

CORRELATION BETWEEN INTENSITY OF OIL AND PROTEIN ACCUMULATION IN SEED AND YIELD STABILITY OF SUNFLOWER HYBRID

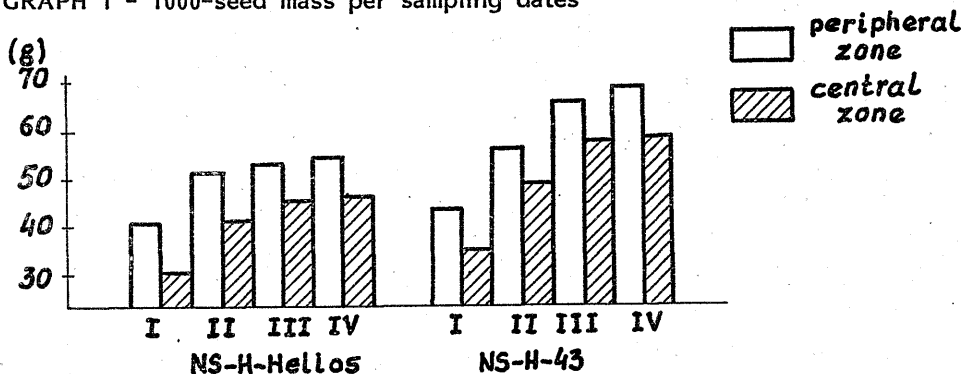
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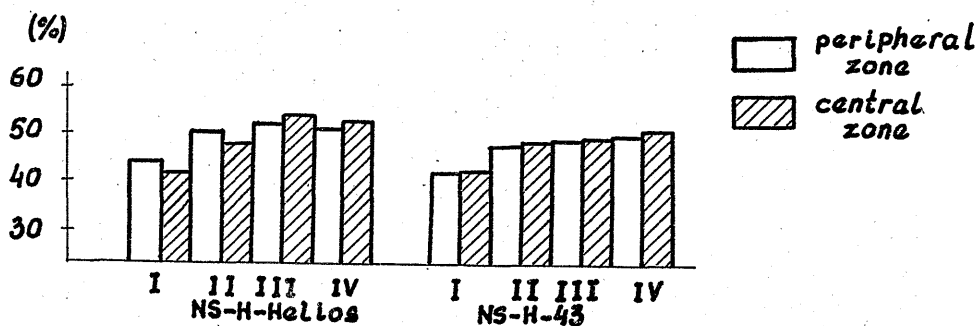
An investigation was conducted in the course of 1985, 1986, and 1987 at the experimental field in Zaječar to examine the Intensity and dynamics of seed filling, i.e., accumulation of oil and protein in two new and genetically distant hybrids, NS-H-Helios and NS-H-43. To follow the dynamics of seed filling and the synthesis of oil and protein in the peripheral part and the center of the head, plant materials were sampled at 10-day intervals from the 20th days after the end of flowering (1st date of sampling) to the stage of physiological maturity (4th date). It was considered important to see if the intensity of accumulation of oil and protein and seed yield were in correlation.

The three-year results show that the examined hybrids differed in the intensity of accumulation of oil and protein in seed in the post-flowering period

GRAPH 1 - 1000-seed mass per sampling dates

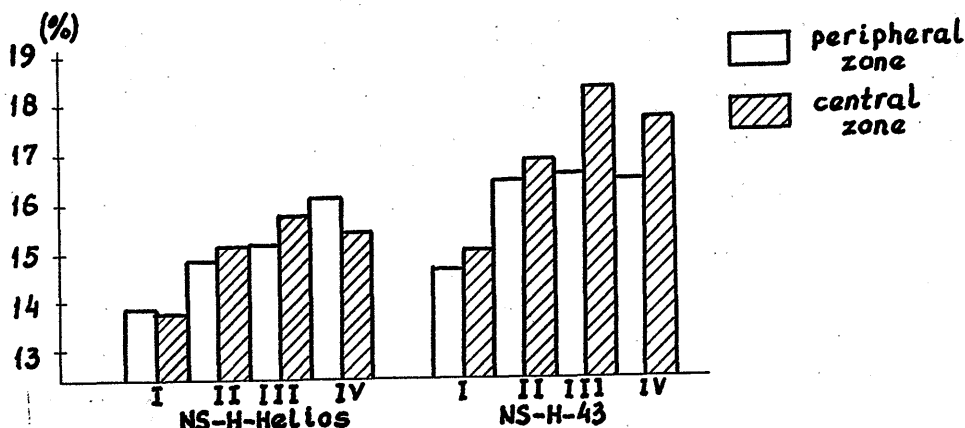


GRAPH 2 - Oil content per sampling dates



Between the 20th and the 30th day after flowering, the increases in the mass of 1000 seeds were more intensive in the peripheral part and the center of the head of NS-H-43 than NS-H-Helios (Graph 1). For the former hybrid, the increases were 14.1 g and 15 g, respectively, i.e., 3.7 g and 3.4 g more than in the latter hybrid. The increase in the mass of 1000 seeds was significantly reduced in the subsequent 20 days, the rate of reduction being higher in NS-H-Helios than in NS-H-43.

GRAPH 3 - Protein content per sampling dates



Oil synthesis was accelerated in both hybrids in the period of 30 days after the end of flowering (Graphs 2 and 3). Between the 20th and 30th day after flowering, the oil contents in the peripheral part and the center of the head were 6.8% and 6.7%, respectively, in the hybrid NS-H-43, i.e., 1.5% and 1.1% more than in the hybrid NS-H-Helios. In the subsequent 20-day period, the increase in oil content was less intensive in NS-H-43 than in NS-H-Helios. Between the 20th and the 30th day after flowering, the accumulation of protein was more intensive in NS-H-43 than in NS-H-Helios. In the subsequent 10-day period, the intensity of protein accumulation in the center of the head dropped sharply. The differences in the synthesis of oil and protein at the beginning of seed filling affected the mass of 1000 seeds not only at certain post-flowering stages but also at the end of the season, which demonstrated the specificity of each hybrid.

TAB. 1 - Seed yields of the hybrids NS-H-Helios and NS-H-43

| HYBRID | Years | | | |
|-------------|-------|------|------|---------|
| | 1985 | 1986 | 1987 | Average |
| NS-H-Helios | 2278 | 4280 | 3482 | 3347 |
| NS-H-43 | 2564 | 3517 | 4190 | 3457 |

The annual variation in seed yield was lower in NS-H-43 than in NS-H-Helios (Table 1), which made the former hybrid the better performer over the 3-year period. This obviously ensued from the more intensive increase in the mass of 1000 seeds and the accumulation of oil and protein in the first 30 days after the end of flowering observed in the hybrid NS-H-43. The obtained grown in regions in which dry spells in the second half of growing season are frequent.