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Date Palms of Arabia: A Multifunctional Genetic Resource

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Arabian Desert is a part of the centre of origin and constitutes a sizable part of the centre of diversity of the date palm (*Phoenix dactylifera*). Cultivated date palm is closely related to a variable aggregate of wild and feral palms distributed over the southern, warm and dry Middle East as well as the north-eastern Saharan and north Arabian deserts. These spontaneous dates show close morphological similarities and parallel climatic requirements with the cultivated clones. In addition, they are inter-fertile with the cultivars and are interconnected with them through occasional hybridization. Date palm cultivars represent a complex gene pool within which historical movement of germplasm, recent introductions and human selection are shaping their genetic structure. The date palm is unique in that it is composed of genetically discrete clones representing cultivars without the benefits of a dynamic mutation-recombination system. The strong artificial selection and clonal propagation of date palms, in the oases agro-ecosystems, greatly altered their original genetic structure. Traditional date palm production is based on thousands of distinct cultivars exhibiting a wide range of adaptation, growth habit and fruit characteristics. Date palm cultivars stand at the centre of a complex agro-ecological, economic and social structure, and for millennia, they functioned as a multi-purpose genetic resource. However, due to biotic and abiotic stresses, economic, and social factors, the diversity of date palm groves in Arabia is declining and the composition of these groves as to the number of cultivars witnessed a sharp decline in recent years. Sustainability of the oases agro-ecosystem, with its limited and declining soil and water resources, depends largely on a highly diverse genetic base of date palms to: help regulate the water cycle and conserve soil and water resources, regulate biomass decomposition and nutrient cycling, conserve biodiversity and optimize biomass and yield production