Yield Dynamics and Sustainable Management of Boswellia Sacra: Insights from Oman's Diverse Agro-Ecological Zones

Ahmed Bakhit Salim AL-Shanfari

Ministry of Agriculture, Fisheries, Wealth & Water Resources, Salalah, Dhofar Governorate, Sultanate of Oman

ABSTRACT

The frankincense tree (Boswellia sacra) is a key economic plant in Oman, but its populations have recently declined sharply due to improper tree-tapping practices. Current scientific understanding of frankincense trees in Oman is limited, particularly regarding yield variations across different agro-ecological zones, the impacts of resin extraction methods and cutting frequencies on yield, and issues related to plant regeneration. This study was conducted in four distinct agro-ecological zones, involving a total of 180 healthy, non-harvested frankincense trees, with four replications for each location. The highest olibanum yield was recorded after the fourth tapping pick. Average resin yields across the four locations were 650 g, 620 g, 360 g, and 470 g per tree per season over ten tapping sessions. The findings revealed a positive correlation between olibanum yield and factors such as stem diameter, crown size, trunk size, and the number of tapping spots, while an inverse correlation was observed with tree flowering and elevation. Sustainable harvesting practices for frankincense trees should include limiting cut depth to the phloem without reaching the hardwood, avoiding cuts in sensitive areas of the tree bole, maintaining adequate distances between cuts, employing traditional tapping methods, and designating specific periods during which tapping is prohibited.

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