

TECHNICAL NEWSLETTER

Invernada Technical Department // August 2019



In our eagerness to continue to be a real asset for our producers, who we consider our strategic partners, we have prepared this Newsletter hoping you will find it useful.

THIS ISSUE ADDRESSES THE FOLLOWING TOPICS:

1.

How to deal with low-price cycles in the industry and what analysis must be made to make orchard-level decisions oriented to maintain proper grades, colors and fills?

- Integrated Pest Management (IPM): When is it worth to use pesticides? What tolerance criteria must be used? When do we practice preventive measures?
- How to improve color (return) by means of orchard-level management?
- How to maintain proper grades as orchard is getting older?

2.

An analysis of a frost occurred in Southern Maule and Northern Biobío regions after the harvest.

3.

Business review of selling season in Chile and expectations in the U.S.

1

Integrated Pest Management

In view of the returns of the last few years, every producer's IPM program should consider all the costs implied in each application and the orchard tolerance thresholds in the face of a certain pest attack. This concept is quantified by the following formula:

$$\text{Tolerance Threshold} = \frac{\text{Management Cost}}{\text{Price} \times \text{Damage} \times \text{Treatment Effectiveness}}$$

(continued)

BORN IN



1

Integrated Pest Management

Where the Tolerance Threshold can be measured by pest population density (amount of specimens per leaf). Whether the application will be able to protect at least a portion of the fruit equivalent to the cost of the IPM should be assessed. Following is an example of an evaluation of potential damages to the crop caused by mites, bearing in mind the presence or absence of natural enemies.

Mite population (% of leaflets ≥ 1)	USES pyrethroids or organophosphorus pesticides			DOES NOT USE pyrethroids or orga- nophosphorus pesticides	
	Predator population levels (% of leaflets con ≥ 1 predators)				
	< 10%	20 - 50%	> 50%	< 10%	> 10%
0 - 9%				UNNECESSARY APPLICATION	
10 - 19%	UNNECESSARY APPLICATION				
20 - 29%					
30 - 39%				CONSIDER APPLICATION	
40 - 49%	CONSIDER APPLICATION				
$\geq 50\%$					

Source: Ucan.

- Mites and aphididae: **Find natural enemies**, such as *Neoseiulus Californicus* or *Thyphlodromus Chilensis*. If some specimens of the latter are observed, pesticide application might be unnecessary.
- Avoid preventive applications if the orchard does not have a history of severe attacks.
- In January/February, when aphididae proliferate, avoid controlling moths with pyrethroids or organophosphorus pesticides. Neonicotinoids can be a good choice.



Photo 1: *Noseiulus Californicus*.



Photo 2: *Thyphlodromus Chilensis*.



2

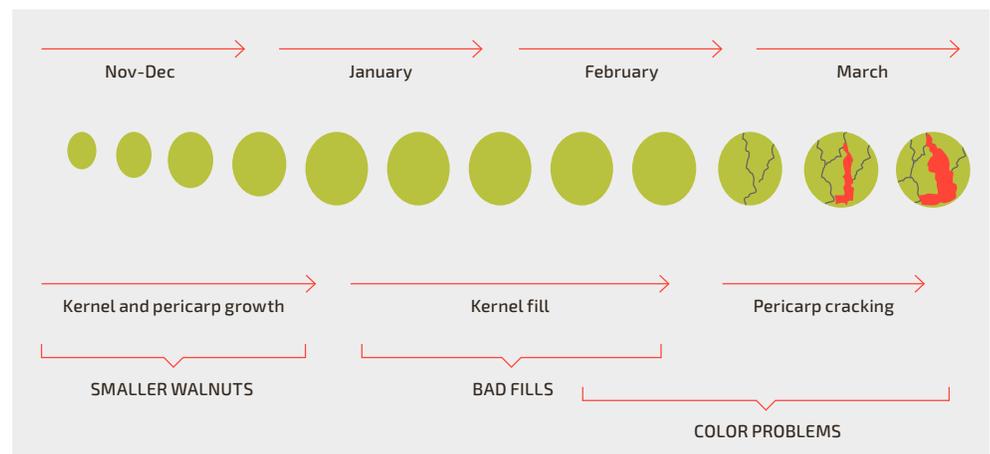
Kernel color: Potential irrigation adjustments

Considering that walnut value is based on yield and quality, keeping a proper level of both factors may be decisive in the profitability of walnut orchards due to the low prices of this commodity. Irrigation management is an adjustable factor for increasing fills and improving kernel colors —two key components of quality—, which can make a difference of up to 30 cents per kilo in the final price.

The most important decision in terms of irrigation is when to **start watering in springtime**. Observations have shown that starting too early in the season results in walnut trees being predisposed to harvest stress.

Pressure Pump: Studies from Davis University have found that delaying irrigation until pump measure reads 2 bar below baseline is a good start in order to ensure the highest potential regarding fruit yield and color. (For more information on Pressure Pump, go to sacvalleyorchards.com/manuals/stem-water-potential/.)

The scheme below shows walnut problems arising from an inadequate irrigation during the season.



Source: Ucan.

(continued)



2

Kernel color:

Potential irrigation adjustments

Historically, amber-colored "butterflies" (halves) have been associated to a lack of irrigation in the last weeks prior to harvest. Nevertheless, latest studies have shown that those orchards that exceeded humidity base levels during the February-March period have had this problem consistently. These studies suggest that keeping orchards 2 bar below baseline (late summer) may help improve colors.

3

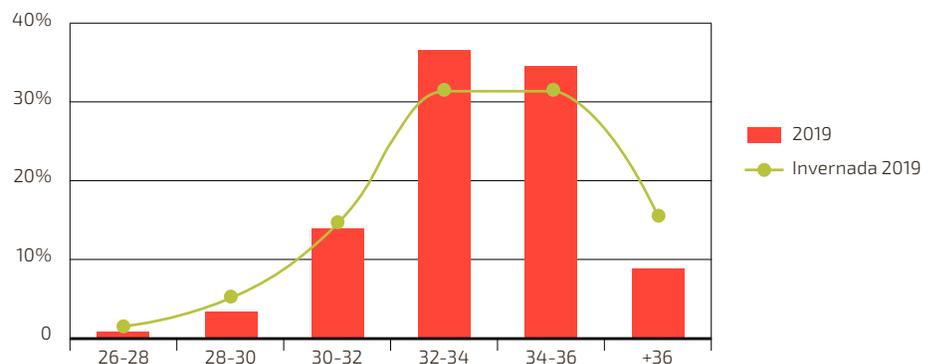
Grades:

Producers must choose lines of work and not wait for the curve to drop to react.

An imminent challenge will be keeping 100% of the fruit over 30 mm of diameter, ideally a large part over 34 mm of diameter per walnut. With that in mind, some work strategies may be chosen, for example:

- Keeping the light and quality of buds by pruning trees yearly, maintaining the height of walnut trees, and seeking to renew production centers, as required.
- Reinforcing the fertilization program by applying cytokines on foliage (a myriad of choices is commercially available). A curve of grades for a 25-year-old Serr walnut orchard is shown below. Based on a program reinforced in hormones and amino acids, this orchard has maintained a good curve of grades.

// CURVE OF GRADES (PRODUCER VS. INVERNADA AVERAGE)





4

Post-Harvest Frost from Linares to Chillán

According to the automatic weather stations (AWS) of three **Invernada producers**, temperatures reached 0 °C, resulting in damages in shoots that could not lignify. Therefore, shoots ceased "capitalizing" potential fruit buds for the next season. However, young orchards suffered the greatest damages. What precautions are to be taken in zones with early frosts?

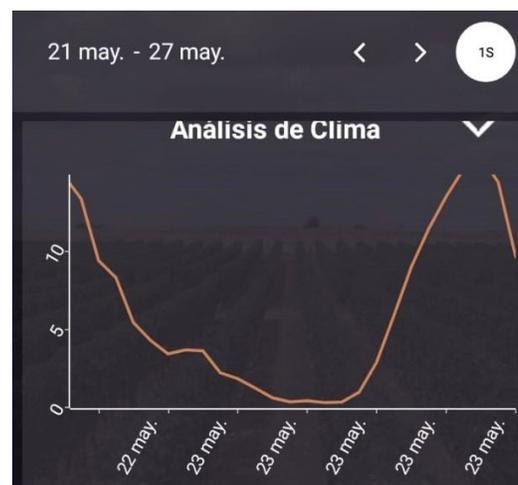


Photos 3 & 4: Post-harvest frost.

For more information on these topics, contact our agricultural engineers:

Rodrigo Domínguez
+569 4477 9793

Juan Ignacio Sánchez
+569 4256 9072



In areas where autumn frosts are more likely, the nitrogen fertilization application deadline should be strictly observed.

In addition, if autumn temperatures remain high and nothing indicates that plants are about to go into dormancy for the winter, there are some foliar applications that can be considered to move sugars and free nitrogen to reserve zones, thus reducing the risk of frost.

TRADE SUMMARY

Invernada Technical Department // August 2019



Following a very complicated 2018 season where prices and demand plummeted, this year looks more promising. Although prices remain at record-low levels, demand at least has been on the rise.



Harvest

We had been expecting that the 2019 harvest would hover around 150,000 metric tons; however, as we mentioned earlier, outputs dropped dramatically, which is why the final yield will be near last year's level, that is, 130,000 MT, approximately. The final yield was established for certain once the harvest had been completed in May.

This yield drop is mostly driven by weather-related factors. On average, temperatures were around 4°C higher than historical ones in February, March, and April, which may have led to lower kernel filling and fruit weight.

Among other relevant factors is the hail that affected certain areas and caused some 3,000 tons in loss. However, in general, the most critical factor for the lower yield was the weather prior to the harvest, which needs to be closely monitored in the future.



Shipping and Sales

In Chile, this season opened with prices significantly lower than in 2018 but consistent with those observed in California. Accordingly, if during Gulfood 2018 (February) a kilo of Chandler 30mm+ was sold for USD 4.30 CIF, in February 2019 the same product was being offered for USD 2.80/kilo CIF, which is a 35% decline.

Another unusual event worth mentioning was the large price mismatch shown this year by the three large nut groups: In-shell, mechanically-cracked and hand-cracked walnuts. Traditionally, these three products have shown fairly similar prices; however, this year in-shell walnuts reached prices significantly higher than the other two products.

BORN IN

TRADE SUMMARY

Invernada Technical Department // August 2019



In-shell walnuts

Let's jog our memory.

The in-shell market was very active since the beginning. Starting from Gulfood (February 2019), demand for the SERR variety **for early shipment** was very high and a kilo of large walnuts (30 mm up) was sold for up to USD 3.00, driven mostly by strong demand from Dubai and other markets that buy mainly SERR or other markets that were seeking to stock up for Ramadan.

Initially, we were anticipating a rather early harvest of the Serr variety, but eventually the harvest took place in the usual dates.

On the other hand, the Chandler variety was harvested a little earlier, therefore, both harvests took place at nearly the same time.

From the onset, the Chandler variety sold very well and prices remained stable, ranging from USD 2.70/kilo CIF to USD 2.85/kilo CIF for large walnuts 30 mm up. These prices spurred demand, particularly in the Middle East. Even if not high, at least this price should help absorb higher volumes in the future.

Closer to harvest time (late March), there was speculation and downward pressure on the prices of in-shell walnuts, especially from Turkey and Europe, both of which delayed their purchases waiting for lower prices, which fortunately did not drop. Turkish buyers were looking for prices in the range of USD 2.50 – 2.60/kilo CIF of large walnuts (30mm+) but strong demand from other countries helped prices to remain stable and even some producers increased prices slightly to signal stability, which eventually set prices at USD 2.80 – 2.90/kilo CIF by mid-May.

By late May, when news of a smaller harvest broke, in-shell nut prices started to increase but by then most deals for in-shell walnuts had already been closed. The remainder –up to 10% of the total volume– could be sold for some 10 to 15 cents more.

Greater activity in sales has been reflected in a 50% surge in shipments compared to same date last year.

(continued)

BORN IN



In-shell walnuts

Only the shipments to the United Arab Emirates amount to nearly 14,000 tons already, up 200% from last year. This surge caused various issues at destination, where a large portion of the volume imported has been resold to Iran and India, the end markets for these purchases.

Other important markets for in-shell walnuts are Lebanon, Morocco and China, which have shown an interesting level of growth.



Hand-cracked walnuts

Hand-cracked walnuts have been a major niche for Chile; however, sales have declined in the past few years as machine shelling is significantly cheaper and competitive at global level.

Given that supply is limited, this market manages to absorb price variations well and tends to be more price inelastic. Consequently, the prices of hand-cracked walnuts remained relatively high, in line with in-shell walnuts, which is ultimately the raw material.

Demand for hand-cracked walnuts has been pretty similar to that of in-shell walnuts. Initially, demand was very active but later a downward pressure on the price mostly from Europe was observed, which was followed by a moderate hike in prices driven by lower availability in Chile. Consequently, prices declined from USD 10.50/kilo CIF in February to USD 10.00– 10.20 in March–April and later rose to USD 10.70 – USD 11.00 from May onwards.

The greatest issue regarding this product is the inability of producers to increase production volumes due to the high labor cost and low availability of people willing to do this job. The greatest challenge is to remain competitive in terms of cost and superior quality regarding image and food safety to offer sustainable supply.



Machine-cracked walnuts

Machine-cracked walnuts are last in this report because of the unusual situation that has affected them.

As we mentioned earlier, this product followed a completely different trend from the other two products along the entire best-selling period (February–May). It should be noted that we are referring to sales dates, rather than to shipment dates, which are different.

At the beginning and given the prices shown by in-shell walnuts, machine-cracked walnuts were offered for USD 7.60 – 7.50/kilo CIF for light halves and pieces (LHP) (40%), which was considered a very good price if we think that in-shell walnuts were being sold for USD 2.80/kilo CIF. Such level of prices discouraged purchases and downward pressure on the prices, particularly from Europe, started to brew. It seemed as if all the fears of the previous year were back to haunt us. By March–April, prices were lower than USD 6.50/kilo CIF, a price totally inconsistent with in-shell walnut prices at that time. In any case, large volumes were sold to the largest retailers and buyers from Europe (by far, the largest market for Chilean cracked walnuts) and other regions.

Until mid-May we were not certain that cracked walnut prices would go up or if in-shell walnut prices would drop, but we did know that the market had to find some balance between these two products at a certain point. It was then that we learnt that the harvest would be less fruitful than originally expected, which added to the strong sales already closed to that date spurred a strong rise in the prices of machine-cracked walnuts and caused them to align with the prices of the other products. Interestingly, by that date Chile had already committed as much as 70%–75% of the total harvest.

Shipments show that sales to European markets were actually very strong. By late June, Europe concentrated 71% of total cracked walnut shipments, up by 40.8% compared to last year, evidencing a buying spree among the largest European retailers that wanted to take advantage of low prices being offered.

TRADE SUMMARY

Invernada Technical Department // August 2019



Current Situation

The local production is mostly sold out, nearly 70% of the total harvest has been shipped and walnuts for sale (in-shell or shelled alike) are quite rare. It is estimated that as much as 95% of the walnut production has been sold.



Lessons to be learnt from this harvest

- Although the volume is on the rise, we believe that given the current prices the market should be able to absorb such growth.
- Buyers are increasingly convinced that Chilean walnuts are a preferred product as a result of their freshness in the off-season and their quality in terms of color and filling, which is true for both in-shell and cracked walnuts.
- Keeping prices stable and competitive is critical. It's no use growing anxious to sell right away as this only generates uncertainty among buyers and pushes prices down.
- We must strictly monitor the quality of our fruit, both regarding the color of the kernel and the filling. Moreover, future challenges regarding size and outside appearance should be addressed.

B O R N I N