UNLOCKING ANCIENT ORCHARDS

HOW HERITAGE TREES CAN HELP US THRIVE IN A CHANGING CLIMATE

The Mediterranean region boasts an incredible array of cultural heritage fruit trees, cultivated for millennia by historical farmers. These ancient, living relic trees (landrace trees[1]) have survived in rural areas across the Near East and the Mediterranean, representing thousands of varieties with the potential to enhance food security and sustainable agriculture amidst growing environmental challenges.

Particularly fascinating to scientists are the autochthonous heritage fruit tree varieties bred by farmers in drought-prone, arid environments. These ancient trees are a largely untapped reservoir of cultural heritage, akin to an unexplored 'archaeological artifact,' holding secrets to resilience and sustainability that are yet to be fully discovered.

Meiri and Bar-Oz

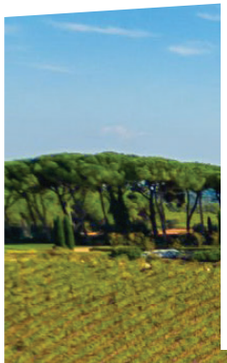
A new project, led by Prof. Guy Bar-Oz of the University of Haifa, is seeking to better understand the ecology and evolution of ancient orchards in the desert fringes of the Mediterranean region. "The Bio-Archaeology of Heritage Trees and Traditional Dryland Farming Horticulture in the Desert Fringes" project is being funded by a €3.5 million advanced grant from the European Research Council.

"The rich and diverse cultural history of these cultivars bear distinct identities and extensive individual histories for local adaptation, whose study can provide profound insights into their centuries of resilience," explains Prof. Bar-Oz The team is embarking on a cross-border journey, collecting samples from ancient trees scattered across the eastern Mediterranean. Examining the 'micro-archaeology' of the tree roots reveals their age and how they were planted and farmed. By examining the lineage and genetic history encoded in both living trees and through analyses of ancient fruit seeds found in nearby archaeological sites, we can uncover valuable insights about their growth patterns and genetic diversity. Archaeobotany, the study of ancient plant remains, will play a vital role in identifying the fruits and seeds unearthed at the archaeological sites, offering a glimpse into the diet and agricultural practices of past civilizations.

Through these case studies, we can piece together crucial historical moments in plant domestication. We can track how these trees spread, mixed with other varieties, and maybe even adapted to their local environment. This kind of detective work is not just about the past. It can connect what archaeologists learn about ancient farming with what farmers need today. By understanding these unique qualities of old trees, we can use them to improve future crops.

The cultural history of heritage fruit trees offers researchers a working model for conducting cross-disciplinary studies of living relic trees that extends the breadth of multidisciplinary research on past human activities. "By documenting the stories preserved in landrace trees, this sort of research extends the historical contract inherent in our relationship with the environment, thereby strengthening our moral obligation towards safeguarding relic trees for present and future generations," said Prof. Bar-Oz.

1 landrace - a local variety of a species of plant or animal that has distinctive characteristics arising from development and adaptation over time to conditions of a localized geographic region and that typically displays greater genetic diversity than types subjected to formal breeding practices



Project Objectives

1 Genetic Diversity:
Uncover the genetic diversity of ancient fruit trees in the Mediterranean's desert fringes, shedding light on their origins and adaptations.

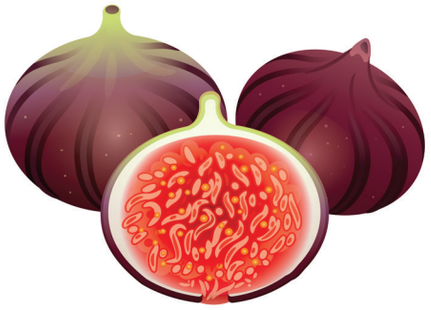
2 Historical Insights:
Reconstruct the history of cultivation practices surrounding these orchards, deciphering the techniques employed by our ancestors.

3 Ecological Factors:
Understand the ecological and environmental factors that influenced the development and success of these orchards in harsh dryland conditions.

4 Conservation Strategies:
Develop sustainable strategies for the conservation and management of these orchards, particularly in the context of the ever-pressing issue of climate change.

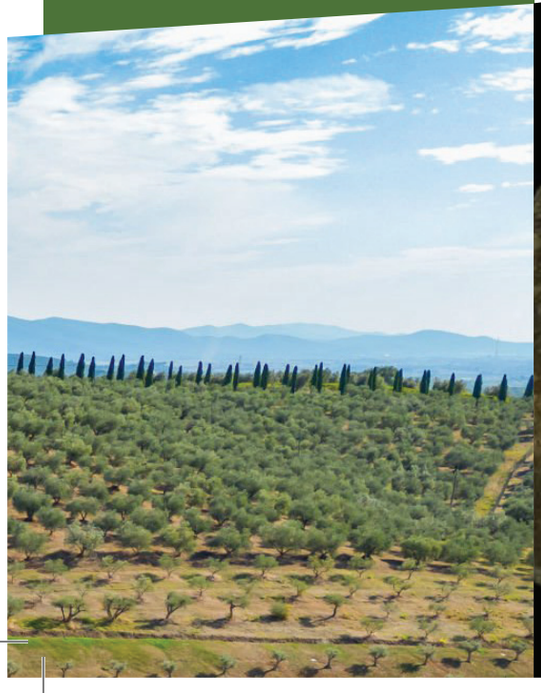
"These ancient orchards are a living archive of human ingenuity and adaptation to climate change. By studying them, we can learn how to better manage and conserve these important cultural and natural resources in the face of climate change.

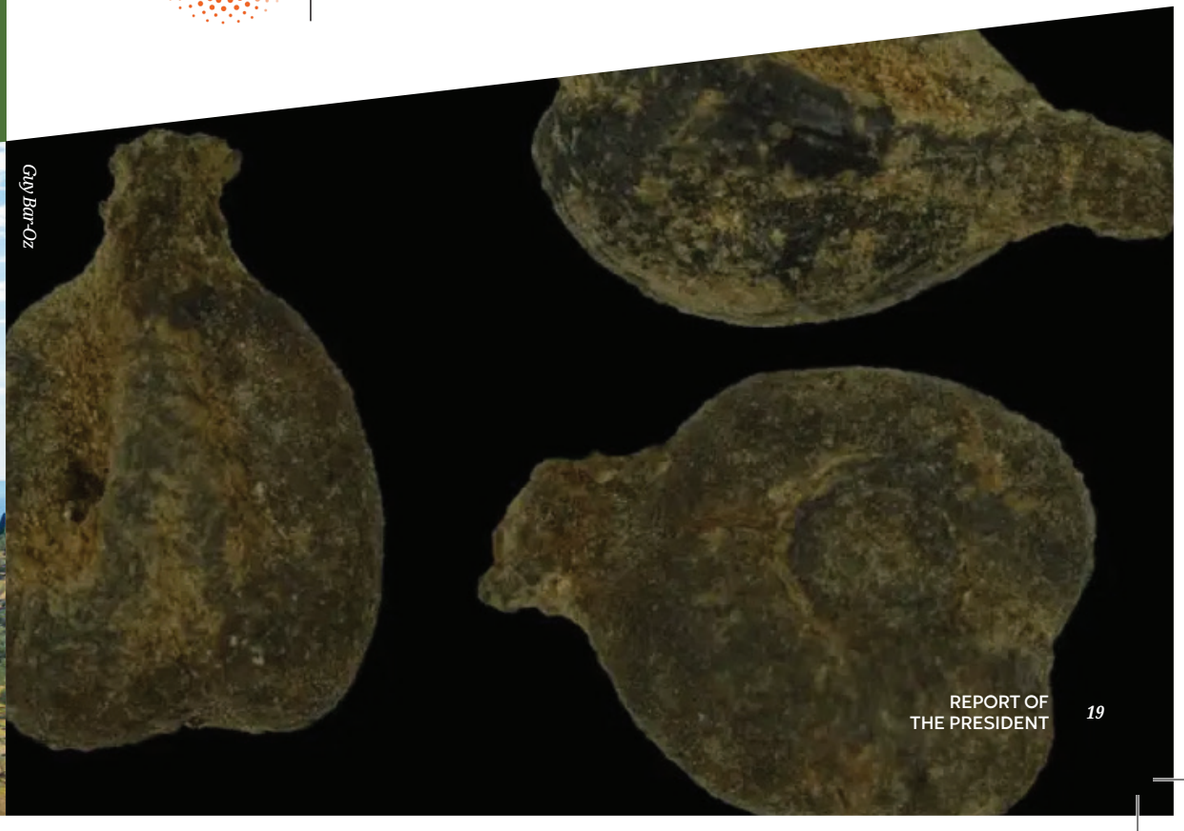
– Prof. Guy Bar-Oz
School of Archaeology and Maritime Cultures



European Research Council

Prof. Guy Bar-Oz
Head, Laboratory of Archaeozoology





Guy Bar-Oz