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EFFECT OF INCREASING NITROGEN DOSES ON IMPORTANT QUANTITATIVE, BIOLOGICAL, AND MORPHOLOGICAL TRAITS OF SUNFLOWER

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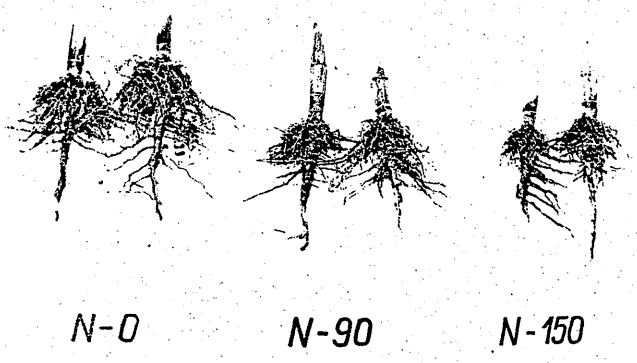
The objective of this investigation was to examine the effect of various nitrogen doses on some important sunflower traits such as: phenostages of development, morphological characters, yields of seed and oil, and oil content in seed. Small-plot trials were conducted in 1986 and 1987 after the method of random blocks in four replications. The trials were established on the vertisol soil containing on average 0.18% nitrogen, 12.3 mg/100 g available phosphorus, and 24.7 mg/100 g available potassium. Providing the same doses of phosphorus and potassium (80 and 60 kg/ha, respectively), five nitrogen doses (30, 60, 90, 120,and 150 kg/ha) were added to assess their effects on the traits of the sunflower hybrid NS-H-33-RM.

The results of the 2-year investigation show that the incrases in nitrogen dose did not have a high effect on the dynamics of plant development (the phenostages of budding, flowering, maturation) although buds did develop 2-3 days earlier in the variants with high nitrogen doses as compared with the unfertilized variant. Likewise, the increases in nitrogen dose did not bear effect on plant height and head diameter.

On the other side, the incrases in nitrogen dose tended to reduce the mass of roots (Figure 1). The alrgest root mass was recorded in variant N0, the lowest



in variant N150. It appears that the plants in the control variant developed a more vigorous root system in their search for nutrients while the plants in the variants well-provided with nitrogen could afford to have a less developed root system.
The incrased nitrogen doses exhibited a higher effect on seed yield, oil content in seed, and oil yield (Table 1 and Graph 1).

The increases in nitrogen dose affected positively the yields of seed and oil only to the dose of 90 kg N/ha. The respective increases were 18% and 20%. Larger doses reduced both yields. The largest reductions of 17% and 21%, respectively, were caused by the largest nitrogen dose. The depressive action of the increased nitrogen doses may be partially explained by the underdeveloped roots in these variants, which, in conditions of drought that occurred at the time of seed filling and oil synthesis, could not take up sufficient amount of nutrients.

The increase in nitrogen dose to 120 kg/ha did not effect the oil content in seed whereas the dose of 150 kg/ha reduced the oil content in seed by 5% in relation to the control variant.

TAB. 1 - Two-year average yields of seed and oil

VARIANT			SEED YIELD		OIL YIELD	
			kg/ha	%	kg/ha	%
0			2.973	100	1.417	100
N-30	P-80	K-60	3.253	109	1.553	110
N-90	P-80	K-60	3.392	114	1.628	115
N-90	P-80	K-60	3.516	118	1.690	120
N-120	P-80	K-60	2.833	95	1.356	96
N-150	P-80	K-60	2.481	83	1.119	79

GRAPH 1 - Two-year average yields of seed and oil depending on nitrogen dose