



MORPHO-PHYSIOLOGICAL AND PRODUCTIVITY PERFORMANCES OF ESENȚIAL WHEAT VARIETY IN SALINE CONDITIONS

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CONTEXT

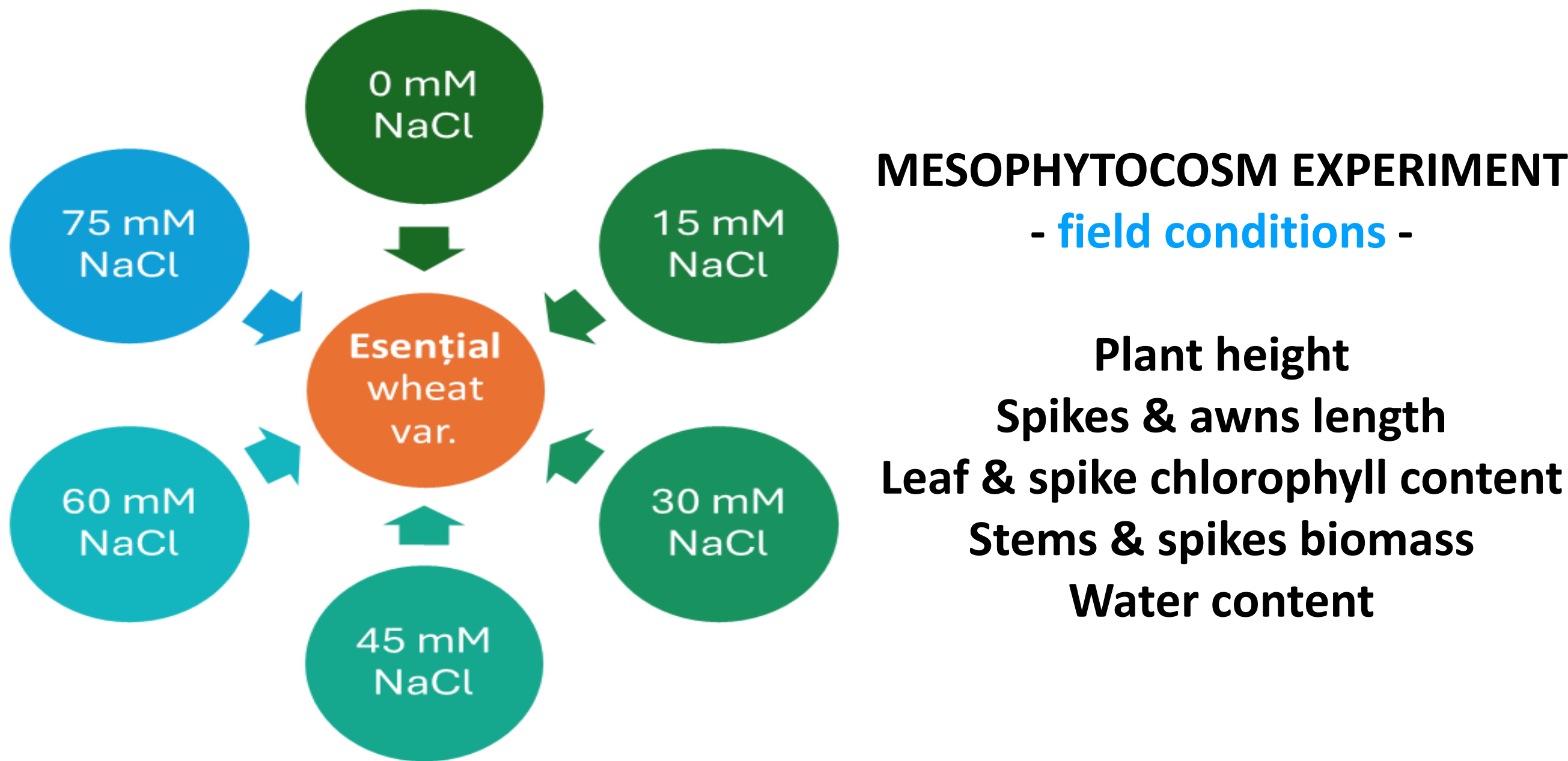
At the European level - following SDGs no hunger - food security- Romania plays a crucial role (Chiurciu et al., 2023).

- in 2020 - Group I - global wheat producers (Gagiu et al., 2023)
- in 2021 - the 3rd largest wheat producer in EU (Chiurciu et al., 2023)
- between 2021/2022 - exported > 6.5 mil. t of wheat (Venig et al., 2023)
- In Romania > 600,000 ha ← salinization and alkalization (Mihalache et al., 2015)

OBJECTIVE

The study aim was to test the tolerance and adaptability of the Esențial wheat variety to six gradually increasing saline doses under field conditions.

MATERIALS AND METHODS



RESULTS AND DISCUSSIONS

Table 1. Esențial wheat variety morphological parameters, plant height, spike length and awns length in cm

Saline doses	Plant height	Spike length	Awns length
0 mM NaCl	39.33±1.56	7.43±0.72	4.70±0.65
15 mM NaCl	45.67±1.54	8.33±0.33	5.00±0.00
30 mM NaCl	38.53±1.92	7.53±0.68	4.37±0.38
45 mM NaCl	39.77±0.95	8.87±0.19	5.23±0.49
60 mM NaCl	40.47±2.59	7.97±0.32	4.77±0.12
75 mM NaCl	47.87±3.19	9.13±0.43	4.70±0.23



Figure 1. Morphological features of Esențial wheat variety under saline conditions (A:0 mM NaCl, B:15 mM NaCl, C:30 mM NaCl, D:45 mM NaCl, E:60 mM NaCl, F:75 mM NaCl).

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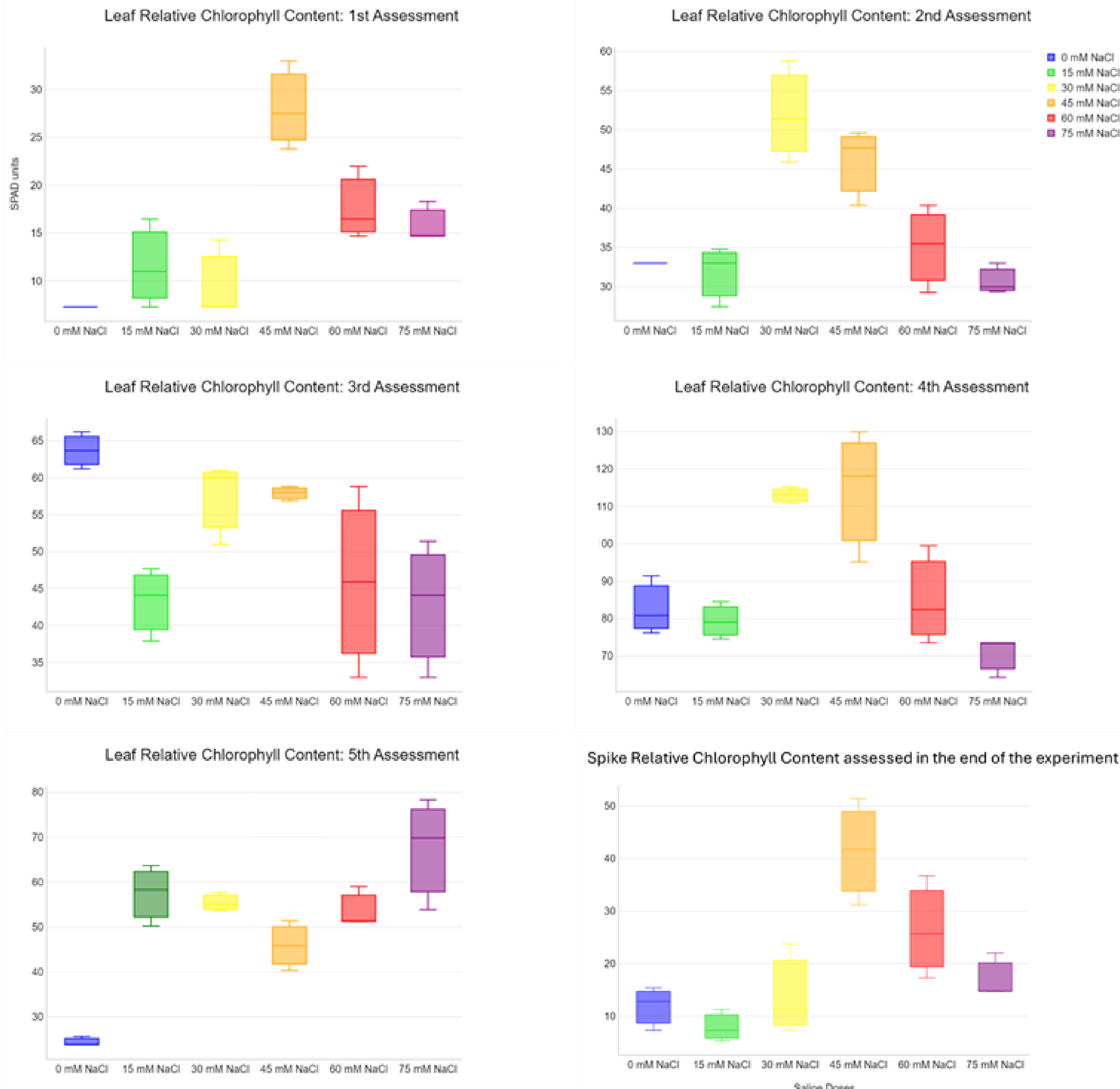


Figure 2. Relative chlorophyll content for leaves, in five assessments, and spike measured at the end of the experiment for Esențial wheat variety.

	M	15 mM NaCl	30 Mm NaCl	45 mM NaCl	60 mM NaCl	75 mM NaCl
Nr.T	30.00	29.00	29.00	22.00	29.00	30.00
Nr T_difM		-1.00	-1.00	-8.00	-1.00	0.00
TFW	6.85	6.00	5.76	3.41	3.48	6.41
TFW_difM		-0.85	-1.09	-3.44	-3.37	-0.44
TDW	6.15	5.40	5.04	3.12	3.27	5.71
TDW_difM		-0.75	-1.11	-3.03	-2.88	-0.44
%H ₂ OT/g	10.22	10.00	12.50	8.50	6.03	10.92
%H ₂ OT/g_difM		-0.22	2.28	-1.71	-4.18	0.70
Nr.S	21.00	25.00	24.00	13.00	22.00	26.00
Nr.S_difM		4.00	3.00	-8.00	1.00	5.00
SFW	0.87	1.62	1.52	0.84	1.11	1.70
SFW_difM		0.75	0.65	-0.03	0.24	0.83
SDW	0.76	1.45	1.33	0.75	1.00	1.52
SDW_difM		0.69	0.57	-0.01	0.24	0.76
%H ₂ OS/g	12.64	10.49	12.50	10.71	9.91	10.59
%H ₂ OS/g_difM		-2.15	-0.14	-1.93	-2.73	-2.06
%Sp	70.00	86.21	82.76	59.09	75.86	86.67
%Sp_difM		16.21	12.76	-10.91	5.86	16.67

Figure 3. Esențial wheat variety productivity parameters under six salinity doses: mean values (number of stems (Nr.T), stems fresh weight (TFW), stems dry weight (TDW), water percentage in one gram of fresh stem (%H₂OT/g), spikes number (Nr.S), spike fresh weight (SFW), spike dry weight (SDW), water percentage in one gram of fresh spikes (%H₂OS/g) and spike percentage (%Sp) and difference compared with control (_difM).

CONCLUSIONS

- Plant growth and development in height and spike length recorded the best performance at 75 mM NaCl. The 45 mM NaCl dose proved to be the most favourable for increasing the awns length.
- Leaf chlorophyll content registered the lowest performance both at the beginning and the end of the experiment in the control treatment.
- Initially, the chlorophyll content was highest in plants stressed with 45 mM NaCl. Throughout the experiment, the top values fluctuated between 0 and 45 mM NaCl, but by the end, the highest leaf chlorophyll content was observed in plants treated stressed with the highest dose of 75 mM NaCl.
- The productivity parameters analysed, apart from water percentage, exhibited the best performance at 75 mM NaCl. Conversely, the lowest biomass values were observed in plants within 45 mM NaCl treatment.
- The highest %H₂O was found in plants tested with the 30 mM NaCl dose.