

Abstract

Date palm trees, especially Alhayani, Barhi, and Majhool, have a rich history in Palestine. However, the waste produced by these trees, such as unripe dates, date pits, and palm fronds, is usually burned on farms, leading to environmental concerns, or collected them inside the farms for long periods, which leads to the emergence of the red date palm weevil, which works to damage palm trees. These wastes are a significant source of excellent biomass that can be used in many applications such as energy production, livestock feed, fertilizer for soil, and wooden boards, and can even be used as insulating materials. This project focuses on utilizing agricultural waste from date palm trees in Palestine by grinding and transforming it into wooden blocks for use in heating, bakery ovens, household wood stoves, and other applications. The effectiveness of these waste materials for use as excellent heat value resources has been demonstrated, especially when compared to other tree waste. The heating values for date kernel (17.1267 MJ/Kg), palm leaf (16.8873 MJ/Kg), and palm frond petiole (15.9897 MJ/Kg) indicate their promising potential for use in heating applications. A feasibility study was conducted for a production line that converts these waste materials into wooden blocks for use in heating applications. The annual profits were estimated at approximately **150,240 NIS**, with a payback period of around **2.4 years** and a return-on-investment rate of **36.3%**