

## Flowering, a critical phenological stage as a limiting factors for cultivation of native genotypes of almond tree in eastern Morocco

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### Introduction

Almond is the most important nut crops in Eastern Morocco. Due to the PROFAO project, this region become the most important growing area for domesticated almond species ferragnes/ fraduel in Morocco, However wild local varieties seems to be forsaken. These native genotypes are early flowering, due to late spring frost, often; they have been damaged. So frost damage to the flowers and early developing fruits is one of the most limiting factors for cultivation of native genotypes in this region. Thus for PROFAO project more than 95% of new orchards have been planted by the domesticated almond species "Ferragnes/ Fraduel (F/F)" which have a tardy flowering period.

This study concerns two mains points (1) caracterisation of the phenological stage of flowering of almond tree of native genotypes named " Beldi (Be)" based on the flowering period and color determination of the flowers (2) Physicochemical characterization and comparison of almond oils (Be vs F/F) as a kind of end product with a commercial high add value.

\*PROFAO: Project for the Development of the Almond Branch in the Oriental Region

### Matériels et Méthodes

- ✓ Observations of flowering period
- ✓ Color determination he flowers' petal by chromameter C-410
- ✓ Mechanical extraction of Almond Oils: acidity and peroxide values. were determined according to standard methods

**a: Beldi :** white almond flower

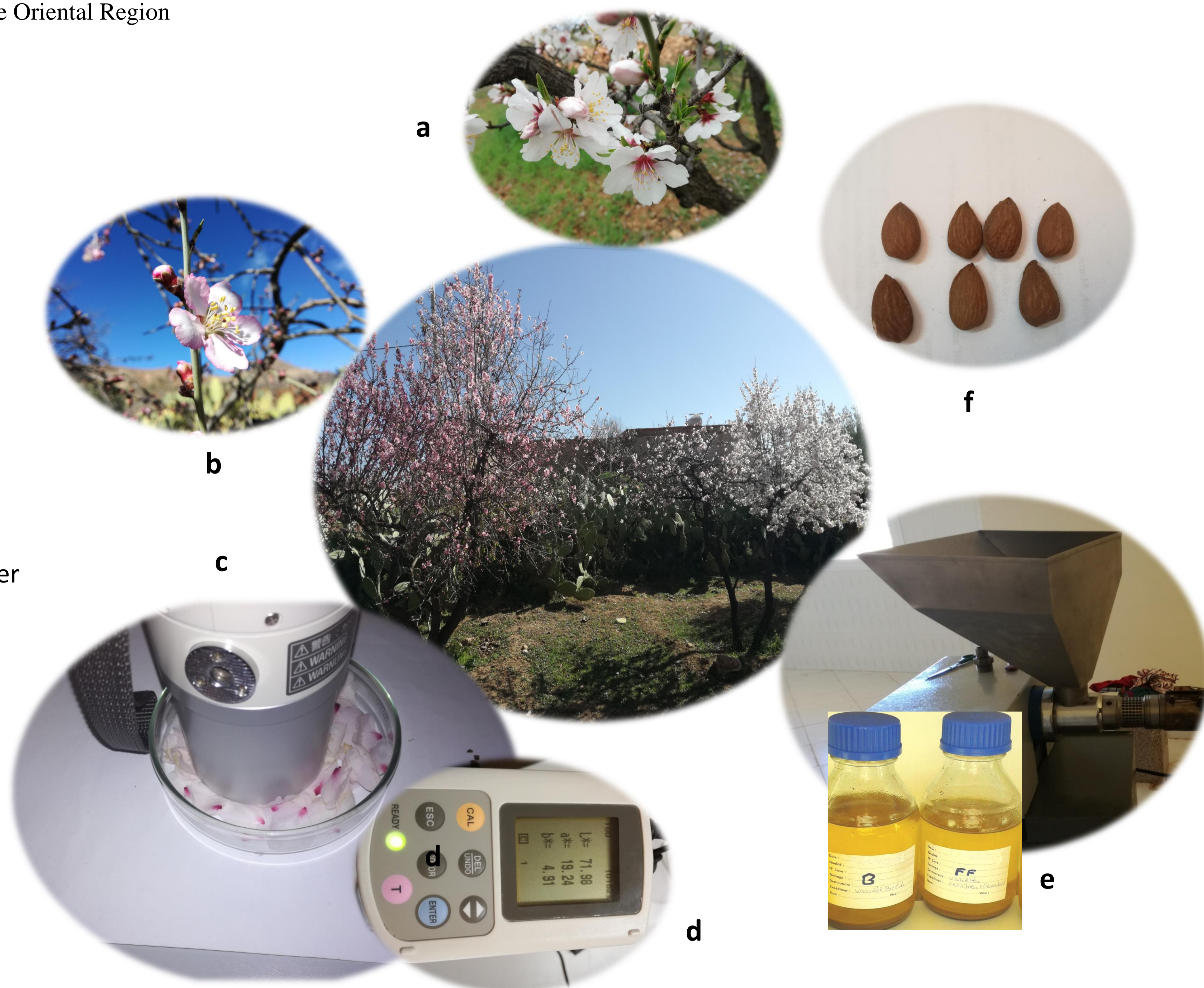
**b: Beldi :** Pink almond flower

**c: Color measurement s of petal flower by chromameter**

**d: system CIE L\*a\*b**

**f: Almand kernel of native genotype « Beldi »**

**e: Screw press : mechanical extraction of almond Oil**



### Résultats

**Table 1:** Color parameters of the first group Beldi "Whitish flowers"

| parametres      | Mean       |
|-----------------|------------|
| L*(Lightness)   | 81,58±1,07 |
| a* (Redness)    | 7,43±0,35  |
| b* (yellowness) | 8,06±0,65  |
| Hue H           | 47,24±1,71 |
| saturation C    | 10,97±0,43 |

**Table 2 :**Color parameters of the second group Beldi (Pinkish flowers)

| Parametres      | Mean       |
|-----------------|------------|
| L*(Lightness)   | 71,64±0,45 |
| a* (Redness)    | 18,34±0,79 |
| b* (yellowness) | 4,97±0,28  |
| Hue (H)         | 15,23±0,03 |
| saturation (C)  | 19,01±0,69 |

**Table 3:** Physico-chemical characterization of almond oils

| Paramètres physico-chimiques            | Beldi (B)    | Ferragnes/ Fraduel (F/F) |
|---|--------------|--------------------------|
| yield (%)                               | 50,00 ± 0,99 | 57,00± 0,79              |
| Acidity (% d'acide oléique )            | 0,40 ± 0,007 | 0.81 ± 0.008             |
| Peroxyde index (meq O <sub>2</sub> /Kg) | 16,39 ± 2,95 | 14.32 ± 0.41             |

### Conclusion

✓ Our results show the presence of at least two different almond varieties of Beldi (native genotypes) with clear differences for flower colors. The first variety with a whitish color (H=47,24° & C=10,97) and the second variety with a pinkish color(H=15,23° & C=19,01). This diversity could be related to natural hybridization between the natives almond trees

✓ When compared to Ferragnes/ Fanduel (F/F), beldi almond oils shows similar characteristics but with a slightly lower "almond oil" yield

✓ Despite all the advantages of F/F, we believe that for the diversity of crops and the conservation of biodiversity it is important to characterize these Beldi native varieties and really interesting to conserve them for the future needs or uses in new programs of almond plantation in response to climate change