studies are temperature annual range, annual precipitation, elevation, precipitation seasonality, and human activity intensity. The most suitable present habitats are concentrated in eastern Sichuan, western Chongqing, southern Guizhou, western Guangxi, central and southern Yunnan, and parts of southeast Tibet or western Taiwan, which provides a practical regional reference for orchard layout (Figure 2) (Xia et al., 2023). More broadly in citrus, orchard location is a primary planning decision, and land suitability models consistently show that site choice should integrate multiple criteria rather than rely on local experience alone (Tercan and Dereli, 2020).



Figure 2 Field overview of *C. medica* L. var. sarcodactylis planting (Adopted from Xia et al., 2023)
Image caption: a: plant; b: fresh fruit; c: dried fruit slices (Adopted from Xia et al., 2023)

Within citrus suitability assessments, winter temperature, elevation, precipitation, sunshine, land capability, and proximity to irrigation water are repeatedly identified as major filters for productive orchard land (Tercan and Dereli, 2020). Fingered citron studies similarly show that future suitable areas may shift under climate change, so orchard establishment should account for both current fit and likely regional change in hydrothermal conditions. After climatic screening, soil evaluation becomes the next core step. Citrus studies show that soil acidification and deficiencies of available nitrogen and phosphorus can reduce orchard suitability, while poor soil and water conservation on slopes can accelerate nutrient loss. Measures such as decomposed organic fertilizer, green manure, integrated water-fertilizer management, and soil amendments have been used to improve citrus orchard soil conditions. For fingered citron, these measures should be selected according to site-specific soil testing and local production conditions rather than adopted as a uniform amendment prescription.

5.2 Orchard planning and infrastructure construction

Once a suitable site has been chosen, orchard planning should match the terrain, water supply, and intended management intensity, because orchard performance depends not only on planting location but also on how the production space is physically organized. Citrus suitability studies identify climate, geography, and soil fertility as joint dimensions of orchard performance, which means infrastructure planning should coordinate slope, drainage, roads, irrigation access, and fertilization logistics rather than address them separately. In commercial citrus systems, orchards established on long raised beds with drainage swales on each side provide a useful model for improving water movement and reducing waterlogging risk (Hamido and Morgan, 2020). This is especially relevant because excessive waterlogging damages fine roots and limits nutrient uptake, whereas better-controlled irrigation improves water availability, plant nutrition, and tree growth (Atta et al., 2025).

Irrigation infrastructure should be built as a core component of standardized orchard establishment rather than added later. Citrus studies show that irrigation scheduled according to evapotranspiration and soil moisture monitoring can stabilize water supply more effectively than fixed manual schedules (Hamido and Morgan, 2021). Drip and microsprinkler fertigation systems, as well as root-zone-targeted irrigation, have been used in citrus to improve water and nutrient distribution and support early tree establishment. These citrus results provide a practical framework rather than fixed operating parameters for fingered citron. Accordingly, fingered citron orchard infrastructure should prioritize dependable water sources, distribution pipelines, filtration and fertigation capacity, drainage channels, access paths, and slope-conserving measures, with system capacity adjusted to local topography, soil, and water availability (Chhetri and Kandel, 2019).