

**CONTENT AND OIL YIELD OF SUNFLOWER (HELIANTUS ANNUS) -
HYBRID DEVEDA DEPENDING ON THE MAIN TILLAGE SYSTEM**

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ABSTRACT

The research was conducted in a stationary field experiment of the Dobrudzha Agricultural Institute - General Toshevo in the period 2016 to 2022. The impact of seven main soil tillage systems (MSTS) with and without turning the cultivated layer, No-till, as well as the alternative alternation between them in a 4-field crop rotation (beans-wheat-sunflower-corn) on the content and yield of oil. The MSTS are: 1. CP - conventional plowing (24-26 cm); 2. D – disking (10-12 cm) 3. C – cutting (chisel-plough); 4. NT - No-till (direct sowing); 5. Coventional plowing (for spring crops) – No-till (for wheat); 6. Cutting (for spring crops) - Disking (for wheat) and 7. Coventional plowing (for spring crops) - Disking (for wheat). The mineral fertilization in the crop rotation was as follows: Common bean – N60P60K60; Wheat – N120P120K60; Sunflower - N60P120K120 and Maize – N120P60K60. The main objectives of the study were: (i) to investigate the seasonal variability in sunflower: (i) in the kernal/husk ratio; (ii) the oil content of the whole seed and its components; (iii) the obtained yields of oil per 1 area. The share of the kernel varies from 74.91% (2016) to 80.20% (2018). The highest percentage of oil in the husk was found in 2018. In the whole seed, this high level of differentiation in oil content values depending on weather conditions over the years was preserved. The seed produced in 2019 is the richest in oil (50.85%). Yields of kernels, husks and their oil yields, as well as whole seed, were more strongly affected by weather conditions during the study period compared to the effect of the MSTS. The tillage systems with or no deep turning treatment of the plow layer applied in crop rotation constantly or in combination with shallow tillage or No-till lead to obtaining seed richer in oil concentration and, accordingly, oil yield compared to the others. The independent permanent application of deep cutting (chisel-plough) oil yield is less with 144.7 kg/ha compared to traditional plowing, while in the application of CP-No-till system this difference is only 88 kg/ha. Shallow tillage alone and in combination, as well as long-term self-application of No-till lead to an increase in the share of husks and a lower yield of oil compared to the deep main tillage. The reliability of the obtained results is of the maximum degree of expression. The influence of meteorology as a factor is more pronounced than that of STS. It has approximately the same values for %

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kernel/husk in the seed, as well as for the percentage of oil in the kernel and the whole seed. However, it was found to have a much stronger influence on oil concentration in the husk compared to that in the kernel and whole seed. The strict adherence to crop rotation, regardless of the diversity in the main tillage systems tested and the high level of selection work lead to a lack of observation of the blue wrist parasite (*Orobanche ssp.*). An additional contribution to this fact is that the areas in the area are lightly infected with aggressive races of this parasite. The proportion of kernel in the seed is strongly negatively correlated (-0.995**) with that of the husk. The proportion of kernel in the seed was also in a well-pronounced positive correlation with the percentage of oil in the seed (+0.485**) and the oil concentration in the husk (+0.445**). There is also a well-expressed correlation between the oil content of the nut and that of the seed (+0.699**).

Key words: main soil tillages systems, sunflower, kernel/husk components, oil concentration, oil yields