

**Acrocomia: The
what, how, and why
of the macauba palm**



From food to fuel, cosmetics, and chemicals. Plant-based oils are crucial for our lives

A note from the authors

It only takes a brief look around, whether we find ourselves in our living rooms, our kitchens, at the supermarket, or even during our daily commute to realize how important biobased oils are in our daily lives. Many products that we use nowadays contain traces of these products, and even though we cannot taste or “see” them, they play an important part on the composition of our foods, fuels or pharmaceuticals.

Plant-based oils can also be used for more complex processes or next-generation products such as biofuels. Therefore, it is important to highlight the current interest and the need to research and diversify their production, as they can help alleviate the ecological crisis, which we are facing.

In this issue of our AcroAlliance Newsletter, we take a glimpse into the current state of vegetable oils and the most important crops for their production. We emphasize the need of diversifying oils and crops in a sustainable way by introducing alternatives such as the macauba palm. Our intention is to put information on the table regarding the facts about our oil cravings, production and possible alternatives that innovation and science has opened for us.



Acrocomia aculeata (Macauba palm), a valuable plant genetic resource for the bioeconomy



Vegetable Oils: a world panorama

The market for vegetable oils represented a 213-million-ton production in 2021, according to the FAO. Among those oils, palm, soybean, rapeseed, and sunflower topped the charts with the biggest share. But data shows that this was not always the case. From 1961 to 1980, vegetable oil production did not exceed 15 million ton per year, and the share of crops was slightly different to recent varieties. It was not until 1980 when crops like the African oil palm saw an increase in their production all around the world. Part of this, due to the fact that vegetable oils are used for a range of products, including food, industry, and bioenergy. Vegetable oils are important not only for markets, but also for communities, as they contribute to farmer income diversification and rural development in some parts of the world.

African oil palm

The African oil palm (*Elaeis guineensis*) is a native species of West Africa and in terms of agriculture, it is perhaps the most important palm species in the world, due to its exceptional yield and cultivation extension. In the last decades its production is mainly concentrated in Southeast Asian countries like Malaysia and Indonesia, with these last two accounting for over 80% of African oil palm production in the world. Currently, there is no other crop or region combination that matches palm oil's productivity levels.

Although the African oil palm has been the go-to crop for oil and derived products worldwide, this crop production system faces several challenges nowadays. Among them are:

- Increasing incidence of new pests and diseases;
- Crop suitability limited to tropical rainforest areas of high importance for biodiversity and ecosystems;
- Lack of climatic resilience;
- Unsustainable land use change and cultivation practices particularly in large-scale systems;
- Negative consumer perception due to sustainability issues.

(Murphy et al., 2021, Doi: 10.1186/s43170-021-00058-3)

Where it all starts

What are the most important oil sources? ...Discover more!



A World favorite

Current challenges



A silver lining

The *Acrocomia* case

Using Science to predict success, in the next issue: The Wanulcas model.

Scientists have selected *Acrocomia aculeata* as a possible more sustainable alternative for the production of vegetable oil. Part of this, is thanks to the traits and characteristics it shows, such as its adaptability to different regions and environments with various climate and soil conditions. Moreover, macauba fruits are rich in oil and the palm productivity indicates a positive prospect (2.5-5 t oils per hectare).

With industry and private sector looking for alternatives to comply with environmental regulations, macauba poses as a prospective crop capable of providing oils and a wide variety of products, including edible fruits, animal feed, fibers, proteins as well as products for the pharmaceutical and chemical sectors.

Pre-requisites for macauba cultivation and crop development that AcroAlliance shades light on include:

- Comprehensive understanding of the genetic structure, evolutionary history and adaptation mechanisms within the genus;
- Knowledge of the interaction between genotype and environment;
- Research into biological diversity for the phenotypic breeding of ideotypes and crop management.

Scan the QR code to find out more about the project



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