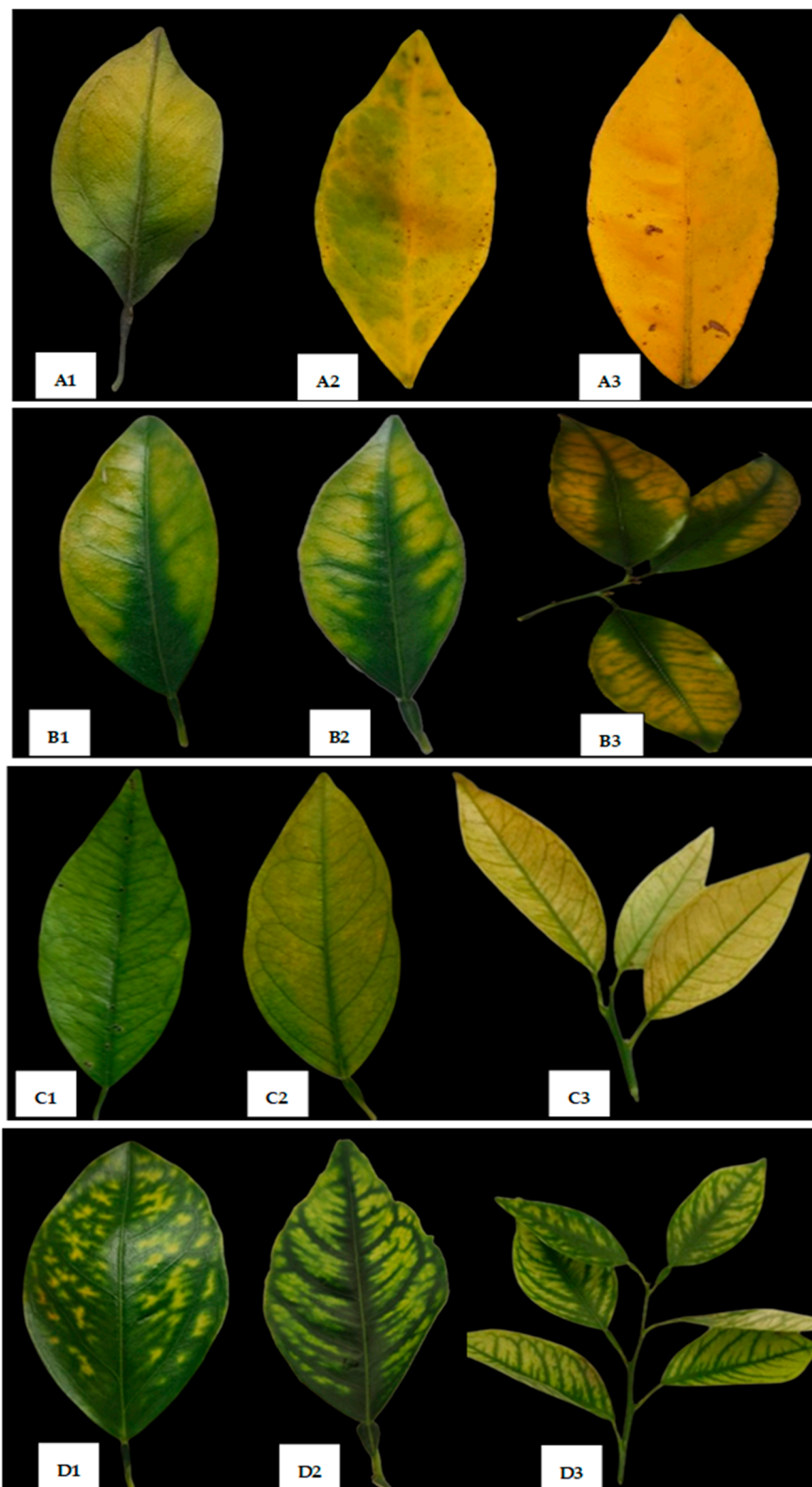


**Supplementary Table S1.** General characteristics and management practices in the 20 surveyed orchards of Valencia Late orange in the Gharb plain of Morocco.

Sample	Rural commune	Farm size (ha)	District	Planting age	Rootstock	Plantation density	Irrigation mode
1	Souk Tlet El Gharb	24	Kenitra	7	Macrophylla	6 X 3	Drip
2	Souk Tlet El Gharb	12	Kenitra	6	Carrizo citrange	6 X 3	Flood
3	Sidi Allal Tazi	11	Kenitra	8	Volkameriana	6 X 3	Drip
4	Dar Bel Amri	4	Sidi slimane	32	Sour orange	6 x 6	Flood
5	Dar Bel Amri	2	Sidi slimane	11	Volkameriana	6 X 6	Flood
6	Boumaiz	2	Sidi slimane	65	Sour orange	6 X 6	Flood
7	Ouled H'Cine	25	Sidi slimane	26	Sour orange	6 X 4	Drip
8	Ouled H'Cine	4	Sidi slimane	6	Macrophylla	5 X 3	Drip
9	Ouled H'Cine	2	Sidi slimane	6	Volkameriana	6 X 3	Drip
10	M'Saada	2	Sidi slimane	51	Sour orange	6 x 6	Flood
11	Oulad Nouel	9	Sidi Kacem	16	Sour orange	6 X 3	Drip
12	Khenichet	250	Sidi Kacem	40	Sour orange	6 X 3	Drip
13	Boumaiz	48	Sidi slimane	33	Sour orange	6 X 3	Flood
14	Oulad hammadi Ben	5	Sidi slimane	9	Carrizo citrange	6 X 3	Drip
15	Oulad hammadi Ben	6	Sidi slimane	17	Carrizo citrange	6 X 4	Drip
16	Zirara	4	Sidi Kacem	8	Macrophylla	7 X 3	Flood
17	EL Houfate	130	Sidi Kacem	7	Macrophylla	6 X 3	Drip
18	Sidi Al Kamel	12	Sidi Kacem	6	Macrophylla	7 X 3	Drip
19	Sefsaf	30	Sidi Kacem	30	Carrizo citrange	5 X 3	Flood
20	Sidi Azzouz	200	Sidi Kacem	4	Macrophylla	6 X 3	Flood



**Supplementary Figure S1:** Multiple correspondence analysis (MCA) of surveyed orchards according to irrigation type (drip and flood), planting age (young:  $\leq 10$  years, old:  $> 10$  years), planting density (high:  $> 500$  tree ha<sup>-1</sup>, low:  $< 500$  tree ha<sup>-1</sup>), rootstock (Macrophylla, Volkameriana, Carrizo citrange, Sour orange), and farm size (small:  $\leq 10$  ha, large:  $> 10$  ha).



**Supplementary Figure S2:** Frequent deficiency symptoms observed during leaf sampling in the studied orchards of the Gharb plain in Morocco. Mild to severe from left to right. Symptoms of nitrogen (A1, A2, A3), magnesium (B1, B2, B3), iron (C1, C2, C3), and zinc (D1, D2, D3) deficiencies observed during leaf sampling at the studied orchards in the Gharb plain of Morocco.