

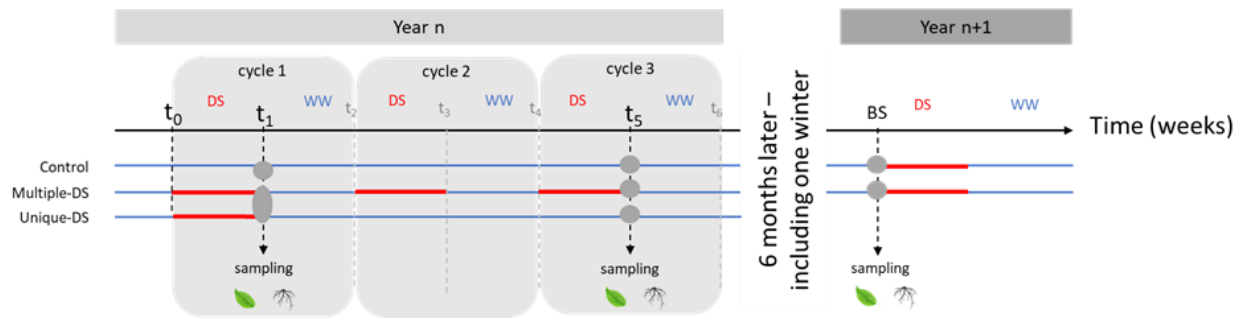


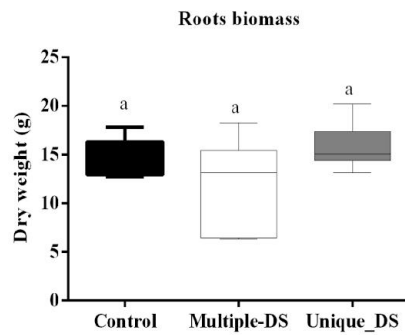
Figure S1. Schematic representation of the experimental design of the recurrent drought cycles.

Recurrent drought stress experiments were conducted on 12-week-old seedlings of ‘Golden Delicious’ double haploid 18 (GDDH18). Plants were divided into three irrigation regimes: (I) Control group – maintained under well-watered (WW) conditions throughout the experiment; (II) Multiple-DS group – subjected to three drought stress (DS) cycles, each consisting of 3 weeks of drought followed by 3 weeks of rewatering (WW); (III) Unique-DS group – exposed to a single drought cycle from T_0 to T_1 . Leaves and roots were collected for transcriptome (t_1) and methylation analyses (t_1 and t_5), following the respective drought periods. In year n+1, roots and leaves from Control and Multiple-DS plants were also sampled prior to the application of a new stress (Before Stress – BS), after completing one winter cycle

A



B



C

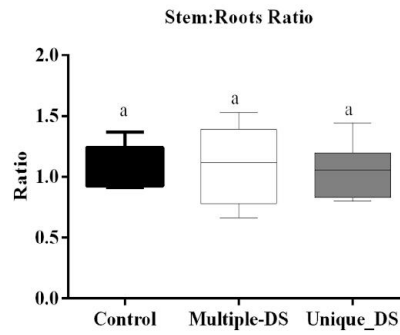


Figure S2. Shoot and root responses of GDDH18 plants under Multiple and Unique drought stress cycles. (A) Images of GDDH18 plants subjected to different irrigation regimes at t_1 and t_5 . (B) Root dry mass measured at T5 for Control, Multiple-DS, and Unique-DS plants. (C) Ratio of stem fresh mass to root fresh mass calculated at the end of the final recovery period (T6) for the same groups. Statistical comparisons between treatments were performed using one-way ANOVA followed by Tukey's post hoc test ($p < 0.05$).

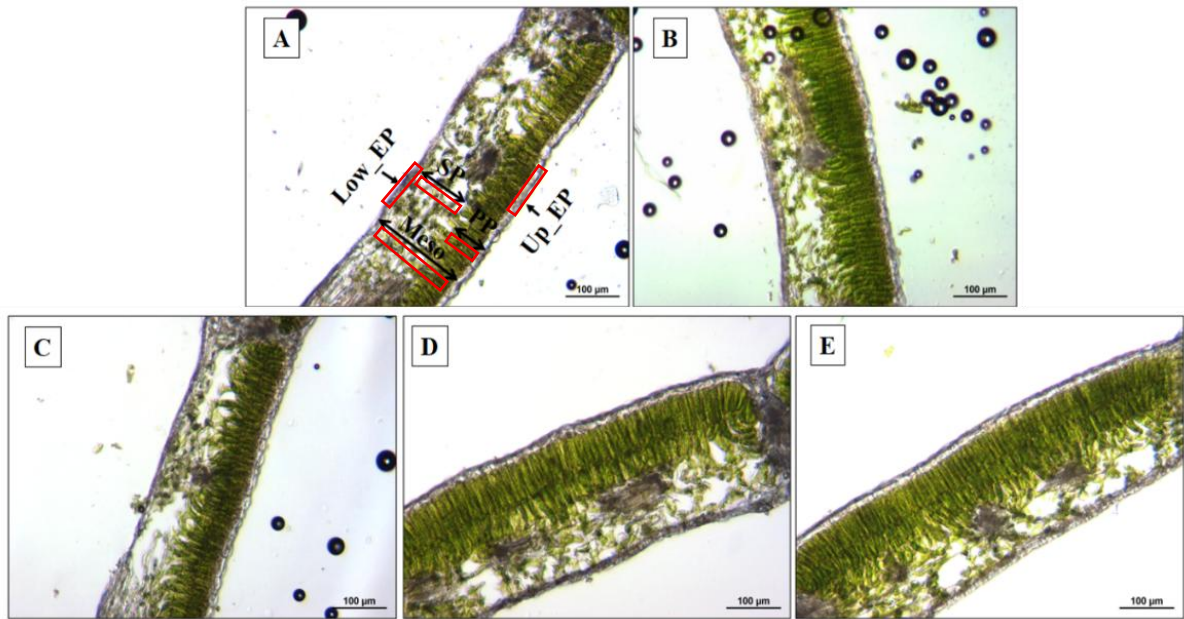


Figure S3. Leaf anatomy of apple seedlings subjected to single and multiple drought cycles. Leaf blades were sectioned at -20°C using a Cryostat® (Leica Biosystems, Germany), producing transverse sections $60\text{ }\mu\text{m}$ thick for optical microscopy analysis. Anatomical features examined included the upper and lower epidermis (EP) and the palisade (PP) and spongy (SP) parenchyma layers of the mesophyll (Meso). Panels show leaves from A) Control and B) single drought stress (DS1) at t_1 , and C) Control, D) multiple drought stress (Multiple-DS), and E) treated plants at DS3 t_5 .