



Ethephon application is addressed in this issue.

1

## What is Ethephon or Ethrel?

Ethephon is a plant growth regulator that acts by releasing ethylene in the plant tissues soon after its application. Ethylene, a naturally occurring plant hormone, induces and regulates certain plant processes, such as ripening, coloring and senescence. Ethephon is used in walnuts for stimulating pericarp opening and detachment, thus obtaining an easier, early and concentrated harvest.

2

## Why do we use Ethephon?

End product quality and particularly kernel color are determined by, among other things, the time elapsed between walnut physiological maturity, harvest and drying. This physiological maturity is achieved when the septum or partition dividing "butterflies" (halves) and the tissue covering them turn from white into light brown (café-au-lait).

At this point, walnuts achieve the maximum oil concentration. However, particularly in climates as ours, this maturity stage is reached before the pericarp cracks and, therefore, long before walnuts can be harvested.

Consequently, by using **Ethephon** in walnuts, harvest is moved forward by 7-14 days (depending on climate and variety), expediting pericarp cracking and detachment. Thus, time elapsed between walnut physiological maturity and harvest is dramatically reduced, decreasing a potential color fading.

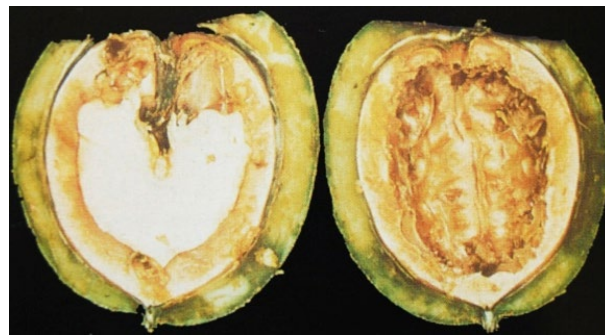
### // SOME ALTERNATIVES OF COMMERCIAL PRODUCTS AND DOSAGE (L/HA)

Ethrel 48 SL	Etherfon 500 GL	Ethylen 48 SL
65 cc/100 liters of water	60 cc/100 liters of water	60 cc/100 liters of water

3

## When do we use it?

The manufacturer recommends using Ethephon once the kernel septum turns dark brown, but in practice this product has been used when the partition has just changed color and features a **light brown** (café-au-lait) color (See Photo 1).



*Photo 1: Walnut with light brown (café-au-lait) membranes.*

Physiological maturity often occurs during the second fortnight of February for the Serr variety and 10-15 days later for the Chandler variety. Therefore, monitoring must begin on February 15 at the latest in Serr orchards and on February 25 in Chandler orchards. This process must be repeated **every 3 to 4 days** until the application date.

4

## How to monitor?

In order to determine the precise time for applying Ethephon:

- Collect 100 walnuts harvested from different parts of the tree. The orchard must be inspected by walking in a diagonal fashion.
- Do not include walnuts obviously advanced in their maturity.
- Cut walnuts into two halves with a knife. Observe the color of the septum dividing "butterflies" and the membrane covering them.
- Classify a half of each walnut in two groups: those that **"do"** have a light brown (café-au-lait) color and those that **"don't"**.

*(continued)*

B O R N I N

4

## How to monitor?

The right moment to use Ethephon is when there are 95 halves (95%) in the "do" group.

(Photo N°1).

This monitoring must be accurately conducted. Should Ethephon be applied before the proper time (Photo 2), walnuts would lose weight and quality, hindering pericarp opening. If the product is applied later instead (Photo 3), pericarp cracking would be homogenized without advancing the process.



Photo 2: Unripe walnut.

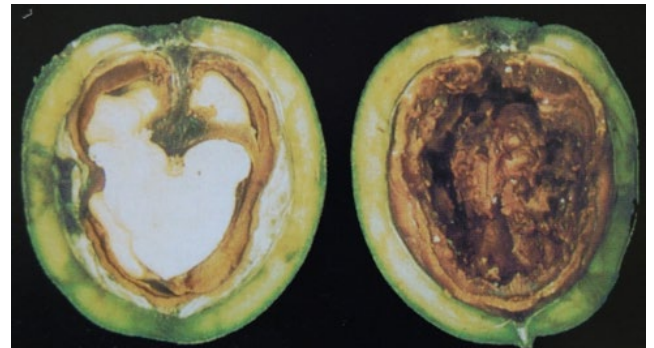


Photo 3: Walnut in an optimum maturity stage.

5

## Precautions

### // WHAT PRECAUTIONS MUST BE TAKEN WHEN PREPARING THE MIX?

- Shake the product before use.
- Fill the tank with water to half its capacity.
- In a separate container, add the required amount of Ethephon, and dilute with a little water.
- Filter this solution through a screen.
- Complete with water to full capacity.
- During filling process and after application, keep the stirrer working constantly.
- Use the product within 6 hours after mixing.



6

## How to use it?

A fine-droplet sprayer and a volume of water to be applied of 1,000–2,000 liters of clean water are recommended, depending on tree size. Ensuring a good coverage is important, particularly in the case of walnuts in the upper two thirds of the tree, since these take longer in breaking the pericarp, and Ethephon does not translocate from leaves to walnuts; therefore, walnuts must be covered completely.

### // IMPORTANT RECOMMENDATIONS

- Ethephon must be applied once in the season.
- Stagger application, according to harvest capacity; otherwise, walnuts would fall to the ground.
- Use on healthy, unstressed and vigorous plants only.
- Use on damped soil: Irrigation is recommended 2-3 days before application.
- Product yields better results with temperatures over 30 °C and below 10 °C. Therefore, use Ethephon in the morning, avoiding high temperatures.
- Do not apply Ethephon if temperatures over 35°C are forecasted for a long time after application.
- Some indicated doses of Ethephon might produce insignificant yellow spots in leaves, and some of them might even fall from healthy trees.
- Harvest takes place 14 days after application, but it may range from 7 to 18 days depending on variety and prevailing temperatures of those days.



7

## Other considerations

- Read the label carefully before using this product.
- Avoid contact with skin, eyes and clothing
- Harmful if swallowed or inhaled.
- Wear personal protective equipment during mixing and application: water-resistant overall, PVC or neoprene gloves, rubber boots, goggles and faceshield.
- Adequate ventilation must be provided.
- Keep away from spraying mist.
- Avoid application of this product when winds are gusty.
- After use, wash body thoroughly with soap and water.
- Wash clothing separately.
- Wash equipment used with plenty of water.

**If you have any questions, please contact Invernada Export Spa's Technical Department.**