CHAMPAGNE EDUCATION
PROGRAM

ICONS 2012
Sparkling wines and Champagne

The production of Champagne is very limited in the world of wines:

• Sparkling wines = 10% of the wines produced in the world
• Champagne = 10% of the sparkling wines production
• Champagne = 1% of the wines produced in the world
Why is champagne different from other sparkling wines?

- A very specific origin from the Champagne region in France
- A unique traditional process called “méthode champenoise”
- A blending or “assemblage” of a wide diversity of base wines of Chardonnay, Pinot Noir and Pinot Meunier, from the Champagne region
- A long maturation inside the bottles, in the cellars
THE CHAMPAGNE REGION
AND ITS VINEYARD

The Champagne region is very specific due to a unique combination of climate, soil, subsoil and relief that allow a perfect ripening of grapes and a perfect balance between fine aromas and freshness.
The Champagne region

- Geographical location: 150 kilometers at the north-east of Paris
- A small vineyard: 34,041 hectares of planted vines
- A fragmented vineyard:
  - 15,600 vinegrowers
  - 319 villages or « crus »:
    › 17 Grands Crus (the highest quality)
    › 44 Premiers Crus
    › 258 other Crus
The Champagne region
The Champagne region

17 “Grand crus”
44 “1er crus”

- Montagne de Reims
- Vallée de la Marne
- Côte des Blancs
- Côte de Sézanne
- Côte des Bar
- Bar / Aube
- Bar / Seine
- Château Thierry
- Reims
- Epernay
The Champagne region

GEOGRAPHY AND CLIMATE

- Planted at altitudes of 90-300m on south, east, and southeast facing slopes:
  - Good drainage
  - Optimum sunlight exposure

- A dual climate:
  - With continental influences:
    - Winter frost
    - Sunshine in summer (an average of 1700 hours of sunshine per year, up to 2100 hours or more in certain years like 1990, 2003...)
  - And oceanic influences:
    - Low temperatures: average annual temperature is only 10.8°C
    - Steady and moderate annual rainfall: 700 mm
The Champagne region

CLIMATE THREATS

- Winter frosts → Destroy vines
- Spring frosts → Destroy buds and leaves
- Cold and wet weather during blossom → Coulure (berry drop) and millerandage (stunted berries)
- Thunderstorms and hailstorms in summer → Affect shoots and leaves
The Champagne region

The most northerly wine growing region in France

10.8°C

1700 hours

700 mm/year (900 mm in Bordeaux)
The Champagne region

THE SOIL

● A soil and subsoil predominantly made of limestone (chalk, marl, limestone)

● A water and thermal regulator:
  › Natural water reservoir
  › Provides good drainage when raining and returns water even in driest summers
The Champagne region

CHAMPAGNE GRAPES

**Pinot Noir: 39% of the AOC champagne**
Black skin, white juice - Montagne de Reims and Aube region on cool limestone soils - Structure, character, vinosity, spiciness and aromas of red fruits

**Pinot Meunier: 33% of the AOC champagne**
Black skin, white juice - Marne Valley, Western Montagne de Reims and Ardre Valley on clayey or sandy soils - Suppleness, roundness, fleshiness and aromas of white flesh fruits

**Chardonnay: 28% of the AOC champagne**
Green to yellow skin, white juice - Côte des Blancs, Côte de Sézanne and East of Montagne de Reims on limestone soils - Freshness, finesse, elegance and aromas of citrus fruits, white blossom
The Champagne region

THE GRAPE VARIETIES

- Montagne de Reims
- Côte de Sézanne
- Côte des Blancs
- Château Thierry
- Reims
- Epernay
- Bar / Aube
- Bar / Seine

Map showing the distribution of grape varieties:
- Pinot Noir
- Pinot Meunier
- Chardonnay
PLANTING

- Grafted vines since the phylloxera epidemic (late 19th century-early 20th century): French varietals grafted on American rootstocks

- High density planting of 10,000 plants per hectare that optimizes fruit quality:
  - 1 $m^2 = 1$ vine = 1 bottle
  - 1.2 kg of grapes per bottle
The most fundamental step in the vineyard that:

› Gives its shape to the vine
› Regulates the vine development

• Purely manual: around 180 hours of work per hectare

• Takes place from November to March
The vineyard

PRUNING

- 4 approved pruning methods:
  
  Chablis pruning
  
  Guyot pruning
  
  Cordon pruning
  
  Vallée de la Marne pruning
  (authorized only for Pinot Meunier)
SUMMER MAINTENANCE

- From April to August: a series of tasks to limit yields and maximize fruit quality:

  - **Desuckering**: manual removal of non fruital shoots to focus on fruit bearing shoots.
  
  - **Lifting**: manual or mechanical lift and attach of shoots to the support wires.
  
  - **Trellising**: manual separation and stapling of shoots to the wires, essential because of high density planting.
  
  - **Pinching back**: manual or mechanical cutting of shoots.
The main diseases or pests in Champagne:
- Fungi: oïdium, powdery mildew, botrytis
- Insects: grape berry moth

Each spraying decided according to:
- Observations and countings of symptoms in the vineyard.
- Risks and thresholds of harmfulness established for each pest.
- The effects on the safety for the sprayer, the consumer and the environment.
A ripening observation network managed by the CIVC:

- 450 control plots spread throughout Champagne area
- 2 samples a week from mid August:
  - when the grapes start to change colour (véraison),
  - until the beginning of harvest.
The vineyard

HARVESTING

● Role of the CIVC:

Sets picking dates by variety and by cru according to the maturity controls.

Determines quantity of grapes approved for AOC production.

Manages the reserve stock (réserve individuelle) that can be set aside in certain years by the vinegrowers.
Harvesting is entirely manual:
- During around 2 weeks.
- 100 000 pickers, porters, loaders and press operators work for harvesting in Champagne.
THE WINE MAKING PROCESS
The wine making process

General process of winemaking from grape pressing to alcoholic and malolactic fermentations.
Grapes are weighed and recorded when arriving at the pressing center: separation by grape variety and cru
The pressing

Vertical basket presses:
standard until late 1980s and still account for 28% of the presses.

Horizontal presses:
with lateral membrane and computer control.
The pressing

5 BASIC PRINCIPLES

1) Pressing grapes immediately after picking

2) Whole cluster pressing

3) Gentle, gradual increase in pressure

4) Low juice extraction

5) Fractionation of the juices: “cuvée” and “tails”
The pressing

Extraction limited to 25.5 hectoliters per 4 000 kilos of grapes (a “marc”):

> First pressing juice = the “cuvée” = 20.5 hl: the purest juice of the pulpe, rich in sugar and acids.

> Second juice = the “taille” = 5 hl: lower in acid and sugar content, higher in mineral content and coloring agents.
SETTLING OF THE MUST

- Takes place in open tanks called belons
- Settling of the juice during 12 to 24 hours, prior to fermentation
- Addition of sulfites to protect the juice:
  > Antiseptic action to inhibit the growth of indigenous bacteria and yeasts
  > Antioxidation action against air oxygen and enzyme from the juice
  > 3 to 9 g/hl depending on the varietal, the sanitary conditions of the grapes and the fraction ("cuvée" or "taille")
THE WINERY
The winery

FIRST ALCOHOLIC FERMENTATION

- Takes place in stainless steel vats with temperature control
- Some producers still ferment their wine in oak barrels or concrete tanks
- Addition of selected yeasts to the must:
  - Yeasts consume the sugar and release alcohol, carbon dioxide and heat,
  - And release aromatic molecules (superior alcohols and esters).
- Addition of sugar to the must, the “chaptalisation” to reach 11% of alcohol at the end of the alcoholic fermentation (grapes naturally contains sugar to reach 9 to 11% of potential alcohol)
MALOLACTIC FERMENTATION AND CLARIFICATION

- Lasts from 5 to 10 days
- Controlled temperature at 18 to 20°C max
- Some producers avoid malolactic fermentation, some do it partially only for some of their wines
- Inoculation of the wine with bacteria:
  > Lactic bacterias break down malic acid (apple acid) into lactic acid (milk acid).
  > That fermentation lowers the acidity of the wine,
  > And produces new aromatic molecules.
The base wines produced can be classified by varietal, crus, and pressing fraction, depending on the Maison philosophy.
“Assemblage” is the art of blending wines from different varietals, origins and years.

“Assemblage” determines the type of wine to create:

- A non-vintage wine, using wine of the year blended with reserve wines => the consistent style of the house, recreated year after year.

- A vintage wine, using wines from only one particular year.

- A rosé, blending red still wine with white base wines (blending method) or doing a short maceration (saignée method).
BLENDING OR “ASSEMBLAGE”

A “blanc de blancs” made only from Chardonnay grapes.

A “blanc de noirs” made only from Pinot Noir and/or Pinot Meunier grapes.

A single-vineyard champagne made only from one single plot of vineyard.
BOTTLING AND SECOND FERMENTATION
Bottling and second fermentation

Second fermentation or “prise de mousse” generating the bubbles inside the bottle:

1/ Addition of “liqueur de tirage” to the blend: a mixture of wine, sugar, yeasts and additives (bentonite or bentonite-alginate) that assist the riddling process.

2/ Sealing of the bottles with the “bidule”, a polyethylene stopper, held in place by a crown cap.

3/ Transfer of the bottles to the cellars where they are laid horizontally “sur lattes”.

- The 2nd fermentation can last up to 8 weeks (very slow due to low temperature): the yeasts consume the sugar and release carbon dioxide gas that is trapped in the bottle, dissolves in the wine, and creates the sparkle.

- Alcohol content increases of 1% to 1.5% (from 11 to 12.5%).
Bottling and second fermentation

- Takes place in the cellars, protected from sunlight, at a constant and fresh temperature

- The rules of the Champagne appellation control the duration of the maturation:
  > 15 months from the date of bottling for a non-vintage, including 12 months minimum of maturation on the lees.
  > 3 years minimum for a vintage “cuvée”.

- Lees consist of dead yeasts that deposit on the side of the bottle
THE RIDDLING
The Riddling

- A natural clarification process to collect the deposit left by the 2nd fermentation in the neck of the bottle.

- The bottles are tilted neck-down and rotated by small increments, clockwise and anti-clockwise: the gravity drives the sediment into the neck of the bottle.
Automated riddling is now very common with the “gyropalette”:

- Computer controlled palettes
- 504 bottles riddled in one single operation

Lasts from 3 days to 1 week depending on the “cuvée”
(about 3 weeks manually)
DOSAGE & DISGORGE MENT
The disgorgement

- The disgorging is the ejection of the sediments collected in the neck of the bottle during the riddling.

- The neck of the bottles are plunged into a refrigerating solution at around -28°C to freeze the sediments.

Jéroboam and some special “cuvées” are still riddled and disgorged by hand, “à la volée”.
The dosage

The dosage is the addition of a small volume of “liqueur de dosage” or “liqueur d’expédition” to the wine:

> A mixture of sugar and wine

> Different types of liqueur, depending on the style of champagne the winemaker is elaborating

> The aim is to soften the champagne and compensate the loss of wine after disgorging
The dosage

Type of the champagne according to the dosage

<table>
<thead>
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<th>Type</th>
<th>Grammes of sugar/liter</th>
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<tbody>
<tr>
<td>Brut nature</td>
<td>3</td>
</tr>
<tr>
<td>Extra Brut</td>
<td>6</td>
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<td>Demi Sec</td>
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<td>Doux</td>
<td>50</td>
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</table>

grammes of sugar/liter
CORKING AND LABELLING
Corking and labelling

Takes place immediately after dosage

The cork is made of:
> A base section made of reconstituted cork granules.
> Topped by two slices of natural cork: the one in contact with the wine is known as the “mirroir” of the cork.
> Displays the name of the Champagne appellation, the vintage when relevant, and often the name of the Maison.

- The cork is squeezed into the neck of the bottle, covered with a protective metal cap, and held in place with a wire muzzle.

- The cork allows some exchanges with the outside air: the wine continues to age over the years after disgorging and corking.
Information you will find on the label:

> The word “Champagne” to guarantee the origin.
> Type of wine as defined by residual sugar content: extra-brut, brut, demi-sec…
> When appropriate, the vintage year and specific details relating to the type of “cuvée” (Blanc de blancs, Rosé, Blanc de noirs…).
> Percentage of alcohol by volume (% vol).
> Bottle capacity (liter, cl or ml).
> Name of the producer or company name, followed by the name of the commune where that producer is registered and the country of origin (France).
> Registration and code number issued by the CIVC, preceded by two initials that indicate the category of producer: NM, RM, CM…
> Allergen content (sulphur dioxide, sulphites…).
THANK YOU!

If you need more information, please contact ICONS leader project