pulp

ripeness

The grape

harvests

whole clusters

pressing

gentle

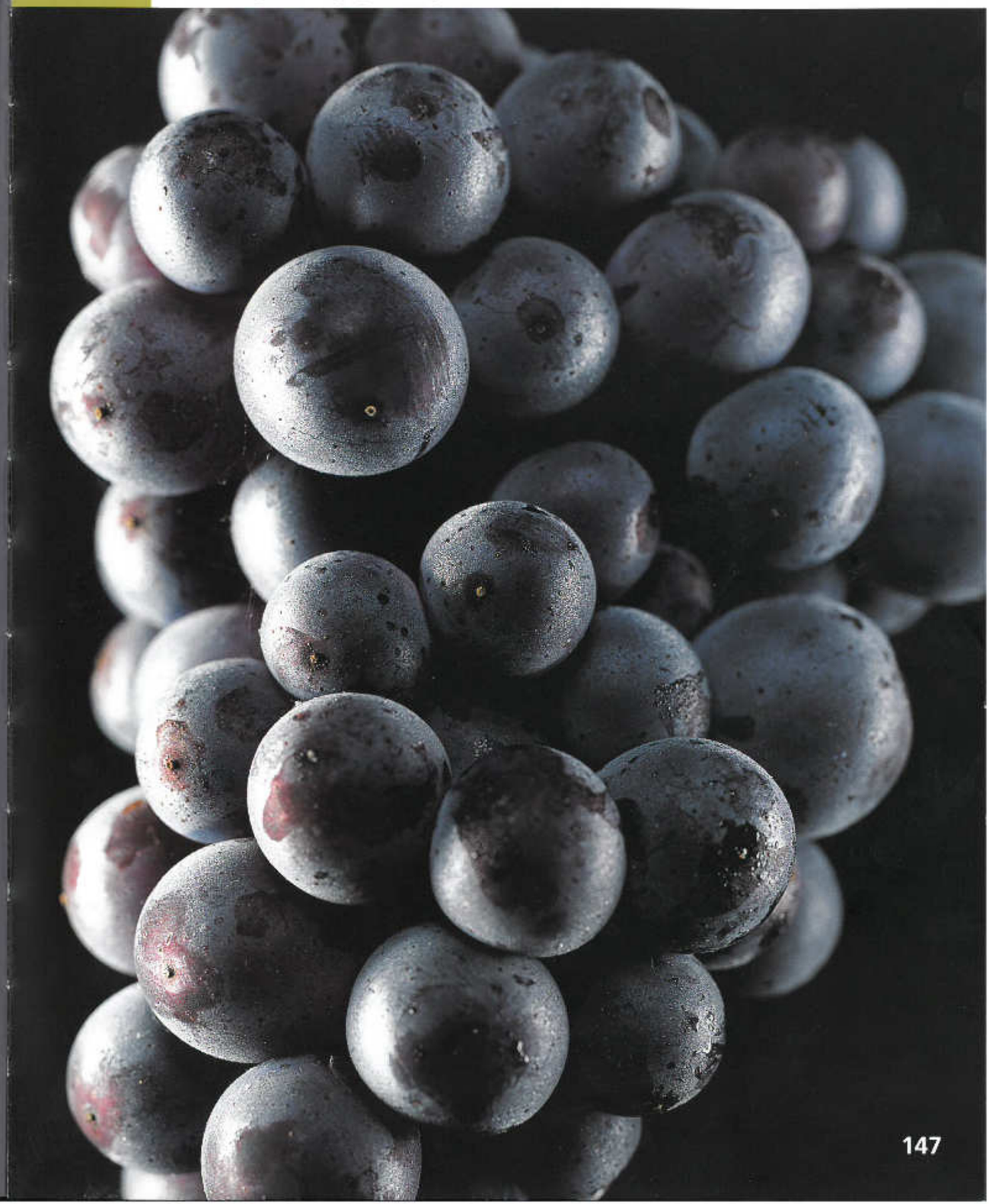
cuvée

Champagne grapes: tended with the greatest of care

Berries that hold the essence of the terroir

Harvesting: a model of precision

Pressing: a very gentle process



Champagne grapes are the **link** between a unique *terroir* and an ancestral method of winemaking.

The fascinating story of these too-often unsung grapes starts with a very long gestation period. The complex fruit produced marks the culmination of 15 month's constant care and attention.
From planting to pressing, there is attention to detail at every stage. For example:

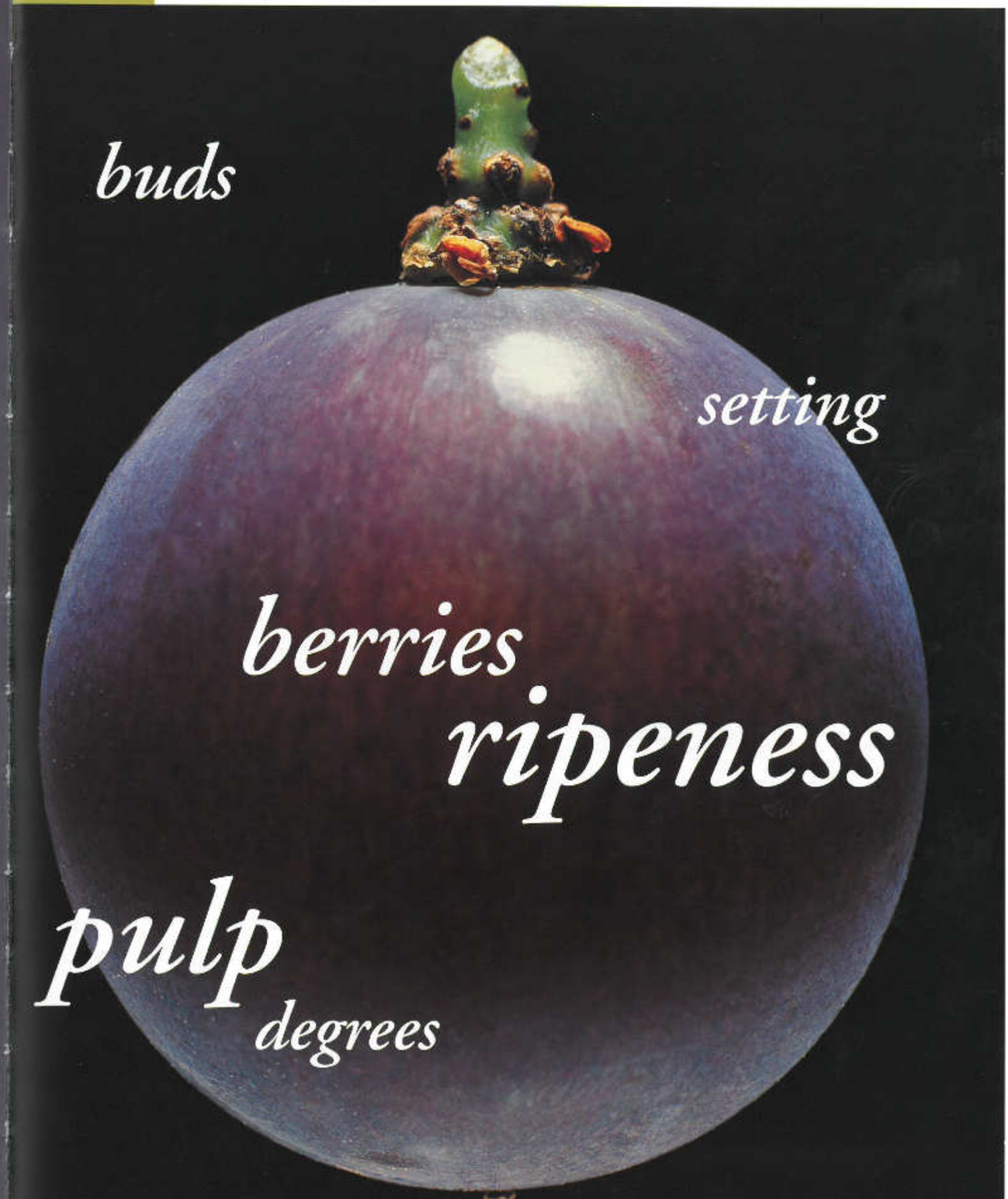
- **Peak ripeness** – that very brief moment when the grapes are fully developed but still fresh – is determined on a *cru-by-cru* basis.
- Picking is entirely manual, selecting only whole, perfectly formed **clusters,** handling them gently so that they reach the pressing centre intact.
- Pressing is a subtle, slow, gradual process based on squeezing the **pulp** to produce the juice required to make Champagne wine, while excluding any of the pigments from the grape skins.

Harvest time is like an **impeccably choreographed ballet,** as man and nature each play their parts to preserve the unique characteristics of a grape that is the **essence of its *terroir*** and the origin of a legendary wine: Champagne.

Berries that hold the essence of the terroir

Harvesting: a model of precision

Pressing: a very gentle process



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① A 15-month gestation period
② The complexity of the berries
③ Ripeness in relation to Champagne production

By the end of their 15-month gestation period, the berries have grown into juicy, succulent fruit with a complex structure.

White, sparkling Champagne wines are exclusively made from the clear, delicate juices that are extracted from the grape pulp.

The timing of the harvest depends on anticipated maturity: the time when each grape variety, and indeed each individual *cru*, is expected to reach peak ripeness.

① A 15-month gestation period

In between budding and cluster maturity, the grape leads two successive lives: first the secret life of the bud, then a public life, out in the open.

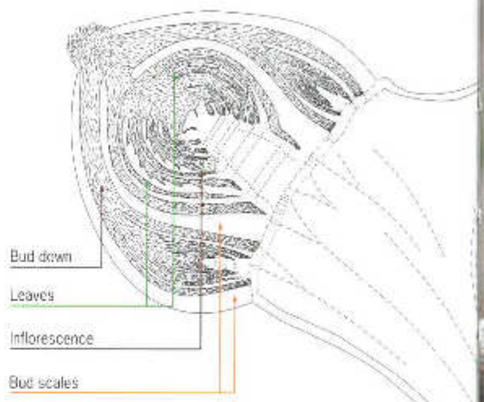
The secret life of the bud

Bud formation starts in June, one year prior to final harvest. **Latent** buds, also known as "eyes", first become visible at the leaf axil, then become dormant until the following autumn or winter.

Latent buds in fact lead a secret life, preparing for every stage of the **reproductive cycle.**

It begins with "flower initiation" or the development of early inflorescences followed by flower formation.

Longitudinal cross section of a latent bud
(as shown by Sartorius, 1937)



The secret life of the bud

Life once the bud has opened

Even at this early stage, bud **fertility** may be assessed from the number of future nodes, leaves and inflorescences visible in a cross-section of the bud.

Ten months before the first shoots appear, 12 months before flowering and 15 months before harvesting, the winegrower can already tell how many clusters the bud will bear (barring any freak weather conditions).

Budhurst

In spring, the bud starts to swell and its protective scales part, revealing a downy, cottony substance known as "bud down".

Life once the bud has opened

In the spring of the following year when the weather turns warmer, the bud awakes from dormancy and begins to swell. Known as bud break, this is the moment when the bud sheds its scaled sheaths. Young leaf shoots are the first to appear, followed by the inflorescences – indicating crop potential – then the flower buds.

Next comes **flowering,** that long awaited but also critical moment when the flower buds turn into flowers and the ovules must be fertilized if they are to develop into seeds.

Following successful pollination, the vine **sets** its fruit as the ovules develop into seeds or berries.

Fruit setting and the risk of *coulure* (non-setting of fruit)

A vine will usually produce half as many berries as flowers because many of the apparently normally fertilized berries drop off. Known as *coulure,* this loss of immature berries is a natural process but it can reach dangerous proportions if flowering occurs in poor weather conditions. In fact, *coulure* is the winegrower's biggest fear at the end of June. Those few days during the flowering period are therefore critical in determining crop potential. They also account for the wide annual variations in yield so characteristic of the Champagne vineyard, sometimes differing by a factor of six from one year to another.

The berries grow bigger every day, surrounding the seeds with flesh. Some five weeks before the start of the harvests, they begin to ripen and change colour. This is the final phase of berry development, continuing from ***véraison*** (the beginning of ripening) to the final stage of maturity. Depending on the grape varieties, the berries turn from green to greenish-gold *(Chardonnay)* or green to bluish-black (*Pinot noir* and *Meunier*).

As they grow riper, the berries also soften, becoming juicy and increasingly plump. The moment of **ripeness** comes when acidity drops and sugar concentrations rise.

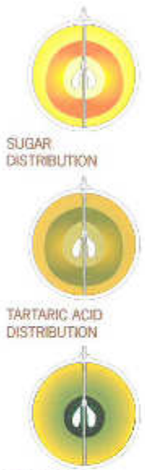
Left to its own devices, the vine would reproduce itself, spreading its seeds far and wide by courtesy of the animals that would eat its succulent grapes.

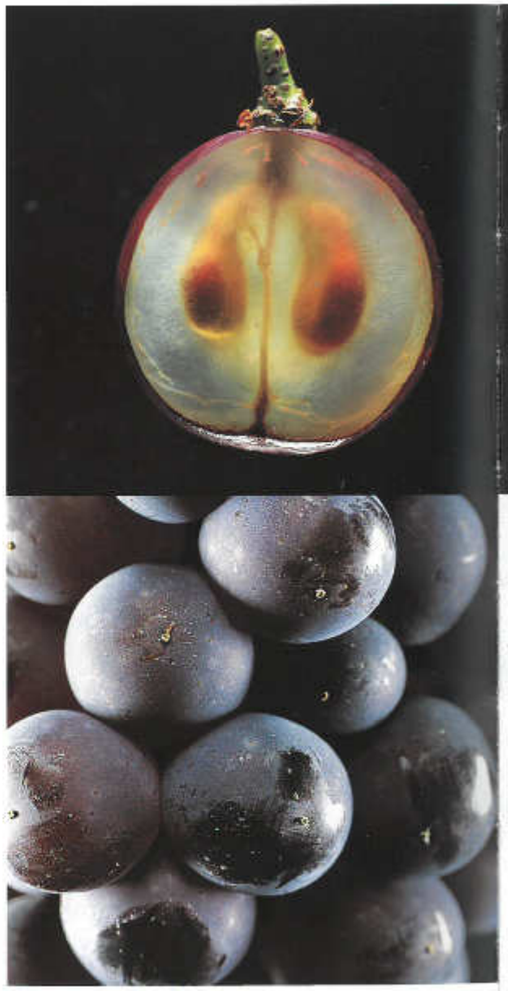
But Champagne grapes are destined for greater things. The time has come to harvest them and make them into a wine quite as remarkable as the grapes themselves.

② The complexity of the berries

There are three main parts to a grape berry, each one quite different in composition:

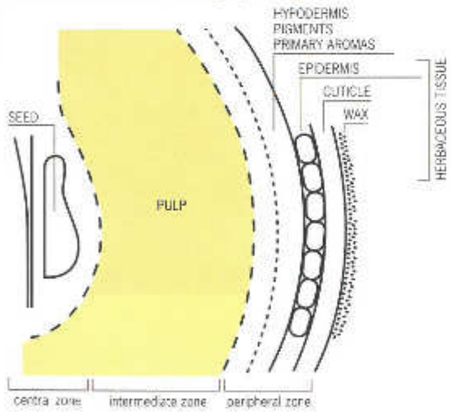
1. The outer part that we call the **skin** consists of the bloom, the cuticle, the epidermis and the hypodermis. The skin is rich in pigments (origin of the different colours of grape varieties) and other substances including mineral salts, tannins, polyphenols and aromatic precursors.
Grape skin **thickness** varies widely depending on the grape variety and level of ripeness. The hard, tough skin found on green, unripe berries grows softer and more flexible as the berry ripens.





Bloom or cuticular wax, is the water-repellent, velvety material that covers the berry. Its velvety texture is more noticeable on black grape varieties (the *Pinot noir* and the *Meunier*) than white (*Chardonnay*).

Detailed cross section of grape berry



2. The intermediate, fleshy part is called the **pulp** and consists of fragile, liquid-rich cells that burst under the slightest pressure, so releasing their juices when pressing commences. They contain more water, sugar and acids than the skin but fewer mineral salts, tannins, polyphenols and pigments.

3. The central part contains the **seeds**, rich in carbohydrates, lipids and tannins.

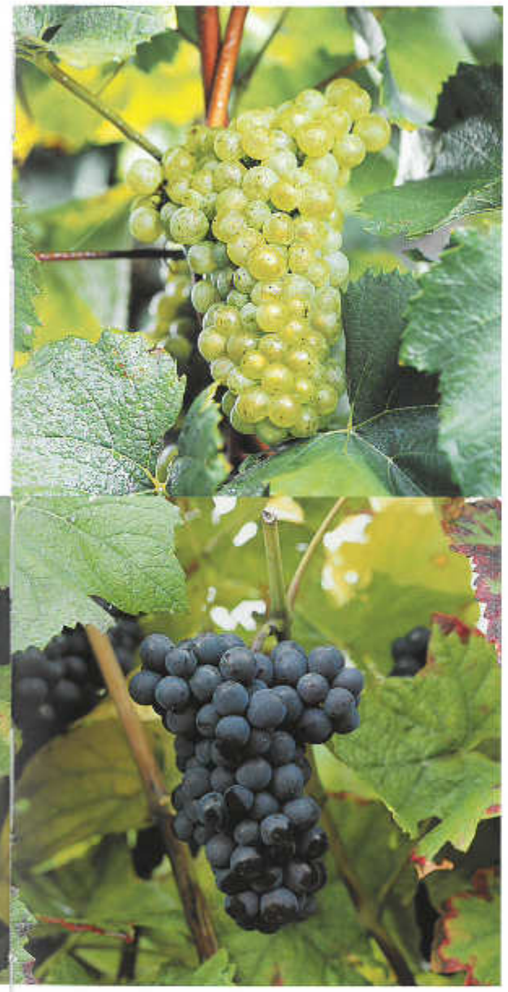
The special pressing technique used in Champagne focuses almost exclusively on the **pulp**. Its clear juice contains the acidity required to give the wines their freshness, the sugar they need for roundness and those subtle aromas that account for the finesse in Champagne wines.

This method of selective pressing allows:
- The production of a **white wine** from mainly black grapes (three quarters of plantings), uncoloured by the pigments in the skin;

• The extraction of **subtle aromas** that complement the wine's effervescence, untainted by the coarser aromas and grassy, astringent, sometimes bitter flavours that are found in the skin and seeds.

③ Ripeness in relation to Champagne production

Optimum maturity is vital to the quality of the finished wine. In terms of Champagne production, optimum maturity is generally defined as the technological maturity of the grapes – the stage when the fruit achieves an **ideal sugar/acidity balance** – rather than the physiological maturity of the vine.

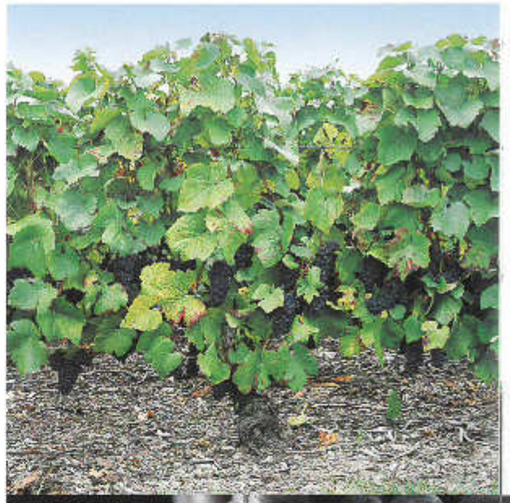


The sugar in the grapes produces the alcohol required to give the wine structure and roundness, while the acidity adds crispness to the palate.

Due to the Champagne vineyard's northerly location, the grapes are always relatively high in acidity. Sugar content on the other hand is less dependable.
Ideally Champagne grapes should reach potential alcohol **levels** of around 10%, equivalent to 170 grams sugar/litre in the finished wine. In practice, ripeness **varies** from year to year, mainly depending on the *cru* and the variety. Major factors affecting ripening include:

• The **climate,** especially in the month on the run-up to the harvest. Warm, sunny weather promotes ripening while cold or, worse still, wet conditions not only reduce sugar concentrations but also increase the likelihood of outbreaks of grey rot.

• **Local weather conditions** and soil type (the precise date of maturation varies from *cru to cru*).



- The distinct growth rates of each of **the three approved grape varieties** (*Chardonnay*, *Pinot noir* and *Meunier*). There can be up to a week's difference in development between each variety.

- Differences created by the work of the winegrower.

With so many variables to contend with, the **timing of the harvests** is particularly critical in Champagne. Traditionally, the grape's appearance was regarded as the best indication of ripeness.

Extract from Canon Godinot's treatise on viticulture, *Manière de cultiver la vigne et de faire le vin en Champagne* (1718).

"As the date of harvesting approaches, having grown and tended the vines throughout the year in the customary manner and made ready the new casks and set them aside for use, and having cleaned and greased the presses, the winegrower must spot the exact moment of ripening. Over-ripe grapes produce lacklustre wines, while those that are under-ripe produce hard, less approachable wines that take longer to develop."

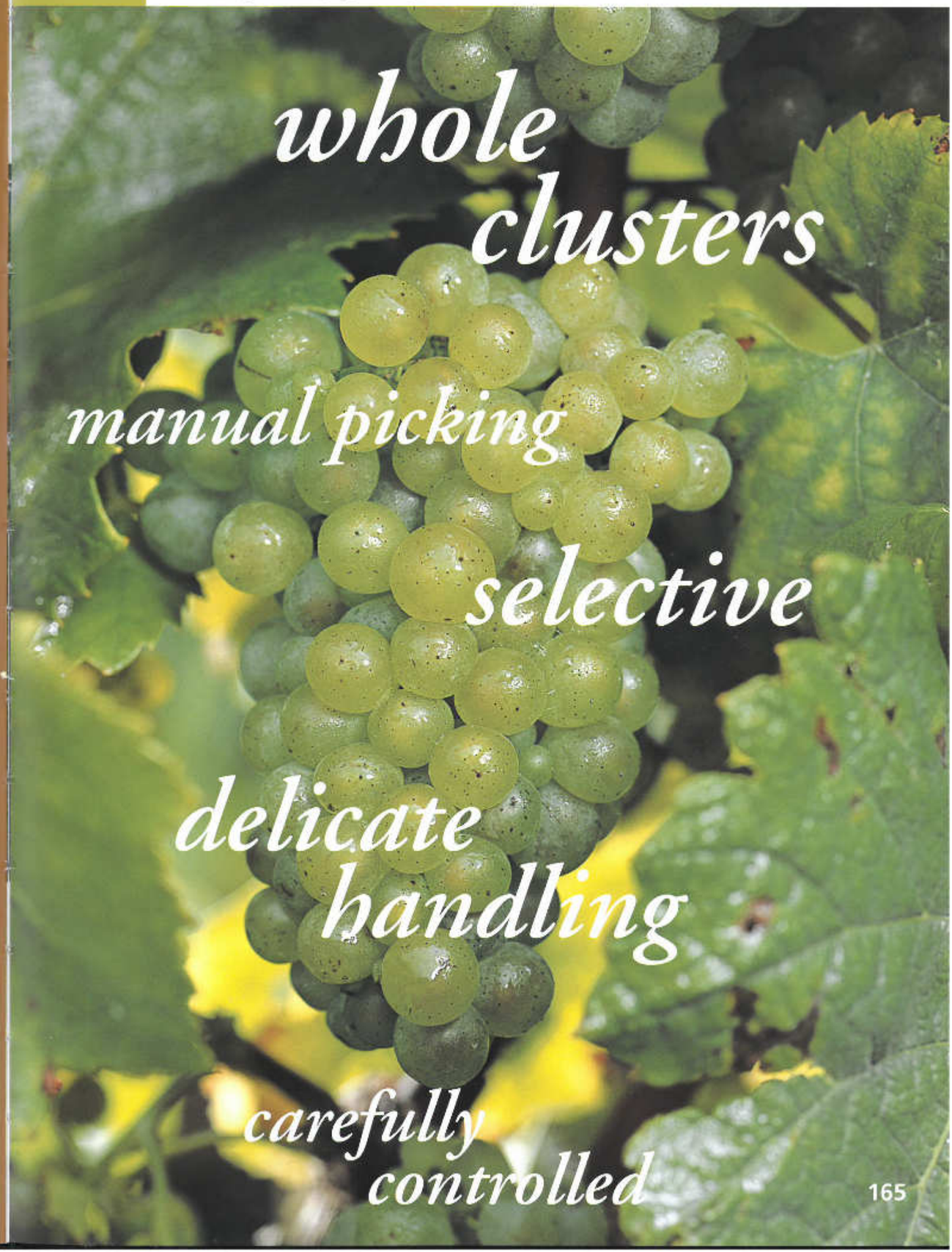
The early 20th century marked the start of new ways of assessing ripeness based on grape analysis and especially **data gathering.** Pioneered by a small group of winegrowers and Champagne Houses, in 1942 these new techniques became a focus of research at the *Station interprofessionnelle de recherches viticoles et œnologiques de Champagne* (Champagne centre for multidisciplinary studies into viticulture and œnology).

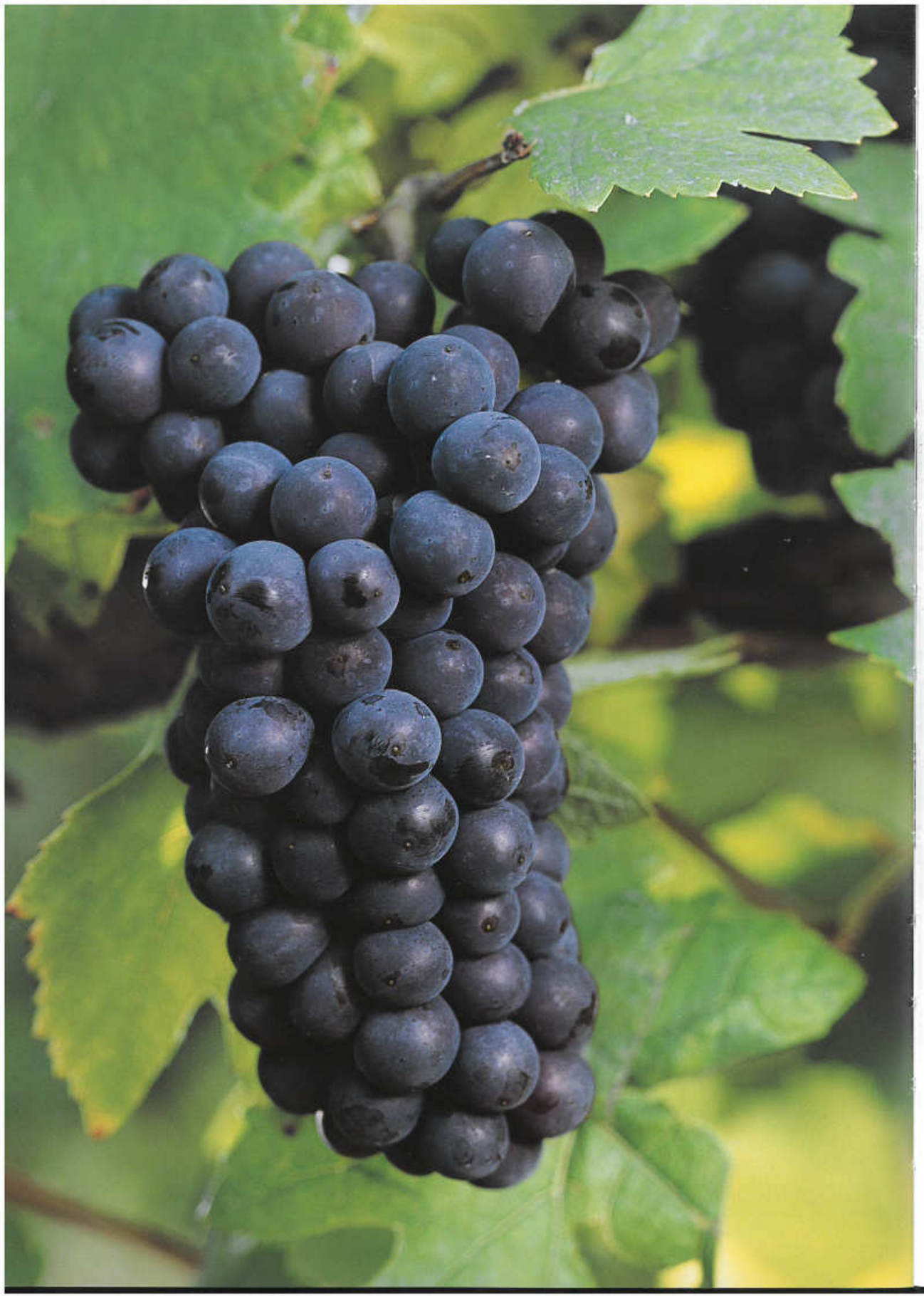
The year 1956 saw the launch of the ***Reseau Maturation*** (ripening observation network), a unique crop-monitoring system that allows the accurate timing of harvests by variety and by *cru*. Start dates vary each year and it is up to each individual vineyard owner to pick the grapes in the right sequence.

Ripening Observation Network

The network today covers more than 440 vineyard plots located in some 20 sub-regions throughout the Champagne production area. It is manned entirely by volunteer growers who test for ripeness according to standard sampling methods. Sampling begins some four weeks before the anticipated harvest date, just as the grapes start to change colour. Twice a week, growers select some 15-20 clusters from each of the network plots, checking the rate of colour change, weighing the clusters and recording sampling conditions. They then extract the juice using a small, specially designed press and test the musts for estimated sugar and total acidity content. This small press works on the same principles as those used at harvest time: a slow build-up of pressure, successive *"retrousses"* (bringing the edges of the press-cake back to the centre), extracting only the juice required for the *cuvée*. The growers' findings are analysed by the CIVC within 24 hours and serve to predict how the sugar/acidity ratio will evolve, taking into account foreseeable weather conditions.

The actual harvesting dates are decided by a two-stage process. First a pre-harvest meeting is held at which each of the communal representatives suggests a date for the start of picking in their respective *terroirs*. These dates are then submitted to the members of the *Association viticole champenoise* and the CIVC Technical Committee who in turn submit them to the INAO. The *ban officiel des vendanges* (literally, "harvest banns" or official declaration of the start of the harvest) specifies the picking dates for each grape variety and each *cru*.


whole clusters
manual picking
selective
delicate handling
carefully controlled



Contents

① Picking only whole clusters requires harvesting entirely by hand
② Harvesting operations
③ Strict quality control procedures

Every year, armies of pickers descend on the vineyards of Champagne to perform a task that is as demanding today as it ever was. Manual picking has always been the tradition in Champagne because only the human hand has the dexterity to select whole, undamaged clusters. Pickers are carefully trained and every stage is subject to the quality control procedures laid down by the rules of the Champagne appellation. For the next 2-3 weeks, pickers, porters and loaders will perform like dancers in some extraordinary ballet.

① Picking only whole clusters requires harvesting entirely by hand

Champagne is one of the few wine-growing regions that still harvests its grapes entirely by hand. According to the rules of the appellation, the clusters of grapes must be **whole** and **undamaged** when they reach the pressing house. Mechanical grape harvesters, while not against the rules as such, work by beating the grapes off the vine, breaking up the clusters in the process.

Manual picking **remains the only known method** of picking whole, undamaged clusters. Pickers select them one by one, holding each cluster gently by the shoulder or supporting it in the palm of their hand, then cutting it off as close as possible to the base of the shoot so as not to damage the berries.
Once removed, the cluster is placed carefully in the picking basket.
These precautions are essential to avoid crushing the clusters and to preserve the integrity of the berries.

Manual grape picking in Champagne, from the picking of the clusters to their transportation to the press house, is a model of **organisation and method** and a far cry from traditional images of harvesting.

Harvesting equipment

The grapes are transported to the press house in specially designed, perforated bins with a maximum capacity of 50 kilos. Limiting the capacity helps to prevent the clusters from being crushed in transport, while drainage holes on the sides and bottom of the bins allow any juice that is produced to escape. This is important to avoid the grapes from macerating in their own juices on their journey to the press house or while awaiting pressing.

Every activity, every piece of equipment and every vehicle must comply with stringent handling procedures aimed at **protecting** the quality of the yield.

Organisation

Every year, around **100,000 pickers** have **just two weeks, three at most,** to harvest some 32,000 hectares of vines before the grapes become over-ripe.

Harvesting involves a series of tasks, carried out by a team of pickers, porters and loaders who work together, supervised, coordinated and supported by a team leader.

Training is provided for all team members prior to picking. The team leader is responsible for clarifying the quality aims of the harvest and for explaining the principles of teamwork and the specific rules applicable at each stage.

② Harvesting operations

Pickers

Pickers cut the clusters off the vine, placing each one gently in a small picking basket, **taking care** not to bruise the berries in the process.

When full, these small picking baskets are emptied by the porters into the bins at the end of each row.

Pickers must **select** only ripe, healthy clusters, discarding the leaves and any clusters attacked by rot or containing unripe grapes stunted by late flowering.

Rules applying to grape pickers

Rule number 1: Never pull or squeeze the clusters

Rule number 2: Holding the cluster in the palm of your hand, cut it off as close as possible to the shoot, keeping the secateurs well clear of the grapes themselves.

Rule number 3: Place the cluster gently in the picking basket, laying the grapes down rather than simply dropping them in.

Rule number 4: Remove any leaves.

Rule number 5: Be careful not to overfill the basket, crushing the grapes or dropping them in the process.

Rule number 6: Call the porter as soon as the basket is full.

Porters

Throughout the day, the porters can be seen shuttling **to and fro between pickers and bins,** moving as smoothly as possible so as to avoid the risk of slipping and dropping the grapes.The going isn't always easy in these sloping vineyards, especially when it rains and the paths become muddy.

Loaders

Their job is to **load** the bins onto the trailers, checking that the contents are properly packed. They also count the number of loaded bins and replace them with empty ones. To reduce the risk of damaging the grapes in transit, transport time is kept to a minimum by locating the pressing centres **as close as possible** to the vineyards themselves.

"Cuider" or *"décuider"*

Cuider is a local winegrowing term meaning to do better than expected out of a harvest; *décuider* means the opposite.

Rules applying to porters:

Rule number 1: when emptying the picking basket, stand as close as possible to the bin, holding the basket just high enough to tip out the content, and spread the clusters gently and evenly over the bed of grapes in the bin. Never place the basket on top of the grapes and never overfill the bins.

Rule number 2: Check that the bins are stable in the wheelbarrow and move them one at a time on sloping ground.

Rule number 3: When stacking the bins prior to loading, spread the grapes evenly around the bin, checking that none of the clusters on the top spill over.

③ Strict quality control rules

The grape harvest in Champagne is governed by two of the appellation's strictest rules. One is the maximum **yield** per hectare, approved for appellation production every year by the INAO on the basis of CIVC recommendations. The second is the **minimum degree** of ripeness suggested by the findings of the ripening network.

The grapes are tested for ripeness on arrival at the pressing centre. A sample of juice is taken from each batch and analysed for sugar content using a special device known in French as a ***colibri.***

If ripeness is found to be lower than required, then the head of the pressing centre is informed and the grapes are refused.

Compliance with the maximum yield per hectare is regulated by the CIVC. Individual winegrowers and Champagne Houses are required to complete a **"Yield Declaration Form"** giving precise details of the volume of grapes harvested, the vines grown, the pressing centre used and so forth.

These data are later crosschecked by the CIVC with those recorded by the pressing centre in the *Carnet de pressoir* (press logbook).

The end of the harvest

Many of the 100,000 pickers are seasonal workers employed by individual growers and Champagne Houses who also provide them with board and lodging. Traditionally a time for conviviality, the harvest in Champagne ends in festive mood with a gala dinner called the *Fête du Cochelet.*

When there are no more vines left to pick, the last vehicle to leave the vineyard is decked with flowers and leaves by each of the growers and Champagne Houses. The meal that follows is washed down with Champagne and continues late into the night, toasting the bringing-in of another harvest before the time finally comes to disband.

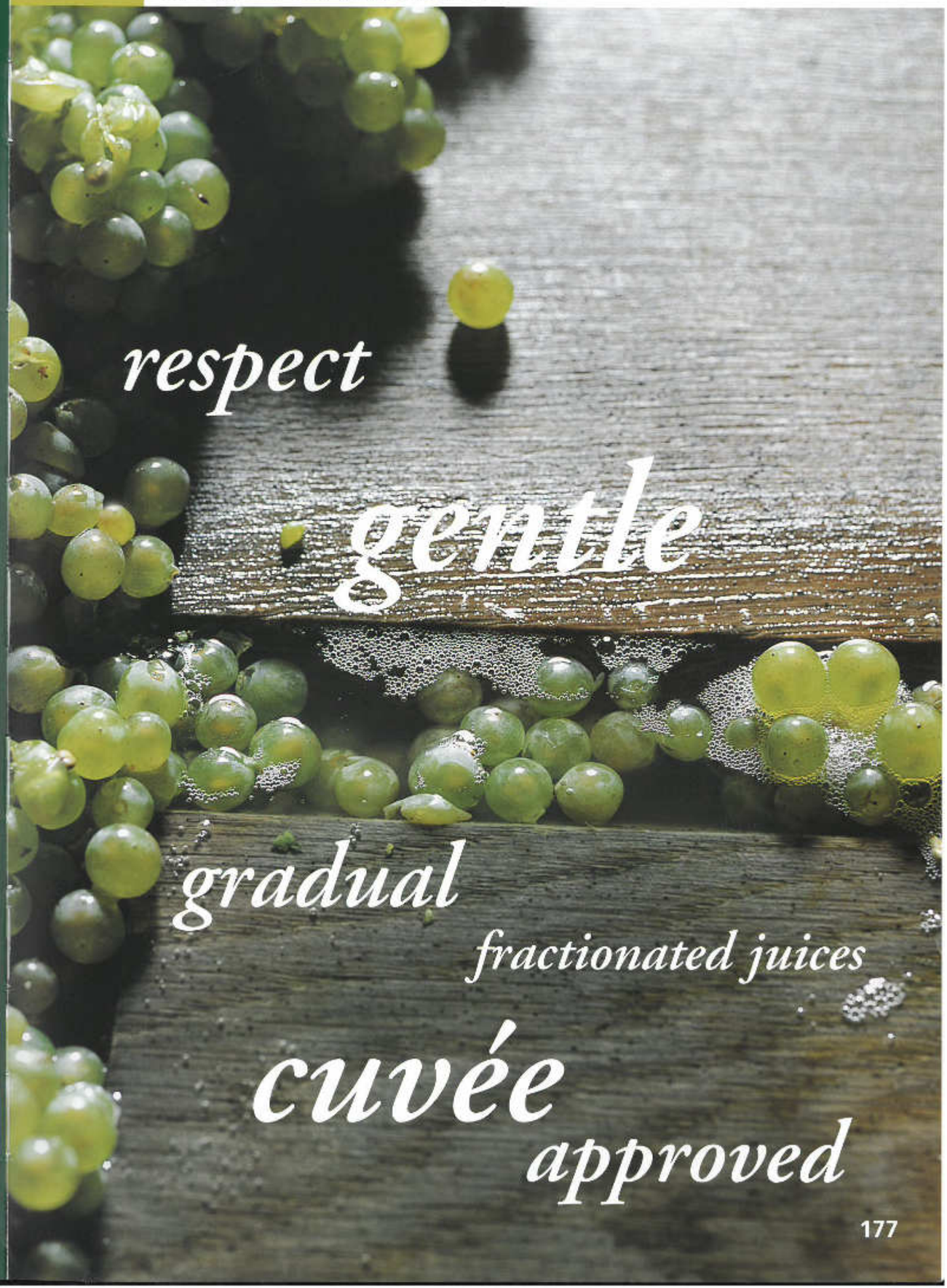
Harvesting in days gone by

The grape harvest in Champagne has always been very carefully organised.
In the early **18th century** for instance, pickers used to start work half an hour after sunrise and stop towards 9 am or 10 am when the sun got too hot.
Two centuries ago, workers were already divided into pickers, porters and loaders and worked in teams known locally as ***hordons.***
There were no bins in those days. Instead, the small picking baskets were emptied into larger baskets called ***paniers-mannequins,*** each holding 60-100 kilos of grapes.

Grape selection was already strict in those times, but it took place after rather than at the moment of picking. The grapes were spread on wicker trays *clayettes* located at the end of each row, then **inspected minutely** by women sorters who discarded any damaged fruit.

Mules, regarded as tougher and calmer than horses, were used to transport the grapes to the press house.

Then as now, harvesting was a time for **celebration** when seasonal workers from the Lorraine and the Argonne would join with the people of Champagne for a grand family gathering.


respect
gentle
gradual
fractionated juices
cuvée
approved

Contents

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2. Whole cluster pressing
3. Low juice extraction
4. Fractionated juices
5. A slow, gradual pressing technique
6. Champagne presses
7. A unique set of quality-control standards
8. Environmental protection

The art of Champagne pressing lies in a very particular method of extraction, regulated by a unique set of standards. At the centre of it all is the grape, which must be pressed slowly and gradually so as to fractionate the juices into the *cuvée* (the free-run juice) and the *taille* (the subsequent pressing). All pressing centres are approved by the appellation and environmental protection is a priority.

In practice, pressing is a complex process that brings into play all of the techniques developed and approved by the Champenois **over the centuries.** Put at its simplest, it is defined by five over-riding principles:

- Pressing immediately after picking
- Whole cluster pressing
- Low juice extraction
- Fractionated juices
- A gentle, gradual increase in pressure

The principle of Champagne pressing

To understand how the process works, put a grape in your mouth and press it gently between your tongue and palate. The juice released will be subtly fruity with a nice balance of acidity and sweetness. Contrast that with what happens when you start to chew the skin, or worse still the pips.

A multi-stage process:

8 am: start of picking
12 am: grape weighing
12.15 pm: loading of the presses
3.30 pm: completion of pressing
4.15 pm: emptying and cleaning of presses
6 am: final racking of the previous day's musts
7 am: the racked musts are transferred to the fermentation tanks

① Pressing immediately after picking

Until the end of the 17th century, pressing did not take place until one or two days after picking. The beginning of the following century brought new techniques based on pressing the grapes as soon as possible after the harvest so as to improve overall quality. These days, thanks to pressing capacity and efficient production systems, the grapes are pressed **immediately** after picking.

② Whole cluster pressing

The original objective of whole cluster pressing was to **avoid colouring** or staining the musts when pressing black-skinned grapes (the *Pinot noir* and *Meunier*). However, winemakers soon realised that the technique was equally valid when pressing the white-skinned *Chardonnay*, a grape that is identical in terms of berry structure and containing the same "undesirable" substances in the skins, stalks and pips.

The stalk

The stalk and its attachments support the berries.

Another advantage of whole cluster pressing is that the stalks help the juice to drain rapidly, preventing the press-cake from clogging too quickly and reducing the need for frequent stirrings.

③ Low juice extraction

Limited juice extraction is key to the Champagne quality policy and dates from the 16th century and the days of *vin gris* production. In the early 20th century, 4,000kg of grapes would yield 25-28 hectolitres of juice (or must) depending on the year. These days, juice extraction is strictly limited to 25.5 hectolitres per 4,000kg press-load of grapes (known as the *marc*), which is equivalent to 102 litres of must per 160kg of grapes.

This quality control procedure requires that each batch of grapes be accurately **weighed** to the nearest kilo before processing can commence.

Responsibilities of the *peseur* (weigher)

These are as follows: to record the weight and quality of each delivery of grapes, together with the place of origin (*cru* and vineyard parcel) and grower; to assemble the *marc* (press load) and issue it with an identification code recording details of composition; to order the loading of the presses. The yield may be recorded by vineyard parcel or by picking team.

Compulsory weighing, which is unique to the Champagne appellation, guarantees compliance with the rules of juice extraction and is essential for **traceability** purposes. The person in charge, known in French as the *peseur* (weigher), *écrivain* (writer) or *comptable* (book-keeper), records key data in the ***carnet de pressoir*** (pressing logbook) that is issued by the CIVC. These data are then correlated with the information entered immediately after picking on the Yield Declaration Form.

④ Fractionated juices

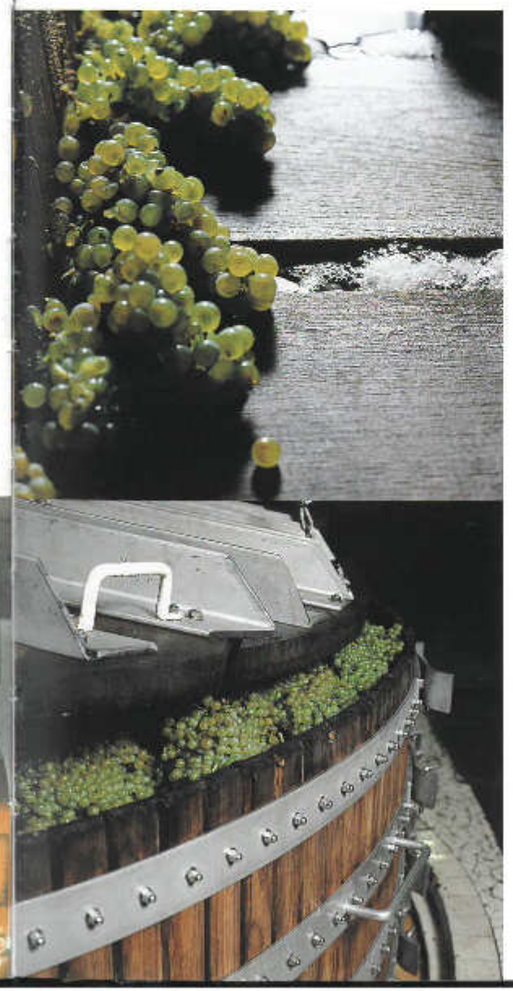
Another key principle of Champagne winemaking is fractionation: **separating** the clearer, purer juices drawn off at the beginning of pressing (the *cuvée* or first pressing juice) from those produced at the end (the *taille*), the latter containing more of the impurities found in the grape skins, and especially pigments.
Fractionated pressing brings out all the natural freshness in the grapes while avoiding any grassy or astringent tastes.

The theory behind it dates from the early 18th century and is described in the following extract from Canon Godinot's *Manière de cultiver la vigne et de faire le vin en Champagne (1718):*

Canon Godinot:

"When those great beams first bear down upon the pile of grapes, the wine released is known as the *Vin de goutte* (free-run wine). It is the finest, most exquisite expression of the grape, but the wine itself is too insubstantial and lacking in body. Called the *abaissement* (the lowering), this first pressing calls for considerable dexterity and speed, quickly lifting the beams up again, scooping up the grapes on all sides and piling them back into the middle, then re-loading the press without delay and pressing the grapes twice more. These second and third pressings are known as the *première* and *deuxième taille** and must take place well within the hour if you want your wine to be good and white. The grapes must not have time to grow warm nor should the juices be left to steep in the *marc*."

*translator's note: literally, first and second cut.



Pressing in 1908:

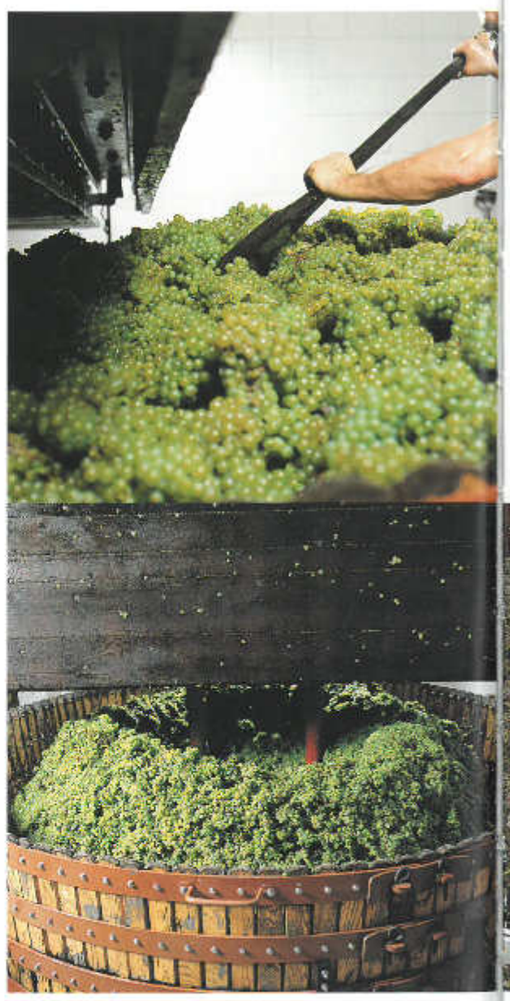
"Within moments of pressing, the grapes release large quantities of juice. As soon as the flow subsides, the pressure is released and the pressing-plate lifted. Using shovels, we then scoop up the grapes along a 25-30 cm border on the outer rim of the press cake, breaking up each shovelful as we go and tossing it back into the press so as to spread the contents evenly.

This operation is repeated three times until all of the free-run juice required to make the *cuvée* has flowed out into the *belons* (collection vats). We then rearrange the entire press cake, breaking it up with hooks and redistributing it evenly, before pressing it once again to obtain the *tailles*."
This chopping up of the cake is the origin of the word *taille* (cut) which comes from *taillage* (meaning to cut or chop).

These days, a 4,000kg marc is fractionated into the *cuvée* and *taille* as follows:

The *cuvée*

This is extracted by three successive **pressings *(serres)*, breaking-up** the press cake between each pressing (a process known in French as the ***retrousse***) to extract 20.5hl of juice.
The *cuvée* is the purest juice of the pulp, extracted from the intermediate berry zone containing the most fragile cells. Overall, this proportion of the pulp accounts for roughly half of the total weight of the press load. The *cuvée* is rich in sugar, tartaric and malic acid and aroma precursors.



The *taille*

Once all of the *cuvée* has been extracted, pressing is repeated two or three times more, breaking-up the press cake before each pressing.

Until 1992, the first and second *taille* consisted of 4.10hl and 2.05hl of must respectively.

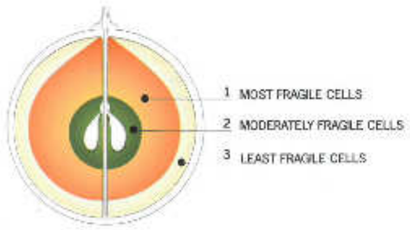
These days, in line with the continuous drive for quality improvement, extraction is limited to **102 litres per 160kg grapes** (instead of 150kg) and the total taille is restricted to 5hl (instead of 6.15hl)
The *taille* has much the same concentrations of sugar as the *cuvée* but is less rich in tartaric and malic acid. It also contains more potassium, oxidisers, minerals, pigments and astringent, grassy elements.
When the time comes to blend the finished wine, the *cuvée* and the *taille* will be used quite differently.
***Cuvée* musts** produce wines with great finesse, subtle aromas, a refreshing palate and good ageing potential.
The *taille* is distinguished by its intense but simpler aromas and its tendency to age rapidly.
The cellar master will use different proportions of *cuvée* and *taille* depending on the blend of wine he or she has in mind.

⑤ A gentle, gradual increase in pressure

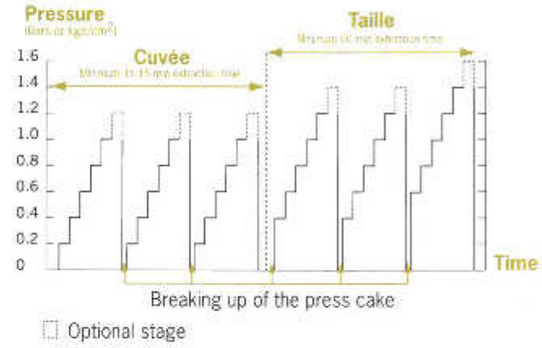
Fractionating the musts is a very delicate operation calling for precisely regulated presses.

Loading the presses is almost always done **by hand,** placing the whole clusters directly into the pressing drum. The berries themselves should be in perfect condition, unscathed by picking or shipping. **Loading should be quick** (no longer than 20 minutes) but as gentle as possible to avoid crushing the grapes already inside the drum.

Having filled the drum, the next step is to press the grapes. The principle behind Champagne pressing is to apply just enough pressure to rupture the intermediate juice zone of the berry. The ideal starting pressure is 50g/cm², (equivalent to squeezing a grape gently between your thumb and forefinger) **stepping up the pressure by degrees**, from 100g/cm² to 200g/cm² all the way to 1kg/cm² (see diagram below). These days, the rate of increase is computer controlled so as to improve juice extraction.



CRUSHABILITY OF BERRY CELLS



⑥ Champagne presses

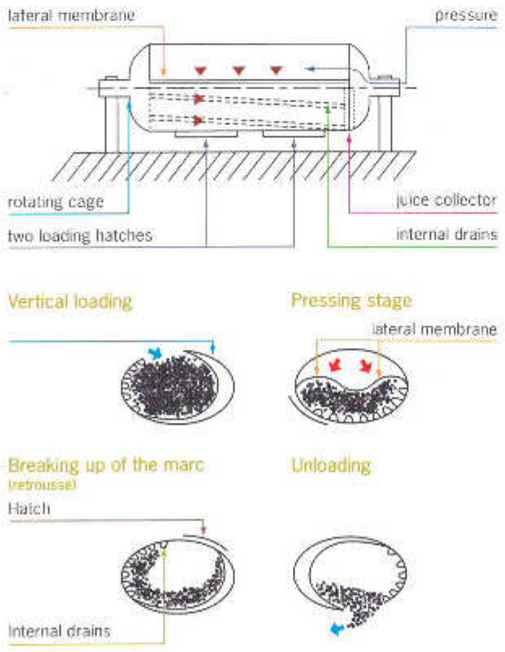
As in other areas, the history of the Champagne press goes back a long way.

At the end of the 18th century, those producers who were pressing black-skinned grapes changed to presses with a **broad pressing surface** and a shallow load, thus reducing the quantity of grapes in relation to pressing area and so minimising the degree to which the skins might colour the juice.

The rules of Champagne pressing were formulated from 1880 onwards. The ***maie*** – the bottom part of the press – was to have a capacity of 4,000kg of grapes, and the height of the cage was limited to one metre maximum, so as to limit the height from which the grapes were loaded. Now accounting for roughly 40% of the investment in plant, Champagne presses have improved considerably since the late 19th century but the basic operating principle remains exactly the same.

A variety of experimental designs led in 1975 to the introduction of the horizontal press with lateral membrane – a growing success now accounting for 29% of all Champagne presses.

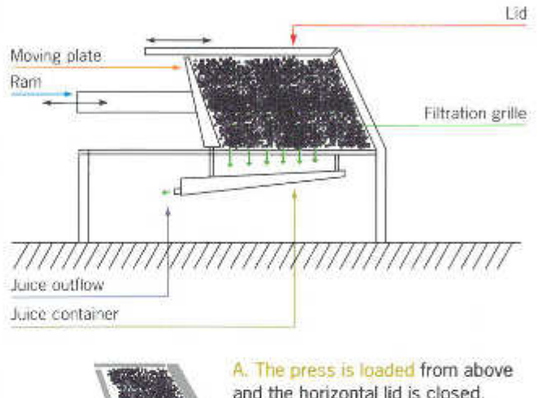
Horizontal press with lateral membrane – how it works



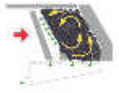
Pressure is applied by the inflation of an internal membrane that occupies half the circumference of the press. The pressure is supplied by compressed air. The cake is then broken up by deflating the membrane and rotating the tank. This system allows precise and consistent control, adapted to suit the characteristics of each harvest.

The latest innovation in pressing came in 1998 with the introduction of a press with a lateral pressing action and angled pressing plates.

Press with lateral pressing action and angled pressing plates – how it works



A. The press is loaded from above and the horizontal lid is closed.

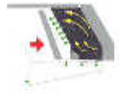


B. Pressing the grapes. The computer-controlled, moving plate slides forward. The juice flows out through the filtration grilles in the fixed pressing plate and the base of the press.

C. The moving plate withdraws and the marc breaks up automatically, crumbling gently under its own weight.

D. The marc is now spread out on the filtration grille.

E. The moving plate advances once more.



F. Pressing is repeated, producing a further flow of clear juice.

The grapes are loaded into a cage with a perforated filtering base made of stainless steel. At one end of the cage is an angled moving plate, driven by a hydraulic ram. Once the pressing action is complete, the plate withdraws leaving an evenly balanced mass of grapes that gently crumbles back into the press cage. This controlled redistribution of the press contents promotes the extraction of good quality juice.

Most traditional presses are **operated** by pressing supervisors who assess the rate of extraction by observing the quantity of juice flowing into the open tanks (called *belons* in Champagne). With a horizontal press, the increase in pressure is automatically regulated, as is the rate of break-up of the press cake.

Once the juice is extracted, the musts are **clarified,** mainly to eliminate any undesirable solid substances, such as particles of skin, stalk or pips, and any pectin compounds.

Clarification – or *débourbage* in French – is a **natural process** that works by precipitation: solid residues and particles in suspension simply sink to the bottom of the tank. These sediments are eliminated at the decanting stage.
Clarification takes 12-14 hours, at ambient temperature.

⑦ A unique set of quality-control standard

In 1980, the authorities in Champagne introduced **approval procedures for pressing centres,** which became part of AOC regulations in 1991.

The **Champagne region then became unique worldwide** as the only wine-growing area to codify its methods of pressing, sparing no effort or expense to ensure compliance across some 2,000 pressing centres, representing 3,000 presses.

Standards of hygiene

Pressing premises and equipment are subject to **strict hygiene procedures.** Bin washing is now compulsory.

Space-planning standards

These specify the space and equipment required to carry out each process in terms of:

- Workspace area
- Number and capacity of presses
- Number and volume of clarification tanks

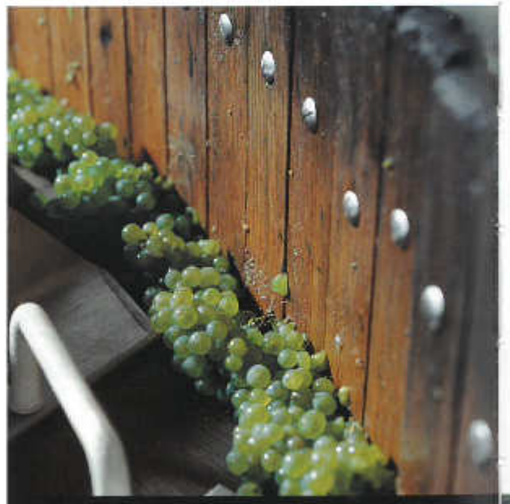
The ratios are precisely fixed on the basis of the quantity of grapes processed per day (the covered delivery bays for instance must be equipped to handle 50% more grapes than the average daily press load).

Equipment performance

Presses and fractionating equipment are also subject to INAO approval on the basis of performance records showing the quality of juice produced by the equipment, together with its time in operation and its maintenance history.

The CIVC is responsible for:

- The practical organisation of the equipment approval process and post-approval monitoring. The approval committees are made up of representatives from the various professions within the industry, together with officers of the INAO and CIVC.
- Testing prototype equipment and innovations that have a bearing on the approvals process (presses, fractionating mechanisms, automated operating procedures).
- Providing advice and technical assistance with equipment design.



⑧ Environmental protection

The final link in the harvest-to-pressing quality chain is the care taken to avoid any **risk of environmental pollution.** A particular risk is the water used for cleaning in the course of pressing. Known as "viticultural effluent", it contains solid particles and organic substances, essentially sugars, which not only smell bad and look unsightly but worse still, pose a threat to aquatic environments.

As part of their overall **environmental protection policy,** the authorities in Champagne, with the support of the Water Board, undertook an in-depth study aimed at preventing and where necessary, correcting waterborne pollution.

Their findings form the basis of the guidelines now put in place by the CIVC for all operators in Champagne, specifying methods for the proper management of water and other viticultural effluent.

This programme forms part of the region's much broader campaign for **environmentally friendly viticulture,** launched in Champagne in 2000.