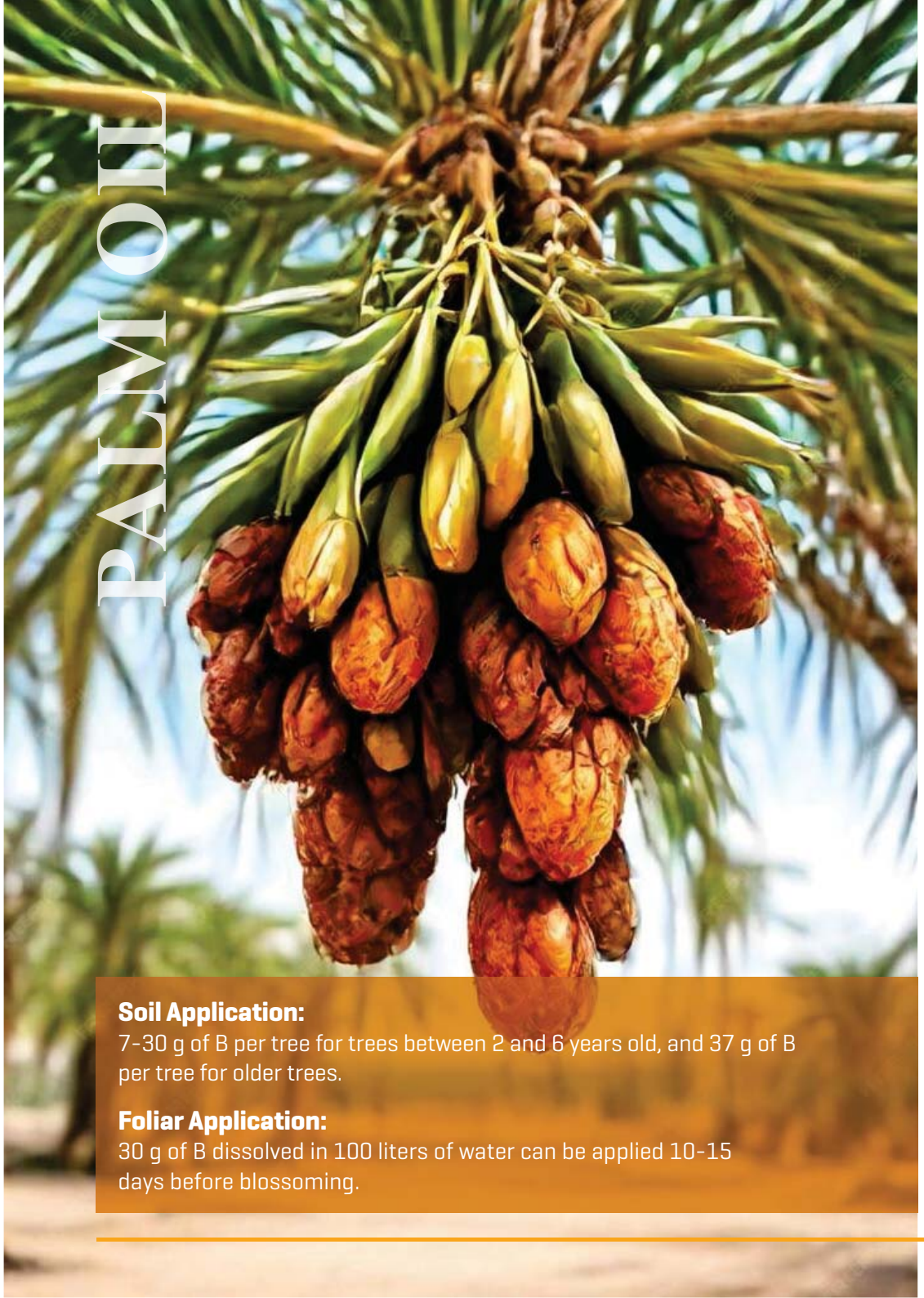

Soil Application:
7-30 g of B per tree for trees between 2 and 6 years old, and 37 g of B per tree for older trees.

Foliar Application:
30 g of B dissolved in 100 liters of water can be applied 10-15 days before blossoming.

PALM OIL

Palm trees are cultivated in the humid tropical regions on more than 12 million hectares of land. Approximately 27% of the world's vegetable and solid fat needs are met by palm oil.

The palm tree is the most productive oil crop in the world and although it is monocotyledonous, it requires higher amounts of boron (B) for adequate nutrition and growth than other monocotyledonous plants. In fact, it is one of the 16 plants that are considered to be the most sensitive to deficiency in B and require higher amounts of B. Although B is classified as an element that is needed in trace amounts, even small amounts of B can make a great difference in the growth and productivity of palm trees.

Deficiency in B in plants affects various organs of the plant, including the apical meristem, which causes a decrease in root growth, development of leaves and reproductive function, leading to a decrease in product yield. In addition, B alleviates the toxic effects of aluminum (Al) that may occur in plant roots, which reduces plant development and product yield, with its significant effect on root growth and development of the plant.

Deficiency in boron is very common in palm trees that are grown in humid climates around the world, but is also observed in desert climates. In Southeast Asia, palm trees are grown mainly in ultisol and oxisol soils. The B content of such soils is low; therefore, various types of symptoms of B deficiency are common in palm trees that are grown in those soils, especially after drought. Trees that are deficient in boron often shed their fruits prematurely and extensive necrosis occurs near the ends of the clusters of flowers. The deformation of leaves may occur in the form of uncinated leaves, creased leaves, fishbone leaves, and scrub leaves.

Such symptoms of leaf deformations results from inhibition of development of leaf lamina, leading to reduced photosynthetic activity. Mild deficiency in B may lead to necrosis of flower clusters and premature drop of fruits. As the deficiency increases, leaf area and yield gradually decrease, and in cases of severe deficiency, fruit development ceases. One of the most common symptoms of deficiency in boron is the failure of lance leaves to open normally. Leaflets are tightly fused along a part or all of their length. The presence of more than one unopened lance leaf in a palm tree is indicative of deficiency in boron.

Deficiency in B in palm trees causes premature lignification of cell walls and a loss of yield of up to 80% may occur under severe deficiency conditions. Application of balanced B fertilizer to this plant depending on the different growth phases can provide a highly productive plantation of palm trees. The literature has many studies that show the effects of B on the growth and yield of palm trees. A study conducted by Eti Mine Works General Directorate in Malaysia reported that an increase of up to 70% in the weight of fruit bunch was achieved with the application of B.

The critical concentration of boron at which yield of palm trees is expected to begin to decline due to deficiency in boron is reported to be 2 mg kg^{-1} for leaf blades. For leaves, 5-31 mg kg^{-1} of boron is considered sufficient. The literature recommends to regularly apply 7-30 gram of B fertilizer per tree for trees between 2 and 6 years old, or 37 gram of B fertilizer per tree for older trees. In foliar fertilization of boron, a solution containing 300 mg of B kg^{-1} per liter can be considered. Soil analysis must be done before boron fertilization to determine the boron needs of the soil.

For more information: tarim.etimaden.gov.tr/en
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