with the valid standard [20].

The soil in the plots was typical leached, medium loamy chernozem. It has the following agrochemical parameters: the humus content in the arable soil layer of 0–30 cm is 3.1%; the nitrate nitrogen content is 3.5–3.8 mg; the mobile phosphorus content is 25–30 mg; the exchangeable potassium content is 34–35 mg/100 g of soil.

The climate of the zone is temperate-continental with insufficient and unstable precipitation. The average multi-year air temperature is + 10.9 °C; during the growing season, it is + 17.8°C; the maximum air temperature sometimes reaches + 41°C.

The summer weather is mostly cloudless, warm, and often hot. The precipitation during the growing period fluctuates greatly from the annual average (248.0 mm), often causing droughts. The relative humidity in the summer is quite low (about 50%), and in some periods decreases to 20–30%.

The weather in the study years did not help the normal development of watermelon plants and fruit formation. During the growing period, the precipitation amount averaged 203.8 mm (82.2% of the multi-year average), and the air temperature was 19.3° (+1.5 °C to the multi-year average of 17.8°C). The maximum air temperatures in June, July and August were 32.8–33.3°C, 35.3–38.3°C and 35.3–36.7°C, respectively. Under such conditions, female flowers and the first ovaries abscised, and fruits were significantly damaged by sun scalds.

Results and discussion. The study on the cultivation of watermelon seed plants in thickened plantations showed that the plant growth and development, seed productivity and yield of this crop depended on thickening plants and their placement in the main crop.

Biometric analyses found that the main stem length was 162–165 cm with mass fruit formation in the control, while in sweet corn-thickened watermelon rows with a layout of 1.4 m x 1.0 m (variant 2), it decreased by 4.3% compared to the control. In the other variants, this indicator was within the control range (159–163 cm).

Thickening of watermelon rows with green bean with a layout of 1.4 m x 0.5 m (variant 6) and 2.8 m x 0.5 m (variant 7) decreased the main stem length by 5.5% and 4.7%, respectively, which was due to the green bean bush compactness and shape. When bean was planted between rows of the thickened crop, the main stem length was similar to the control.

It was found that the height thickening plants depended on their placement in the crop and was 113–116 cm in sweet corn grown in watermelon rows, 121–126 cm in sweet corn grown in interrows, with the cob number of 1.2–1.3 and 1.4–1.5 per plant, respectively, 31–33 cm in green bean grown in watermelon rows, and 35–38 cm in green bean grown in interrows, with the pod number of 4.8–5.5 per plant, respectively.

Our study of the ripening of watermelon seed plants showed that the thickening of plantations had a positive effect on fruit formation and seed productivity.

When watermelon plantations were thickened, the incidence of fruit scalds decreased on average from 21.2% (control) to 7.1–10.8% (sweet corn) and to 13.8–16.1% (green bean) (Table 1).

Table 1

Effect of thickening on the incidence of sunray-induced fruit scalds and seed productivity in watermelon (2019–2020)

No	Experiment	Incidence of sunray-induced fruit scalds, %	Seeds per fruit	
			g	%
1	No thickeners (control)	21.2	18.4	0.83
2	Watermelon + sweet corn (1.4 m x 1.0 m in the same row with watermelon)	10.8	20.0	0.86
3	Watermelon + sweet corn (2.8 m x 1.0 m in the same row with watermelon)	9.7	20.5	0.86
4	Watermelon + sweet corn (1.4 m x 1.0 m between watermelon rows)	9.0	20.4	0.87
5	Watermelon + sweet corn (2.8 m x 1.0 m between watermelon rows)	7.1	21.3	0.88
6	Watermelon + green bean (1.4 m x 0.5 m in the same row with watermelon)	16.1	19.2	0.85
7	Watermelon + green bean (2.8 m x 0.5 m in the same row with watermelon)	15.3	19.9	0.86
8	Watermelon + green bean (1.4 m x 0.5 m between watermelon rows)	13.8	20.8	0.87
9	Watermelon + green bean (2.8 m x 0.5 m between watermelon rows)	14.6	20.0	0.86
LSD ₀₅ , %		3.9		

The least damage to fruits (7.1%, or by 14.1% less than in the non-thickened plots [control]) was recorded when sweet corn was sown between watermelon rows, with a layout of 2.8 m x 1.0 m. Thickening watermelon with green bean proved to be less effective in the protection of watermelon fruits because bean plant are shorter (35–38 cm). Anyway, both thickeners, with different layouts and placement (in watermelon rows and interrows) ensured a significant reduction in sunray-induced damage to fruits.

Analysis shows that thickening watermelon seed plantations helped to increase the seed productivity and quality. This technological approach increased the seed yield from fruits from 0.83% (control) to 0.85–0.88% in the thickened plots.

The highest output of seeds per fruit (21.3 g, or by 15.8% higher than in the control [18.4 g]) was recorded when sugar corn was sown in interrows of the main crop, with a layout of 2.8 m x 1.0 m. When green bean was used for thickening in watermelon interrows, with a layout of 1.4 m x 0.5 m, the yield increased by 13.0% (Table. 1).

The sowing and quality indicators of watermelon seeds in the experiment are summarized in Table 2.

Table 2

**Sowing and quality indicators of watermelon seeds produced in thickened plantations,
2019–2020**

Experiment	Seed weight/20 fruits			Sowing indicators		
	Total g	Grade seeds %	Undergrad e seeds %	Energy, %	Germina bility,%	1000- seed weight, g
No thickeners (control)	366	74.6	25.4	87.0	92.0	52.6
Watermelon + sweet corn (1.4 m x 1.0 m in the same row with watermelon)	400	83.8	16.2	85.0	92.0	54.3
Watermelon + sweet corn (2.8 m x 1.0 m in the same row with watermelon)	410	85.4	14.6	86.0	92.0	54.8
Watermelon + sweet corn (1.4 m x 1.0 m between watermelon rows)	408	86.6	13.4	87.0	93.0	55.2
Watermelon + sweet corn (2.8 m x 1.0 m between watermelon rows)	426	88.6	11.4	88.0	93.0	55.5
Watermelon + green bean (1.4 m x 0.5 m in the same row with watermelon)	384	79.5	20.5	85.0	91.0	53.3
Watermelon + green bean (2.8 m x 0.5 m in the same row with watermelon)	398	81.4	18.6	86.0	91.0	53.7
Watermelon + green bean (1.4 m x 0.5 m between watermelon rows)	416	84.3	15.7	87.0	93.0	54.4
Watermelon + green bean (2.8 m x 0.5 m between watermelon rows)	400	83.1	16.9	86.0	92.0	53.8
LSD ₀₅ , %		12.1		3.2	2.7	2.5

The highest content of grade seeds in fruits (88.6%, or by 14.0% higher than in the control [74.6%]) was achieved when watermelon plantations were thickened with sugar corn in interrows of the main crop at a distance of 2.8 m. The difference between this variant and the control was statistically significant. The percentage of undergrade seeds decreased from 25.4% to 11.4%.

With the other layouts and placement of sweet corn (watermelon + sweet corn 1.4 m x 1.0 m in the same row with watermelon; watermelon + sweet corn 2.8 m x 1.0 m in the same row with watermelon; watermelon + sweet corn 1.4 m x 1.0 m in between watermelon rows), there was a slight inhibition of the growth and development of watermelon plants and fruits, which significantly affected the output of watermelon grade seeds.

In these variants of thickening watermelon with sweet corn, the percentage of grade seeds increased by 9.2–12.0%, but it was within the LSD limits. The percentage of undergrade seeds in fruits ranged 13.4 to 16.2%.

When green bean was used for thickening, the percentage of grade seeds in fruits was higher (84.3%, or+ 9.7% to the control value) where green bean was sown in watermelon interrows with a layout of 1.4 m x 0.5 m. With the other layouts of green bean, the yield of grade seeds was 79.5–83.1%. The percentage of undergrade seeds was 16.9–20.5%. As green bean plants are not tall enough, they could not ensure a significant difference in the output of grade seeds compared to the control, because the growth of watermelon plants was somewhat inhibited.

Analysis of the sowing qualities of watermelon seeds showed that the germination energy and germinability in all thickening variants did not differ significantly from the control and were 91–92% and 85–88%, respectively.

Reduction of sun scalds due to thickening of watermelon interrows with sweet corn contributed to an increase in the 1000-seed weight from 52.6 g (control) to 55.5 g. However, a significant increase in the 1000-seed weight was only observed with a layout of 2.8 m x 1.0 m

Differences in the yield of watermelon seeds between the experimental variants indicate that plants respond to the studied factors (Table 3). The seed yield was shown to significantly increase with combination of factor A (thickener) and factor B (thickener layout and placement) in all variants (173–187 kg/ha vs. 166 kg/ha in the control).

The highest yield of watermelon seeds (187.0 kg/ha, or + 21.0 kg/ha [12.7%] to the value without thickening [166 kg/ha]) was obtained where sweet corn was sown between rows of the main crop with a layout of 2.8 m x 1.0 m.

When thickener was planted in watermelon rows, the seed yield increased by 10–14 kg/ha (5.9–8.4%) compared to the control. Concurrently, along with watermelon seeds, 0.6-1.8 t/ha of milky-wax ripe corn cobs were additionally harvested, depending on its layouts.

Table 3

Effect of thickening on yields of watermelon seeds and plants - thickeners, 2019–2020

Thickener (factor A)	Thickener layout (factor B)	Seed yield, kg/ha			Related to the control		Yield of the thickeners: corn (t/ha), bean (kg/ha)
		2019	2020	Mean	kg	%	
No thickeners (control)	–	162	169	166	–	–	–
Sweet corn	1.4 m x 1.0 m in the same row with watermelon	173	179	176	10	6.0	1.1
	2.8 m x 1.0 m in the same row with watermelon	176	184	180	14	8.4	0.6
	1.4 m x 1.0 m between watermelon rows	181	187	184	18	10.8	1.8
	2.8 m x 0.5 m between watermelon rows	184	190	187	21	12.7	0.8
	Green bean	1.4 m x 1.0 m in the same row with watermelon	170	176	173	7	4.2
Green bean	2.8 m x 1.0 m in the same row with watermelon	174	180	177	11	6.6	47
	1.4 m x 1.0 m between watermelon rows	178	184	181	15	9.0	98
	2.8 m x 0.5 m between watermelon rows	175	181	178	12	7.2	56
LSD ₀₅ factor A		5.7	4.8				
LSD ₀₅ factor B		8.4	3.5				
LSD factor AB interaction		6.7	7.4				

When green bean was used as a thickener for watermelon seed plants, the yield of the main crop seeds (181 kg/ha, or by 8.9% higher than in the control) was higher where bean was sown in

watermelon interrows with a layout of 1.4 m x 0.5 m, and 98 kg/ha of beans were additionally harvested.

Conclusions. The use of thickeners grown between rows of the main crop is the most effective technological technique in the Northern Steppe of Ukraine to increase the yield and improve the quality of watermelon seeds. Our experiments demonstrated that sweet corn was the best thickener, interrow was the best placement, and 2.8 m x 1.0 m was the best layout. This method in watermelon seed production allows increasing the seed yield by 12.7% related to the control (no thickeners) and raising the economic efficiency of seed production due to a gain in the net profit of 14,800 UAH/ha (26.4%) and profitability by 37.9% while maintaining high sowing indicators of seeds.

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ВПЛИВ УЩІЛЬНЕННЯ ПОСІВУ КАВУНА НА ВРОЖАЙНІСТЬ НАСІННЯ ТА ЙОГО ЯКІСТЬ

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Мета і задачі дослідження. Мета – вивчення впливу ущільнення сім'яників кавуна на врожайність насіння і їх якість при різних схемах розміщення ущільнювачів в умовах Північного Степу України.

Матеріали та методи. Основна культура – кавун. Ущільнювачі – кукурудза цукрова та квасоля овочева. Ущільнювачі розміщували в міжряддях і рядках кавуна за схемою посіву – 1,4 x 1,0 м і 2,8 x 1,0 м (кукурудза цукрова) і 1,4 x 0,5 м, 2,8 x 0,5 м (квасоля овочева).

Обговорення результатів. Найбільш високий вихід насіння з плоду (21,3 г) встановлено за ущільнення міжрядь кавуна кукурудзою цукровою за схемою 2,8 x 1,0 м (контроль – 18,4 г). Ущільнення міжрядь кавуна кукурудзою цукровою сприяло підвищенню маси 1000 насінин від 52,6 г (контроль) до 55,5 г. Найвища врожайність насіння кавуна (187 кг/га) отримана за ущільнення міжрядь кавуна кукурудзою цукровою за схемою 2,8 x 1,0 м (збільшення до контролю – 21 кг/га або 12,7%). Використання в якості ущільнювача кавуна квасолі овочевої було менш ефективним. Збільшення врожаю за варіантами дослідів склало 7–15 кг/га (4,2–9,0%). Додатково отримано 0,8–1,8 т/га молочно-воскових качанів кукурудзи цукрової і 47–98 кг/га зерна квасолі овочевої.

Висновки. З метою збільшення врожайності і підвищення якості насіння кавуна найбільш ефективним технологічним прийомом в умовах Північного Степу України є використання ущільнювачів в міжряддях основної культури. За результатами експериментальних досліджень визначено кращий ущільнювач (кукурудза цукрова), схема та спосіб його розміщення (2,8 x 1,0 м в міжряддях кавуна). Використання даного способу в технології насінництва кавуна дозволяє збільшити врожайність насіння на 12,7% відносно контролю (посів без ущільнення) та підвищити економічну ефективність вирощування насіння за рахунок збільшення чистого прибутку на 14,8 тис. грн/га (26,4%) та рівня рентабельності на 37,9% із збереженням високих посівних кондицій насіння.

Ключові слова: кавун, насіння, ущільнення посіву, ущільнювач, культура, схема посіву, врожайність.

ВЛИЯНИЕ УПЛОТНЕНИЯ ПОСЕВА АРБУЗА НА УРОЖАЙНОСТЬ СЕМЯН И ЕГО КАЧЕСТВО

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Цель и задачи исследования. Цель – изучение влияния уплотнения семенников арбуза на урожайность семян и их качество при различных схемах размещения уплотнителей в условиях Северной Степи Украины.

Материалы и методы. Основная культура – арбуз. Уплотнители – кукуруза сахарная и фасоль овощная. Уплотнители размещали в междурядьях и рядках арбуза по схеме посева – 1,4 x 1,0 м и 2,8 x 1,0 м (кукуруза сахарная) и 1,4 x 0,5 м, 2,8 x 0,5 м (фасоль овощная).

Обсуждение результатов. Наиболее высокий выход семян из плода (21,3 г) установлен при уплотнении междурядий арбуза кукурузой сахарной по схеме 2,8 x 1,0 м (контроль – 18,4 г). Уплотнение междурядий арбуза кукурузой сахарной способствовало повышению массы 1000 семян от 52,6 г (контроль) до 55,5 г. Наивысшая урожайность семян арбуза

(187 кг/га) получена при уплотнении междурядий арбуза кукурузой сахарной по схеме 2,8 x 1,0 м (прибавка к контролю – 21 кг/га или 12,7%). Использование в качестве уплотнителя арбуза фасоли овощной было менее эффективным. Прибавки урожая по вариантам опыта составили 7–15 кг/га (4,2–9,0%). Дополнительно получено 0,8–1,8 т/га молочно-восковых початков кукурузы сахарной и 47–98 кг/га зерна фасоли овощной.

Выводы. С целью увеличения урожайности и повышения качества семян арбуза наиболее эффективным технологическим приемом в условиях Северной Степи Украины является использование уплотнителей в междурядьях основной культуры. По результатам экспериментальных исследований определен лучший уплотнитель (кукуруза сахарная), схема и способ его размещения (2,8 x 1,0 м в междурядьях арбуза). Использование данного способа в технологии семеноводства арбуза позволяет увеличить урожайность семян на 12,7% относительно контроля (посев без уплотнения) и повысить экономическую эффективность выращивания семян за счет увеличения чистой прибыли на 14,8 тыс. грн/га (26,4%) и уровня рентабельности на 37,9% с сохранением высоких посевных кондиций семян.

Ключевые слова: арбуз, семена, уплотнение посева, уплотнитель, культура, схема посева, урожайность.

EFFECT OF THICKENING OF WATERMELON SOWING ON YIELD AND SEED QUALITY

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Purpose and objectives. To study the effect thickening plantations of watermelon seed plants on seed yield and quality, using different thickening designs in the Northern Steppe of Ukraine.

Materials and methods. The main crop was watermelon. Sweet corn and green bean were used as thickeners. The thickeners were placed in watermelon interrows or in rows with the following layouts: 1.4 m x 1.0 m and 2.8 m x 1.0 m (sweet corn) and 1.4 m x 0.5 m, 2.8 m x 0.5 m (green beans).

Results and discussion. The highest output of seeds per fruit (21.3 g) was recorded when sweet corn was sown between watermelon rows with a layout of 2.8 m x 1.0 m (18.4 g in the control). Growing sweet corn in watermelon interrows increased the 1000-seed weight from 52.6 g (control) to 55.5 g. The highest yield of watermelon seeds (187 kg/ha) was obtained in plantations where sweet corn was grown watermelon interrows with a layout of 2.8 m x 1.0 m (+ 21 kg/ha or 12.7% to the control). The use of green bean as a thickener for watermelon was less effective. The yield increased by 7-15 kg/ha (4.2–9.0%) compared to the control. In addition, 0.8-1.8 t/ha of milky-wax cobs of sweet corn and 47–98 kg/ha of green beans were harvested.

Conclusions. The use of thickeners grown between rows of the main crop is the most effective technological technique in the Northern Steppe of Ukraine to increase the yield and improve the quality of watermelon seeds. Our experiments demonstrated that sweet corn was the best thickener, interrow was the best placement, and 2.8 m x 1.0 m was the best layout. This method in watermelon seed production allows increasing the seed yield by 12.7% related to the control (no thickeners) and raising the economic efficiency of seed production due to a gain in the net profit of 14,800 UAH/ha (26.4%) and profitability by 37.9% while maintaining high sowing indicators of seeds.

Key words: watermelon, seeds, sowing thickening, thickener, crop, sowing design, yield.