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MÓDULO 1

Determining the Optimum Harvest Point in Oil Palm Interspecific Hybrids (O×G) to Maximize Oil Content

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Introduction

Interspecific hybrids, or O×G hybrids, result from the cross between two oil palm species: the American oil palm *Elaeis oleifera* (HBK) Cortés and the African oil palm *Elaeis guineensis* Jacq. [1]. The O×G hybrids are the most important and feasible alternative for oil palm growers affected by diseases such as Bud Rot (BR) [2].

Due to the rapid expansion of the O×G hybrids in South America, the agronomic management of these was transferred from the African oil palm with minimum or no adaptation of the technologies. For instance, critical activities toward oil yield, such as pollination and harvest criteria, were conducted empirically. Thus, it is essential to determine the optimum harvest point to maximize the oil extraction efficiency of the O×G hybrids, specifically Coari × La Mé (C×LM), Manaos × Compacta (M×C), and Brazil × Djongo (B×DJ).

Materials and methods

Table 1. Location, age, and harvest seasons of O×G hybrids evaluated for the optimum harvest point (OHP) determination.

O×G Hybrid	Planing date	Harvest time of the bunches analyzed	Location
Coari × La Mé C×LM (Sepalm)	2008	First half of 2013 (rainy season) and the second half of 2014 (dry season)	Araki plantation, Tumaco-Pasto
Brazil × Djongo B×DJ (Unipalma)	2009	First half of 2014 (rainy season) and the second half of 2014 (dry season)	Astorga S.A., Tumaco-Pasto
Manaos × Compacta M×C (ASD)	2012	End of 2017 (dry season) and the first half of 2018 (rainy season)	Palmas de Tumaco S.A.

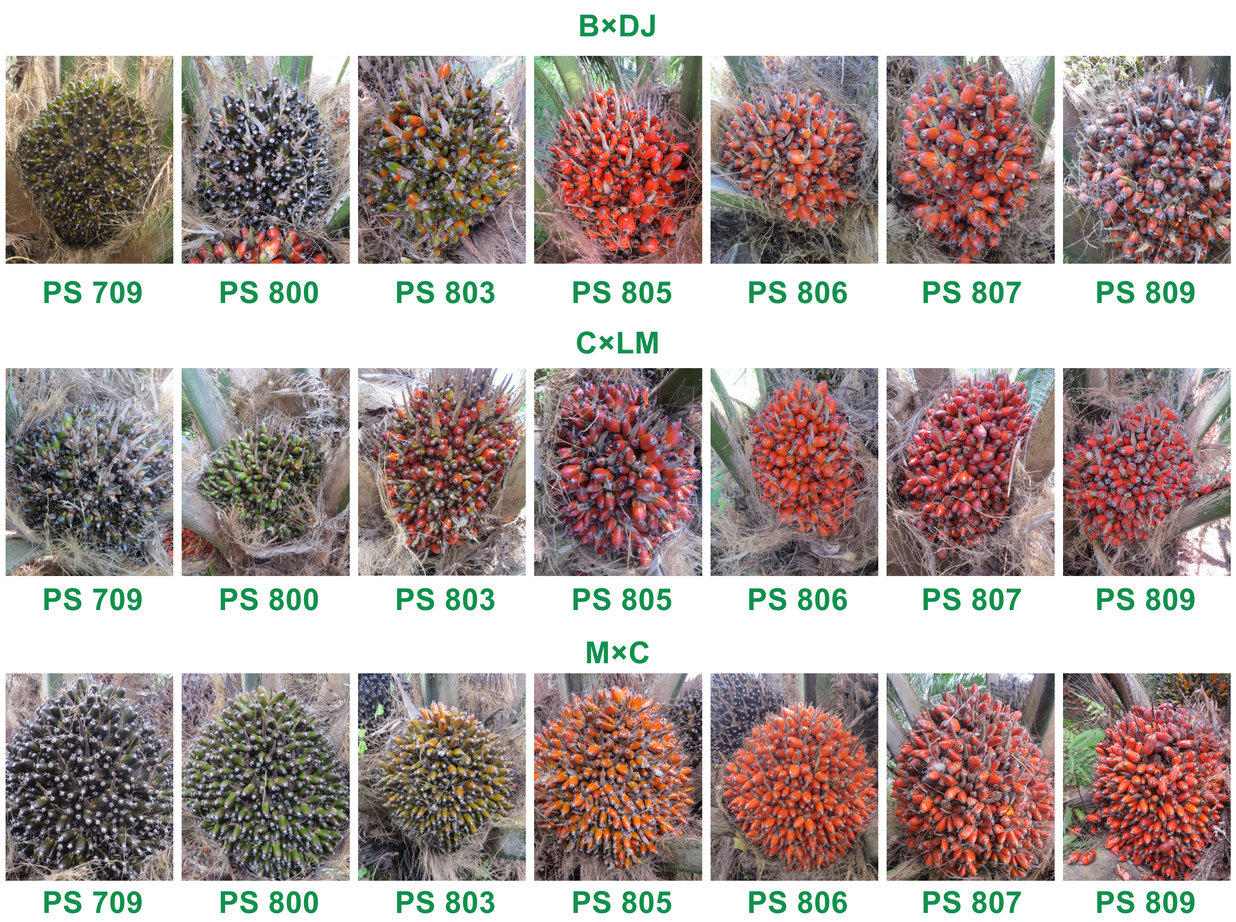
Bunch and Fruit Morphological Changes and Bunch Components and Oil Quality Analyses

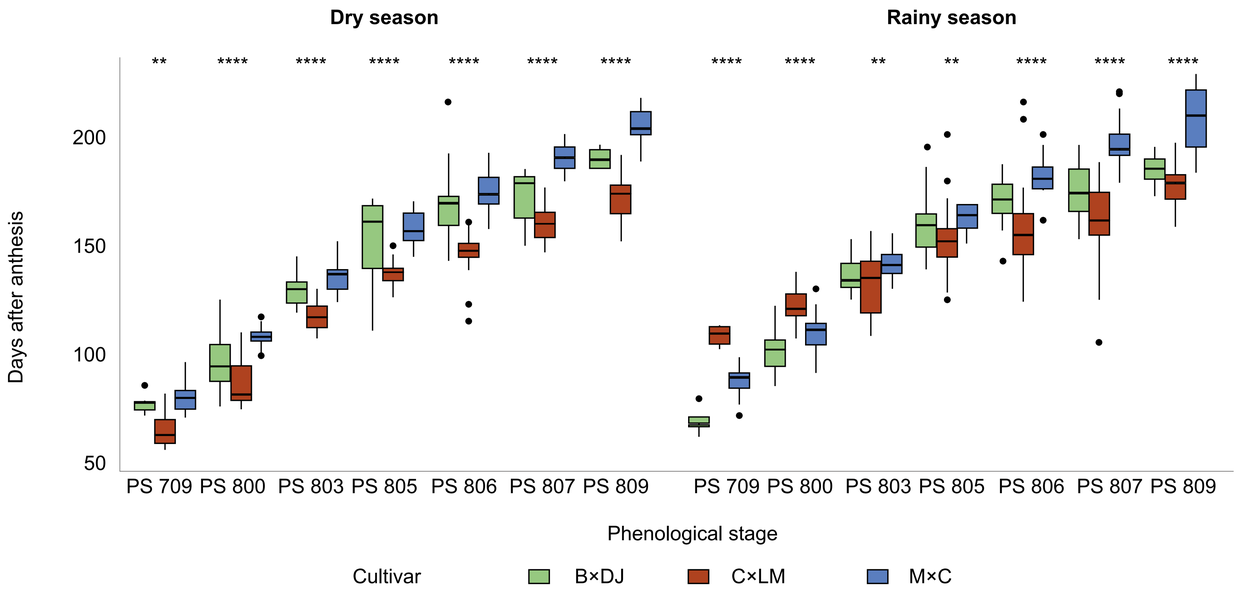
The external fruit and mesocarp colors were analyzed. Also, fruit detachment, fruit cracking, and fruit opacity were recorded to assess ripening in O×G hybrids:

0: No cracking or opacity observed.
1: Cracking or opacity between 0 % and 25 % of the fruits in the bunch. 2: Cracking or opacity between 25 % and 50 % of the fruits.
3: Cracking or opacity between 50 % and 75 % of the fruits.
4: Cracking or opacity affecting 75 % to 100 % of the fruits in the bunch.

Results

Morphological Changes During Fruit and Bunch Morphological Development

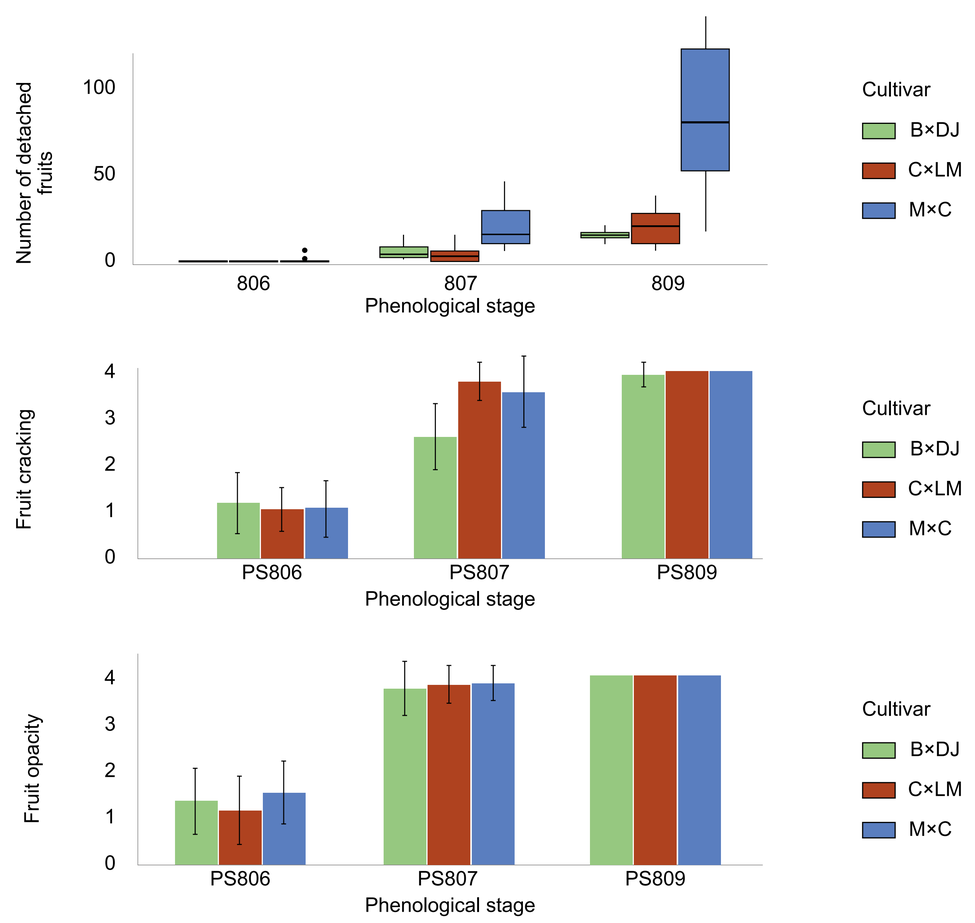




Despite of seasonal variation in maturation in C×LM from PS 800 to PS 809, the total time required for fruit growth and ripening (PS 607 to PS 809) remained unchanged across seasons, with 174 DAA in the rainy season and 172 DAA in the dry season. In contrast, B×DJ and M×C showed no significant differences in DAA between seasons, indicating that environmental factors less influence their maturation processes.

This study highlights the significant variations among hybrid cultivars regarding organoleptic characteristics, bunch composition, oil content, fatty acid profile, and overall quality.

These findings confirm that genetic background influences O×G cultivar behavior. Based on our results, harvest should occur at PS 807 for all cultivars, regardless of season. The selection of OHP indicators should include opacity, fruit cracking, and detachment. While at least two of these parameters should be used.



Bibliographic references

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