Plant Production

UDC 633.854.78:631.543.3 https://doi.org/10.31867/2523-4544/0235

RESULTS OF STUDYING THE PRODUCTIVITY OF THREE-LINE HYBRIDS OF SUNFLOWER (*HELIANTHUS ANNUUS* L.) AND THEIR PARENTAL FORMS UNDER THE INFLUENCE OF WEATHER CONDITIONS

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Topicality. *Nowadays, agriculture is the basis of Ukraine's economy. No other industry is more susceptible to weather fluctuations than agriculture, which is constantly forced to adapt to climate change. Rising temperatures, changes in the amount of precipitation and its distribution over time, unstable weather, and the spread of pests and diseases are the result of climate change, which threatens the agricultural production of sunflower hybrids. Thus, the issue about the influence of weather factors on the formation of productive traits of both hybrids and their parental forms, the dependence of agricultural crops on weather factors (temperature and precipitation, both for the entire growth season and for several months) is relevant.* ***Purpose.*** *To study the impact of weather conditions on the formation of productivity indicators for hybrids and their parental components.* ***Materials and Methods.*** *The triple hybrids of sunflower (Helianthus annuus* L.*) Ahent, Ahronomicnyi, Kameniar, Marshal, Zaporizkyi 28 and their parental components such as single-cross sterile hybrids ZL(22x102)A, ZL(42x46)A, ZL(42x58)A and the restorers of fertility ZL512Rf, ZL678Rf and ZL7034Rf were studied.* ***Results.*** *Over the years of research, yield fluctuations reached to 0.90 t/ha for Ahent hybrid, 1.66 t/ha – Agronomichnyi, 0.13 t/ha – Marshal, 0.96 t/ha – Kameniar and 0.58 t/ha – Zaporizkyi 28. The highest yields and oil yield per unit area were in 2018. According to the results of three-year testing the hybrids and their parental forms, Marshal hybrid had the highest yield – 2.64 t/ha with seed oil content of 50.78 % in 2016. Also in 2016, all pollen fertility restorers had the highest yields and oil yield. In 2018, four out of five hybrids showed the highest yields and oil yield per unit area. In 2017, the lowest oil content in the seeds of the tested sunflower hybrids ranged 45.16–48.49 % for Ahent and Zaporizkyi 28, respectively.* ***Conclusions.*** *It was established that Marshal is the most productive hybrid for growing sunflower in the Southern Steppe of Ukraine, its average yield was 2.56 t/ha that exceeded by 0.27–0.48 t/ha other hybrids.*

Key words: *sunflower, hybrid, yield, oil content, thousand seed weight, oil yield, weather conditions, precipitation, temperature, sum of active temperatures, correlation coefficient*

Introduction. Ukraine's economy is currently based on agricultural production. No other industry is as dependent on weather fluctuations as agriculture. And it is constantly forced to adapt to climate change.

In general, climate change is a completely natural process. They are caused by both natural cycles and human activity and are quite real. The current warming began at the end of the 19th century and by the end of the 20th

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century, the temperature had increased by 0.7–0.8 °C. Human economic activity has led to a significant acceleration of this process.

An increase of 0.7–0.8 °C has been occurring in nature for thousands of years, and now we have the corresponding indicator for a century. Over the past 20 years, the average temperature has been changing even more rapidly [1].

Rising temperatures, changes in the amount of precipitation and its distribution over time, unstable weather patterns, and the spread of pests and diseases are the result of climate change, which threatens agricultural production.

To ensure the country's food security, the agricultural sector should take steps to adapt crops to climate change. It is necessary to constantly study the level of variability and adaptability of breeding linear material and hybrids developed on its basis in the arid conditions of the Steppe of Ukraine.

The purpose of this study is to investigate the influence of weather factors on the formation of productivity indicators of hybrids and their parental components.

Materials and Methods. The research was conducted on the fields of the Institute of Oilseed Crops of NAAS (IOC NAAS) located in the Southern Steppe of Ukraine. The climate was continental, with excessive heat and insufficient moisture, especially in summer. Summers were very hot and dry. There were often long rainless periods. The maximum summer precipitation falls in June–July, but their distribution over time is very variable in different years.

The three-line hybrids of sunflower (*Helianthus annuus* L.) Ahent, Ahronomichnyi, Kameniar, Marshal and Zaporozkyi 28 and their parental components, namely, single cross sterile hybrids ZL(22x102)A, ZL(42x46)A, ZL(42x58)A and pollen fertility restorers ZL512Rf, ZL678Rf, ZL7034Rf were studied. All sunflower hybrids, both simple sterile and trilinear, have single flower head, and pollen fertility restorers are well-branched.

The trial was laid out according to Dospekhov's methodology [2]. Sowing scheme was 70x35 cm, one plant per hole. The plots were six-row, 8.4 meters long, with a total plot area of 50.4 m^2 and an accounting area of 28.0 m^2.

The hydrothermal coefficient (HTC) was calculated according to the method of H. T. Selianinov [3] for the growing season of sunflower (May – September):

$$HTC = \frac{\sum P}{\sum t} 10;$$

where: Σ P – precipitation sum for the growing season, in mm; Σ t – temperature sum in degrees Celsius for the period with an average daily temperature more than 10 °C (within the same period).

Results and Discussion. During 2015–2019, we analyzed the adaptability of hybrid combinations of the Laboratory of Interlinear Sunflower Hybrids to the climatic conditions of our region [4], the impact of fertility restorers on the economically valuable traits of the obtained hybrid combinations [5], the dependence of productivity indicators in zoned hybrids [6, 7] and the features of new sunflower hybrids bred by IOC NAAS [8].

Field work was started to prepare the soil for sowing in April, and sowing in sunflower breeding nurseries – in the first third of May. The agrometeorological conditions of the sunflower growing season by years of testing are shown in Table 1.

The largest amount of precipitation in the 2016 growing season, 67.0 mm, fell in May (Table 1). In 2017, this indicator for May was 6.5 mm. And further, until the end of the growing season, precipitation was below the long-term average, except for September, when it fell by 23.0 mm more than the long-term norm, but they did not affect the formation of yields. The indicators for May and June 2018 were lower than the long-term average by 34.0 and 27.0 mm, respectively. And only in July and September there were heavy rains, which amounted to 122.0 (+64.0) and 90.0 (+57.0) mm.

The temperature regime of the years of sunflower cultivation was characterized by high active temperatures, which in 2016 were 2.4–5.4 °C higher than the average long-term temperature in 2017, and 1.4–6.5 °C higher than the average long-term temperature in 2016 (Table 1). The growing season of 2018 was also characterized by high temperatures, which exceeded the long-term average by 1.6–4.8 °C. As can be seen from these data, the sum of temperatures in all three years exceeded long-term averages (the excess was 3.4–3.8 °C).

Table 1. Agrometeorological conditions of sunflower growing season 2016–2018

Month	Third of month	2016		2017		2018		Average long-term indicators	
		a.d.t., °C	Precipitation, mm	a.d.t., °C	Precipitation, mm	a.d.t., °C	Precipitation, mm	a.d.t., °C	Precipitation, mm
May	I	17.7	7.0	19.1	2.5	22.6	0.0		
	II	18.1	48.0	13.5	4.0	18.2	6.0		
	III	20.9	12.0	19.5	0.0	20.6	0.0		
Average monthly temperature		18.9 + 2.9	-	17.4 + 1.4	-	20.5 + 4.5	-	16.6	-
Average monthly precipitation		-	67.0 + 27.0	-	6.5 - 33.5	-	6.0 - 34.0	-	40.0
June	I	19.8	27.0	23.1	0.0	22.5	0.0		
	II	24.4	9.0	21.4	4.0	25.2	4.0		
	III	29.1	6.0	26.0	6.0	24.8	31.0		
Average monthly temperature		24.4 + 5.0	-	23.5 + 4.1	-	24.2 + 4.8	-	19.4	-
Average monthly precipitation		-	42.0 -20.0	-	10.0 -52.0	-	35.0 -27.0	-	62.0
July	I	24.0	14.0	21.3	37.0	24.8	4.0		
	II	28.3	0.0	24.4	0.0	25.3	46.0		
	III	25.8	0.0	27.2	8.0	22.4	72.0		-
Average monthly temperature		26.0 + 3.4	-	24.3 + 1.7	-	24.2 + 1.6	-	22.6	-
Average monthly precipitation		-	14.0 - 44.0	-	45.0 - 13.0	-	122.0 + 64.0	-	58.0
August	I	29.3	0.0	30.6	0.0	26.9	0.0		
	II	24.1	0.0	28.7	0.0	25.2	0.0		
	III	26.3	0.0	21.9	4.0	24.5	0.0		
Average monthly temperature		26.6 + 5.4	-	27.1 + 5.9	-	25.5 + 4.3	-	21.2	
Average monthly precipitation		-	0.0 - 51.0	-	4.0 - 47.0	-	0.0 - 51.0	-	51.0
September	I	23.2	0.0	20.3	18.0	21.7	70.0		
	II	19.1	0.0	23.1	13.0	18.6	3.0		
	III	11.6	20.0	15.1	25.0	13.7	17.0		-
Average monthly temperature		18.0 + 2.4	-	19.5 + 3.9	-	18.0 + 2.4	-	15.6	
Average monthly precipitation		-	20.0 -13.0	-	56.0 +23.0	-	90.0 +57.0	-	33.0
Average temperatures over the growing season		22.8 + 3.8	-	22.4 + 3.4	-	22.5 + 3.5	-	19.0	-
Total precipitation		-	143.0 - 101.0	-	121.5 - 122.5	-	253.0 + 9.0	-	244.0

a.d.t., °C – average daily temperature, °C

At the same time, the amount of precipitation during the growing season was significantly higher than the long-term average (244 mm) and exceeded the average by + 9.0 mm in 2018, but was significantly lower than the statistical average – within 101.0 mm in 2016 and 122.0 mm in

2017. In 2016, 70 days were rain-free, namely the second and third ten-day periods of July, the entire August, and the first and second ten-day periods of September. There was also a rainless period in August in 2018, and in 2017, there was only 4 mm of precipitation in August. It is the weather conditions in August that have an important impact on the formation and filling of sunflower seeds in the Southern Steppe.

Based on the analysis of weather conditions, we calculated the hydrothermal coefficient for the period from May to September (153 days), which was 0.46 in 2016, 0.38 in 2017, and 0.79 in 2018 (Table 2).

Table 2. Climatic parameters of the growing season by years of testing (2016–2018)

Month	2016			2017			2018		
	Precipitation ∑, mm	a.m. ∑ t °C	HTC	Precipitation ∑, mm	a.m. ∑ t °C	HTC	Precipitation ∑, mm	a.m. ∑ t °C	HTC
May	67.0	56.7	1.18	6.5	52.1	0.12	6.0	61.4	0.10
June	42.0	73.3	0.57	10.0	70.5	0.14	36.0	72.5	0.50
July	14.0	78.1	0.18	45.0	72.9	0.61	122.0	72.5	1.68
August	0.0	79.7	0.0	4.0	81.2	0.05	0.0	76.6	0.0
September	20.0	53.9	0.37	56.0	58.5	0.96	90.0	54.0	1.67
Average for the growing season	***28.6***	***68.34***	***0.46***	***24.30***	***67.04***	***0.38***	***50.80***	***67.40***	***0.79***

a.m. – average monthly sum

According to such fluctuations, we assessed the adaptability of hybrids and their parental forms to stressful growing conditions.

Our work is aimed to develop new self-pollinated lines, pollen fertility restorers and create sunflower hybrid combinations with high genetic potential of economic traits, which are resistant to biotic and abiotic environmental factors, in order to maximize the genetic potential of the crop.

This article presents the results of three years of trials of three-line sunflower hybrids – Ahent [ZL(42x58) Ax7034Rf], Ahronomichnyi [ZL(42x58) Ax678Rf], Marshal [ZL(42x46) Ax512Rf], Kameniar [ZL(42x46) Ax678Rf], Zaporizkyi 28 [ZL(22x102) Ax678Rf] and their parental components (Table 3). The variations of productivity indicators were studied such as thousand seed weight, husk and oil content of seeds, yield and, respectively, fat yield per hectare.

After analyzing the results by year, it was proved that the highest yield and oil yield per area unit were recorded by four out of five hybrids in 2018, only the Marshal hybrid had a yield of 2.51 t/ha, which was the lowest in 3 years, while its highest yield of 2.64 t/ha was recorded in 2016. However, it was noted that the yield fluctuations of the Marshal hybrid over the years are insignificant, and among the five hybrids studied, Marshal is the most stable. Fluctuations between the indicators for three years were 0.13 t/ha in yield and 0.14 t/ha in oil yield. Also in 2016, all pollen fertility restorers had the highest yield and oil yield. Single-cross sterile hybrids demonstrated significant individual diversity: ZL(42x46)A had the best yield (1.75 t/ha) and oil yield (0.74 t/ha) in 2018; in 2016, ZL(42x58)A – 2.23 t/ha and 1.01 t/ha, respectively; in 2017, ZL(22x102)A – 1.46 t/ha and 0.60 t/ha, respectively. Yield fluctuations over the years reached 0.90 t/ha or 38.97 % for Agent, 1.66 t/ha (63.97 %) for Ahronomichnyi, 0.13 t/ha (5.08 %) for Marshal, 0.96 t/ha (38.06 %) for Kameniar and 0.58 t/ha (27.77 %) for Zaporizkyi 28.

The patterns of seed oil content were different. Four out of five hybrids had the highest oil content in 2016: Ahent – 48.84 %, Ahronomichnyi – 49.11 %, Marshal – 50.78 %, Kameniar – 48.90 %, and Zaporizkyi 28 hybrid had average oil content of 48.85 %. In 2017, the lowest oil content in seeds of all hybrids was 45.16 % in Ahent, 46.14 % in Ahronomichnyi, 48.02 % in Marshal, 44.80 % in Kameniar and 48.49 % in Zaporizkyi 28. As a result of the three-year research, fluctuations in oil content in seeds varied within 3.68 % in Ahent hybrid, 2.97 % in Ahronomichnyi, 2.76 % in Marshal,

Table 3. Characteristics of three-line hybrids and their parental components (2016–2018)

Name of hybrids and their genetic formula	Years of trials	Husk content, %	Thousand seed weight, g	Yield, t/ha	Oil content of seeds, %	*Oil yield, t/ha
Ahent ZL(42x58)x7034Rf	2016	25.1	55.0	2.38	48.84	1.05
	2017	31.4	41.0	1.85	45.16	0.75
	2018	25.3	56.0	2.75	46.46	1.15
	Average	27.27	50.67	2.33	46.82	0.98
Ahronomichnyi ZL(42x58)x678Rf	2016	22.8	46.0	2.42	49.11	1.07
	2017	29.3	37.0	1.52	46.14	0.63
	2018	23.1	50.0	3.18	46.34	1.33
	Average	25.07	44.33	2.37	47.20	1.01
Marshal ZL(42x46)x512Rf	2016	22.2	48.0	2.64	50.78	1.21
	2017	28.4	51.0	2.52	48.02	1.09
	2018	25.6	53.0	2.51	48.75	1.10
	Average	25.40	50.67	2.56	49.18	1.13
Kameniar ZL(42x46)x678Rf	2016	20.0	35.0	2.26	48.90	0.99
	2017	22.5	32.0	2.19	44.80	0.88
	2018	21.9	34.0	3.15	48.87	1.38
	Average	21.47	33.67	2.53	47.52	1.08
Zaporizkyi 28 ZL(22x102)x678Rf	2016	19.4	35.0	2.17	48.85	0.95
	2017	21.0	40.0	1.75	48.49	0.76
	2018	20.6	42.0	2.33	49.05	1.03
	Average	20.33	39.00	2.09	48.80	0.91
Average for three-line hybrids per year	2016	21.9	43.8	2.37	49.30	1.05
	2017	26.5	40.2	1.96	46.52	0.82
	2018	23.3	47.0	2.79	47.89	1.20
Average for 3 years		23.90	43.67	2.37	47.9	1.02
ZL42Ax58B	2016	23.3	57.6	2.23	48.18	1.01
	2017	22.6	51.0	1.97	47.04	0.83
	2018	22.0	50.5	1.87	47.52	0.80
	Average	22.63	45.13	1.56	47.81	0.88
ZL42Ax46B	2016	23.1	46.6	1.43	49.62	0.64
	2017	22.6	45.5	1.49	46.80	0.63
	2018	22.0	43.3	1.75	47.00	0.74
	Average	22.57	45.13	1.56	47.81	0.67
ZL22Ax102B	2016	21.6	42.2	1.26	47.90	0.54
	2017	22.5	45.5	1.46	45.99	0.60
	2018	24.1	44.8	1.18	47.02	0.50
	Average	22.73	44.17	1.30	46.97	0.55
Average number of sterile hybrids per year	2016	22.7	48.80	1.64	48.57	0.71
	2017	22.6	47.33	1.64	46.61	0.69
	2018	23.1	46.20	1.60	47.18	0.68
Average for 3 years		22.64	47.44	1.63	47.45	0.69
ZL512Rf	2016	20.2	37.5	1.30	39.30	0.46
	2017	21.9	40.1	1.11	41.70	0.42
	2018	20.4	34.3	1.20	40.60	0.44
	Average	20.83	37.30	1.20	40.53	0.44
ZL678Rf	2016	23.2	31.3	1.35	41.89	0.51
	2017	24.6	23.0	0.85	38.83	0.30
	2018	20.4	25.0	1.01	45.17	0.41
	Average	22.73	26.43	1.07	41.96	0.40

Table 3 continuation

ZL7034Rf	2016	20.7	43.6	1.49	43.37	0.58
	2017	19.8	40.0	0.98	43.87	0.39
	2018	20.3	45.6	1.12	50.61	0.51
	Average	20.27	43.07	1.20	45.95	0.50
Average for lines per year	2016	21.4	37.5	1.38	41.52	0.52
	2017	22.1	34.4	0.98	41.47	0.37
	2018	20.4	35.0	1.11	45.46	0.45
Average for 3 years		21.30	35.60	1.16	42.82	0.45

**– oil yield per hectare at 10% moisture content*

4.10 % in Kameniar and 0.56 % in Zaporizkyi 28. The thousand seed weight for four hybrids was the highest in 2018: Ahent – 56.0 g, Ahronomichnyi – 50.0 g, Marshal – 53.0 g, Zaporizkyi 28–42.0 g, Kameniar hybrid had a weight of 34.0 g, which was 1.0 g lower than in 2016.

The difference between the limit values was within 15.0 g or 29.60 % in Ahent hybrid, 13.0 g (29.33 %) in Ahronomichnyi, 5.0 g (9.87 %) in Marshal, 3.0 g (8.91 %) in Kameniar and 7.0 g (17.95 %) in Zapozhskyi 28.

In 2017, the formation of husk content in all three-line hybrids was the highest – 31.4 % in Ahent, 29.3 % in Ahronomichnyi, 28.4 % in Marshal, 22.5 % in Kameniar and 21.0 % in Zaporizkyi 28 hybrid, the average in 2018 – 25.3 %, 23.1 %, 25.6 %, 21.9 % and 20.6 %, the lowest in 2016 – 25.1 %, 22.8 %, 22.2 %, 20.0 %, 19.4 %, respectively. In sterile hybrids, the formation of the husk content was relatively stable and varied within 22.0–23.3 % in ZL42Ax58Rf, 22.0–23.1 % in ZL42Ax46Rf, 21.6–24.1 % in ZL22Ax102Rf.

As for pollen fertility restorers, the variation of this trait over the years was more individual: ZL512Rf varied within 1.7 %, ZL678Rf – 4.2 %, and ZL7034Rf – 0.9 %.

In general, it was determined that three-line, single-cross sterile hybrids and pollen fertility restorers had different expressions of individual indicators by years of study (Table 3).

Analysis of the influence of weather conditions on the formation of sunflower productivity traits revealed unequal dependence of different genotypes of the studied hybrids and their parental components on the supply of heat and moisture to plants in individual months and during the growing season as a whole. The hybrid Zaporizkyi 28 was the most demanding to heat, the correlation coefficient between the active temperature sum and yield was 0.87. For other hybrids, this coefficient was slightly lower – 0.79 for Ahent, 0.76 for Ahronomichnyi, 0.68 for Marshal and only 0.35 for Kameniar. The temperatures of the first two months of the growing season (May – June) were of great importance for the yield formation of most hybrids, with correlation coefficients of 0.99 and 0.99 for Ahent, 1.00 and 0.99 for Ahronomichnyi, 0.88 and 0.83 for Kameniar, and 0.98 and 0.99 for Zaporizkyi 28. The temperature in July was crucial only for the hybrid Marshal, with a correlation coefficient of 0.99.

Precipitation's effect on yield was quite different. In general, our hybrids proved to be quite tolerant of precipitation. May precipitation had a major impact only on the yield of the Marshall hybrid, with a correlation coefficient of 1.00. And only June precipitation positively affected all hybrids – the correlation coefficient was 0.83 for Agent, 0.79 for Agronomichnyi, 0.64 for Marshal, 0.41 for Kameniar and 0.89 for Zaporizkyi 28.

Among the simple hybrids in terms of oil accumulation in seeds, the hybrid combination ZL42Ax46Rf was the least demanding to temperature: the correlation coefficient with the active temperature sum was 0.73, in ZL42Ax58R – 0.93, and in ZL22Ax102R – 0.97. The ZL22Ax102B hybrid is quite special by its requirements to weather conditions. The conditions of August-September are of great importance for the realization of its potential, the correlation coefficients of yield with moisture supply are 0.96, with August temperature – 0.76, with September temperature – 0.96 and, as a result, the correlation of oil yield is 0.91, 0.85, and 0.91.

For pollen fertility restorers, a significant correlation between productivity indicators and weather factors was also established. The correlation coefficient of the sum of temperatures

with yield in the line ZL7034Rf is 0.84, thouline ZL678Rf – 0.86, 0.82, 0.96, respectively.

The meteorological conditions had a completely different effect on the ZL512Rf line, in which temperatures positively correlated with yield of 0.95 and oil yield of 0.97, but negatively with thousand seed weight of 0.71. The analysis of the weather influence in different months of growing season showed that their yield was most influenced by July temperatures, the correlation coefficients in the line ZL7034Rf were 0.95, in ZL678Rf – 0.93, in ZL512Rf – 0.84 and precipitation in May – 0.96, 0.95, 0.86 and June 0.83, 0.85, 0.94, respectively.

Conclusion. Zaporizkyi 28 (0.87) was the most susceptible to heat, while other hybrids had greater ecological adaptability: Ahent (0.79), Ahronomichnyi (0.76), Marshal (0.68) and Kameniar (0.35). For the yield formation of most hybrids, the temperatures of the first two months of the growing season (May – June) were very important.

Correlation coefficient for oil accumulation in seeds of single-cross hybrids to temperature sand seed weight is 0.85, oil yield is 0.99; in the was sufficient, namely ZL42Ax46B – 0.73, ZL42Ax58B – 0.93, for ZL22Ax102B – 0.97. Thus, the hybrid ZL42Ax46B should be recommended for cultivation in the Northern Steppe and Forest-Steppe zones, where temperatures are lower than for the cultivation of other hybrids.

Analysis of three-year studies of the influence of weather conditions on fertility restorer lines in different months of the growth season showed that their yield was most affected by July temperatures, the correlation coefficient of ZL7034Rf line was 0.95, ZL678Rf – 0.93, ZL512Rf 0.84 and precipitation in May – 0.96, 0.95, 0.86 and June 0.83, 0.85, 0.94, respectively.

According to three years of trials, we can conclude that Marshal is the most productive three-line hybrid in our zone, its average yield was 2.56 t/ha (with fluctuations over the years from 2.51 to 2.64 t/ha), which exceeded the yield of other hybrid combinations by 0.03–0.47 t/ha. The average oil yield per hectare for this hybrid was 1.13 t/ha (1.09–1.21), which was 0.05–0.22 t/ha higher than for other hybrids.

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УДК 633.854.78:631.543.3

Кутіщева Н. М., Шудря Л. І. , Одинець С. І. , Безсусідній О. В., Середа В. О. Результати вивчення показників продуктивності трилінійних гібридів соняшника та їхніх батьківських форм під впливом погодних умов. *Зернові культури. 2022. 6 (2). 70–77.*

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Актуальність. На сучасному етапі основу економіки України складає сільгоспвиробництво. Жодна інша галузь не залежить так від коливань погоди, як сільське господарство. І йому постійно доводиться пристосовуватись до змін клімату, що відбуваються. Підвищення температури, зміна

кількості опадів та їх розподіл у часі, нестійкий характер погоди, поширення шкідників і хвороб є результатом зміни клімату, що загрожує сільськогосподарському виробництву гібридів соняшника. Постає питання впливу погодних факторів на формування господарських ознак як самих гібридів так і їх батьківських форм, формування рослинами врожаю від погодних чинників – температури і опадів як за вегетацію в цілому, так і по місяцям. ***Мета.*** Вивчення впливу погодних умов на формування показників продуктивності гібридів і їх батьківських компонентів. ***Матеріали і методи.*** Дослідження були проведені на трилінійних гібридах соняшника (*Helianthus annuus* L.) Ahent, Ahronomichnyi, Kameniar, Marshal і Zaporizkyi 28 та на їх батьківських компонентах – простих стерильних гібридах ZL(22x102)A, ZL(42x46)A, ZL(42x58)A та на відновниках фер-тильності ZL512B, ZL678B і ZL7034B. ***Результати.*** Коливання врожайності за роками сягали 0,90 т/га у гібрида Ahent, 1,66 т/га у Ahronomichnyi, 0,13 т/га у Marshal, 0,96 т/га у Kameniar і 0,58 т/га у Запорізького 28. Найвищі показники врожайності та вихід жиру з одиниці площі були в 2018 р. За результатами трирічних випробувань гібридів і їх батьківських форм найвищу врожайність склав гібрид Marshal – 2,64 т/га в 2016 р. при олійності насіння 50,78 %. Також у 2016 р. найвищі показники врожайності та виходу олії мали всі відновники фертильності пилку. В той же час найвищі показники врожайності та вихід жиру з одиниці площі чотири з п’яти гібридів показали в 2018 році. Найнижчий вміст жиру в насінні у представлених гібридів був 2017 р. і знаходився в межах – 45,16–48,49 % у Ahenta та Запорізького 28, відповідно. ***Висновки.*** Встановлено, що для вирощування гібридів соняшника для Південного степу України найбільш продуктивним є гібрид Marshal, його середня врожайність склала 2,56 т/га і перевищила на 0,27–0,48 т/га цей показник у інших гібридів.

Ключові слова*: соняшник, гібрид, врожайність, олійність, маса 1000 насінин, вихід олії, погодні умови, опади, температура, сума активних температур, коефіцієнт кореляції*