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## Evaluation of Fruit Production in the Mountain Oasis Balad Seed in Northern Oman

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### Abstract

Little is known about the agricultural sustainability of the millenia old mountain oases in northern Oman. The oasis Balad Seet (23.19°N, 57.39°E, 950–1020 m asl) is located in a small valley of the Al-Hajar mountain range and surrounded by limestone cliffs up to 1200 m high.

In this study GIS-based field research on orchards was conducted to investigate the structure and fruit tree diversity. Information about local knowledge and management of the orchards was gathered through farmer interviews.

Overall 15 fruit species and six under-utilised fruit species from 14 families were identified. A total of 2690 date palms (*Phoenix dactylifera* L.) comprising 16 varieties cover 8.8 ha of man-made terraced land. The palm groves are typical agroforestry systems in which the date palms are interplanted with fruit plants such as banana (*Musa x paradisiaca* L.), lime (*Citrus aurantiifolia* [L.] Swingle), papaya (*Carica papaya* L.) and annual crops. In palm groves intensities of inputs such as manure, mineral fertilisers and irrigation water far exceeded outputs of harvests products for N, P and K. The surpluses were 303 kg N, 38 kg P and 173 kg K (ha yr)<sup>-1</sup>. Yields of the 1560 fruit bearing palms strongly depend on the variety and differed from 10 to 100 kg (palm yr)<sup>-1</sup>. High quality irrigation water, the elaborately built soil structure of the orchard terraces and adequate drainage are the main factors explaining the lack of salinisation in this hyper-arid environment.

The data show that fruit production with a total of 3478 plants (395 plants ha<sup>-1</sup>) is an important component of the oasis agriculture. However, specific horticultural know-how such as clone selection, pruning and grafting seems to be missing. All fruits are consumed by the households within the oasis and none are sold outside. In recent years the number of lime trees in the oasis declined by approximately 75 % due to the rapid spread of the witches broom disease (*Crinipellis pernicioso* [Stahel] Singer).

**Keywords:** Agroforestry, multilayer vegetation structure, orchard, palm groves, sustainability, under-utilised fruits