

Hybrid Properties of Cucumber Elegant F1

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ABSTRACT

The article describes the features of technologies for growing cucumber on temporary protected grounds. The elements of the cultivation technology of different methods of sowing 5 varieties specimens of cucumber have been studied. The cucumber hybrid Elegant F1 is intended for cultivation on open and protected soils. Plant height reaches up to 2.5 - 3.5 meters, belongs to the indeterminate type. The distance between the nodes is 9-10 cm. 1-2 fruits are formed in the axil of the leaf. It has 100% parthenocarpic properties and retains this property until the end of the growing season. The shape of the fruit is cylindrical, the surface is glossy, there is practically no bitter taste. The average fruit weight is 120 - 130 grams. The first crop ripens 30-35 days after germination. With the correct and timely application of the necessary agrotechnical measures in protected areas, 23-25 kg/m² of the crop can be harvested in natural soil and 30-35 kg/m² in hydroponics. One of the distinguishing features of this hybrid is the density of the fruit pulp, and thus the juiciness of the fruit. This feature allows the fruits to gain more weight, be stored for a long time and transported over long distances without losing the quality of the fruit. The average weight of one fruit reaches up to 130 grams. This hybrid shows tolerance to diseases such as downy mildew, powdery mildew and cucumber mosaic.

KEYWORDS: *technologies, cucumber, hybrid Elegant.*

Introduction. Vegetable products are of great importance in human life and play an important role in the diet. In recent years, the President and the Cabinet of Ministers of the Republic of Uzbekistan have adopted a number of decrees and resolutions to expand the area of vegetable crops and grow high-quality export-oriented products. A lot of practical work is being done on the ground to develop this sector. Currently, in our country, the cultivation of vegetables in protected ground is becoming increasingly popular. One of the main factors for obtaining high and high-quality yields of vegetable crops is the use of heterotic hybrids.

Cucumber - although it is not very high in calories, it occupies a special place with its dietary properties and taste and is considered popular among vegetable crops. In our country, the heterose-free cucumber hybrids are growing in many farms. Interest in this culture is growing very rapidly in the greenhouse economy due to its short growing season, early fruit and commodity of fruits. However, in most cases, the bulk of the crop is grown from hybrid seeds imported from abroad. This, in turn, sets the challenge for breeders to obtain high-yielding varieties and hybrids that are resistant to diseases and adverse environmental factors. breeding of high-yielding, disease-resistant new varieties and hybrids of cucumber, as well as the development of innovative technological elements of cultivation.

Materials and methods. Field experiments were carried out in 2019-2021 in the greenhouses of the private enterprise "Green Valley Seeds" of the Altinkul district of the Andijan region.

The roof of the greenhouse is arched, 4-section. The width of each section is 7 m and the length is 35

m. The building area is 980 m². The greenhouse is covered with a polyethylene 0.8mm. For the purpose of comparative study of economically valuable traits, hybrids Elegant F1 (Green Valley Seeds), Accent F1 (Agrotyp), Xon F1 (Productive seed), Espadana F1 (RijkZvaan), Asia F1 (Green Valley) seeds).

The Espadana F1 hybrid, which is now widely grown in greenhouses, was taken as a standard. The experiments were carried out in 4-fold repetition. There were 20 plants in the plot, the planting pattern was 90 cm between bands, 70 cm between rows, 40 cm between plants, and the feeding area of the plot was 7.2 m².

The plant was irrigated using drip irrigation equipment from the "ECO DRIP LYX" company, and the number and timing of irrigation were determined based on the mechanical composition of the soil. In experiments, cucumbers were harvested 15-18 times per weight of the growing season. In the experiments, phenological observations, biometric measurements, determination of resistance to diseases, observation and accounting of yield and commercial quality were carried out in accordance with generally accepted requirements.

The study of cucumber hybrids was carried out on the basis of the following guidelines; "Methodology of state variety testing of agricultural crops". Issue IV. Potatoes, melons and vegetables (M. Kolos. 1975). "Methodology of field experience", "Methodology of experimental work in vegetable growing and melon growing" Statistical analysis of the results of observations was calculated using the method of analysis of variance in the computer programs "Excel 2010" and "Statistic 7.0 for Windows".

Results and discussion. During the study, the passage of phenological phases and the duration of the growing season were observed. 10 - 75% seedlings began to appear 3-4 days after sowing. In Espadana F1 and Elegant F1 hybrids, 75% of seedlings appeared after 3 days, relatively earlier than other hybrids. In the rest of the hybrids, seedlings appeared within 4 days. In terms of seed germination, the best result was noted in the Elegant F1 hybrid - 99%. In the Khan F1 hybrid, this figure was 92%. The remaining hybrids have 93 - 98%.

On average for the collection, 23-30 days after sowing, the formation of the third true leaf was noted. In Espadana F1 and Elegant F1 hybrids, this phase was observed relatively early, that is, 23 days after sowing.

In the experiments, phases from 10 to 70% of the appearance of flowers after emergence of shoots were also observed. At the same time, 10% of the appearance of uterine flowers, on average, depending on the variety sample, was 42-48 days. And the difference between the hybrids was noticeable in the mass flowering of 75%. The earliest onset of the "beginning of flowering" phase was noted in the Elegant F1- hybrid 46 days after germination. On the 47th day, the 75% flowering phase was observed in Espadana F1 and Asian F1 hybrids. In other hybrids, the period from germination to 75% flowering varied from 51 to 53 days. Among the studied hybrids, Elegant F1 proved to be early ripe, blooming on the 46th day (Table 1).

Table 1. Seed germination of cucumber hybrids in a greenhouse and the duration of growth phases (2019-2021).

Hybrids	Growing season						Duration of fruiting	
	mass germination		the flowering of mother flowers		formation of the first fruits	first harvest		last harvest
	germination 75%	third real	10%	75%				

		leaf						
EspanadaF1-st	3	23	42	47	55	58	144	86
AccentF1	4	30	48	53	60	64	144	80
KhonF1	4	30	45	51	58	62	144	82
ElegantF1	3	23	42	46	52	57	144	87
AsiaF1	4	27	44	47	55	61	144	83

As a result of phenological observations, the period from mass shoots to the beginning of fruit formation, the dates of the first and last harvest were determined. From mass shoots to the beginning of fruit formation, as a result of observations on variety samples, it took from 52 to 60 days. The collection of the first crop on variety samples was carried out in 57-64 days. The hybrid Elegant F1 had its first harvest on the 57th day. The first crop was harvested 1 day earlier than the standard and 4-7 days earlier than the rest of the hybrids. The period from mass germination to the last harvest for variety samples was 144 days. The studied hybrids had a fruiting period of 80 to 87 days.

The longest period was observed in the Elegant F1 hybrid - 87 days. In other hybrids, the duration of fruiting varied from 80 to 86 days. During the experiments, biometric measurements were carried out twice, i.e. at the beginning of fruit formation and at the end of the growing season. The length of the main stem, the number of fruit elements, the number of lateral shoots and the number of leaves were determined. There was a significant difference in the growth and development of the aerial parts of plants (Table 2).

Table 2. Growth and development of the aerial part of cucumber hybrids in the greenhouse (2019-2021).

Hybrids	During fruit formation				At the end of the growing season			
	Stem length, cm	Number of leaves, pieces / plant	Number of fruit elements, pieces/plant	Number of side shoots pcs/plant	Stem length, cm	Number of leaves,	Number of fruit	Number of side shoots pcs/plant
EspanadaF1-st	85	20	16	-	316	41	31	4
AccentF1	87	18	15	-	283	40	28	4
KhonF1	88	21	10	0.3	233	36	27	4
ElegantF1	85	20	17	0.3	353	45	32	5
AsiaF1	90	19	17	0.3	320	42	27	5

During the period of fruit formation in the studied cucumber hybrids, the length of the main stem averaged 85-90 cm, the number of leaves was 18-21, the number of fruits was 10-17. Over the years of study, lateral shoots during this period formed in small quantities. This figure averaged 0.3 pcs/plant.

Before the onset of the fruiting period, mainly in the period of the beginning of flowering, the seedlings were fed with mineral fertilizers in the ratio N:P:K 13-40-13 at a rate of 1.5 kg per 1000 liters of water by drip irrigation. At the beginning of fruiting, they were fed with FORTE fertilizer with a composition of 20-10-20+ME. After the first harvest, the cucumbers began to be fed with fertilizers containing more potassium, N:P:K 12-5-40 at a rate of 2 kg per 1000 liters of water by fertigation.

Over the years of study, at the end of the growing season, the length of the main stem according to

variety samples averaged 233–353 cm. The Elegant F1 hybrid stood out along the length of the main stem with an indicator of 353 cm. i.e. 37 cm more than the standard. In other hybrids, the length of the main stem varied from 233 to 320 cm. During this period, the average number of leaves per stem for the collection was 36–45 pieces. A relatively high rate was observed in the Elegant F1 hybrid (45 pcs). During the experiments, when counting the number of fruits from one plant, the average for variety samples was 27–32 pcs. According to this indicator, the Elegant F1 hybrid was distinguished (32 pieces).

It was found that the number of fruits in the Elegant F1 hybrid was 1 pc more compared to the standard Espadana F1 hybrid and 4–5 pcs more than in other hybrids. The number of lateral shoots for variety samples averaged 4–5 pcs.

During the studied years, observations were also made on the resistance of cucumbers to diseases such as downy mildew (*Peronosporabrassicae* Gaum), powdery mildew (*Erysiphecichoracearum Sphaerothecafuliginea*), mosaic (Cucumber mosaic virus). In the results, the Elegant F1 hybrid showed high tolerance to these diseases. Relatively low rates of disease resistance were noted in the hybrids Accent F1 and Espadana F1.

Harvest is the main evaluation criterion when growing any crop. Cucumbers require frequent and timely collection. We held 15–18 gatherings annually. The previous 6 collections were counted as individual early harvests, and then the total yield at the end of the growing season was calculated. Yield accounting was carried out by weighing all products from one plant, both marketable and non-commercial. Productivity, one of the key indicators of the study, was revealed. (Table 3). In 2019–2021 harvesting 15–18 times during the growing season, their previous 6 harvests were counted as separate early harvests, and then the total harvest at the end of the growing season was calculated. After each harvest, the crop was divided into separate fractions and weighed. As a result, the productivity of single plants, the yield per square meter and the share of commercial yield in the total yield were determined.

Table3. The yield of cucumber hybrids in the greenhouse (2019–2021).

Hybrids	Yield percentage 6 times yield, kg/m ²	General harvest	
		1 m ² /kg	relative to the standard,%
Espadana F1-st	8.8	19.6	100
Accent F1	6.8	12.6	64
KhonF1	7.1	13.5	69
ElegantF1	10.1	23.0	115
AsiaF1	8.7	18.0	92

Analyzing the yield per square meter for three years, compared with the previous 6 collections, the yield by variety samples averaged 6.8–10.1 kg/m².

The standard hybrid Espadana F1 had a yield of 8.8 kg/m², the Elegant F1 hybrid had a higher early yield of 10.1 kg/m². In other hybrids, the early yield averaged 6.8–8.7 kg/m².

The total yield of marketable fruits by variety samples for three years amounted to 12.6–23.0 centner/m². The standard hybrid Espadana F1 yielded 19.6 kg/m², while the Elegant F1 hybrid yielded 23.0 kg/m², which is 15% more than the standard. In other hybrids, the total yield is below the standard (12.6–18.0 c/m²).

In the course of the experiments, a sign of cucumber parthenocarpy was observed, which is one of the valuable economic signs. It is important that the plant retains parthenocarpic properties until the end of the growing season, as these hybrids do not need pollination by insects. Otherwise, attracting

bees to the greenhouse for pollination is also a big problem. For three years of observations, the Elegant F1 hybrid was able to maintain 100% parthenocarpicity until the end of the growing season.

Conclusions. Based on the results of experiments and observations, it can be concluded that the Elegant F1 hybrid recorded higher results than the standard and other hybrids for all economically valuable traits. The marketable yield was 23.0 c/m², which is 15% higher than the standard, disease resistance and full preservation of the parthenocarpy property were revealed.

The cucumber hybrid Elegant F1 was entered into the State Register in 2020 by the private enterprise Green Valley Seeds and patented in 2021. We recommend growing this new cucumber hybrid to owners of all farms, private household plots and clusters in their greenhouses, as this new hybrid can serve as the basis for growing a high-quality, export-oriented crop. A brief description of the hybrid is as follows:

When breeding the Elegant F1 hybrid, the CBY-910687 line was taken as the maternal component and the Champion F1 hybrid we previously bred as the paternal component. The hybrid is intended for cultivation on open and protected soils. Plant height reaches up to 2.5 - 3.5 meters, belongs to the indeterminate type. The distance between the nodes is 9-10 cm. 1-2 fruits are formed in the axil of the leaf. It has 100% parthenocarpic properties and retains this property until the end of the growing season.

The shape of the fruit is cylindrical, the surface is glossy, there is practically no bitter taste. The average fruit weight is 120 - 130 grams. The first crop ripens 30-35 days after germination. With the correct and timely application of the necessary agro technical measures in protected areas, 23-25 kg/m² of the crop can be harvested in natural soil and 30-35 kg/m² in hydroponics. One of the distinguishing features of this hybrid is the density of the fruit pulp, and thus the juiciness of the fruit. This feature allows the fruits to gain more weight, be stored for a long time and transported over long distances without losing the quality of the fruit. The average weight of one fruit reaches up to 130 grams. This hybrid shows tolerance to diseases such as downy mildew, powdery mildew and cucumber mosaic.

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