Enhancing Growth, Yield and Fruit Quality of Date Palm Trees in Coachella Valley, CA

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Total acreage for date production in the U.S. consists of 7,000 acres in the Coachella Valley, California and 600 acres in BARD area near Yuma, Arizona. Tree vigor in many of these full-bearing orchards precipitously declined in the last three decades in spite of timely applications of water and commercial fertilizers. The frequency of fallen trees increased and yield and fruit quality showed significant decline. The California Date Commission and the Coachella Valley Natural Resources Conservation District Board of Directors requested help from USDA's Agricultural Research Service. To analyze and solve the problem, USDA designated Dr. Aref A. Abdul-Baki, a plant physiologist with many years of experience on date orchard management. Dr. Aref A. Abdul-Baki acquired this knowledge on dates while working in North Africa and Saudi Arabia. Dr. Abdul-Baki and his collaborator, Mr. Sam Aslan, a soil conservationist, Natural Resources Conservation Service at Indio, California, delved deep into the problem for seven years. Their research revealed that the primary cause for the tree vigor decline as well as reduction in the fruit yield and quality was a combination of (1) soil stratification by eroded material from neighboring hills being deposited in the Valley at the time it was formed and (2) soil compaction caused by excessive use of farm machinery. This combination negatively affected root growth and water/nutrient use efficiency. The two scientists together solved the problem by introducing a 2-step treatment. First, slip plowing the field to fracture the strata and mix the soil 5 feet wide and 6 feet deep, and second, seed the orchards with Lana vetch – a legume cover crop that fixes nitrogen and prevents the soil from re-compacting by allowing a robust root growth and a deep network of roots. This approach provided a practical and economical solution, and is now widely applied over 45% of the date and vineyard acreage in the Coachella Valley. This exotic crop generates $38 million annually in revenue and use of this technology has reduced production costs by $100 per acre due to savings on cultivation, fertilization and most importantly decreased water usage.

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