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Cooperating across borders in the Mediterranean

Project funded by the EUROPEAN UNION

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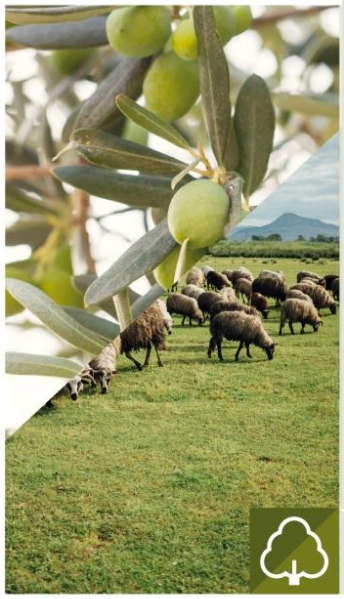

3rd B2B event (LL1) in Lebanon: Agroforestry for Multifunctional olive systems

Time Domain - Nuclear Magnetic Resonance (TD-NMR) as a useful tool for the determination of oil content in olive paste

Dr. Milad El Riachy

Beirut, February 16th, 2023

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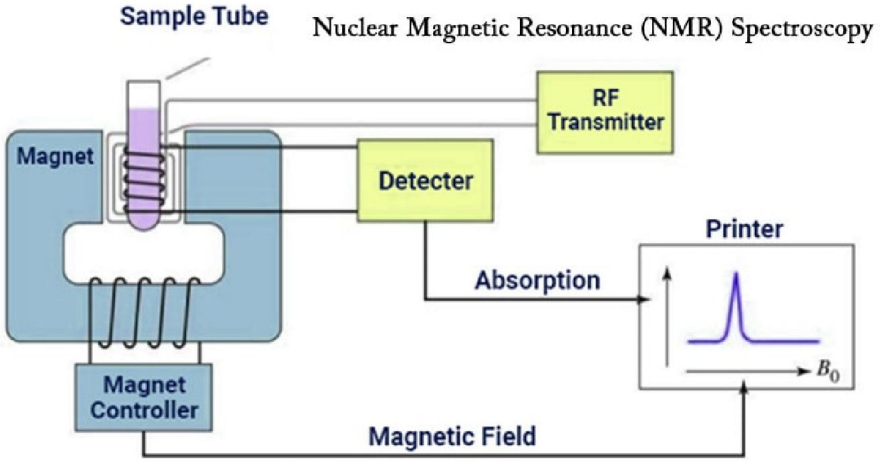
Introduction

- Nuclear Magnetic Resonance (NMR) spectroscopy is a physicochemical analytical technique used in quality control and research for determining the content and purity of a sample as well as its molecular structure



- Time Domain–Nuclear Magnetic Resonance (TD-NMR) is a well known variant of NMR that is important in defining the compositional, physicochemical and textural properties of foods

Background

- Oil content is a main factor in determining the harvest time for olive fruits and calculating the payments to olive growers at mills
- The most widely used method to determine the oil content of olive paste is the Randall method (Soxhlet): BUT!! very expensive, time consuming, and using many chemicals that pollute the environment
- However, the Time Domain - Nuclear Magnetic Resonance (TD-NMR) technique offers a novel alternative for determining oil content

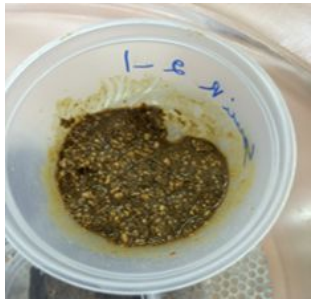
This innovation is ready for implementation!! HOW??

Methodology

Sample preparation and determination of a prediction model

Olive fruit samples

Hummer mill



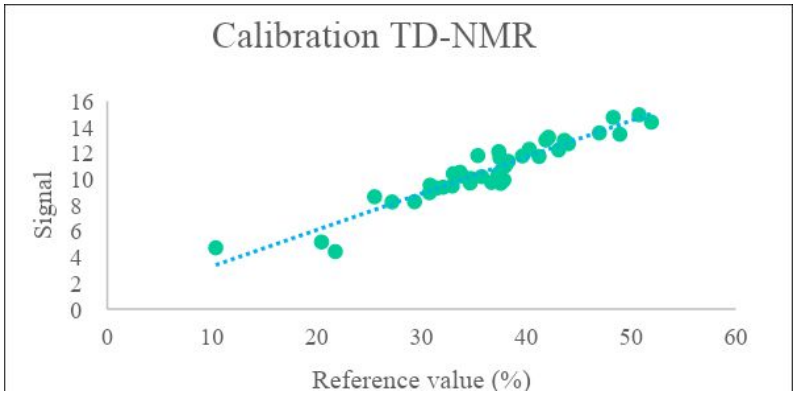
Olive paste

The tube to be inserted in the TD-NMR instrument including the sample

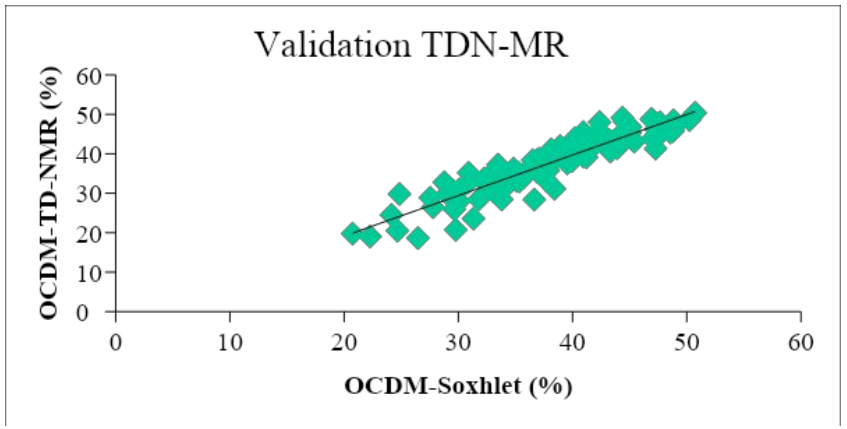
The TD-NMR Instrument. mq one – Total Fat analyzer

Prediction model

- A Prediction model was obtained through the calibration (30 % of samples) of the TD-NMR



- Then, the model was validated (70 % of samples)



TD-NMR as a service delivered from LARI to farmers!!

- This innovation has been widely tested in Europe and worldwide and gave very close results to the traditional method in a shorter time, with a very low cost and very low use of chemicals
- This innovation could be considered as a ready to use service delivered from LARI to farmers with a relatively low cost to help them determine the best harvesting time for their olives
- Farmers can send their olive samples to LARI's tal Amara station

Contact information

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THANK YOU VERY MUCH!!

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