Viticulture in Switzerland and in the canton of Vaud

Olivier Viret

8 September 2017
Lavaux (VD)
UNESCO World heritage
Wine market in Switzerland
Market part

- 35% Suisse
- 24% Italie
- 15% France
- 6% Autres Europe
- 10% Espagne
- 10% Nouveau Monde
Switzerland

Area: 41’000 km² (16.3x < France)
Altitude: 195 m - 4634 m

- Forest: ~30%
- Unproductive: ~25%
  mountains, glacier…
- Agriculture: ~24%
- Viticulture: 0.3%
- Grassland: ~13%
- Cities, infrastructures: ~7%
Viticulture in Switzerland
15’000 ha, turnover approx. 1-1.5 milliards SFrs
143’000 ha cereals: approx. 480 mio. SFrs (2014: 9.6 millions q à 50.-)

15’000 ha
=150’000’000 m²
1kg raisin /m²
=1 bouteille /m²
à 10.- la bouteille
= 1.5 milliard

2014: 933’649 hl
= 124 millions btl.
à 10.-

Source: l’année viticole 2016, rapport OFAG
Production structures

33’000 grape growers

~27’000 part time growers (12’500 in Valais)

Valais: 4’976 ha (2012), 33.2% of the vine growing area:
• mean plot size: 440 m²
• mean size run by a grower: 0.38 ha
• only 3.8% of the winegrowers own more than 1 ha
Viticulture in Switzerland

Organic production
< 3 % area

Integrated production
>85 % area
**Viticulture of diversity**

15’000 ha: 90 varieties (>1ha), totally >200 varieties

<table>
<thead>
<tr>
<th>Variety</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chasselas</td>
<td>3995 ha</td>
</tr>
<tr>
<td>Müller-Thurgau</td>
<td>481 ha</td>
</tr>
<tr>
<td>Sylvaner (Johannisberg)</td>
<td></td>
</tr>
<tr>
<td>Chardonnay</td>
<td></td>
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<tr>
<td>Marsanne (Ermitage)</td>
<td></td>
</tr>
<tr>
<td>Pinot gris</td>
<td></td>
</tr>
<tr>
<td>Pinot blanc</td>
<td></td>
</tr>
<tr>
<td>Sauvignon blanc</td>
<td></td>
</tr>
<tr>
<td>Savagnin blanc (=Païen or Heida)</td>
<td></td>
</tr>
<tr>
<td>Rèze</td>
<td></td>
</tr>
<tr>
<td>Humagne blanc</td>
<td></td>
</tr>
<tr>
<td>Petite Arvine</td>
<td></td>
</tr>
<tr>
<td>Amigne</td>
<td></td>
</tr>
<tr>
<td>Charmont</td>
<td></td>
</tr>
<tr>
<td>Doral</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Pinot noir</td>
<td>4330 ha</td>
</tr>
<tr>
<td>Gamay</td>
<td>1470 ha</td>
</tr>
<tr>
<td>Merlot</td>
<td>1068 ha</td>
</tr>
<tr>
<td>Cabernet franc</td>
<td></td>
</tr>
<tr>
<td>Cabernet Sauvignon</td>
<td></td>
</tr>
<tr>
<td>Syrah</td>
<td></td>
</tr>
<tr>
<td>Bondola</td>
<td></td>
</tr>
<tr>
<td>Humagne rouge</td>
<td></td>
</tr>
<tr>
<td>Cornalin</td>
<td></td>
</tr>
<tr>
<td>Gamaret</td>
<td>404 ha</td>
</tr>
<tr>
<td>Garanoir</td>
<td>215 ha</td>
</tr>
<tr>
<td>Diolinoir</td>
<td>116 ha</td>
</tr>
<tr>
<td>Carminoir (Pinot noir x Cab. Sauv.)</td>
<td></td>
</tr>
<tr>
<td>Galotta (Ancellotta x Gamay)</td>
<td></td>
</tr>
<tr>
<td>Mara</td>
<td></td>
</tr>
<tr>
<td>Divico (Gamaret x Bronner)</td>
<td></td>
</tr>
<tr>
<td>Merello</td>
<td></td>
</tr>
<tr>
<td>Cabernello</td>
<td></td>
</tr>
<tr>
<td>Cornarello</td>
<td></td>
</tr>
<tr>
<td>Nerolo</td>
<td></td>
</tr>
<tr>
<td>Nerolo</td>
<td></td>
</tr>
<tr>
<td>Gamarello</td>
<td></td>
</tr>
</tbody>
</table>
Viticulture of diversity

- <1 ha: 200 varieties
- >1 ha: >90 varieties
- >10 ha: 48 varieties
- >100 ha: 17 varieties
- >500 ha: 4 varieties (Pinot noir, Chasselas, Gamay, Merlot)
Main varieties

- White: 49%
- Red: 51%

Source: l’année viticole 2016, rapport OFAG
Main red varieties

- Pinot Noir/Blauburgunder 49%
- Gamay 15%
- Merlot 13%
- Andere 23%
- Cornalin/Landroter 2%
- Humagne Rouge 2%
- Syrah 2%
- Garanoir 3%
- Gamaret 5%
- Diolinoir 1%
- Cabernet Franc 1%
- Cabernet Sauvignon 1%
- übrige / autres 6%

Source: l’année viticole 2016, rapport OFAG
Main white varieties

- Chasselas/Gutedel: 62%
- Müller-Thurgau: 8%
- Chardonnay: 6%
- Sylvaner/Rhin: 4%
- Andere: 20%

Source: l’année viticole 2016, rapport OFAG
White local cultivars

80 other white cultivars, among them >10 unique local cultivars

Source: l’année viticole 2016, rapport OFAG
Red local cultivars

120 other red cultivars, among them >10 local unique cultivars

Source: l’année viticole 2016, rapport OFAG
Chance for new varieties?

<table>
<thead>
<tr>
<th>Variety</th>
<th>Pinot noir</th>
<th>Gamay</th>
<th>Merlot</th>
<th>Varieties Agroscope (N=7+5)</th>
<th>Varieties V. Blattner (N=37)</th>
<th>Spécialités VS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinot Noir</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gamay</td>
<td>50.4%</td>
<td>17.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlot</td>
<td>50.4%</td>
<td></td>
<td>12.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gamaret</td>
<td>50.4%</td>
<td></td>
<td>12.4%</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Syrah</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humagne Rouge</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cornalin</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diolinoir</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabernet Sauvignon</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabernet Franc</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regent</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galotta</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carminoir</td>
<td>50.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mara</td>
<td>50.4%</td>
<td></td>
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</tr>
</tbody>
</table>

Department of Economy, Innovation and Sport
Agriculture and Viticulture Service
Viticulture in the french part and in the canton of Vaud

**French part** 11’019 ha

**Trois lacs** 944 ha

**GE** 1’408 ha

**VD** 3’774 ha

**VS** 4’874 ha
Viticulture in the canton of Vaud

- 6 AOC areas
  - La Côte (2000.9 ha)
  - Lavaux (735.8 ha)
  - Chablais (583.8 ha)
  - Côte de l’Orbe (173.4 ha)
  - Bonvillard (188.5 ha)
  - Vully (51.2 ha)

- 2 appellations Grands crus
  - Dézaley (53.8 ha)
  - Calamin (16.3 ha)
Evolution of the viticulture area in Switzerland

- 1880: 32’000 ha
- 1920: 18’700 ha
- 1969: 12’000 ha
- 1980: 13’500 ha
- 2016: 14’780 ha
Main varieties grown in 1955 in the canton of Vaud

2016, large diversity of cultivars

66 varieties for AOC wines

- 37 white
- 29 red
Varieties (>1% of the growing area)

- Chasselas: 60.13%
- Pinot noir: 12.91%
- Gamay: 9.9%
- Gamaret: 3.14%
- Garanoir: 3.85%
- Merlot: 1.3%
- Other: 7.71%

>50 varieties
Grape growers and production Structures – canton of Vaud

1838: 5’568 cellars (5’542 ha)
(Frossard, 1839, Notice sur les productions des vignes du canton de Vaud de 1818 à 1838. Autographié par Spengler et Cie, Lausanne, pp 16.)

2016
> 13’000 plots
> 2’400 grape growers

Cellars and winemaking companies:

• 1 international holding
• 7 cooperatives (15’000 - 3.6 mio L)
• >400 “family” cellars
Wine production 2016

Répartition de la production 2016 (%)

Production totale: 30.4 mio L

- AOC: 64.1%
- AOC grands crus: 27.9%
- AOC Premiers grands crus: 0.7%
- Jus raisin, vin industriel: 3.8%
- Vin de table: 0.1%
- Vin de pays: 3.3%
Challenges and chances for viticulture in Switzerland

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8 September 2017
Challenges and chances for viticulture in Switzerland

- Alpine conditions, cool climate, complex production structures, high disease pressure…
- Open market (since 1996) – competiveness
- Very high production costs
- High ecological pressure (politics, consumers, society)
- Climate change…

We have to do what others not do
# Competition and production costs

<table>
<thead>
<tr>
<th>Growing system</th>
<th>hours/ ha</th>
<th>Frs / ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>«Gobelet» not mechanised</td>
<td>1180</td>
<td>&gt;50’000.-</td>
</tr>
<tr>
<td>High plant density poorly mechanised</td>
<td>840</td>
<td>&gt;40’000.-</td>
</tr>
<tr>
<td>Terraces poorly mechanised</td>
<td>690</td>
<td>37’000</td>
</tr>
<tr>
<td>Terraces, tractor</td>
<td>639</td>
<td>34’000</td>
</tr>
<tr>
<td>Guyot-pruned, max. mechanised</td>
<td>434</td>
<td>30’000</td>
</tr>
<tr>
<td>California, Australia, Chili, Argentina, South Africa...</td>
<td>100-200</td>
<td>5000 - 10’000</td>
</tr>
</tbody>
</table>

*Source: Frais de production en viticulture, résultats technico-économiques 2010, Agridea*
Competition and production costs

Source: www.diapo.ch (R. Colombo)
Competition and production costs
Biodiversity of traditional cultivars

Clonal diversity of traditional varieties
- Conservation
- Prospection for 13 main varieties in old vineyards
- Agronomical and enological characterization
- Homologation and diffusion of certified planting material

Varieties in collection (20 clones per variety):
Chasselas          Arvine
Pinot noir         Amigne
Gamay              Païen (Savagnin blanc)
Pinot gris (Malvoisie)  Räuschling
…                  Cornalin
                     Humagne rouge…
Conservation of grapevine’s biodiversity and clone selection

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Number of surveyed plots</th>
<th>Nr. plants (clone) tested</th>
<th>Clones in selection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ELISA</td>
<td>number</td>
</tr>
<tr>
<td>Arvine</td>
<td>7 +1 pergola</td>
<td>161</td>
<td>109</td>
</tr>
<tr>
<td>Humagne rouge</td>
<td>8</td>
<td>187</td>
<td>110</td>
</tr>
<tr>
<td>Cornalin</td>
<td>9 + 69 pergole</td>
<td>231</td>
<td>104</td>
</tr>
<tr>
<td>Pinot gris (Malvoisie)</td>
<td>14</td>
<td>214</td>
<td>176</td>
</tr>
<tr>
<td>Pinot noir</td>
<td>19</td>
<td>350</td>
<td>251</td>
</tr>
<tr>
<td>Amigne</td>
<td>13</td>
<td>153</td>
<td>91</td>
</tr>
<tr>
<td>Humagne blanc</td>
<td>15 + 3 pergole</td>
<td>217</td>
<td>93</td>
</tr>
<tr>
<td>Savagnin blanc (Païen)</td>
<td>16</td>
<td>196</td>
<td>28</td>
</tr>
<tr>
<td>Marsanne</td>
<td>14</td>
<td>176</td>
<td>60</td>
</tr>
<tr>
<td>Roussanne</td>
<td>3</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>Rèze</td>
<td>5 +12 pergole</td>
<td>60</td>
<td>1</td>
</tr>
<tr>
<td>Sylvaner</td>
<td>20</td>
<td>153</td>
<td>64</td>
</tr>
<tr>
<td>Muscat blanc</td>
<td>20</td>
<td>130</td>
<td>41</td>
</tr>
<tr>
<td>Muscat du Pays</td>
<td>16</td>
<td>66</td>
<td>37</td>
</tr>
<tr>
<td>Gamay</td>
<td>30</td>
<td>212</td>
<td>170</td>
</tr>
<tr>
<td>Chasselas</td>
<td>25</td>
<td>350</td>
<td>283</td>
</tr>
<tr>
<td>Gewürztraminer</td>
<td>1</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Durize</td>
<td>3</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Syrah</td>
<td>1</td>
<td>27</td>
<td>14</td>
</tr>
<tr>
<td>Sum</td>
<td>237+85 pergole</td>
<td>2980</td>
<td>1659</td>
</tr>
</tbody>
</table>
Biodiversity of the cultivar Chasselas

Shape of the leaves

Color of the branches

Reymondin, 1798

Blanchet, 1852

Burnat et Anken, 1911
Biodiversity of cultivar Chasselas

Size of the bunches

Color of the bunches
Biodiversity of cultivar Chasselas

Size and form of the berries

«Fendant»
Consistence of the pulp
«Giclet»
Biodiversity of cultivar Chasselas

• Since 1923: maintain of the biodiversity of the cultivar Chasselas: conservatory of 283 clones at Agroscope-Pully (VD), representing all biotypes of the cultivar

• Worldwide the largest clone collection of Chasselas

• Selection of interesting clones (fendant, giclet, bois rouge…) adapted to the current production (limited yield) and climatic conditions (sugar-acidity balance), diffused through for the Swiss certification process
Plant protection: reduced inputs for a sustainable grape production

A. IPM (integrated pest management)

B. Disease forecasting

C. Crop adapted spraying

D. Resistant cultivars
IPM (integrated pest management)

✓ since 1970 at Agroscope

✓ 1993: national IPM organization (Vitiswiss) with the label “Vinatura” (www.vinatura.ch)

✓ since 1993: **financial support for the growers** “requested ecological contributions” (PER)

✓ **high level of exigencies for the growers** in accordance with IOBC regulations

✓ **Technical commission upgrades** regulation depending on experimental field-data and scientific knowledge

✓ Since 2003, Vitiswiss is certified

✓ 2015: **IPM >85% of the viticulture area of Switzerland**
**Contribution of IPM**

- **Control of mites**
  
  *Result: no more acaricide against mites*

- **Sexual confusion against grape berry moths**
  
  *Result: > 80% without any insecticides*
Control of fungal diseases

Objectives: ecological, economical sustainable production

- reduced use of inputs and perfect agricultural products

France: reduction of 50% the use of phytosanitary products

CH: national plan of action 2016

Worldwide: >95% *Vitis vinifera* highly sensitive to fungal diseases

1. Precise use of phytosanitary products
   - disease forecasting
   - precise dosage adapted to leaf canopy
   - adapted choice of active ingredients
   - calibration of spraying device

2. Organic, biodynamic production

3. Elicitors antagonists

4. Breeding resistant cultivars

www.agrometeo.ch

cv. Chasselas

cv. Solaris

Department of Economy, Innovation and Sport
Agriculture and Viticulture Service
An internet platform for crop protection:

- 157 weather stations on the territory
- Online weather data
- Free, 3 lingual access
- I-phone access
- 5 days forecasting (weather, downy, powdery mildew…)
- Crop adapted spraying
- Calibration of sprayers
- Maturation of grapes (actual and historical data)
- Phenology of vine (actual and historical data)
- Index of phytosanitary products
- Etc…
Impact of Agroscope’s approaches for a reduced use of pesticides

<table>
<thead>
<tr>
<th>STRATEGIES</th>
<th>IMPACT</th>
<th>NUMBER OF SPRAYS (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Integrated production</td>
<td>10 - 30% insecticides</td>
<td>- 2 à 4</td>
</tr>
<tr>
<td>B. Agrometeo, disease forecasting *</td>
<td>10 - 30% fungicides</td>
<td>- 1 à 4</td>
</tr>
<tr>
<td>C. Leaf area adapted dosages *</td>
<td>20 - 30%</td>
<td>0 (dose reduction)</td>
</tr>
<tr>
<td>D. Breeding multi-resistant varieties</td>
<td>75 – 100 %</td>
<td>- 8 à 12</td>
</tr>
</tbody>
</table>

*average values of >10 years field experiments at Agroscope under different climatic conditions
Thank you for your attention