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Conference proceedings are devoted to theoretical and practical aspects of the development of science in Central and Eastern European countries. General issues of the engineering, medical, psychological, philological, economic sciences, history of art, social communications and so on are considered. The publication is designed for scientists, lecturers, postgraduate students, students, as well as for the general reader.

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RESISTANCE OF SUNFLOWER LINES AND HYBRIDS TO OROBANCHE CUMANA WALLR

Svitlana Tretiakova[1]

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Sunflower is the main oilseed crop in Ukraine. Sunflower sown areas in Ukraine occupy more than 2 million hectares, which is 96% of all oilseeds [2, p. 67].

According to scientists, the competent selection of a hybrid provides 35% of the yield, the rest – agrotechnological and soil-climatic factors. Preference should be given to drought-resistant hybrids, resistant to lodging and shattering, high-oil hybrids, adapted to the continental climate.

High yields are achieved when using seeds for sowing with a mass of 1000 seeds of at least 50 g. Moreover, the similarity for hybrids should not be less than 85%, for varieties – at least 87-92% [1, p. 25].

Compliance with the minimum period of return to the field, which for sunflower is 7-8 years, is one of the main conditions for obtaining high and stable crop yields [3, p. 88; 4 p. 36].

Research methodology. The research program was designed to establish resistance of lines and hybrids to the sunflower sobole (Orobanche cumana Wallr.). To find decisions during 2017-2018 field experiments were carried out, they were carried out in the household of SGI-NTNS «Dachna» of Biliayivskyi district of Odesa region. In the experiments, the degree of infestation by diseases of both the whole plant and seeds, as well as the oil content were determined. The studied hybrids are represented by two groups of ripeness: mid-early and mid-ripening belong to the simple interline and oil type.

Research results. Our research data during 2017-2018 evidence that the hybrids were early maturing – Ex. 133/18 and Ex. 135/18, in which the period from germination to flowering was 93 days. This period was somewhat longer in the experimental hybrids – Ex. 126/18 – Ex. 132/18. Thus, the period from germination to flowering varied among them at the level of 96-99 days, however, these hybrids also belong to early ripening. Hybrid Ex 134/18 belongs to the middle early ripeness group, therefore the period from germination to flowering was 100 days (Table 1).

The plant height indicator is not standardized that's why it's not constant. It usually has his limits. In the vegetation conditions 2017-2018 the highest plants were plants of experimental hybrids Ex. 126/18 and Ex. 134/18. Thus, the height indicators were consequently 167 and 170 cm. The rest of other studied hybrids were somewhat lower and ranged from 149 to 160 cm.

As for the diameter of the basket, the biggest is in Ex. 129/18 – 24 cm, and the smallest in Ex. 133/18 and was 15 cm.

[1] Uman National University of Horticulture, Ukraine

The oil content of the seeds of all studied hybrids was at a sufficiently high level and a high rate was in the hybrid Ex. 130/18 – 50.4%.

This shows that growing the studied hybrids it's possible to get seeds with a high level of oil content. The lowest indicator of this feature was observed in Ex. 131/18 having – 43.2% of oil content.

Table 1

Basic morphological and biological indicators of sunflower hybrids (SE «Experimental base» Dachna «2017-2018)

№	Hybrids	Period from germination to flowering, days	Plant height, cm	Basket diameter, cm	Oil content, %	Husk-ness, %	Mass of 1000 seeds, g
1	Ex. 126/18	96	167	16	45,1	27,0	48
2	Ex. 127/18	97	160	17	45,5	33,3	60
3	Ex. 128/18	99	157	16	45,0	38,5	52
4	Ex. 129/18	97	156	24	46,9	29,1	48
5	Ex. 130/18	99	159	16	50,4	29,0	69
6	Ex. 131/18	99	149	16	43,2	22,4	67
7	Ex. 132/18	97	155	17	46,7	21,8	87
8	Ex. 133/18	93	155	15	47,3	31,1	61
9	Ex. 134/18	100	170	18	47,3	24,6	69
10	Ex. 135/18	93	152	17	48,1	31,9	47

The lowest huskness indexes were in the hybrids under study Ex. 132/18 and Ex. 131/18 and were respectively 21.8 and 22.4%, the highest were in Ex. 135/18 and Ex. 128/18 – 31.9 and 38.5%, respectively.

On average, for 2017–2018 years of research, high levels of oil content were in the experimental hybrid – Ex. 130/18 and amounted to – 50.4%, however, the mass of 1000 seeds was slightly lower and amounted to – 69 g.

Then, the largest indicator of the mass of 1000 seeds was in hybrid Ex. 131/18 and amounted to 87 g, meanwhile it has the lowest indicators of huskness – 21.8%, which in its turn indicates the positive economically valuable traits of this hybrid.

According to the table 2, the tendency of damage of various hybrids by the main diseases was established. On average for 2017-2018 of investigations of sunflower plants resistance to sobole under conditions of a natural infectious background ranged from 50 to 100%, while the degree of damage was 3–9 points.

Thus, 2018 in comparison with 2017 was less favorable for the formation of resistance of sunflower hybrids to sobole in conditions of natural infectious background, while the grade of plant damage in 2018 decreased.

The lowest indicators of resistance and damage grade were in 2018 in the Vivat standard and were respectively 56% and 3 points, whereas in 2018 they were even lower and were 50% and 3 points.

Table 2

Sunflower hybrids infestation by sobole in natural infectious background (SE «Experimental base Dachna»)

№	Hybrids	2017		2018	
		Resistant plants, %	Grade of infestation, points	Resistant plants, %	Grade of infestation, points
1	Ex. 126/18	100	9	100	9
2	Ex. 127/18	94	7	96	8
3	Ex. 128/18	92	6	90	7
4	Ex. 129/18	100	9	100	9
5	Ex. 130/18	78	5	70	5
6	Ex. 131/18	92	6	88	6
7	Ex. 132/18	94	7	90	7
8	Ex. 133/18	94	7	90	7
9	Ex. 134/18	96	8	92	7
10	Ex. 135/18	96	8	94	7
11	Vivat st.	56	3	50	3

So, in 2017 – the most resistant hybrids to sobole were Ex. 126/18 and Ex. 129/18, the resistance of which was 100%, and the grade of the lesion – 9.

So, in 2017, these indicators were slightly lower in the Ex studied hybrids. 134/18 and Ex. 135/18 resistance of sunflower plants to sobole was 96%, while the infestation grade was 8. So, we can conclude that the most resistant hybrids to sobole in 2017-2018 in conditions of natural infectious background are Ex. 126/18 and Ex. 129/18, the resistance of which was 100%, and the grade of infestation – 9.

Sunflower hybrids infestation by sobole in artificial infectious background over the years of research ranged from 36 to 100%, respectively, the degree of infestation ranged from 3 to 9 points. Thus, in comparison with 2018, 2017 was less favorable for formation of sunflower hybrids resistance in conditions of artificial infectious background to sobole, while the plant infestation grade in 2017 has decreased.

The lowest indicators of resistance and infestation grade were in 2017 in Vivat standard and amounted to 36% and 3 points respectively, whereas in 2018 they were slightly higher and amounted to 40% and 3 points (Table 3).

So, in 2017, the most resistant hybrids to sobole under conditions of a natural infectious background were Ex. 126/18 and Ex. 129/18, the resistance of which was 100%, and the grade of infestation – 9. Slightly lower these indicators were in 2018 under conditions of artificial infectious background in hybrids Ex. 127/18 and Ex. 128/18 the resistance of plants was respectively – 94 and 92%, the degree of infestation was at the level of 7-8 points.

Table 3

Sunflower hybrids infestation by sobole in artificial infectious background (SE «Experimental base Dachna»)

№	Hybrids	2017		2018	
		Resistant plants, %	Grade of infestation, points	Resistant plants, %	Grade of infestation, points
1	Ex. 126/18	100	9	100	9
2	Ex. 127/18	90	7	94	8
3	Ex. 128/18	90	7	92	7
4	Ex. 129/18	100	9	100	9
5	Ex. 130/18	68	5	70	5
6	Ex. 131/18	88	6	84	6
7	Ex. 132/18	86	6	88	6
8	Ex. 133/18	86	6	88	6
9	Ex. 134/18	90	7	90	7
10	Ex. 135/18	90	7	90	7
11	Vivat st.	36	3	40	3

So, in 2017-2018 somewhat lower these figures were in studied hybrids Ex.134/18 and Ex. 135/18 the resistance of sunflower plants to sobole under conditions of artificial infectious background was 90%, while the infestation grade was 7.

Therefore, it can be concluded that in 2018 the most resistant hybrids to sobole under artificial infectious background were hybrids Ex. 126/18, Ex. 129/18 and Ex. 127/18, the degree of infestation was 8-9 points.

Consequently, to increase the yield and the quality of sunflower it is crucially important to select new hybrids with different adaptive capabilities to specific zonal conditions and which fully reveal genetic potential of their productivity.

A complex study of economic properties showed that such elements of the crop structure as the size of the basket, the mass of 1000 seeds, the oil content and the yield are closely related and have dependence.

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