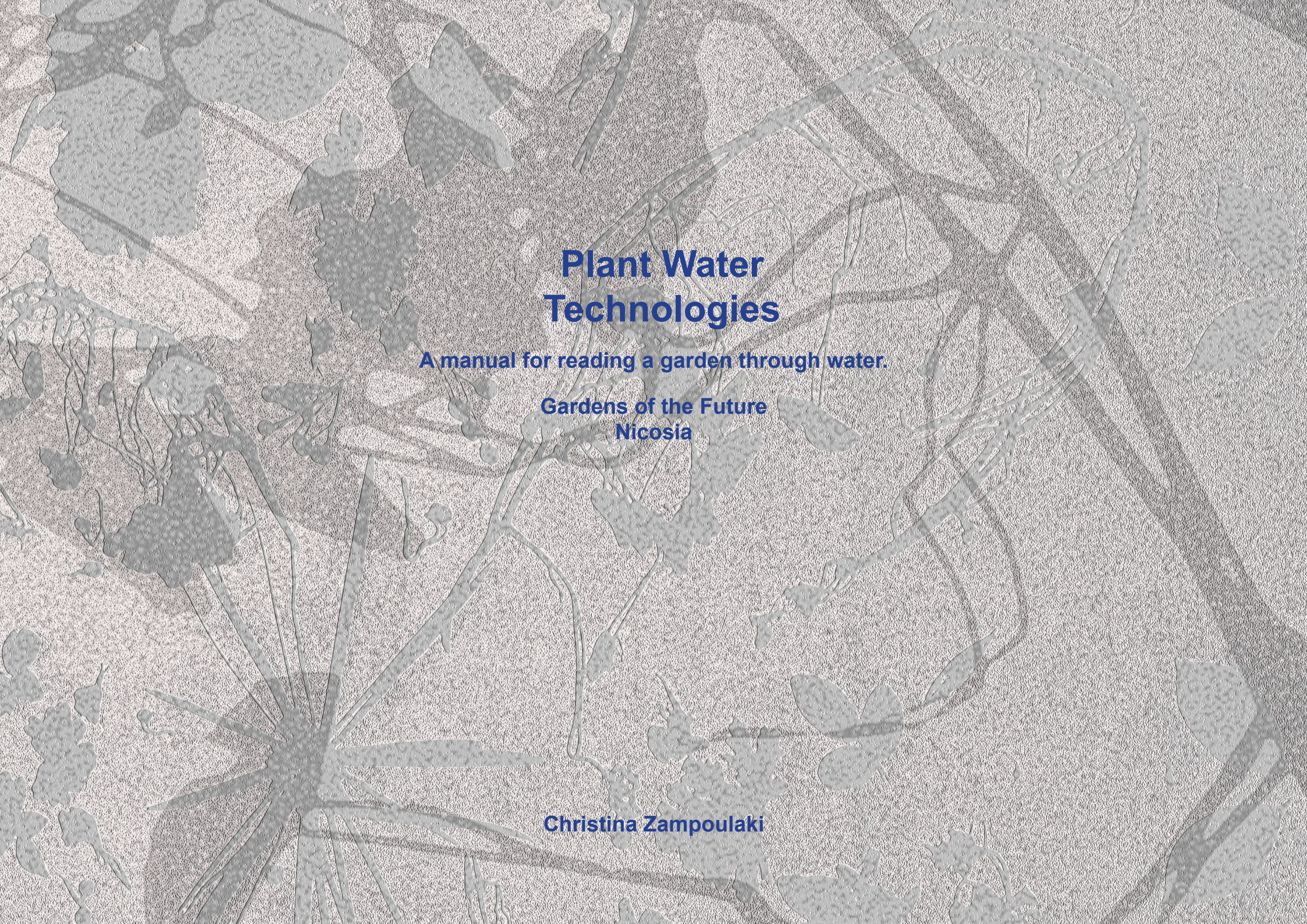


Plant Water Technologies

A manual for reading a garden through water.

Gardens of the Future
Nicosia

Christina Zampoulaki



This garden operates in a Mediterranean climate defined by water scarcity.
Water availability is seasonal, uneven, and unpredictable.

Plants are not passive elements but active participants in how water moves and is distributed.
Each species demonstrates a method of managing scarcity.

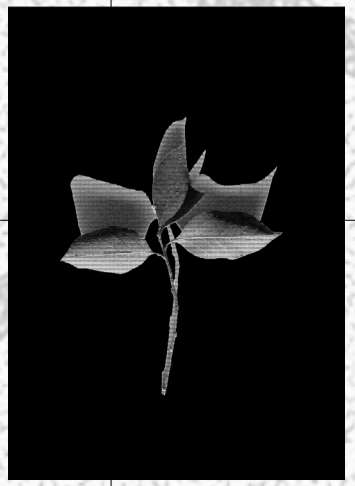
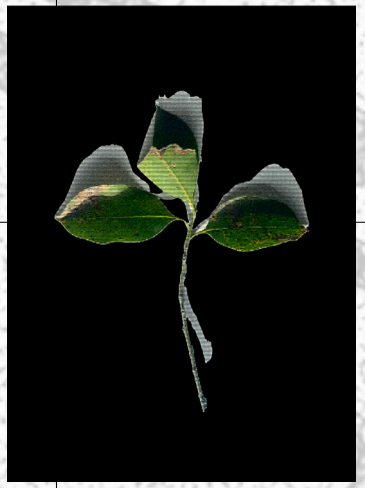


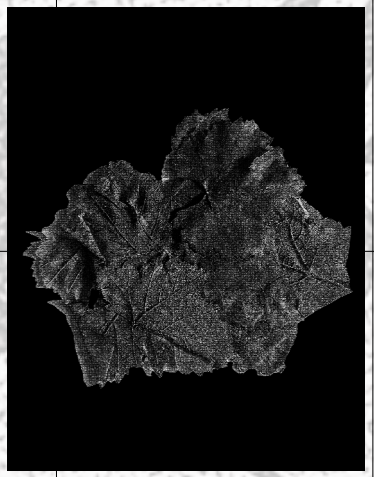
Plants operate as systems in which water is not simply received but continuously reorganised. Each plant establishes a different temporal and material relation to moisture, and through these differences the structure of the garden begins to form. Some plants accelerate water into growth, converting intake into rapid expansion and outward circulation. Others retain it within slower biological processes, extending its presence across dry intervals and maintaining continuity where external conditions break. Others intervene at the level of loss itself, altering evaporation through shade, density, and surface conditions, effectively changing how long water remains legible in the soil.

Across these behaviours, water ceases to function as a uniform input. It becomes differentiated in the moment of contact, shaped by the internal logic of each plant system. The same rainfall produces multiple trajectories at once, fragmenting into parallel durations and effects.

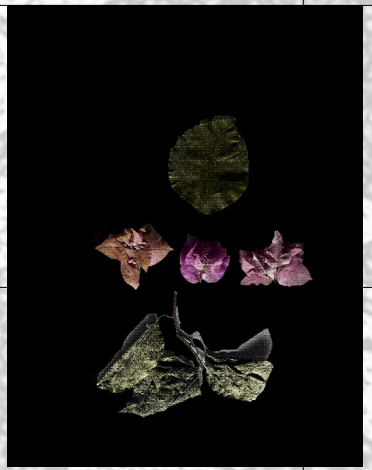
From this fragmentation, a field of relations emerges. Plants begin to operate as conditions for one another rather than isolated units: one structure stabilises moisture that another depends on, one accelerates depletion that another adapts to, one slows loss that reorganises surrounding availability. What appears as a garden is in fact a layered distribution of delayed, retained, and redirected water.

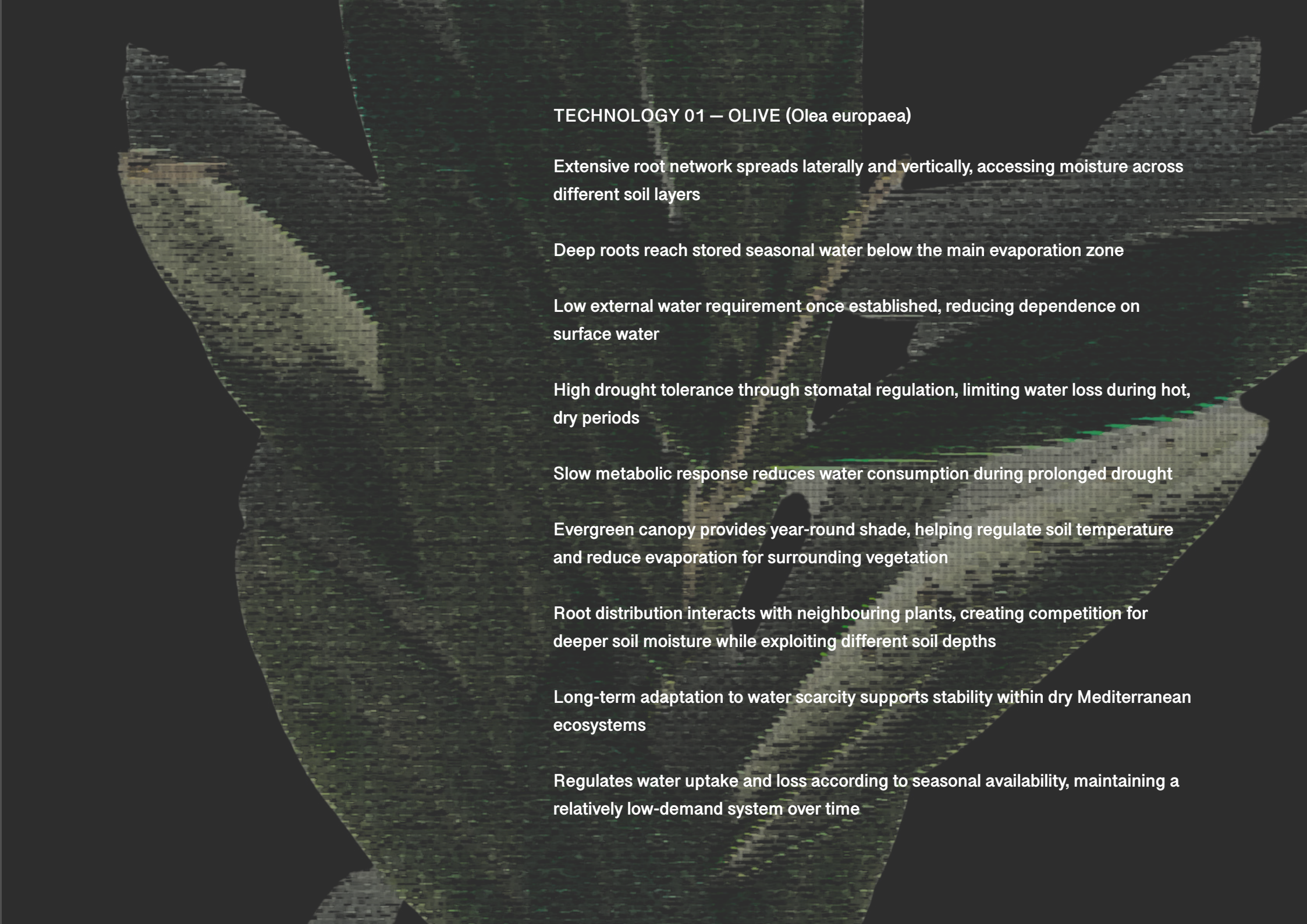
In this sense, the system does not describe interaction between fixed elements but the continuous production of unevenness itself. Water is not distributed across the garden; it is produced as different states through the capacities of plants to hold, transform, or release it. The garden becomes the record of these transformations, where ecology is not balance but sustained differentiation over time.







TECHNOLOGY 01 — OLIVE (Olea europaea)

Extensive root network spreads laterally and vertically, accessing moisture across different soil layers

Deep roots reach stored seasonal water below the main evaporation zone

Low external water requirement once established, reducing dependence on surface water

High drought tolerance through stomatal regulation, limiting water loss during hot, dry periods

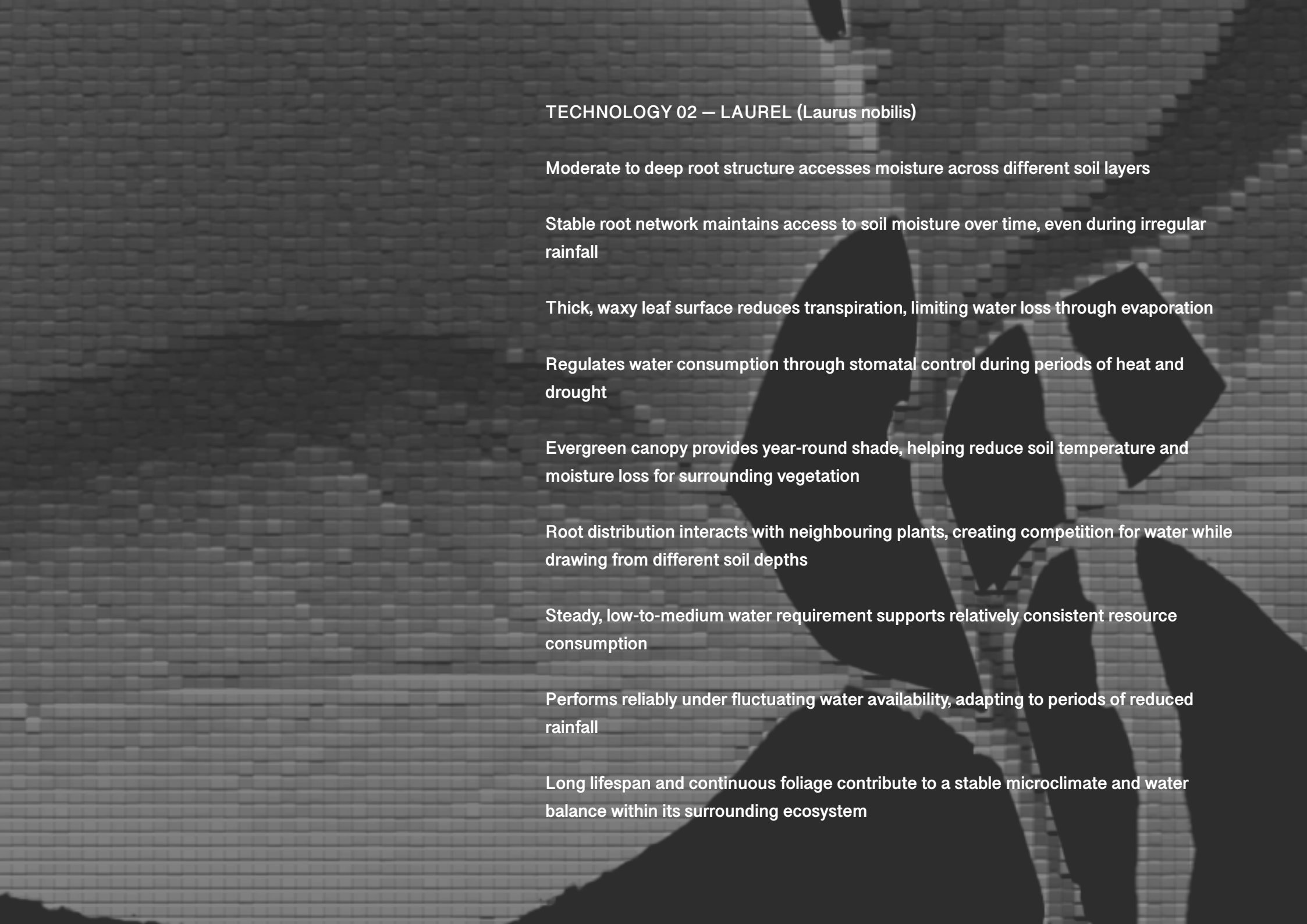
Slow metabolic response reduces water consumption during prolonged drought

Evergreen canopy provides year-round shade, helping regulate soil temperature and reduce evaporation for surrounding vegetation

Root distribution interacts with neighbouring plants, creating competition for deeper soil moisture while exploiting different soil depths

Long-term adaptation to water scarcity supports stability within dry Mediterranean ecosystems

Regulates water uptake and loss according to seasonal availability, maintaining a relatively low-demand system over time



TECHNOLOGY 02 — LAUREL (Laurus nobilis)

Moderate to deep root structure accesses moisture across different soil layers

Stable root network maintains access to soil moisture over time, even during irregular rainfall

Thick, waxy leaf surface reduces transpiration, limiting water loss through evaporation

Regulates water consumption through stomatal control during periods of heat and drought

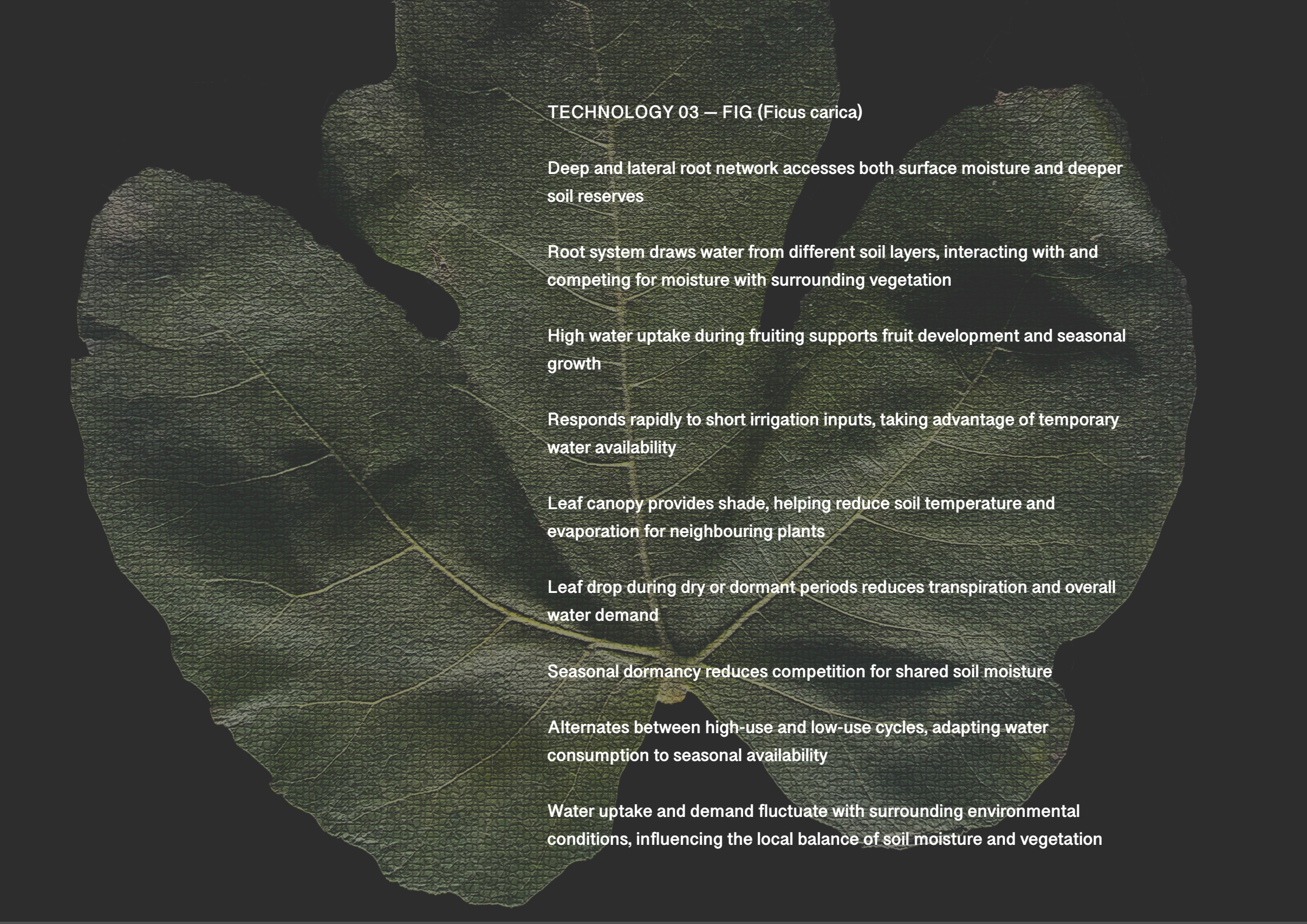
Evergreen canopy provides year-round shade, helping reduce soil temperature and moisture loss for surrounding vegetation

Root distribution interacts with neighbouring plants, creating competition for water while drawing from different soil depths

Steady, low-to-medium water requirement supports relatively consistent resource consumption

Performs reliably under fluctuating water availability, adapting to periods of reduced rainfall

Long lifespan and continuous foliage contribute to a stable microclimate and water balance within its surrounding ecosystem



TECHNOLOGY 03 — FIG (Ficus carica)

Deep and lateral root network accesses both surface moisture and deeper soil reserves

Root system draws water from different soil layers, interacting with and competing for moisture with surrounding vegetation

High water uptake during fruiting supports fruit development and seasonal growth

Responds rapidly to short irrigation inputs, taking advantage of temporary water availability

Leaf canopy provides shade, helping reduce soil temperature and evaporation for neighbouring plants

Leaf drop during dry or dormant periods reduces transpiration and overall water demand

Seasonal dormancy reduces competition for shared soil moisture

Alternates between high-use and low-use cycles, adapting water consumption to seasonal availability

Water uptake and demand fluctuate with surrounding environmental conditions, influencing the local balance of soil moisture and vegetation



TECHNOLOGY 04 — GRAPEVINE (Vitis vinifera)

Extensive root network absorbs water from multiple soil layers

Root distribution interacts with surrounding plants, creating competition and shared access to soil moisture

Seasonal growth patterns align water demand with periods of rainfall

Large leaf surface area regulates water loss through transpiration

Stomatal closure reduces water loss during periods of drought and high temperatures

Leaf canopy creates shaded, cooler microclimates, reducing soil evaporation for surrounding vegetation

Seasonal leaf shedding reduces water demand during winter dormancy

Adapts water uptake and growth in response to soil moisture availability and neighbouring vegetation



A place is shaped by its relationship with water, reflected in both its natural landscape and human traditions. In Cyprus, plants and traditional practices reveal different ways of adapting to the island’s dry climate and managing its limited resources.


Every place has its own language of plants, rooted in its landscape, climate and culture. If the Cypriot flag were woven from the island’s native flora, what would it look like? Could its flowers and plants become a living symbol of Cyprus and its sense of place?









Beyond representing a place, its natural materials and traditions hold knowledge about how to live within its climate. In Cyprus, this knowledge can be seen in both the water-management strategies of native plants and the traditional use of clay in human-made filtration systems.







Traditional Cypriot pottery offers a human-made approach to water filtration, using natural materials to filter and manage water. Alongside plant-based systems, it presents another way of responding to water scarcity.





ΧΑΛΙΚΙ/ GRAVEL

ΜΙΚΡΟ ΧΑΛΙΚΙ/ SMALL GRAVEL

ΑΜΜΟΣ/ SAND

ΕΝΕΡΓΟΣ ΑΝΘΡΑΚΑΣ/ ACTIVATED CARBON

ΒΙΟΛΟΓΙΚΟ ΒΑΜΒΑΚΙ/ ORGANIC COTTON

In this project plants are understood in relation to water and each other, not through conventional spatial layouts. Mapping is based on water relationships: which plants share moisture, benefit from shade, or influence local soil conditions. Deep-rooted plants access water from lower soil layers, storing it and creating microclimates that affect neighboring species. Tubes and ceramics make water distribution legible without dominating the garden physically. The ceramics themselves draw from Cypriot traditions, but their design is determined by function: filtering, holding, or directing water to specific plant clusters. They may visually reference the plants they serve or the processes they perform, but their primary role is operational.

The project documents these relationships through a combination of text and visual material. A structured system records plants' water sources, absorption behavior, and interactions with neighboring species. Connections indicate shared resources and influence rather than physical proximity alone. This system allows the garden to be understood as a dynamic network in which water, plants, and human care are constantly interacting.

The work does not present an idealized solution to water scarcity. Instead, it highlights the complexity of managing water in a dry environment and the ways that plant systems, human intervention, and infrastructure coexist. By centering the garden around water relationships rather than human-centered organization, it offers a model for observing, recording, and understanding how gardens might function in water-limited Mediterranean climates, emphasizing adaptation, observation, and relational knowledge.

match Mediterranean as the Climate Hotspot

Co-funded by the European Union

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