

EVALUATION OF REACTION OF NEW HYBRIDS SUNFLOWER ON GROWING CONDITIONS

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New sunflower hybrids studied by the complex of economically valuable traits. Using cluster analysis allowed for grouping hybrids at a rate response to growing conditions.

Keywords: *sunflower, cluster analysis, agronomic traits*

For agriculture Ukraine sunflower oil is the main crop. He received much attention due to the growing demand for sunflower oil used in food and technical industry, and waste recycling - for feeding farm animals [3, 4, 7]. The registry varieties of Ukraine for 2011 included more than 270 varieties of sunflower hybrids and [1, 6].

Nevertheless for production use only a tenth of them. This is due to the fact that new sunflower hybrids respond to growing conditions the same. Therefore, it is necessary to study not only the basic farming practices and new hybrids and reaction to growing conditions in different soil and climatic zones. This will create optimal conditions for plant growth and development of new sunflower hybrids and exercise maximum potential yield.

The aim of the research was to study the response of new hybrids of sunflower growing conditions in different soil and climatic zones.

Materials and methods research. Studies of modern sunflower hybrids was carried out in the area of unstable humidity in research areas of the department of genetics, plant breeding and biotechnology Uman National University of Horticulture

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in Cherkasy region, and Veselopodilskiy on experimental breeding station, Institute of bioenergy crops and sugar beet NAAS, Semenivskiy district in Poltava region area (zone of unstable humidity) during 2011-2012.

Soil test sites - black soil ashed heavy texture, thickness of humus horizon 45 cm, depth of carbonates - 70-100 cm. The relief area equal. In the plow layer (0-30 cm) research areas of the department of genetics, plant breeding and biotechnology Uman National University of Horticulture on average contained 2,8 and Veselopodilskoyi experimental breeding station – 3,2% of humus, nitrogen respectively 10,5 and 14,0, mobile phosphorus 5,5 and 9,2, potassium exchange 8,8 and 16,3 mg per 100 g soil.

The climatic conditions of the studies were generally favorable to the growth and development of most crops, including sunflower.

Over the years, studies have investigated sunflower hybrids of domestic and foreign selection: Ukrayins'ke sonechko, Ukrayins'kyy F1, Arena PR, Zahrava, Ukrayins'kyy skorostyhlyy, Kazio, Sonyachnyy nastriy, Dariy, Etyud, Bohun, Bayda, NK Meldimi, Armada KL, Armaheddon. The total area of the experimental plot 34 m², accounting – 25 m², number of repetitions, quadruple.

Experimental tests were performed according to the method of field experiment [2].

For a comprehensive assessment of individual observations using cluster analysis, ie the compilation of a large number of features in a small number of generalizing the results, highlighting the complex and essential characteristics of hybrids. While each is involved in the analysis feature is a separate independent element with its characteristics, the number of parameters that express the results of statistical analysis is not subject to reduction. The only way is the most signs of rejection and return to the classic pinpoint problems or combination of signs and replacing them with one artificially constructed based on them [5].

The research results elaborated by statistical methods, including dispersion and cluster analysis. The calculation was performed using computer software applications «MS Excel» and «STATISTICA 10».

Results. Based on field experiments were formed such economically valuable signs, which conducted a cluster analysis of sunflower hybrids: the year of registration, the recommended growing area, Usage, group maturity, quality, resistance imidozalin, plant height, stem diameter, number of leaves, leaf surface area diameter basket, the number and weight of seeds, weight of 1000 seeds, oil content, yield.

An important issue through the use of various methods of complex analysis sunflower hybrids, is to establish standards similarity of response to environmental factors. Growing hybrids in different production conditions can not get their consistently high performance just because that environmental factors they react the same way. Therefore, the negative conditions prevailing at the time of growing them in a particular sector, do not allow to form seemingly different performance (from a biological point of view) hybrids.

To test this assertion, cluster analysis was conducted for key performance indicators - yield and oil content in seeds and complex commercially valuable traits studied hybrids (Fig. 1-2.).

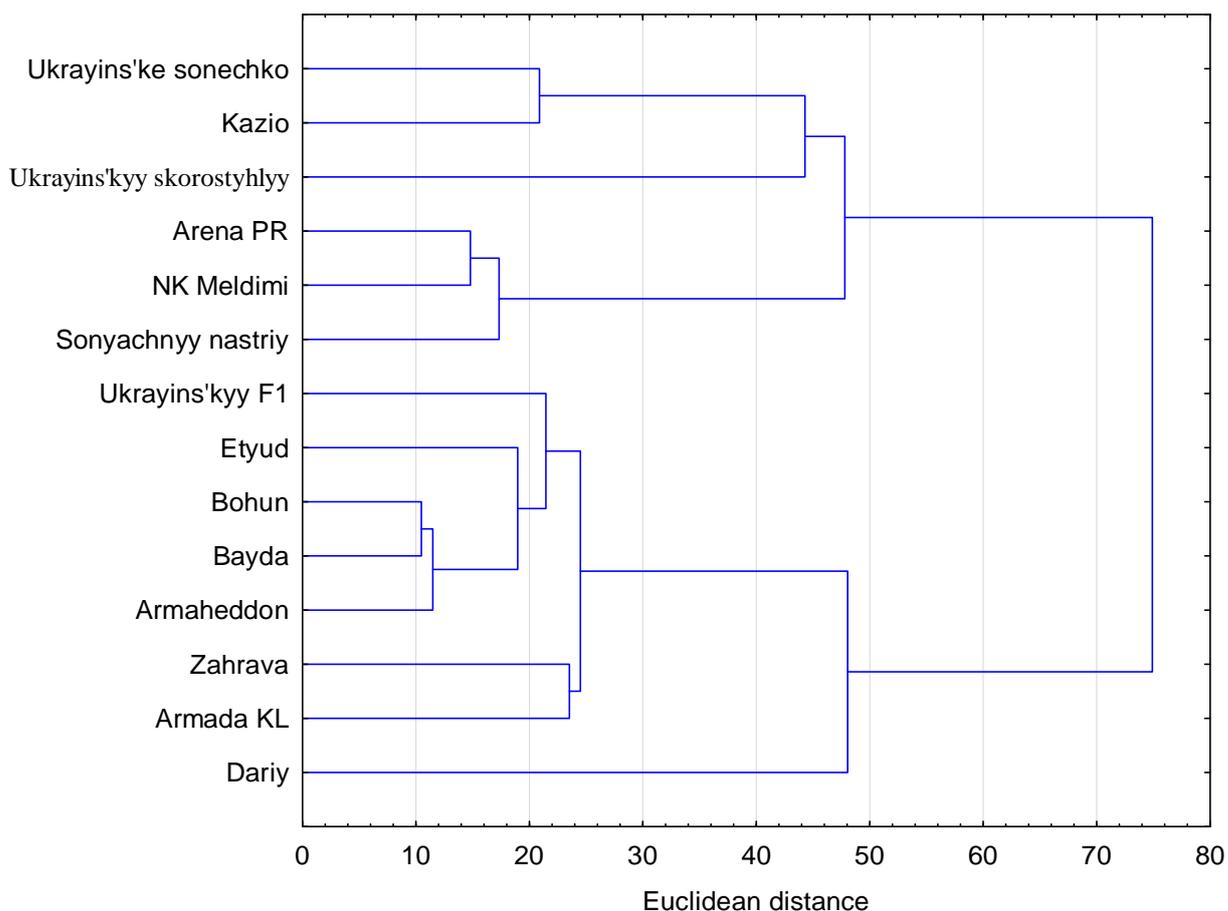


Fig. 1. Cluster analysis of sunflower hybrids by the complex agronomic traits

Based on cluster analysis we found that, for a set of commercially valuable traits can be divided into a number of clusters - that is similar in these terms of sunflower hybrids: the first cluster - Ukrayins'ke sonechko, Kazio; second - Arena PR, NK Meldimi, Sonyachnyy nastriy, third - Bohun, Bayda, Armaheddon, fourth - Zahrava, Armada KL.

In general, analyzing the origin of the studied hybrids, it is worth noting that in the second cluster hybrids Arena PR and NK Meldimi belong to the same institution originator - Syngenta sids. In all other clusters is no coincidence grouping of identical complex biological traits of hybrids by originators seeds.

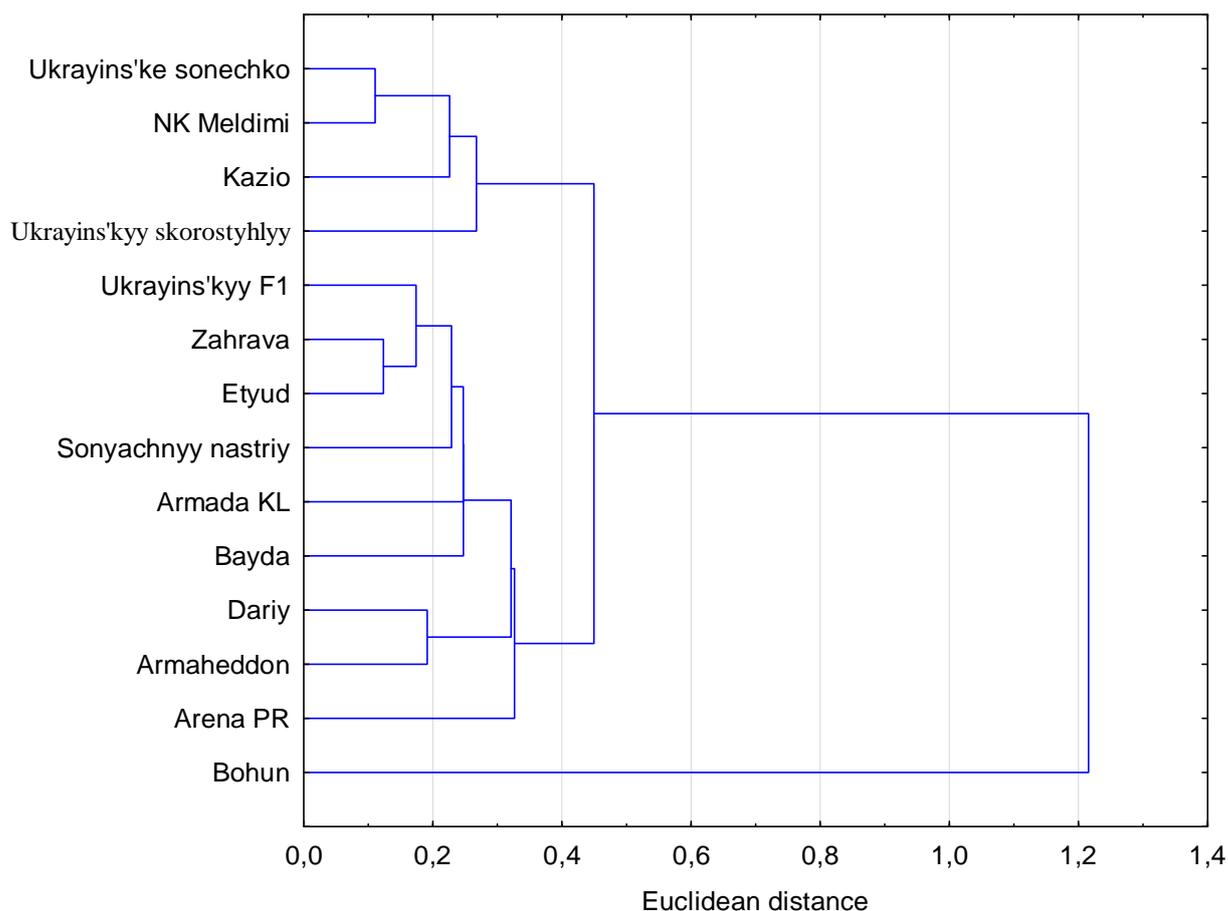


Fig. 2. Cluster analysis of new sunflower hybrids for yield and oil content

Analyzing the results of cluster analysis for yield and oil content, we have identified several clusters: the first - Ukrayins'ke sonechko, NK Meldimi second - Ukrayins'ky F1, Zahrava, Etyud, the third - Dariy, Armaheddon (Fig. 2).

The analysis only the yield and oil content in seeds less informative because the probability of coincidence of these features is much higher than a complex of economically valuable traits. After selection of modern hybrids mainly happens on the formation of a stable manifestation yield and oil content.

In addition, the results of analysis of variance was analyzed by biological features of hybrids and growing conditions on yield signs and oil content in the seeds we have studied sunflower hybrids (Fig. 3, 4).

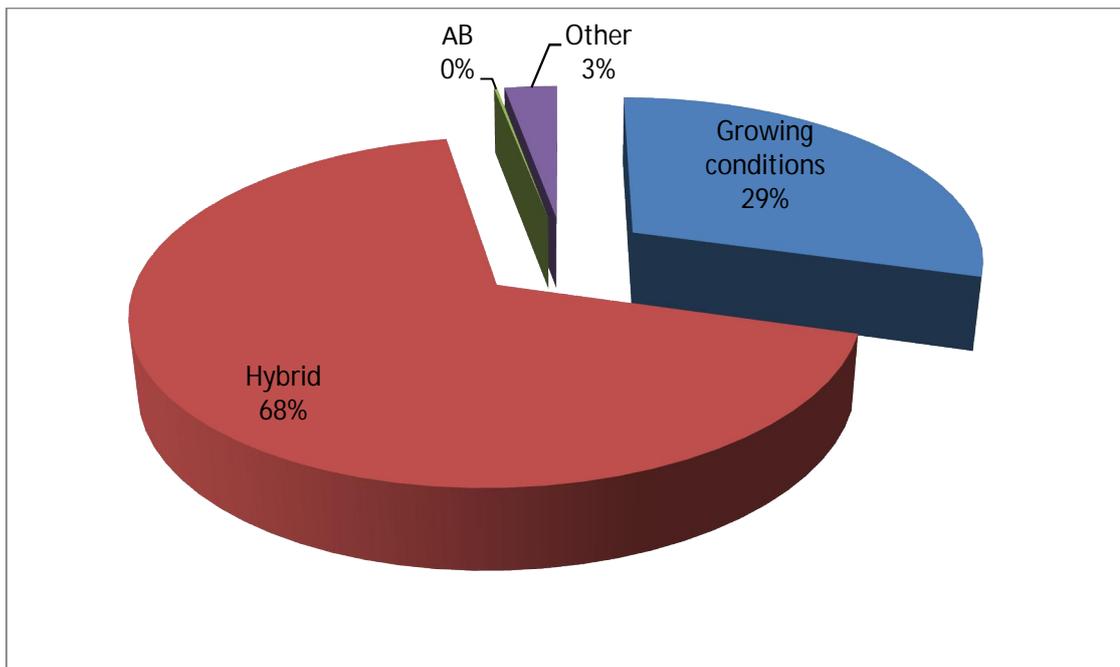


Fig. 3. Share of influence factors on the formation of yield of sunflower

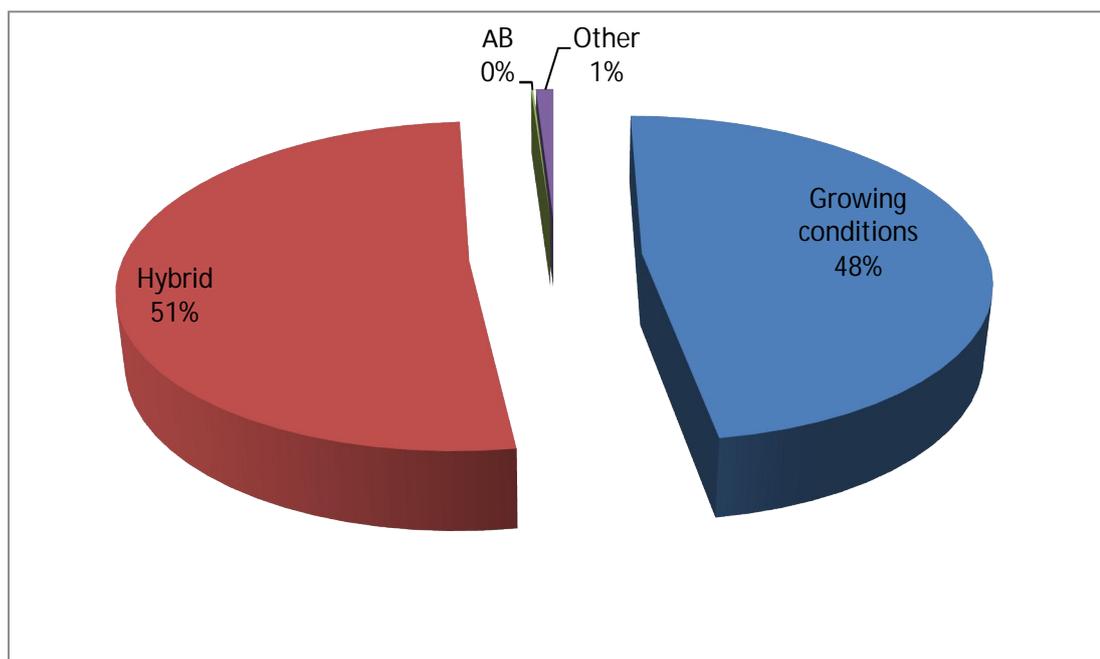


Fig. 4. The share of influence factors on formation of oil content in sunflower seeds

Based on the analysis found that the formation yield of sunflower hybrid affects 68% and growing conditions merely 29%. And the formation of oil content of hybrid biological characteristics affecting 51% and growing conditions - 48%.

Conclusions

1. An introduction to cluster analysis only indicators of yield and oil content in seeds results in inaccurate scientific information, as the probability of coincidence of these features is much higher than a complex of economically valuable traits. After selection of modern hybrids mainly happens on the formation of a stable manifestation yield and oil content.

2. Dedicated cluster hybrids Arena PR and NK Meldimi belongs to one institution originator - Syngenta seeds. Consequently, these hybrids are equally responsive to growing conditions and on the basis of performance most like.

3. Productivity of sunflower depends on the choice of 68% of the hybrid and 29% - of growing conditions and oil content, respectively 51% and 48%.

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ОЦІНКА РЕАКЦІЇ НОВИХ ГІБРИДІВ СОНЯШНИКУ НА УМОВИ ВИРОЩУВАННЯ

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Вивчено нові гібриди соняшнику за комплексом господарсько цінних ознак. Використання методу кластерного аналізу дозволило провести групування гібридів за нормою реакції на умови вирощування.

Ключові слова: соняшник, кластерний аналіз, господарсько-цінні ознаки.

ОЦЕНКА РЕАКЦИИ НОВЫХ ГИБРИДОВ ПОДСОЛНЕЧНИКА НА УСЛОВИЯ ВЫРАЩИВАНИЯ

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Изучены новые гибриды подсолнечника по комплексу хозяйственно ценных признаков. Использование метода кластерного анализа позволило провести группировки гибридов по норме реакции на условия выращивания.

Ключевые слова: подсолнечник, кластерный анализ, хозяйственно-ценные признаки