



Project Description for ARASIA TC Programme

TC Cycle 2020-2021

Project Number: RAS5089

Project Title: Enhancing the Sustainability of Date Palm Production in States Parties through Climate-Smart Irrigation, Nutrient and Best Management Practices (ARASIA).

Overall Objective: To enhance the sustainability of date palm productivity in the ARASIA States Parties through climate-smart irrigation, nutrient and best management practices.

Project Duration: (2020 – 2021)

Project Description: Date palm farming plays a pivotal role in the economy, food security and culture of Cooperative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA) State Parties. Every year, hundreds of thousands of date palms are planted in the region for fruit production and landscaping. Under changing climate and poor agronomic practices, sustainable date production in the ARASIA region is threatened by a shortage of irrigation water and poor nutrient management, resulting in infestation by several pests and diseases. Despite the scarcity of water, applying large quantities of water (>200 m³ of water/tree/year in some ARASIA State Parties) is the norm in date palm farming in the ARASIA region, thereby placing pressure on dwindling water resources. The situation is further aggravated by climate change bringing extreme weather events – mainly due to the rising temperature of the Earth's atmosphere. Among the key pests threatening date palm productivity, palm borers are rapidly spreading in some of the MSs. Using best irrigation and nutrient management practices, as well as controlling and eradicating date palm borer infestation is critical for the sustainable increase in date palm productivity and its quality in the ARASIA region. Thus, the present ARASIA project aims to enhance date palm productivity and its quality through climate-smart irrigation and nutrient management practices, using isotopic and related techniques, which in turn will ultimately contribute to mitigating pest problems in date palms.

Problem to be addressed: Date palm (pheonix dactylifera, L.) is highly tolerant to harsh conditions (hot and dry climate) and high salinity. Date palm is considered a sign of life in the desert where it has historically been connected with sustaining human life and the traditions of people in several Arab countries. Date palm farming is practiced intensively in many countries in the region. Nearly 75% of the total global date production occurs in the Arab region, more than half of which is contributed by ARASIA countries (Kuwait, Oman, Qatar, Kingdom of Saudi Arabia, United Arab Emirates (UAE), Iraq, Syria, Yemen, and Jordan). The average date palm yield in ARASIA countries is much lower than in those reported by other countries in the region. The majority of ARASIA



countries have harsh climate conditions with high evaporation rates and low precipitation, making it impossible to grow any crop without irrigation. As a result, the agricultural sector consumes 85% of available water resources in the ARASIA region. Date palms consume large quantities of irrigation water (1500–3600 mm/year). A large proportion of this water is provided by desalinated seawater or saline ground water. Declining soil fertility and harsh climate nutrient mining as a result of subsistence farming has resulted in low productivity and quality of dates. Therefore, these poor practices carry huge economic as well as environmental consequences. Strategic application of irrigation and nutrients is urgently required to optimize water and nutrient use efficiency and mitigate effects of the palm date borer to enhance the sustainability of date palm production in the ARASIA region.

This project is proposed as a regional activity for the following reason(s): Poor irrigation and nutrient management practices under date palm farming is the norm in the ARASIA region, which is also facing water scarcity due to climate change. In addition, pests (especially borers) pose a major challenge for the sustainable production of dates in the ARASIA region. Therefore, there is an urgent need for close cooperation among the ARASIA State Parties to work together and find a sustainable solution to overcome these major challenges which threaten date palm farming in the region.

Stakeholders: The main stakeholders are (1) the Ministries of Agriculture, Water and Environment; (2) end users (date producers); (3) scientists, researchers and extension specialists; (4) academic and research institutions; (5) civil society organizations; and (6) the private sector.

Partnerships: This project will be implemented through close partnerships among international (e.g. Food and Agricultural Organization (FAO); International Center for Biosaline Agriculture (ICBA); International Centre for Agricultural Research in the Dry Areas (ICARDA); IAEA, and Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD)), regional and local institutions within participating countries. Kuwait will assume the role of the lead country coordinator, and other participating countries will host a number of activities.

Role of nuclear technology: To enhance date palm production in a sustainable manner, there is a strong need to develop climate-smart agricultural practices to enhance nutrient and water-use efficiencies. The IAEA, in partnership with FAO through the Joint FAO/IAEA Division, have developed/validated a range of nuclear and isotopic techniques, such as soil moisture neutron probe and nitrogen-15, to provide critical information on the most strategically important issues of water and nutrient management under different agro-ecosystems. Previous efforts have been applied to saline soils, but never to date palms; this would therefore be the first regional project on date palm production.