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Climatic Requirements of Temperate Perennials in Oman

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Abstract

This study was conducted to investigate the climatic conditions favouring the cultivation of temperate perennials in the Jabal Akhdar mountain range of northern Oman, where farmers are successfully growing roses and temperate and subtropical fruits, such as pomegranates, peaches and apricots. In the strongly eroded centre of this range, the oases of Al 'Ayn/Al 'Aqr (1750–1930 masl), Qasha' (1620–1640 masl) and Masayrat ar Ruwajah (1030–1060 masl) are representing a strong altitude gradient, which allows the comparison of cropping systems under different climatic conditions.

Temperatures and relative air humidity were measured at 30-min intervals throughout the year, and field areas with their trees were mapped using high-resolution aerial photographs and a Differential Global Positioning System (DGPS).

While mean relative air humidity in all oases was with 37–40 % relatively similar, average annual temperatures strongly varied between sites, ranging from 18.8°C in the upper oases, and 20.8°C in Qasha' to 24.8°C in Masayrat ar Ruwajah. The number of hours below 7°C, important to break a temperate fruit tree's dormancy, was 192 at Al 'Ayn/Al 'Aqr, 88 at Qasha' and 0 at Masayrat ar Ruwajah.

These climatic differences are reflected in the cropping patterns of the three sites. At Al 'Ayn/Al 'Aqr, farmers grow mostly temperate and subtropical perennials, particularly pomegranates (48 % of all perennials) and roses (40 %), while citrus (3 %) and peaches (4 %) are of minor importance. At Qasha', pomegranates (58 %) and roses (13 %) are still present, but peaches (13 %), citrus (5 %) and bananas (3 %) take up larger percentages. At Masayrat ar Ruwajah, the tree layer is dominated by tropical date palm (68 %), which is virtually absent uphill, bananas (15 %) and citrus (12 %). Peaches (2 %), roses (0 %) and pomegranates (0 %) cannot fulfil their chilling requirements and are thus rarely found.

Keywords: Chilling requirement, fruit trees, oasis agriculture, Oman, pomegranate, rose

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