SECTOR STUDY ON COVERED HORTICULTURE IN FRANCE

May 2021

Commissioned by
The Agricultural Counsellor at the Embassy of the Netherlands in France on behalf of The Netherlands Enterprise Agency

Foreword

Commissioned by the Agricultural Counsellor at the Embassy of the Netherlands in France, on behalf of the Netherlands Enterprise Agency (RVO), this market analysis was executed to inform the Dutch horticulture business community about available facts and figures related to covered horticulture in France. RVO supports Dutch companies from this business community in a range of activities, such as the organization of international trade missions, matchmaking, market reports, and the production of promotional materials about the Dutch horticulture sector.

This report intends to give insight in the covered horticulture sector and possible short- and medium-term opportunities in France. It aims to support international cooperation and trade across the Dutch horticulture value chain. It also provides input for the development of a public-private growth strategy and trade promotion.

The information in this report was collected by the French consultancy bureau AND International from public sources (reports and websites) supplemented with interviews with French sector specialists. The specific research questions and scope have been determined in close collaboration with Netherlands based stakeholders RVO, Greenhouse Technology Center AVAG, Groenten Fuit Huis and West-Hollands horticulture cluster, and the Agrifood Team of the Embassy of the Netherlands in France.

We express special thanks to the members of the reading committee:

- Mrs Annie van de Riet, President of Greenhouse Technology Center AVAG
- Mrs Marga Vintges, Strategic Advisor, Knowledge, Innovation and European relations at the Municipality of Westland and the Greenport West-Holland

We sincerely hope that this study will encourage and enable you to further explore the French covered horticulture sector and to partake in it. We are here to support you with this!

For practical and specific advice, interested parties are invited to contact:

- The Agrifood Team of the Embassy of the Netherlands in France (par-lnv@minbuza.nl)
- Netherlands Enterprise Agency - RVO (redesk@rvo.nl)

General advice for doing business in France is given on this website:
https://www.rvo.nl/onderwerpen/internationaal-ondernemen/landenoverzicht/frankrijk/dos-and-donts

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EXECUTIVE SUMMARY

1 - Main statistical data.

Total area of cultivation covered by greenhouses or high cover represented 10 300 ha in 2016 (among which 8 380 ha in vegetables and 1 140 ha in ornamentals). This area showed a -8% decrease on the 2013-2016 period (following the decrease in the number of farms). Five main regions with covered agriculture are: Provence-Alpes-Côte d'Azur (2 150 ha in 2016), Occitanie (1 660 ha in 2016), Nouvelle-Aquitaine (1 500 ha in 2016), Pays-de-la-Loire (1 270 ha in 2016), and Brittany (1 050 ha in 2016). The evolution of covered areas was heterogeneous between regions: important decrease in Provence-Alpes-Côte d'Azur and Centre-Val de Loire; important growth in Pays-de-la-Loire and Occitanie.

Average age of installations in 2011 was 19 years for vegetables and 21 years for ornamentals. In 2016, the oldest installations observed in the tomato and cucumber sector were localized in the North-East area and concerned glass greenhouses. Most recent heated greenhouses were in Brittany and the South-West region. From 2016 until now some new greenhouses were built, mostly with a cogeneration heat technology, but larger projects are often delayed by legal procedures.

Tomato, and strawberry account for 77% of the national covered vegetable production. Tomato production is concentrated in Brittany, Provence-Alpes-Côte d'Azur, Occitanie and Nouvelle-Aquitaine. Strawberry production is more developed in Nouvelle-Aquitaine, Centre-Val de Loire, and Provence-Alpes-Côte d'Azur.

Main ornamental covered products are potted and bedding plants. Most dynamic ornamental production basin is the Maine-et-Loire department (in Pays-de-la-Loire region), which concentrates more than 20% of the French ornamental covered area.

The French production of covered vegetables is variable from year to year. In 2019, the volumes of production have decreased by -3% in comparison with 2010. However, the trend evolution shows a global stability of the covered vegetable production. Product policy based on certification and differentiation allows main French producers' groups to control the high-end segments of the market.

Financial output for covered vegetables increased over the 2015-2019 period but with fluctuation. However, despite higher prices, the reduction of production volumes from 2015 to 2019 has led to a decrease in tomato and strawberry production value.

In the ornamental sector, production turnover remained stable over the 2017-2019 period.

The self-sufficiency rate of French vegetable production is lower for covered vegetables (51% in 2018 for strawberries, to 70% for tomatoes) than for vegetables produced in open-air.

Despite being one of Europe's most important outlet French trade balance in live plants and floricultural products is very unfavourable (EUR 979.7 million for imports; EUR 67.9 million for exports).

2 - Sectorial information

The fresh vegetable marketing chain is characterized by the resilience of the wholesale companies, of the main physical wholesale marketplaces (Marchés d'Intérêt National), and of independent specialised retailers. The wholesale stage includes very diverse companies: wholesalers, importers, co-operatives. The covered vegetable production is present through 4 co-operative groups, involved in tomato, strawberry, and cucumber production: Arcal-Prince de Bretagne, Savéol, Océane and Rougeline. At the retail stage, mass retailers dominate the market.

The French ornamental and nursery industry is characterised by high diversity of professions and products. In 2019, retail sales on farms and outdoor markets remained ornamental and nursery companies' main outlet (25.7% of horticultural turnover; 58% of producers). Other main outlets were garden centres (23% of horticultural turnover), other producers (13.7% of sales), and wholesalers of flowers and plants (12% of horticultural turnover). Biggest ornamentals' companies are cooperatives situated in the Pays-de-la-Loire region.

Vertical relationships in the vegetable sector are strong and well established, with the concentration of shipping and retailing companies. Recent demand trend for local products led to various incentives: direct relationships between producers and wholesalers, public support ("Projets alimentaires territoriaux"), traceability tools, ...

The ornamental and vegetable sectors benefit from different kinds of public supports at European, national, and regional levels. At EU level, the 'National Strategy for Fruit and Vegetable sector', elaborated in accordance with EU common market regulation, grants a specific support over the 2013-2018 period. National measures include knowledge on the ornamentals' market and experimental programmes of the ASTREDHOR technical institute. Since 2015, the management of subsidies for investments in greenhouses is managed by Regions, in the context of regional programs for rural development. Eventually, in 2020, the French government implemented a EUR 25 million state aid scheme aimed at compensating ornamentals' producers' loss of turnover during the containment period.

Recent European and national regulations apply to the vegetable and ornamental sectors concerning: the use of chemical pesticides, with some products forbidden in France but allowed in other European countries; energy;

labour; and packaging, with upcoming regulations on food waste and ban on plastic packages for fruits and vegetables weighing less than 1.5kg.
Barriers to entry on vegetable or ornamental market are not important in the context of the EU single market. If the number of competitors has been declining progressively, the total number, including foreigners has been increasing.

3 - Swot analysis

STRENGTHS • French market size • The preference of a significant part of the population for French products • An active communication for French products and for some GI protected products • The choice of French products by mass retailers • The diversity of regions and climates • A rapid development in organic production	**WEAKNESSES** • Labour costs in agriculture • Input costs • Complexity of French market and high competition at retail level
OPPORTUNITIES • "Eco-certified" products on the vegetable market • To take over French farms • Opportunities on the ornamental market • Opportunities for farming equipment • Partnerships could be developed. • Innovation and public funding: digitalisation, vertical farming, plant ingredients, integrated pest management, energy.	**THREATS** • Competitiveness of European production • The systematic and effective opposition of local populations against any project which could be assimilated to "industrial farming", including greenhouses.

The SWOT analysis reflects the complexity of French production chains and markets. Internal costs put French growers under pressure of European competitors and lead them to find innovative strategies.
They do not follow a maximum yield and cost cutting through maximal productivity strategy like Dutch actors do. They cannot use foreign workers to the largest extent, as it is seen in Germany and Spain (a large part of seasonal workers in France come from abroad, even central America, but with a higher cost than Ukrainian workers in Germany or Moroccan workers in Spain. French farmers do not use 'posted workers' in such a large scale as German do and legal wages are far lower in Spain).
The third way is to respond to French demand: healthy, tasty, original products, wide ranges of products, national or regional products that give trust and pleasure to French consumers. This way will not allow French producers to control all segments, especially low-end categories, but it helps containing the raise of imports and to limit the deficit.
It also stimulates new techniques (the organic marketing chain development is a success) and research.
This singular situation shapes opportunities for Dutch companies: many French farms will need to be taken over, even if the greenhouse farms are less numerous on the market than others, technical partnerships can be developed, special French know-how (how to make money with high production costs) can be learned from.

4 - Outlook

What will be the future of covered production in France?
Vegetable sector may continue to growth if no serious competition raises in the high-end segment for tomato, cucumber, and strawberry. A projection based on recent evolution shows that covered surfaces dedicated to tomato, strawberry, melon, and cucumber could reach 6 230 ha in 2030, to be compared with 5 300 ha in 2019. Almost all new plants will rely on co-generation techniques. Some projects could be supported by large energy or waste management companies but most investment will be done by producers involved in the main producers' organisations, with public support granted by various CAP instruments (EAFRD, National strategy for fruit and vegetables).
These projects to come will certainly include modern equipment such as digitalized tools. From a commercial point of view, French actors will keep on developing certified products (zero pesticide, low carbon, non-polluting

carton packaging, …), encouraged by public support, consumers and mass retailing companies demand, even in the growing segment (hard discount, organic shops, fresh products' specialised shops).
Low energy techniques (semi-closed greenhouse, greenhouse with active dehumidification, open buffers, heat shield) will develop, as well as methanization facilities. Irrigation will be another challenge, due to restrictive support policy and water shortages perspectives in southern part of France (Occitanie, Nouvelle- Aquitaine, Auvergne-Rhône-Alpes, PACA).
Main producers' organisations will keep on gaining market shares.
In ornamentals sector, projection of pas trends leads to a pessimistic perspective: covered area could fall from more 1,000 ha in 2020 to less than 800 ha in 2025.
In terms of product range, sales of vegetable seedlings and aromatic plants for private individuals have been on an upstream trend over the last years. They could be an interesting greenhouse production to further develop.
Eventually, considering the investment difficulties of the producers, a sharing of the risk with the downstream part of the sector (distributors) could help to modernise production tools. This could also secure the upstream part of the sector in the context of the actual Covid-19 crisis.
The State recovery plan announced last year also aims to support the horticultural sector in the context of the Covid-19 crisis. Its methods of implementation are not defined yet, and the scheme is currently being validated by the European Commission.

CONTEXT AND OBJECTIVES

The Netherlands Embassy in France wishes to provide Dutch professionals in the agro food sector with information on the evolution of covered agricultural production in France, including production and marketing of fruits, vegetables, flowers and ornamental plants.
Required information can be sorted into three categories:

- Available statistical data about production and marketing,
- Description of the various production chains,
- Sectoral issues and opportunities, including:
    - Evolution in production and consumption,
    - Public and professional strategies,
    - Subsidies granted by national and regional authorities,
    - Professional fairs,
    - Outlook on regulations (especially in the covered sector),
    - Market opportunities (vegetables, ornamental plants, farm and greenhouse equipment, farm input and genetics),
    - Barriers to entry (vegetable market),
    - Partnerships.

First part of the report presents available official data about areas and production. Unfortunately, the farm structures most detailed descriptions rely on the 2010 agricultural general census, while the 2020 census is still in the making, with expected results in 2022. Another source is the structure survey (coordinated survey at the EU level) whose last data are about 2016. Other public sources allow us to give up-to-date pictures on production areas (main vegetables produced in greenhouses, ornamental products) and analyses published by FranceAgriMer, SSP (statistical service of the Ministry for agriculture and professional bodies) provide data on other aspects (sales, consumption, profitability).

Second part of the report is dedicated to sectorial information: microeconomic approach at farm stage, importance and characteristics of the shipment and wholesale activities, main companies, sales at retail stage, presentation of professional and interbranch associations, vertical relationships, public supports, fairs and events, training centres, legal recent changes, barriers to entry.

Third part includes a SWOT analysis, and the **fourth and last part** is an outlook analysis.

Annexes present lists of main companies, acronyms' translation, and other general information.

1. STATISTICAL INFORMATION

1.1. What is the current area of covered cultivation in France?

1.1.1. General data (RGA 2010 – Structure survey 2013 and 2016)

According to Eurostat data on the farm structure surveys, the total area of cultivation covered by greenhouses or high cover totalized 10,300 ha in 2016. This area shows a -8% decrease in comparison with 2013. The 7 main regions with covered agriculture are:

- Provence-Alpes-Côte d'Azur (PACA-Region SUD) – South-Eastern Region Head office in Marseille
- Occitanie – South from the Mediterranean coast to the Pyrenees and the Central Mountains – Region Head office in Toulouse
- Nouvelle-Aquitaine – South Western - Region Head office in Bordeaux
- Pays de la Loire – Downstream Loire Valley – Region Head office in Nantes.
- Bretagne – Brittany - Region Head office in Rennes
- Auvergne-Rhône-Alpes (AURA) – Massif Central- Alps – Rhône Valley – region Head office in Lyon.
- Centre-Val de Loire - Medium Loire Valley. Region Head office in Orléans
-

Table 1 Surface covered agriculture in French regions in 2013 and 2016

	Total covered agriculture			
	2013	2016	% in total 2016	Evolution 2013/2016
France	11 200	10 300	100%	-8%
Provence-Alpes-Côte d'Azur	2 520	2 150	21%	-15%
Occitanie	1 130	1 660	16%	47%
Nouvelle-Aquitaine	1 660	1 500	15%	-10%
Pays de la Loire	1 170	1 270	12%	9%
Bretagne	1 160	1 050	10%	-9%
Auvergne-Rhône-Alpes	820	630	6%	-23%
Centre-Val de Loire	1 230	560	5%	-54%
Grand Est	260	390	4%	50%
Hauts-de-France	450	240	2%	-47%
Ile de France	190	220	2%	16%
Normandie	150	170	2%	13%
La Réunion	100	170	2%	70%
Bourgogne-Franche-Comté	200	140	1%	-30%
French Guyana	-	50	0%	-
Corse	50	20	0%	-60%
Guadeloupe	110	10	0%	-91%

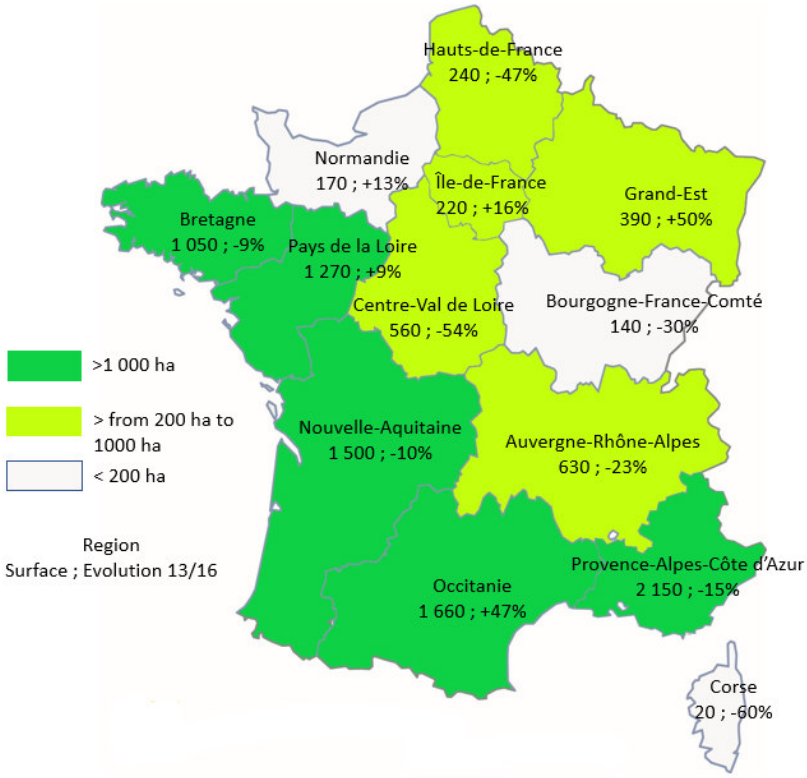
Source: Eurostat[1] Unit: hectares – Martinique Region : 0

The top 5 regions represent 74% the total covered area in France in 2016 and accounted for 68% in 2013.The global decrease in covered surfaces can be partly explained by the decrease in the number of farms involved in this type of production.

According to Eurostat figures, the number of farms with greenhouses or high cover decreased by -5% from 2013 to 2015, to reach 13 740 farms.
In particular, the region Provence-Alpes-Côte d'Azur – which presents the most important covered area – has shown a decrease of -15% with 2 080 farms. The Centre -Val de Loire Region has registered the most important decrease (-54%), dropping from the third national rank to the seventh rank. In the meantime, Pays-de-la-Loire and Occitanie regions have registered an important growth.

[1] https://ec.europa.eu/eurostat/web/products-datasets/-/ef_lus_unglass

Figure 1 Regional covered surfaces in 2016 (ha)



Source: AND international based on Eurostat[2]

Table 2 Number of farms with covered production and average covered surface 2013 and 2016

	2013		2016	
	Number of farms	**average covered area by farm**	**Number of farms**	**average covered area by farm**
France	14 460	0,77	13 740	0,75
Provence-Alpes-Côte d'Azur	2 450	1,03	2 080	1,03
Occitanie	1 600	0,71	1 740	0,95
Nouvelle-Aquitaine	2 120	0,78	1 980	0,76
Pays de la Loire	1 050	1,11	1 080	1,18
Bretagne	1 250	0,93	1 280	0,82
Auvergne-Rhône-Alpes	1 770	0,46	1 900	0,33
Centre-Val de Loire	700	1,76	360	1,56
Grand Est	780	0,33	720	0,54
Hauts-de-France	710	0,63	780	0,31
Ile de France	270	0,70	220	1,00
Normandie	560	0,27	530	0,32
La Réunion	390	0,26	480	0,35
Bourgogne-Franche-Comté	580	0,34	370	0,38
Guyane	20	-	70	0,71
Corse	60	0,83	60	0,33
Guadeloupe	60	1,83	30	0,33
Martinique	60	-	50	-

Source: Eurostat[3] Unit: hectares

[2] https://ec.europa.eu/eurostat/web/products-datasets/-/ef_lus_unglass
[3] https://ec.europa.eu/eurostat/web/products-datasets/-/ef_lus_unglass

From 2013 to 2016, the average covered area by farm slightly decreased from 0,77 ha to 0,75 ha. The situation varies significantly according to the region considered. In the most developed region in terms of covered area (Provence-Alpes-Côte d'Azur, Occitanie, and Pays de la Loire), the average covered area has generally increased, except for the region Nouvelle-Aquitaine.

1.1.2. Vegetable production

-1121- General overview

According to Eurostat data on the farm structures, the total area of cultivation in the vegetable sector covered by greenhouses or high cover totalized 8 380 ha in 2016. The area of production of vegetables represented 8 370 ha, a decrease of -11% from 2013.

Table 3 Surface of covered production of vegetables in French regions in 2013 and 2016

hectares	Vegetables (including melon and grapefruit) and strawberries			
	2013	**2016**	**% in total 2016**	**Evolution 2013/2016**
France	**9 380**	**8 380**	**100%**	**-11%**
Provence-Alpes-Côte d'Azur	2 240	1 720	21%	-23%
Occitanie	970	1 510	18%	56%
Nouvelle-Aquitaine	1 490	1 290	15%	-13%
Pays de la Loire	870	1 100	13%	26%
Bretagne	1 000	970	12%	-3%
Auvergne-Rhône-Alpes	640	460	5%	-28%
Centre-Val de Loire	1 130	460	5%	-59%
Grand Est	130	140	2%	8%
Hauts-de-France	350	160	2%	-54%
Ile de France	130	150	2%	15%
Normandie	80	110	1%	38%
La Réunion	80	120	1%	50%
Bourgogne-Franche-Comté	120	80	1%	-33%
French Guyana	Secret	40	0%	n.a.
Corse	40	20	0%	-50%
Guadeloupe	100	10	0%	-90%
Martinique	10	40	0%	300%

Source: Eurostat[4]

The national decrease rates (-11% in three years) hide contrasted local changes.

- À huge decrease in PACA, Nouvelle-Aquitaine, Auvergne-Rhône-Alpes, Centre-Val-de-Loire, Hauts-de-France, Bourgogne-Franche-Comté, Corsica and Guadeloupe.
- A rapid increase in Occitanie, Pays-de-la-Loire, Grand-Est, Ile-de-France, Normandie, La Réunion, French Guyana, and Martinique

Generally, changes are caused by a renewing of the covered vegetable production: a decline of old-fashioned production (with a large range of products); the growth of specialized houses; and a decline in areas where agriculture lets room for urbanization and growth in regions where producers' organizations have followed successful product strategies.

-1122- Focus by product.

The French Ministry of Agricultures provides statistics on covered production and surfaces for the main productions concerned. These data are published annually and allow to segregate open-air crops from

[4] https://ec.europa.eu/eurostat/web/products-datasets/-/ef_lus_unglass

covered crops. Open-air surfaces include low (not accessible) protective cover and covered crops include greenhouses and high cover.

Table 4 Covered area of vegetables from 2010 to 2019

Species	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	%19/10
Total 4 species	**4 737**	**4 843**	**5 011**	**5 039**	**4 969**	**5 081**	**5 151**	**5 188**	**5 230**	**5 306**	**12%**
Tomato	2 026	2 092	2 211	2 205	2 072	2 038	2 099	2 119	2 136	2 195	8%
Strawberry	1 462	1 495	1 578	1 631	1 679	1 842	1 847	1 859	1 883	1 893	29%
Melon	746	752	721	708	681	674	691	678	682	678	-9%
Cucumber	503	504	501	495	537	527	514	532	529	540	7%

Source: Agreste - Statistique Agricole annuelle - (Annual Farm statistical data) Unit: hectares

These figures show a global increase of +12% in the covered vegetable surfaces from 2010 to 2019. This growth can be observed for most vegetables: tomato (+8%), strawberries (+29%) and cucumber (+7%). Covered production of tomatoes represents 41% of the total covered vegetable production monitored by the French Ministry of agriculture.

According to an interview with a representative of the CTIFL of the greenhouse department, in 2019, the total surface of covered production of vegetables was estimated at 7 500 ha. Considering this estimate, about 2 200 ha of covered vegetables concern other types of production: lettuce, chicory, pepper-bell, radish, etc. There is no detailed information available on the distribution of this surface by type of product.

1.1.3. Ornamental plants

Based on FranceAgriMer observatory of ornamentals companies[5], France totalized 1 040,3 ha of greenhouses dedicated to ornamentals in 2019, with 565 ha of glass greenhouses, and 475,3 ha of plastic greenhouses. In 2019, more than half of French horticultural farms had glass greenhouses, and almost 40% of French horticultural farms had plastic greenhouses.

In 2019, the five regions with the largest areas in covered cultivation were Pays-de-la-Loire (24% of French covered area), Provence-Alpes Côte d'Azur (PACA) (15% of French covered area), Auvergne-Rhône-Alpes (10% of French covered area), Nouvelle Aquitaine (10% of French covered area), and Bretagne (9% of French covered area).

PACA and Pays-de-la-Loire totalized 42% of glass greenhouse areas.

Table 5 Covered area dedicated to ornamentals productions in French regions in 2019.

Regions	Covered area (ha)	%
FRANCE	**1 040,3**	**100%**
AUVERGNE-RHONE-ALPES	107,7	10%
BOURGOGNE-FRANCHE-COMTE	41,8	4%
BRETAGNE	90,3	9%
CENTRE-VAL-DE-LOIRE	42,3	4%
GRAND-EST	59,8	6%
HAUTS-DE-FRANCE	44,1	4%
ILE-DE-FRANCE	42,6	4%
NORMANDIE	34,8	3%
NOUVELLE-AQUITAINE	106,4	10%
OCCITANIE	68,2	7%
PACA	155,1	15%
PAYS-DE-LA-LOIRE	247,2	24%

Source: FranceAgriMer, Observatory of structural data of ornamentals and nursery companies – France, 2019 - Unit: hectares

Over the 2015-2019 period, the French covered area decreased by 11% (-3% each year). It has nonetheless remained around 7% of the total horticultural surface.

[5] FranceAgriMer, Observatoire des données structurelles des entreprises de production de l'horticulture et de la pépinière ornementales – France

Regions in which the decrease in covered areas has been the largest were Ile-de-France (- 28% over the 2015-2019 period), Centre-Val-de-Loire (- 25%), Hauts-de-France (- 20%), Normandie (- 20%), and PACA (- 19%).

This decline in covered areas arises from two phenomena that took place over the last decades:

- On the one hand, the disappearance of greenhouse growers who could not afford high investment costs and the increase in the price of energy,
- On the other hand, the disappearance of small horticulturalists from the Mediterranean basin who got the opportunity to sell their land for construction projects.

It must be noted that an important decline happened in the covered vegetable production in the same regions.

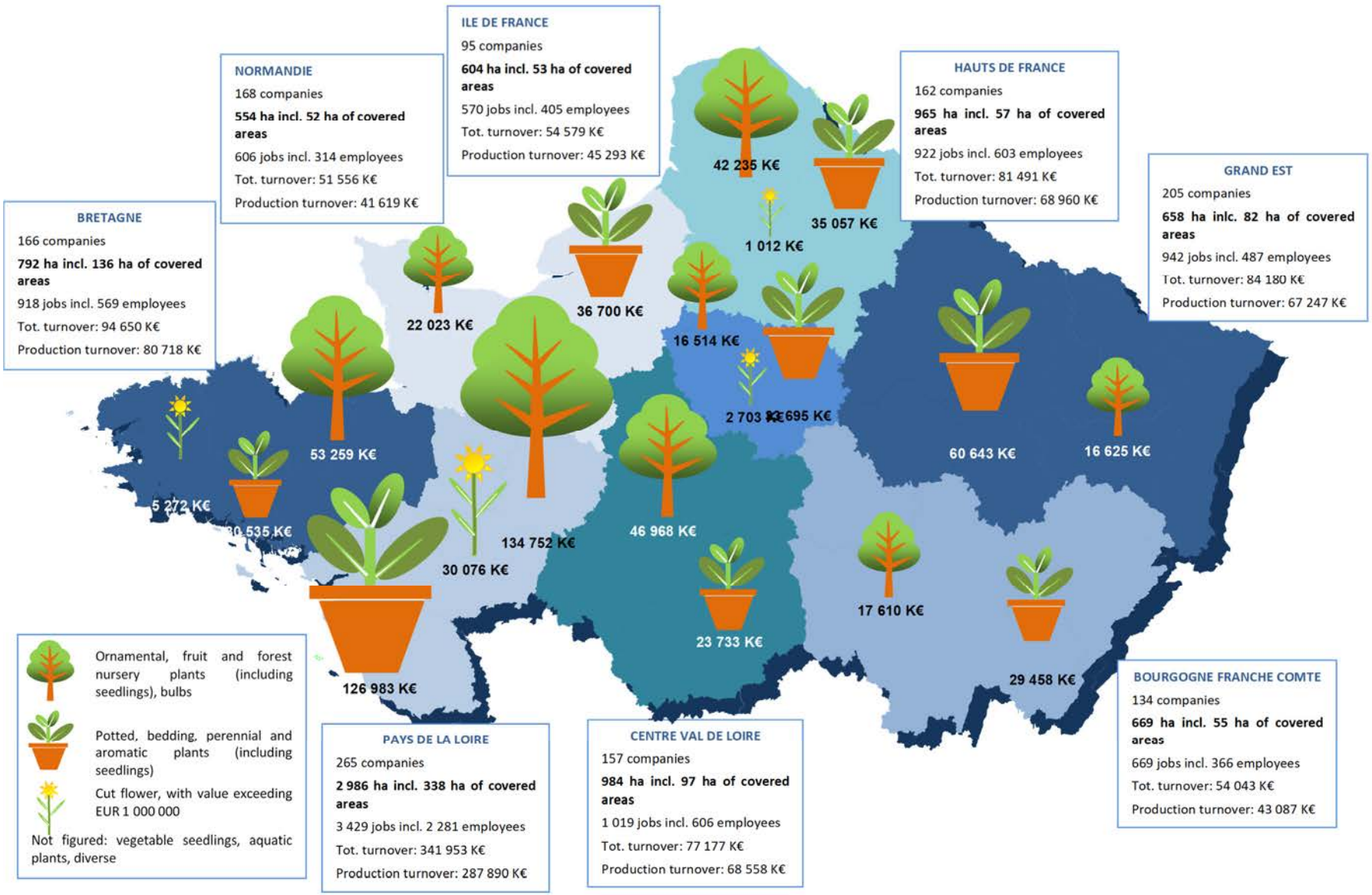
Table 6 : Changes of covered area dedicated to ornamentals productions in French regions over the 2013-2019 period.

Regions	2019	2017	2015	2013	*Change 2019\2017*	*Change 2019\2015*
FRANCE	**1 040,3**	**1 104,6**	**1 171,8**	**1 226,0**	***-6%***	***-11%***
AUVERGNE-RHONE-ALPES	107,7	114,6	112,1	101,9	*-6%*	*-4%*
BOURGOGNE-FRANCHE-COMTE	41,8	35,9	39,8	36,8	*17%*	*5%*
BRETAGNE	90,3	97,9	97,9	112,1	*-8%*	*-8%*
CENTRE-VAL-DE-LOIRE	42,3	60,2	56,7	61,8	*-30%*	*-25%*
GRAND-EST	59,8	61,3	73,1	72,9	*-2%*	*-18%*
HAUTS-DE-FRANCE	44,1	53,5	55,1	58,4	*-18%*	*-20%*
ILE-DE-FRANCE	42,6	53,9	59,5	59,1	*-21%*	*-28%*
NORMANDIE	34,8	39,9	43,6	47,6	*-13%*	*-20%*
NOUVELLE-AQUITAINE	106,4	107,3	114,9	107,6	*-1%*	*-7%*
OCCITANIE	68,2	68,6	71,9	72,1	*-1%*	*-5%*
PACA	155,1	159,2	190,8	251,1	*-3%*	*-19%*
PAYS-DE-LA-LOIRE	247,2	252,2	256,3	244,5	*-2%*	*-4%*

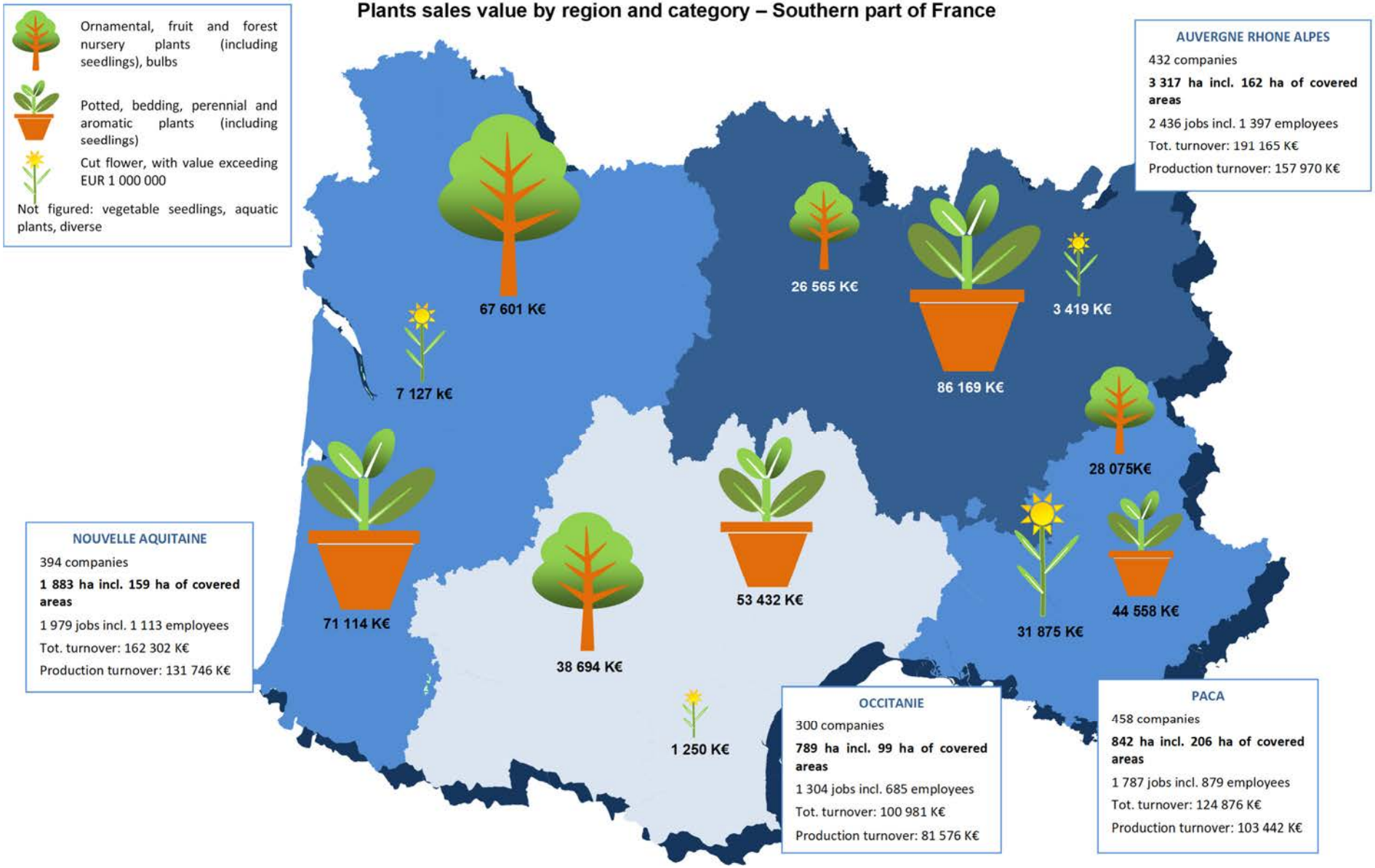
Source: FranceAgriMer, Observatory of structural data of ornamentals and nursery companies – France, 2013-2019

Figure 2 Plant sales values by regions

Plants sales value by region and category – Northern part of France



Plants sales value by region and category – Southern part of France



1.2. What is the age of the current installations (greenhouses and tunnels) and what are the prospects (in terms of time and size) for replacement?

1.2.1. General overview

The French public structure FranceAgriMer has implemented a policy of support for modernisation in the vegetable and ornamental greenhouse sector. The ex-post evaluation draws a state of play of the age of the current covered installations. According to a CTIFL study in 2011[6], installation rate of new farmers in covered production of vegetables varies significantly from a region to another, in terms of age, structure and equipment.

Concerning the average date of construction, CTIFL estimated in 2011 that the French greenhouses and high covers were in average 19 years old. This average age varies depending on the regions:

Table 7 Age of greenhouses and high covers.

	Britany	North West	Loire Valley	South-East	South-West	**France**
Average date of construction of greenhouses and high covers in 2011	1998	1991	1992	1988	2001	**1992**

Source: Quelles évolutions du parc de serre et des équipements de chauffage en France depuis 2006 ?, CTIFL

The oldest installations were found in the South-East, North-East and Val-de-Loire, and the more recent in Brittany, and South-West. These regional trends have not changed during the last decade (please see annex 5.4:'post 2016 trends').

1.2.2. Focus on heated greenhouses.

Various studies carried by CTIFL provide a global overview on the age of heated installations in France in the most important productions.

Strawberries

In 2013, CTIFL studied the use of energy in heated off-ground strawberry production in the main producing areas[7]: Aquitaine, Brittany, and the Mediterranean region.

Table 8 Average date of installation of heated greenhouses – strawberry (2013)

	Glass greenhouse	Multi-span greenhouses	Tunnel	Glass greenhouse	Multi-hood greenhouses	Tunnel
	Share of surfaces			Average year of construction		
Aquitaine	13%	66%	20%	1994	2002	2001
Brittany	93%	7%	-	1985	1994	-
Mediterranean region	30%	36%	35%	1977	1999	1990

Source: Parc serre et énergie en fraise hors-sol chauffé – état des lieux de la production sur la campagne 2011-2012, CTIFL, 2013

Glass greenhouses are generally the oldest installations in the 3 regions scouted. It was often initially constructed to produce other heated production. Tomato represented the main initial production of these installations: 51% of the glass greenhouses in Aquitaine, 61% in Brittany and 74% in the Mediterranean region.

[6] Quelles évolutions du parc de serre et des équipements de chauffage en France depuis 2006 ? CTIFL *What evolution of the greenhouse installations and heating equipment in France since 2006 ?*, CTIFL

[7] Parc serre et énergie en fraise hors-sol chauffé – état des lieux de la production sur la campagne 2011-2012, CTIFL, 2013 *Greenhouse installations and heated off-ground production of strawberry – overview of the 2011-2012 production campaign, CTIFL, 2013*

Tomato and cucumber

Every 5 years, CTIFL carries a study on the installation of heated greenhouses in France and presents its main characteristics for the tomato and cucumber productions.

Table 9 Average date of installation of heated greenhouses – tomato and cucumber (2016)

	Average year of construction	% of glass greenhouses
Brittany	2003	96%
Loire Valley	1996	99%
North-East	1988	100%
South-West	2006	78%
South-East	1997	91%

Source: « Évolution du parc de serres chauffées en tomate et concombre, CTIFL, 2016 »

According to the study[8], the oldest installations observed in the tomato and cucumber sector are localized in the North-East area, and concern glass greenhouses. Most recent heated greenhouses are in Brittany and the South-West region, that mainly covers Nouvelle-Aquitaine, whereas oldest installations are concentrated in the North-East and Loire Valley areas (especially in the Orleans basin).

In some regions (Brittany) old greenhouses are taken over by organic producers, who do not heat anymore; in South-East and all coastal areas real estate speculation is stronger than farming activities. In some little towns in Alpes-Maritimes (Nice area) local authorities buy farms and then recruit young farmers, to avoid town expansion and disappearance of farming activities.

The question of land artificialization (land dedicated to housing, roads, railroads, car parks, airports, paths, wastelands, ...) has become a national issue, in a recent paper, the Cour des comptes (court of auditors) noted that each year 35 000 ha of farming land are dedicated to new uses (other than agriculture or nature) and claimed the quick implementation of an observatory to a better understanding of this phenomenon that could inspire a new policy.

1.2.3. Ornamental plants

From 2002 to 2012, the French public body FranceAgriMer implemented a policy of support for modernisation in the vegetable and ornamental greenhouse sector. The ex-post evaluation realised in 2013[9] drew a state of play of the age of the current covered installations.

According to ASTREDHOR, greenhouses for horticultural heated products were plastic or glass greenhouses.

- Plastic greenhouses were covered either with a single wall layer or with a double layer inflatable wall. This second type of equipment was particularly waterproof. The tunnels were a kind of plastic greenhouse and could also be heated.
- Glass greenhouses had a good seal and a better light transmission than plastic walls, so they heated up better in direct sunlight.

Glass greenhouses were more widely used than plastic greenhouses. The last available picture was about 2011, glass greenhouse park was on average 20 years old, out of which, 18% were less than 10 years old, and 16% over 30 years old. Heat shields were present on 63% of heated glass greenhouse surfaces. Almost 80% of the greenhouses aged from 10 to 20 and 55% of greenhouses under 10 years old were equipped with heat shield. (Please see annex 5.4 about 2016 trends).

[8] Évolution du parc de serres chauffées en tomate et concombre, CTIFL, 2016 *Evolution of heated greenhouses and covered installations for tomato and cucumber production*, CTIFL, 2016

[9] FranceAgriMer, Évaluation ex post des programmes de financement de certaines dépenses de modernisation dans le secteur des serres maraîchères et horticoles. *Ex post evaluation of funding programs for the modernisation in the vegetable and flower covered production sector.*

Table 10 Average characteristics of horticultural greenhouses in 2011

glass	plastic	tunnel	age	height	heat shields	power
60%	32%	8%	20.8 yrs	2.8m	60% (10 years)	324 W/m^2

CO2 injection	light	dehumidification
4% of companies	16% of companies	18% of companies

Source: ASTREDHOR

1.3. Which type of covered cultivation can be found in which regions?

1.3.1. Vegetable production

The distribution of the surface of covered vegetables varies from a region to another. Based on the data produced by the French Ministry of agriculture, a global state of play of the main covered vegetables can be drawn:

Table 11: surfaces of the main covered vegetables by region in 2019 (ha)

	Strawberry	Melon	Cucumber	Tomato	Total 4 products
France	**1 893**	**678**	**540**	**2 195**	**5 306**
Provence-Alpes-Côte d'Azur	248	405	50	504	1 207
Nouvelle-Aquitaine	795	39	52	254	1 140
Bretagne	78	9	17	528	632
Occitanie	129	149	91	213	582
Pays de la Loire	43	23	126	228	420
Centre-Val de Loire	270	4	73	42	389
Auvergne-Rhône-Alpes	167	26	8	96	297
Hauts-de-France	86	0	5	50	141
Grand Est	22	2	61	46	131
Normandie	25	1	6	51	83
Île-de-France	21	4	12	42	79
Corse	8	14	6	23	51
La Réunion	0	0	0	50	50
Bourgogne-Franche-Comté	0	1	23	19	43
Guyane	0	1	5	20	26
Martinique	0	0	0	25	25
Mayotte	0	0	5	4	9
Guadeloupe	1	0	0	0	1

Source: Agreste - Statistique Agricole annuelle - (Annual Farm statistical data) [10]

The figures represent the surfaces of the four species considered in the total covered area of these products by region. It does not include other covered productions that are not monitored by the French Ministry of Agriculture (such as lettuce, radish, chicory, etc.). According to an interview with CTIFL, at national level the share of other products is estimated at 30% of the total covered areas.
Some regions are very specialised:

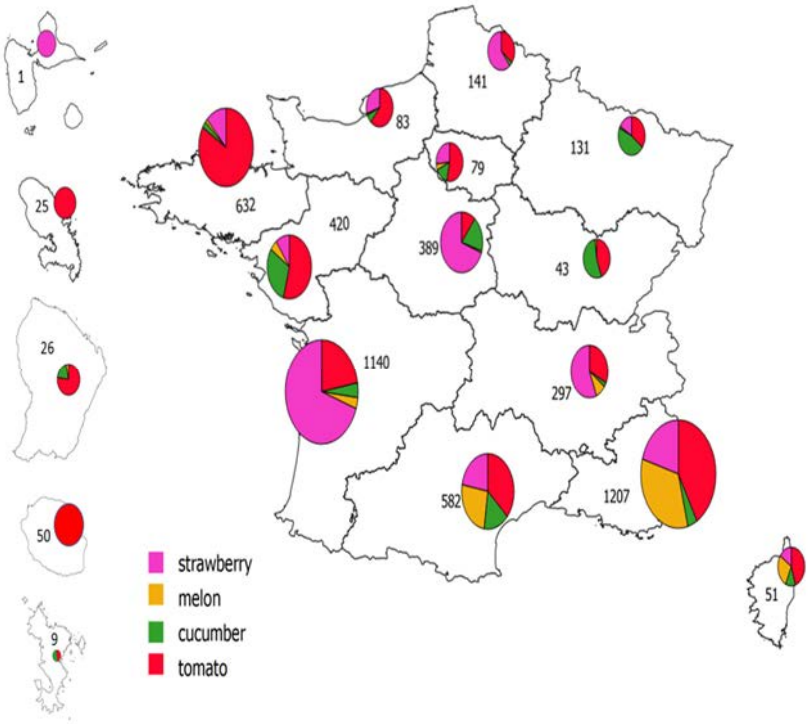
- Provence-Alpes-Côte d'Azur: 42% of the covered surfaces concern tomato, and 34% concern melon
- Nouvelle-Aquitaine: 70% of covered surfaces are dedicated to the production of strawberry.

[10] https://agreste.agriculture.gouv.fr/agreste-web/disaron/SAANR_DEVELOPPE_2/detail/

- Brittany: 84% of the covered surfaces produce tomato.

The following map provides a general overview of the geographic distribution of the main covered vegetable productions.

Figure 3 Regional breakdown of the main vegetables produced in greenhouses and high covers in 2019 (ha)



Source: AND international, based on Agreste[11]

Tomato production is concentrated in Brittany (528 ha), Provence-Alpes-Côte d'Azur (504 ha), Occitanie (213 ha) and Nouvelle-Aquitaine (254 ha). The production of strawberries is more developed in Nouvelle-Aquitaine (795 ha), Centre-Val de Loire (270 ha) and Provence-Alpes-Côte d'Azur (248 ha). Together these two products accounts for 77% of the national covered vegetable production.

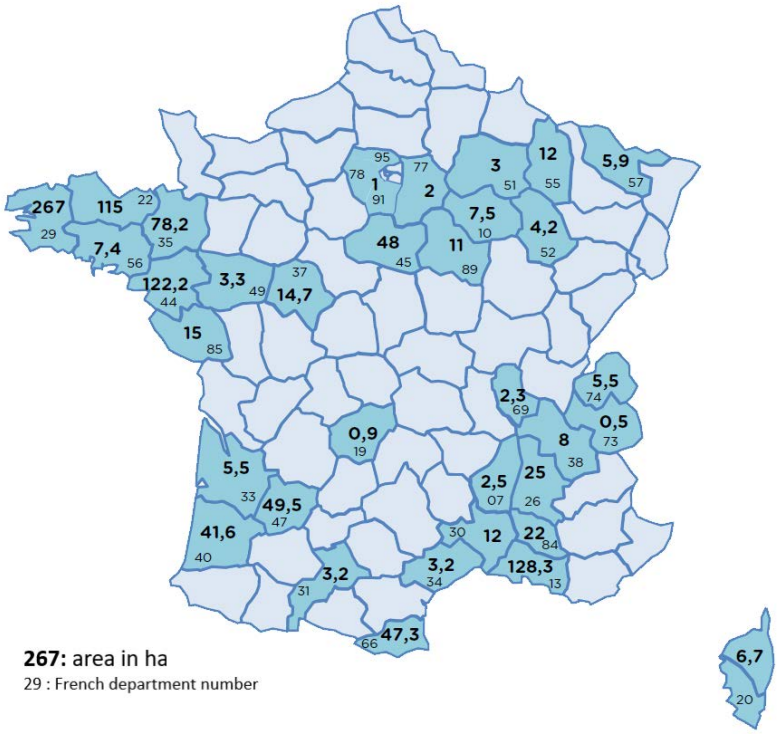
According to an interview with a representative of CTIFL of the greenhouse department, in 2019, the total surface of covered production of vegetables is estimated at 7 500 ha, with 1 400 ha of heated installations.

Concerning heated greenhouses, a CTIFL[12] study presents a regional distribution of the types of installations concerning tomato and cucumber. According to the study, the surface of heated greenhouses is increasing in the west-part of France, and significantly decreasing in the South and the North-East regions (-20% in average). For the French department of Bouche-du-Rhône only, the area declined from 245 ha in 2005 to 171,3 ha in 2011, and to 128,3 ha in 2016, which represents a loss of 117 ha in 11 years.

11 https://agreste.agriculture.gouv.fr/agreste-web/disaron/SAANR_DEVELOPPE_2/detail/

12 Évolution du parc de serres chauffées en tomate et concombre, CTIFL, 2016 *Evolution of heated greenhouses and cover installations for tomato and cucumber production*, CTIFL, 2016

Figure 4 : Surfaces of tomato and cucumber heated greenhouses and high covers in 2016 (ha)



Source: Évolution du parc de serres chauffées en tomate et concombre, CTIFL, 2016

1.3.2. Ornamental plants

At French level, more than half of the productions cultivated by horticultural farms with glass greenhouses are potted and bedding plants. The main productions cultivated by horticultural farms with plastic greenhouses are potted and bedding plants, but also nursery plants.

The Maine-et-Loire department (chief place: Angers), in Pays-de-la-Loire region, is the most dynamic French horticultural production basin. It concentrates more than 20% of the French covered areas. The Pays-de-la-Loire production is diversified. In 2018, the main production was nursery plants with 27% of the Pays-de-la-Loire plant sales value, followed by potted and bedding plants with 23% of the sales value. The production of seedlings and cut flowers, in decline at national level, was maintained and respectively represented 12% and 10% of the Pays-de-la-Loire sales value. Vegetable seedlings enjoyed a rapid growth over the 2015-2018 period.

The Var department, in PACA region, is a major cut flower production basin and concentrates more than 15% of glass greenhouse areas in France. This production has been declining over the last two decades, with the cessation of many small horticultural farms.

The ornamental plants production evolution above is presented in sales value, as there is no data on production volumes.

Changes in plant range over the 2017-2019 period highlight the dynamism of perennials and aromatics sales (+ 12.3%), and of nursery seedlings and plants sales (+ 4.4% cumulatively).
Strongest setbacks occurred on horticultural seedlings, potted plants, and bulbs. Sales of cut flowers, partly marketed by producer-wholesalers, show a moderate decline after the sharp drops registered over the 2005-2015 period.

Table 12: Evolution of plant sales value by product category over the 2013-2019 period (in K€)

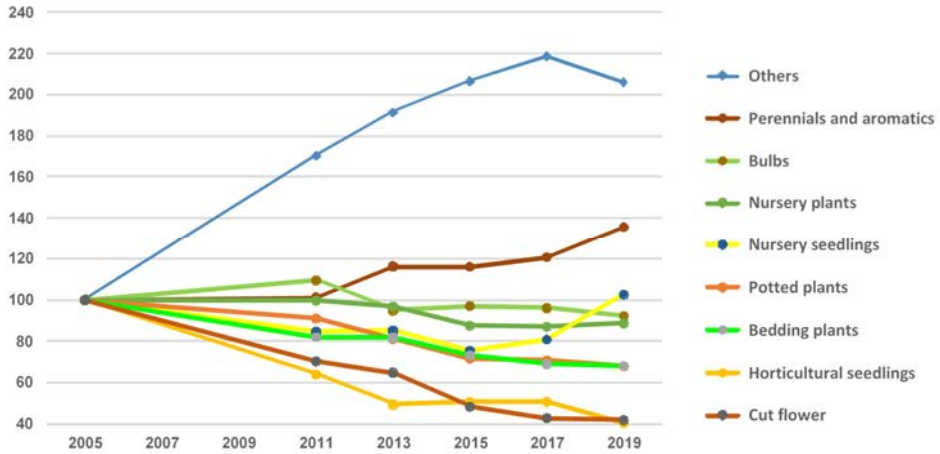
Product category	2019	2017	2015	2013	*2019/2017*
Potted plants	278 522	290 003	293 740	332 694	*-4,0%*
Bedding plants	236 160	239 450	253 861	282 923	*-1,4%*
Horticultural seedlings	28 137	35 267	35 227	34 276	*-20,2%*
Nursery plants	491 147	482 098	484 889	536 405	*1,9%*
Nursery seedlings	67 799	53 449	49 959	56 301	*26,8%*
Perennial and aromatic plants	93 151	82 927	79 678	79 778	*12,3%*
Cut flowers	84 983	86 917	98 204	131 403	*-2,2%*
Bulbs	20 621	21 468	21 697	21 227	*-3,9%*
Others	118 432	125 709	118 662	109 963	*-5,8%*
Total	**1 418 953**	**1 417 289**	**1 435 917**	**1 584 970**	*0,1%*

Source: FranceAgriMer, Observatory of structural data of ornamentals and nursery companies – France, 2019

Over the 2005-2019 period (figure 5 below), observed trends are as follows:

- **Cut flower sales value decreased by 60% between** 2005 and 2017, because of the difficulties encountered by the historical basin of the Var and the Alpes-Maritimes departments. It seems that they reached a "floor" in 2019.
- **Horticultural seedling sales value decreased by 60%** over the 2005-2019 period, due to the cessation of many specialized companies.
- "Other products" (mostly **vegetable seedlings) sales value more than doubled since 2005**. It seemed to level off in 2019 partly due to a competition from certain vegetable seedling producers.
- **Perennials and aromatics have shown a positive and significant development (+ 36%)** since **2015.**
- Seedlings and finished nursery plants have held up well over the period despite the cessation of leading companies during the 2009-2013 crisis period.
- **Potted plant and bedding plant sales value followed a very similar dynamics, with a 36%** decrease over the 2005-2019 period.

Figure 5: Plant sales value evolution by product category over the 2005-2019 period (index base 100 = 2005)



Source: FranceAgriMer, Observatory of structural data of ornamentals and nursery companies – France, 2019

1.4. Production volumes

1.4.1. Vegetable production

Table 13: Evolution of covered production of the main vegetables (tonnes)

	2010	2015	2016	2017	2018	2019	%19/10	Trend 2010-2019
Total	**722 825**	**771 421**	**800 303**	**784 060**	**691 773**	**704 498**	**-3%**	**0,2%**
Tomato	556 095	590 863	620 491	600 036	522 271	525 927	-5%	0,0%
Cucumber	117 803	120 516	120 496	127 310	119 977	123 074	4%	0,9%
Strawberry	29 808	42 463	41 421	39 195	33 952	39 206	32%	2,0%
Melon	19 118	17 579	17 895	17 518	15 573	16 291	-15%	-2,3%

Source: Agreste - Statistique Agricole annuelle - (Annual Farm statistical data)[13]

The French production of covered vegetables is variable from year to year. The volumes of production in 2019 have decrease by -3% in comparison with 2010. Tomato volumes have decreased by -5% from 2010 to 2019. However, the trend evolution shows a global stability of the production, and a limited increase concerning cucumber and strawberry.
In comparison with the change of the total production of these species (open-air production and covered), the decrease of the covered volume produced is limited. Indeed, the total production of the 4 vegetables considered has decreased by -12% from 2010 to 2019, and by -0,8% in trend (see Annexe 1).
Other fruits and vegetables can be grown under greenhouses but no public data on volumes and areas are available. Concerning the whole production of these products (either in open-air or covered), public statistics show that volumes of production are quite limited in comparison with the main covered productions such as tomato or cucumber.

What about consumption[14] and trade? Tomato apparent consumption decreased from 1,07 million tonnes in 2014 to 0,99 million tonnes in 2019. This drop results both of a decrease in national production and in imports. Local production covers 70% of the consumption. Cucumber balance follows the same trends: slight decrease in production, imports, exports, and consumption. Self-sufficiency rate is 66%. In melon case, one can notice an important decrease in production and area (out of which covered production is only a little part, around 5%) a drop in exports and stability in imports. Consumption is fluctuating (depending on yields). Self-sufficiency rate is only 64% in 2019, compared to 66% in 2014.

Concerning other vegetables that can be grown under cover, we observe a global increase of both volumes and cultivated area from 2010 to 2019. Eggplant production, either cultivated in open-air or in greenhouses, reached 31 332 tonnes in 2019, which represent a 48% increase from 2010. Pepper bell production reached 32 100 tonnes, a 77% increase over the same period. Regarding these figures, the production of eggplant and pepper bell is growing, and the trend should continue in the coming years.

[13] https://agreste.agriculture.gouv.fr/agreste-web/disaron/SAANR_DEVELOPPE_2/detail/

[14] See balance sheets in Annex 5.1

Table 14 : Evolution of production and area of other vegetables

		2010	2015	2016	2017	2018	2019	%10/19
Volumes (tonnes)	Eggplant	21 215	31 304	31 779	28 990	29 620	31 332	48%
	Pepper bell and pepper	18 137	21 841	46 867	29 043	31 474	32 100	77%
	Total	**39 352**	**53 144**	**78 647**	**58 033**	**61 094**	**63 431**	**61%**
Area (ha)	Eggplant	722	721	733	740	770	820	14%
	Pepper bell and pepper	619	615	955	948	951	932	51%
	Total	**1 341**	**1 336**	**1 688**	**1 688**	**1 721**	**1 752**	**31%**

Source : Agreste - Statistique Agricole annuelle - (Annual Farm statistical data)Erreur ! Signet non défini.

Concerning berry production, the global French production is declining by 4% from 2010 to 2019, as surface also decline by 6%. Only raspberry production shows a substantial increase (+52% in volume and +1% in cultivated area). For berry in general, the global trend remains negative for both cultivated area and production volumes.

Table 15 : Evolution of production and area of other berries

		2010	2015	2016	2017	2018	2019	%10/19
Volumes (tonnes)	Raspberry	3 590	4 242	3 922	4 549	5 029	5 452	52%
	Redcurrant	2 111	1 746	1 507	1 757	1 745	2 063	-2%
	Blueberry and blackcurrant	11 110	9 613	6 706	8 496	9 206	8 678	-22%
	Total	**16 812**	**15 600**	**12 134**	**14 801**	**15 979**	**16 193**	**-4%**
Area (ha)	Raspberry	671	662	685	680	675	676	1%
	Redcurrant	335	327	335	337	290	287	-14%
	Blueberry and blackcurrant	2 658	2 474	2 477	2 421	2 489	2 484	-7%
	Total	**3 664**	**3 463**	**3 497**	**3 438**	**3 454**	**3 447**	**-6%**

Source : Agreste - Statistique Agricole annuelle - (Annual Farm statistical data)Erreur ! Signet non défini.

In addition to limited volumes in comparison with tomato, cucumber, melon and strawberries, berries, eggplants, and pepper bell are produced in a limited period over the year. The CTIFL details the calendar for these products[15]. It shows that in general, the production periods are concentrated from June to September, at the time of the year when open-air cultivation is preferred from covered cultivation:

- eggplant: July to September
- pepper bell: June to October
- raspberry: April to November

A covered production exists for these products, and is mainly implemented in colder regions, and allow an early and late production: Bretagne, Auvergne-Rhône Alpes, Limousin, Pays-de-la-Loire or, Grand-Est.

According to public data on production and trade, the weight of production in the total available volumes is quite limited for berries, eggplant, and pepper bell. The Imports largely exceed exports, as detailed in the following table:

[15] https://memento.ctifl.fr/

Table 16 : Supply balance of different products in 2019 (in tonnes)

	Fresh Eggplant	Courgettes	Fresh Pepper bell	Raspberry (fresh and frozen)	Redcurrant (fresh and frozen)	Blueberry and Blackcurrant (fresh and frozen)
Production	31 332	116 372	32 100	5 452	2 063	8 678
Imports	52 520	151 701	152 252	59 080	2 643	25 802
Exports	4 775	25 478	40 754	5 172	214	5 820
Apparent consumption	79 078	242 595	143 597	59 360	4 493	28 659

Source: Agreste - Statistique Agricole annuelle - (Annual Farm statistical data)[Erreur ! Signet non défini.], French Customs

Imported fresh eggplants come from Spain (75%) and Netherlands (circa 10%), import flow grew by 5% between 2019 and 2020. Fresh pepper bells come also from Spain (67%) and Morocco (17%), it also grew by 8% between 2019 and 2020. In addition, in 2020, France imported 30 729 tonnes of frozen pepper bells (Spain, Portugal, Belgium) and 4 000 tonnes of preserved pepper bells (Turkey).
Courgettes are imported from Spain (3 out of 4) and Morocco (1 out of 5) and, to less extent, from Italy and Belgium (in Summer).

Concerning fresh raspberry, main suppliers in 2019 are Spain (16 600 t), and Portugal (3 260 t). Frozen raspberry mainly originates from Serbia (10 500 t), Cyprus (4 800 t), Belgium (4 800 t), and Poland (3 000 t).

Fresh blueberries (11 000 t) are mainly imported from Spain, Morocco, Peru, and Portugal. Deep frozen blueberries (12 000 t) are imported from Canada, Ukraine, Poland, Belgium, Belarus, and The Netherlands.

Frozen berries are mainly dedicated to dairy products plants (yogurt, fresh cheese) and secondly to jam manufacturers (French jam range is the widest in the world).

1.5. Prices and financial output

1.5.1. Vegetable production

Distribution of hectares:

The distribution of the covered surfaces in the vegetable sector are detailed by region in part 2.1.2. In addition, regional data on the main fruits and vegetables cultivated under greenhouses and high covers are presented in part 2.3.1, and volumes for the main covered vegetables are presented in part 2.4.1.

Financial output

The French public body "Observatoire de la formation des prix et des marges des produits alimentaires[16]" provides prices for several vegetable products on a yearly basis, at shipper and retailer stages.

16 https://observatoire-prixmarges.franceagrimer.fr/

The following table represents the average price observed for vegetables, strawberries and tomatoes, at producer, shipper, and retail stages:

Table 17 Price for the main covered vegetables (EUR/kg)

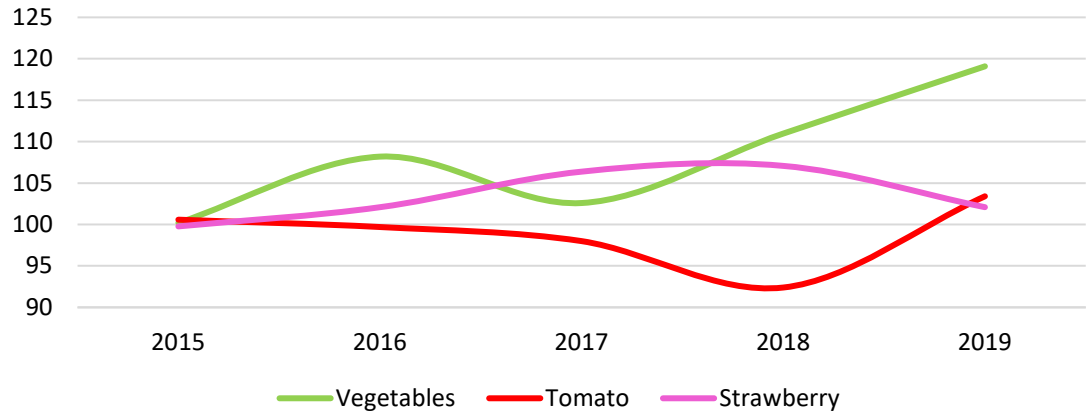
	Stage	2015	2016	2017	2018	2019	%19/15*
Average - seasonal vegetables	producer	0,61	0,64	0,61	0,68	0,72	18%
	shipper	0,76	0,8	0,76	0,84	0,9	18%
	retail	1,67	1,69	1,69	1,80	1,91	14%
Tomato	producer	1,01	0,98	0,99	0,91	1,02	2%
	shipper	1,25	1,22	1,23	1,12	1,27	2%
	retail	2,21	2,15	2,19	2,12	2,30	4%
Strawberry	producer	4,50	4,35	4,71	4,81	-	7%
	shipper	5,60	5,41	5,86	5,98	-	7%
	retail	9,19	9,20	9,60	9,90	-	8%

* Change from 2015 to 2018 for strawberry. Note: Producer prices were estimated[17]
Source: Observatoire de la formation des prix et des marges des produits alimentaires

The "average of seasonal vegetables" category includes vegetables representatives of the consumption in France. The composition of the category evolves on a weekly basis to represent the evolution of the vegetables on the market according to the period of the year. The category represents only French vegetables (Tomato, Carrot, Cucumber, Courgetti, Onion, Lettuce, Endive, Cauliflower, Melon, Leek; imported products consumed in France are excluded).These figures underline the progression of prices over the period 2015-2019, with an increase of +18%. At retail stage, the increase is also important, but to a lesser extent.

An increase in prices can also be observed over the period concerning the two main covered products, tomato, and strawberry. The increase in prices at producing stage reached +2% for tomato in 2019, and +7% for strawberry in 2018.
This trend has been confirmed by the analysis of the index IPPAP[18], that follows the evolution of prices for fresh vegetables.

Figure 6 Evolution of the IPPAP index (based 2015)



Source: Agreste[19]

The IPPAP index for fresh vegetables shows a growing trend over the period 2015-2019. Tomato and strawberry prices have also increased over the period but show a more important yearly volatility. The IPPAP index underlines that the financial output for covered vegetables rely on the evolution of prices,

17 Observatoire des entreprises de gros et d'expédition des fruits et légumes frais en France, CTIFL, 2019 (Wholesale fruit and vegetable companies' observatory).
18 IPPAP: Indice des prix à la production agricole, Agreste (Prices at farm stage index) - Agreste
19 https://agreste.agriculture.gouv.fr/agreste-web/disaron/D_0037/detail/

that have progressed since 2015 but with fluctuations. This conclusion must be taken into account when analyzing the evolution of the financial output of the two products.
The evolution of the volumes produced has been detailed in point 2.4.1. From 2015 to 2019, the volumes of production declined for both tomato and strawberry productions. This decline is mainly conjunctural, as the surfaces cultivated follow a growing trend (see point 2121).

Based on the production volumes and average prices at producer stage, it is possible to estimate the financial output at producer stage for the two products:

Table 18 Estimation of the financial output in the strawberry and tomato sectors (1000 euros)

	2015	2016	2017	2018	2019	%19/15*	Trend 2015-2019
Tomato	596 772	608 081	594 036	475 267	536 446	-10,1%	-5%
Strawberry	191 084	180 181	184 608	163 309	-	-14,5%	-4%

* Evolution from 2015 to 2018 for strawberry
Source: AND international from Agreste data.

According to this estimate, the financial output for the covered tomato sector reached EUR 536 million in 2019 (-10,1% in comparison with 2015), and the covered strawberry sector EUR 163 309 million in 2018 (- 14,5% in comparison with 2015). Despite higher prices, the reduction of production volumes from 2015 to 2019 has led to a decrease in production value.

1.5.2. Ornamental plants

Table 19 Evolution of cut flower areas in French regions over the 2010-2019 period (in ha)

Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	*19\10*
France	**2420**	**2510**	**2532**	**2501**	**2300**	**2395**	**2242**	**2236**	**2238**	**2235**	***-8%***
Auvergne-Rhône-Alpes	174	184	185	185	183	182	181	181	181	181	*4%*
Bourgogne-Fr-Comté	17	19	19	19	16	16	16	16	16	16	*-6%*
Bretagne	142	142	143	143	131	131	125	125	125	125	*-12%*
Centre-Val de Loire	52	58	58	56	55	56	55	55	57	55	*6%*
Grand Est	35	30	30	30	28	28	28	28	28	28	*-20%*
Hauts-de-France	45	54	61	61	58	57	54	54	54	54	*20%*
Île-de-France	248	250	250	224	190	172	163	155	155	148	*-40%*
Normandie	24	58	61	60	54	53	51	51	51	51	*113%*
Nouvelle-Aquitaine	168	174	175	174	185	191	188	188	188	188	*12%*
Occitanie	189	190	191	188	172	170	163	163	163	163	*-14%*
Pays de la Loire	264	276	276	276	276	276	270	270	270	276	*5%*
PACA	1062	1075	1083	1085	952	1063	948	950	950	950	*-11%*

Source: Agreste - Statistique Agricole annuelle - (Annual Farm statistical data)

Based on Agreste statistics on the evolution of cut flower areas (covered and open ground), the main cut flower production basin remains PACA region (42.5% of French cut flower area), despite a - 11% decrease over the 2010-2019 period. To a lesser extent, Pays-de-la-Loire (12% of French cut flower area), Nouvelle-Aquitaine (8%) and Occitanie (7%) are also cut flower producing regions.
French cut flower area decreased by - 8% over the 2010-2019 period. According to FranceAgriMer key figures for ornamentals production, 2019 (table 3), cut flower sales value decreased by - 35% over the 2013-2019 period.

Table 20 : Evolution of potted and green plant areas in French regions over the 2010-2019 period (in ha)

Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	*19\10*
France	**2103**	**2165**	**2174**	**2135**	**2154**	**2156**	**2122**	**2108**	**2015**	**2020**	***-4%***
Auvergne-Rhône-Alpes	255	254	254	253	253	253	255	255	201	201	*-21%*
Bourgogne-FrComté	109	101	101	99	100	100	99	99	95	95	*-13%*
Bretagne	77	77	77	76	77	77	76	76	72	72	*-6%*
Centre-Val de Loire	96	96	96	96	96	96	96	89	89	89	*-7%*
Grand Est	194	154	154	150	151	151	149	149	143	143	*-26%*
Hauts-de-France	266	263	267	268	270	268	263	261	249	250	*-6%*
Île-de-France	140	142	142	120	108	96	96	92	92	88	*-37%*
Normandie	100	171	176	168	169	168	166	165	159	159	*59%*
Nouvelle-Aquitaine	171	175	175	175	176	175	175	175	177	177	*4%*
Occitanie	211	211	212	210	214	213	211	211	202	202	*-4%*
Pays de la Loire	341	379	379	379	379	379	372	372	372	380	*11%*
PACA	143	142	141	141	161	180	164	164	164	164	*15%*

Source: Agreste Statistique Agricole annuelle - (Annual Farm statistical data)

Based on Agreste statistics on the evolution of potted and green plant areas (covered and open ground), the main potted and green plant production basin is Pays-de-la-Loire (19% of French potted and green plant area). Its production area increased by + 11% over the 2010-2019 period. Hauts-de-France (12% of French potted and green plants area), Occitanie (10%) and Auvergne-Rhône-Alpes (10%) are also potted and green plant producing regions, but all of them faced a decrease in producing areas over the 2011-2019 period.

French potted and green plant area decreased by - 4% over the 2010-2019 period. According to FranceAgriMer key figures for ornamentals production, 2019 (table 3), potted plant sales value decreased by - 16% over the 2013-2019 period.

Table 21 Evolution of bedding and perennial plant areas in French regions over the 2010-2019 period (in ha)

Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	*19\10*
France	**1865**	**1874**	**1886**	**1889**	**1808**	**1797**	**1778**	**1779**	**1748**	**1745**	***-6%***
Auvergne-Rhône-Alpes	273	268	268	268	265	265	265	265	242	242	*-11%*
Bourgogne-Fr.-Comté	92	88	88	90	86	86	86	86	85	85	*-8%*
Bretagne	62	62	62	63	60	60	60	60	59	59	*-5%*
Centre-Val de Loire	87	87	87	87	87	87	87	88	88	88	*1%*
Grand Est	183	222	222	223	214	212	211	211	207	207	*13%*
Hauts-de-France	120	121	127	129	123	121	120	120	119	119	*-1%*
Île-de-France	149	150	150	125	130	118	114	109	109	104	*-30%*
Normandie	66	103	108	130	126	125	125	125	123	123	*86%*
Nouvelle-Aquitaine	159	160	159	159	163	164	164	164	165	165	*4%*
Occitanie	166	165	164	166	161	158	158	158	157	157	*-5%*
Pays de la Loire	390	333	333	333	333	333	332	332	332	334	*-14%*
PACA	112	109	107	108	52	60	52	52	52	52	*-54%*

Source: Agreste Statistique Agricole Annuelle - (Annual Farm statistical data)

Based on Agreste statistics on the evolution of bedding and perennial plant areas (covered and open ground), the main bedding and perennial plants production basin is Pays-de-la-Loire (19% of French bedding and perennial plant area). Its production area decreased by - 14% over the 2010-2019 period. Auvergne-Rhône-Alpes (14% of French bedding and perennial plant area) and Grand-Est (12%) are also bedding and perennial plant producing regions. The Auvergne-Rhône-Alpes production area decreased by – 11% over the 2011-2019 period, whereas Grand Est production area increased by + 13%.

French bedding and perennial plant area decreased by - 6% over the 2010-2019 period. According to FranceAgriMer key figures for ornamentals production, 2019 (table 3), bedding, perennial and aromatic plant sales value decreased by - 9% over the 2013-2019 period.

1.6. Supply balance

1.6.1. Vegetable production

The following table[20] provides a global overview on the supply balance in tonnes for vegetables and for the main vegetable products. It is not possible to segregate the covered production. Details of the supply balance by product is presented in annex.

Concerning all vegetables together, the production and imports are high, whereas exports tend to be more limited. This situation illustrates the important producing capacity of France for some products, with self-sufficiency rates above 80%.

However, this situation varies significantly according to the production considered. For the most important productions, the open-air culture allows to implement mechanical agriculture, limit the use of human workforce (in comparison with covered agriculture), and produce important volumes. It is the case for cauliflower, that is open-air produced, and presents a self-sufficiency rate above 100%: there is more production than consumption in France. Regarding the main vegetables produced in open-air, the self-sufficiency rate tends to be higher, and varies from 86% (carrots) up to 125% (cauliflower).

Concerning covered vegetables, the self-sufficiency rate varies from 51% in 2018 (strawberry) to 74% (salads: lettuce and chicory). These figures underline the dependence of the French market on imports. The important dependence of France in the sector of covered vegetables is related to important production costs in the sector, in comparison with other countries: labour cost, cost of energy in heated systems, etc.

Table 22 Supply balance of vegetables in France (tonnes)

		2014	2015	2016	2017	2018	2018/ average 14-17
Production	(1) Harvested area (ha)	232 214	229 187	234 061	241 899	243 616	4,0%
	(2) Yield (t/ha)	24	24	23	24	22	-4,7%
	(3) Harvested volumes (t)	5 449 442	5 423 192	5 471 174	5 698 147	5 459 427	-0,9%
Trade	(4) Exports (t)	1 019 709	1 067 956	1 056 884	1 050 647	977 000	-6,8%
	(5) Imports (t)	1 865 736	1 869 606	1 953 263	1 894 303	1 945 000	2,6%
	(6) = (4)-(5) Balance (t)	- 846 027	- 801 650	- 896 379	- 843 656	- 968 000	
(3)-(6) Apparent consumption		4 603 415	6 295 469	6 224 842	6 367 553	6 541 803	6 427 427
(3) / ((3) +(5)-(4)) Self-sufficiency rate		87%	87%	87%	86%	87%	85%

Source: Les chiffres-clés de la filière fruits et légumes frais et transformés, FranceAgriMer, 2018 (Key figures for the fresh and processed vegetable marketing chain).

[20] Supply balance of Fruits and Vegetables, FranceAgriMer, 2019

1.6.2. Ornamental plants

According to FranceAgriMer horticultural competitive intelligence[21], the French ornamentals, floristry, and landscape sector consists of 53,000 specialized companies. It generates 170,000 jobs and a EUR 14,8 billion cumulated turnover, out of which only 1,6 billion for the production stage, most of the sales are made at retail stage and by the landscape companies, it includes living ornamentals products but also any kind of related articles (tools, fertilizers, chemicals, …). Table below presents the sales breakdown according to each stage.

Table 23 Sales value in ornamentals' sectors in 2019

Stage	Turnover (EUR billion)
Production	**1,6**
Distribution	**7,1**
out of which wholesale trade	*0,8*
out of which florists	*1,7*
out of which garden centres	*2,9*
out of which non-specialised distribution	*1,7*
Services - landscape companies	**6,1**
TOTAL	***14,8***

Source: FranceAgriMer

This sector's activity mainly concentrates on the domestic market, which is one of Europe's most important outlet. Indeed, France is characterised by a high per capita consumption and a large population. In 2019, overall household purchases of ornamental plants tended to maintain with 76% of households having purchased at least one plant (21.5 million households), and the activity of landscape entrepreneurs increased by + 3.5%.

However, the French production is not sufficient to satisfy its domestic market, and faces high competition from other EU countries, like the Netherlands (63.4% of French imports in 2019), Belgium (12.1%), Italy (7.6%) and Spain (5.2%). It is estimated, depending on the share of re-exported imports, that 28% to 30% of the plants consumed in France are produced abroad.

Based on FranceAgriMer supply balance[22], French trade balance in live plants and floricultural products is very unfavourable. In 2019, imports of live plants and floricultural products represented EUR 979.7 million against EUR 67.9 million of exports, trade balance deficit being 911.8 million euros.

Compared to 2018, the trade balance deficit increased by + 3%, with different evolutions according to plant categories. Outdoor ornamental plants and indoor plant trade balance deficit increased, whereas trade deficit in bulbs, fresh cut flowers and foliage decreased between 2018 and 2019.

21 FranceAgriMer, veille concurrentielle horticole 2018

22 FranceAgriMer, Commerce extérieur des produits de l'horticulture ornementale – Bilan annuel 2019

Table 24 Evolution of exports, imports, and trade balance over the 2017-2019 period (in million euros)

	EXPORTS			IMPORTS			TRADE BALANCE		
	2017	**2018**	**2019**	**2017**	**2018**	**2019**	**2017**	**2018**	**2019**
Bulbs	6,9	5,7	6,3	99,2	100,7	100,6	-92,4	-95,0	-94,3
Outdoor ornamental plants	32,4	39,5	37,4	244,3	249,4	267,1	-211,9	-209,9	-229,7
Indoor plants	6,8	7,6	7,9	257,0	263,9	281,6	-250,2	-256,3	-273,6
Fresh cut flowers	10,7	11,0	10,3	294,0	294,3	290,9	-283,3	-283,4	-280,5
Fresh foliage	3,3	4,9	6,0	37,2	43,3	39,6	-33,9	-38,4	-33,6
Tot fresh flowers and ornamental plants	**60,1**	**68,7**	**67,9**	**931,7**	**951,6**	**979,7**	**-871,6**	**-882,9**	**-911,8**

Source: FranceAgriMer, Foreign trade in ornamental horticultural products - Annual review 2019

In 2019, the deficit in trade balance mainly concerned cut flowers (30.8% of the total trade deficit), indoor plants (30%) and outdoor ornamental plants (25.2%).

Table 25 Exports, imports, and deficit value share of each plant category in 2019

	Export value share	Import value share	Deficit value share
Bulbs	9,3%	10,3%	10,3%
Outdoor ornamental plants	55,0%	27,3%	25,2%
Indoor plants	11,7%	28,7%	30,0%
Fresh cut flowers	15,2%	29,7%	30,8%
Fresh foliage	8,8%	4,0%	3,7%

Source: FranceAgriMer, Foreign trade in ornamental horticultural products - Annual review 2019

Based on FranceAgriMer horticultural competitive intelligence, the competitiveness of the French ornamental horticultural sector has improved since 2016, especially in terms of "ability of companies to conquer markets" and of "organization of the sector". Indeed, the distance between production and destination country of exports remained stable in France, whereas it tended to increase in other countries, and cooperation between production actors (commercial and logistics group) and vertical collaboration has developed.

In 2017, the French ornamentals, floristry and landscape sector adopted an action plan for the 2018-2022 period[23], with the aim of adapting to market evolutions, reviving sales value, and boosting the sector. The four following axes have been identified to tackle these issues:

- Respond to the requests and expectations of the citizen consumer,
- Create preference to reduce the commercial deficit and give added value to the sector's products and services,
- Improve the sector's competitiveness factors,
- Improve the companies' competitiveness.

The plan was elaborated in response to the 2017' new government impulse that asked each interbranch association in agricultural universe to elaborate a strategic plan (it was one of the principles of the so called Etats Généraux de l'Alimentation EGA meeting). In principle, all professions constituting the marketing chain (see part 2.2) are involved in the implementation of this program. Monitoring of the action is run by Val'Hor, the Interbranch Association, but no review has been yet published.

[23] Val'Hor, Plan de la Filière Française de l'horticulture, de la Fleuristerie et du Paysage

1.7. Part 1 main findings

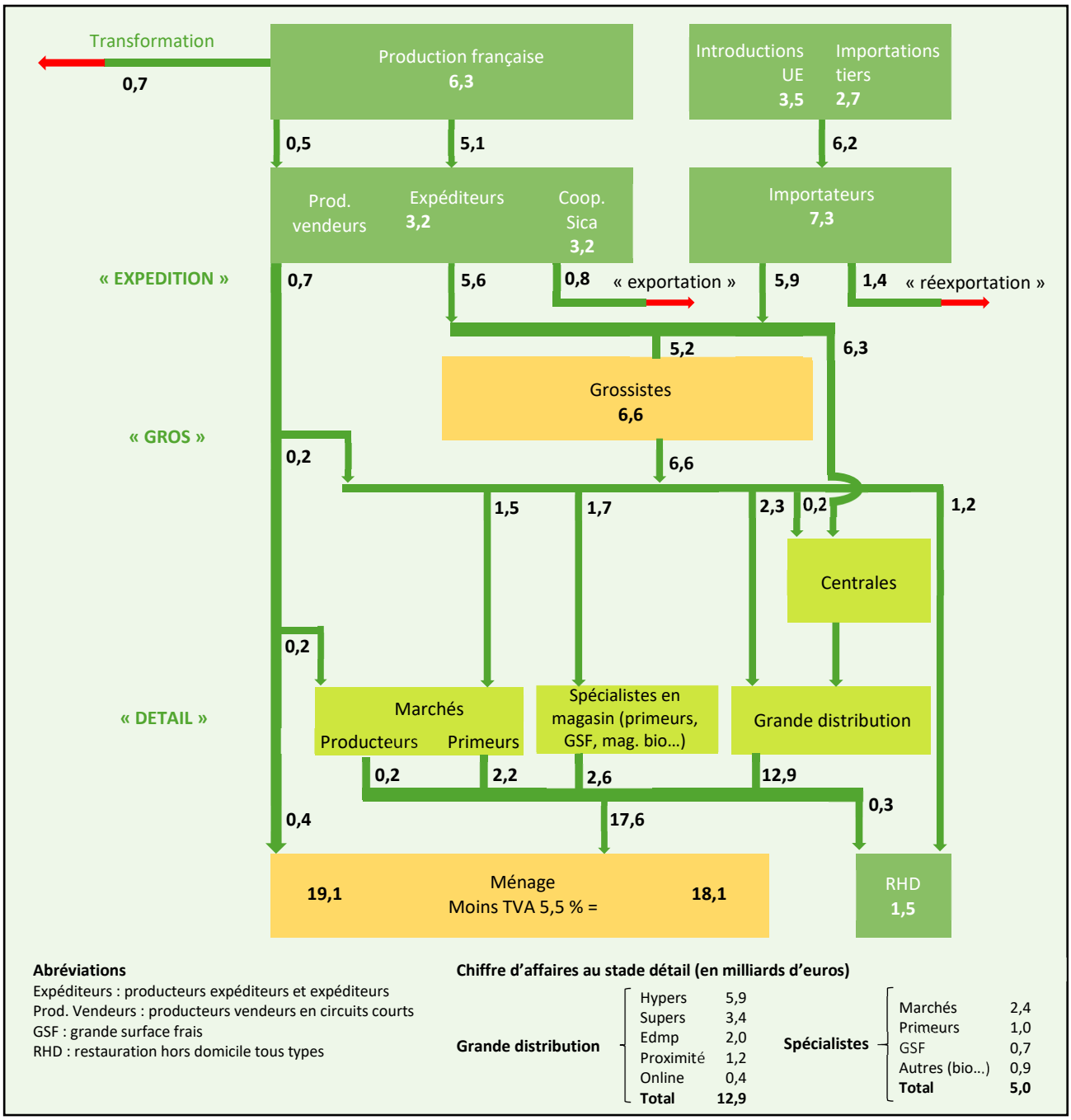
- ✓ **Total area of cultivation covered by greenhouses or high cover represented 10 300 ha in 2016 (among which 8 380 ha in vegetables and 1 140 ha in ornamentals). This area showed a -8% decrease on the 2013-2016 period (following the decrease in the number of farms). Five main regions with covered agriculture are: Provence-Alpes-Côte d'Azur (2 150 ha in 2016), Occitanie (1 660 ha in 2016), Nouvelle-Aquitaine (1 500 ha in 2016), Pays-de-la-Loire (1 270 ha in 2016), and Brittany (1 050 ha in 2016). The evolution of covered areas was heterogeneous between regions: important decrease in Provence-Alpes-Côte d'Azur and Centre-Val de Loire; important growth in Pays-de-la-Loire and Occitanie.**
- ✓ **Average age of installations in 2011 was 19 years for vegetables and 21 years for ornamentals. In 2016, the oldest installations observed in the tomato and cucumber sector were localized in the North-East area and concerned glass greenhouses. Most recent heated greenhouses were in Brittany and the South-West region. From 2016 until now some new greenhouses were built, mostly with a cogeneration heat technology, but larger projects are often delayed by legal procedures.**
- ✓ **Tomato, and strawberry account for 77% of the national covered vegetable production. Tomato production is concentrated in Brittany, Provence-Alpes-Côte d'Azur, Occitanie and Nouvelle-Aquitaine. Strawberry production is more developed in Nouvelle-Aquitaine, Centre-Val de Loire, and Provence-Alpes-Côte d'Azur.**
- ✓ **Main ornamental covered products are potted and bedding plants. Most dynamic ornamental production basin is the Maine-et-Loire department (in Pays-de-la-Loire region), which concentrates more than 20% of the French ornamental covered area.**
- ✓ **The French production of covered vegetables is variable from year to year. In 2019, the volumes of production have decreased by -3% in comparison with 2010. However, the trend evolution shows a global stability of the covered vegetable production. Product policy based on certification and differentiation allows main French producers' groups to control the high-end segments of the market.**
- ✓ **Financial output for covered vegetables increased over the 2015-2019 period but with fluctuation. However, despite higher prices, the reduction of production volumes from 2015 to 2019 has led to a decrease in tomato and strawberry production value.**
- ✓ **In the ornamental sector, production turnover remained stable over the 2017-2019 period.**
- ✓ **The self-sufficiency rate of French vegetable production is lower for covered vegetables (51% in 2018 for strawberries, to 70% for tomatoes) than for vegetables produced in open-air.**
- ✓ **Despite being one of Europe's most important outlet French trade balance in live plants and floricultural products is very unfavourable (EUR 979.7 million for imports; EUR 67.9 million for exports).**

2. SECTORAL DESCRIPTIONS

2.1. Fresh Vegetable industry

The fresh vegetable marketing chain is part of the fruit and vegetable marketing chain because many wholesale companies are involved in both kinds of products' production and marketing. Even some farmers may be involved in both marketing chains.
From farm to fork, one can distinguish 4 stages in the chain: production, wholesale in production basins (or shipping in French: 'expedition)', wholesale in the consumption area (distribution B2B, in French: 'gros'); and retail.

Figure 7 French Fruit and Vegetable marketing chain (flow sheet) - 2018



Source: CTIFL

Such an analysis does not exist at species level. The general scheme gives a picture of the importance of different types of actors.
The resilience of the wholesale companies must be underlined. In most French food marketing chains (meat, milk, etc), wholesale companies have only a residual market share. Thanks to the technical characteristics of the fresh fruit and vegetable distribution chain, to the resilience of the main physical wholesale market places (Marchés d'Interêt National - markets of national interest) in Rungis-Paris, Lille (Rijsel), Toulouse, Marseille, Nice, Nantes, Strasbourg, to the resilience of independent specialised retailers, to the importance of the catering market(in French: RHD), and to range enlargement to other products such as fresh fish, fresh processed meat, dairy products, wholesale companies have managed to overcome competition against the integrated platforms of the mass retail companies.

2.1.1. Production stage: microeconomics approach

This stage is partly described in the first part of the study: surfaces, regions, outputs, trade and commercial balances. The present paragraph focuses on economic analyses.

The first source is the Result of the FranceAgriMer' "observatory of the French vegetable farm"[24] which was an annual study of the financial results of the vegetable farms. It includes a typological analysis. This distinguishes two kinds of covered vegetable production: cold houses and heated houses. The last edition, in 2013 reported about the 2012 results. Despite the date, this analysis, based on the real results of 441 farms, still provides some interesting views.
It distinguishes 6 types of specialised vegetable farms: 1) witloof producers; 2) Producers in Greenhouses (in French: Serristes); 3) Vegetable producers with cold houses (in French: Maraîchers[25] avec abris froids); 4) Open air vegetable producers (Maraichers de plein air); 5) Producers in open fields (Producteurs de plein champ); 6) Mechanised production.

The results of the 'serristes' were the best among the 6 types' results, with a '*net margin / AWU'*[26] of 5114 EUR, when most of others farm types recorded negative results.
Description of the average 'serriste' farm is as follows.

–Table 26 Average characteristics and results of greenhouse' farms (Serristes) in 2012

ITEM	Data	Unit
Surface (out of which vegetable)	8,30 (3,14)	ha
Covered surface	2,6	ha
AWU	15,6	People
Revenues	1 160 949	euro
Expenses	1 082 320	euro
Net margin	76 629	euro
Family income*	102 738	euro
Net capital assets	561 148	euro

(*) Net margin plus estimated family salaries.
Source: Observatoire des exploitations légumières – FranceAgrimer 2013 – Farms included in the sample have the following average profile : 2.4 ha of high covered and heated greenhouse, producing tomat, strawberries, cucumber.

According to the study, 2012 was a good year, with average yields but good prices. Most of the farms analysed through this sample are in 3 regions (Brittany, 49%, Aquitaine 26%, Pays de la Loire 13%). In

[24] FranceAgriMer « Observatoire des exploitations légumières » résultats 2013 – December 2013
[25] The word « maraîcher » comes from the word « marais » (swamp). Traditionally, this kind of area is suited for the vegetable cultivation. A "maraicher" is, traditionally a vegetable producer with a limited area who grows a large range of species and, in most cases, who directly sells his production to consumers.
[26] AWU: Annual Work Unit.

the statistical description we noted that covered production has been growing in these territories. Main products are tomato, cucumber, and strawberry.

Breakdown of expenses was as follows: salaries 29%, family labour 4%, purchases 39%, housing and machines 14%, others 13%.

Another farm type is interesting, concerning covered production: 'maraichers avec abris froids' (vegetable producers with cold houses).

Table 27 – Average characteristics and results of vegetable producers with cold houses in 2012

ITEM	Data	Unit
Surface (out of which vegetable)	10,04 (5,6)	ha
Covered area	3,62	ha
AWU	5,2	People
Revenues	318 402	euro
Expenses	311 909	euro
Net margin	6 492	euro
Family income*	31 062	euro
Net capital assets	268 769	euro

(*) Net margin plus estimated family salaries.
Source: Observatoire des exploitations légumières – FranceAgrimer 2013

Breakdown of expenses was as follows: salaries 24%, family labour 11%, purchases 28%, housing and machines 19%, others 18%.

Farms included in the sample are in Languedoc Roussillon (nowadays, eastern part of Occitanie, the main vegetable department is Pyrénées Orientales, Chief place: Perpignan), other territories are Pays de la Loire and Aquitaine. The main products are salads, melons, tomatoes, and strawberries.

A more recent analysis run in 2018 by the Angers regional office of the main farm accountancy company (CER – Centre d'économie rurale) gives references for local vegetable farms, whose profile is comparable to the "maraichers avec abris froids" type. It shows that, between 2012 and 2017, the net income by familial AWU fluctuated from 18 600 EUR (2014) to 33 600 (2017). This peak reflects a growing trend in vegetable prices (see figure one page 22). [27] Another regional analysis, drawn up by CER Occitanie[28] gives similar average results in 2018 for a sample of 145 farms. (Surface: 8 ha, 4,2 AWU out which 1,4 are family workforce; revenues: 240 000 EUR, net result: 29 180 EUR).

Another source, the annual FADN (Farm accountancy data network, run by EU Commission' DG Agri and national authorities) standard results, provides more recent and precise data, based on less precise farm types. The last edition, in January 2020, presented the 2018 national results[29]. Farm types '2800 maraîchage' include all categories of farms in which vegetables are the main production, without any distinction regarding covered or open-air cultivation. The table below offers a selection of economic and financial ratios from this yearly analysis.

27 CER France Maine et Loire. Résultats économiques 2017.

28 CER France Occitanie – Agriscopie Edition 2020

29 Agreste – Chiffres et données – Janvier 2020, n°1 – Rica France – Tableaux standards.

Table 28 FADN DATA for farm type '2800 Maraîchage' in 2018

DESCRIPTION			RESULTS		
ITEM	data	Unit	ITEM	data	Unit
Representativity	4 913	number of farms	Revenues	355 890	EUR
AWU	4,68	number of AWU	Expenses	301 210	EUR
out of which family AWU	1,47	-	*out of which labour*	73 900	EUR
Surface	13,27	UUA in ha	*out of which energy*	30 530	EUR
out of which irrigated	1,88	UUA in ha	*out of which depreciations*	34 770	EUR
out of which dedicated to vegetables	5,94	UUA in ha	Operating result before tax	52 680	EUR
out of which in open air	4,28	UUA in ha	Family income	45 250	EUR
out of which covered	1,42	UUA in ha	Net capital assets	199 130	EUR
Open field	0,03	UUA in ha	Debts	197 100	EUR

Source: AND international from Agreste RICA France 2020 Tableau Standard – See complete table in Annex

This table gives a picture of specialised vegetable production in France, with:

- 24% of covered surfaces.
- Important labour expenses (21% of total revenues).
- Low family incomes (30 782 EUR / family AWU), this amount includes social security expenses).
- A high level of capital assets (56% of revenues)
- A sustainable but rather high level of debts (4 years of cash flow)

Of course, the national average results hide huge differences from one farm to another. We have seen that some production basins offer more opportunities to farmers, for instance, covered tomato production offered important opportunities of development, until 2019, in Brittany and Pays de la Loire, as well as organic vegetable production wherever in France, during all the 2010s and still in 2020 and 2021. These examples reflect accurate production choices. French tomato range is large and unique in Europe, by the end of 2021 all covered tomato farms and producers' organisations involved in the Alliance Nature et Saveurs (Nature and Savour Alliance) will be certified HVE level 3 and be in capacity of producing 100% of fruits without pesticide or without pesticide residue. This matches consumers' expectation and gives an opportunity for higher prices. It works the same with the organic market. From 2008 to 2020, French organic market grew steadily (with a two digits rate, almost every year), it may reach the first rank in the EU in 2021 and exceed the German market. (See annexe 5.8)

2.1.2. Wholesale stage: importance and characteristics

-2121- Importance and characteristics.

According to the official data (INSEE[30] ESANE[31]), there are 2 789 companies in the fresh fruit and vegetable wholesale sector, generating a EUR 19.6 billion annual turnover in 2018 and employing almost 26,000 people.

This large universe includes different types of companies: Co-operatives owned by producers, small family-owned companies involved in shipping products from production basins to metropoles, importers (from third countries or from EU countries), companies specialised in potato packing and shipping, wholesalers located in physical markets, wholesalers located outside physical marketplaces, integrated platforms of mass retailing companies.

Three national networks of distribution control a large part of the wholesaling activity. The oldest one is the Pomona Group, family owned, with integrated local branches, the largest is Vivalya which groups 25 family-owned companies in a co-operative network, the third largest is Creno, which is also a group

[30] Institut National de la Statistique et des Etudes Économiques. (National institute for statistics and Economical studies).

[31] https://www.data.gouv.fr/fr/datasets/statistiques-annuelles-d-entreprises-esane/

of independent companies. Beside these three general networks, well suited to furnishing integrated networks of restaurant chains, totally independent companies find opportunities in specialization (by products such as condiments, mushrooms, high end or luxury fruits, summer fruits, etc.).

According to a CTIFL publication[32] based on statistical analysis of companies' annual reports we can summarize average financial characteristics of the different types of companies.

Table 29 Financial characteristics of fruit and vegetable wholesale companies in 2017

	Unit	Shippers	Cooperatives	Importers	Wholesalers
Number of analysed companies		186	104	108	366
Average turnover	1000 EUR	11 400	53 500	24 300	19 900
Commercial margin	% of Turnover	19,5%	13,1%	14,6%	19,70%
Added Value	% of Turnover	8,3%	4,1%	6,7%	12%
Labour cost	% of Added value	71,0%	90,4%	63,8%	73,40%
Operating result	% of Turnover	1,8%	0,4%	2,1%	2,00%
Cash flow	% of Turnover	1,9%	0,4%	1,4%	2,10%

Source: CTIFL, opus mentioned.

It appears that the average size of companies is very low, especially in the shipping sector, where there is no big family-owned organisation. Co-operatives are important bodies, with an average sales value of EUR 53 million, hiding huge differences, from large scale co-operatives in Brittany (Sica Kerisnel); Normandy (Agrial Group), and Occitanie (Blue Whale Group) to small clubs of producers, with annual sales less than EUR 2 million worth.
A similar phenomenon can be seen in the importing sector, with small companies, for instance in the Marché St Charles in Perpignan (Occitanie) near the Spanish border, and some very large companies, such as Compagnie Fruitière, based in Marseille, integrating production unit in Western Africa, transport facilities and wholesale units in France, Spain, Portugal, Italy, Belgium, the Netherlands, and Hungary.

2.1.3. Wholesale stage: Main companies

A table in annex 5.13 presents key data for 30 companies known as the biggest of the fresh fruit and vegetable industry. An appendix will complete this table with a list of other companies (from the 31st to the hundredth ranks).
What are the findings:

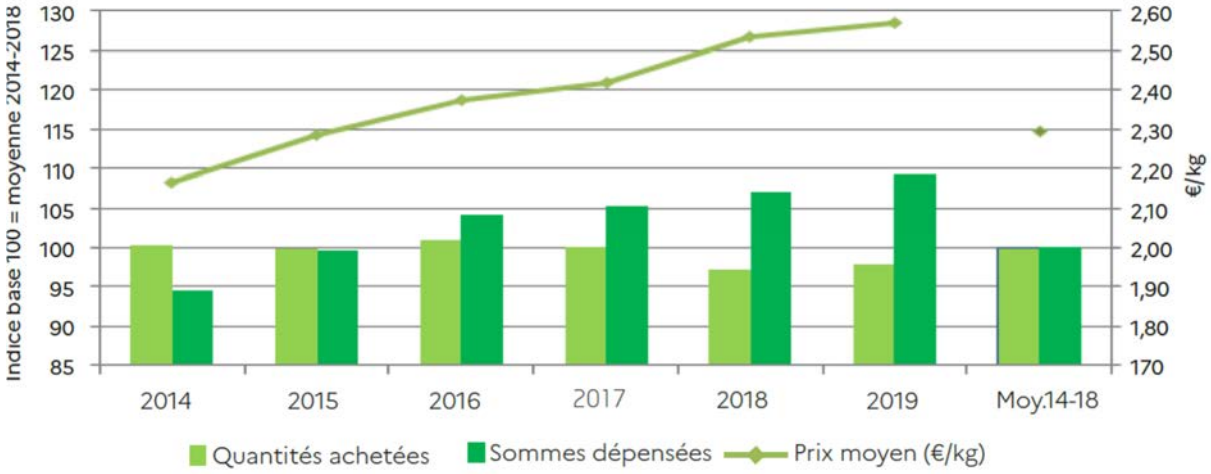
- Very diverse companies hold the first ranks in this industry: wholesalers, importers, co-operatives.
- Northern significant French vegetable basins (Brittany, Hauts-de-France, Normandy) have generated two important groups of cooperatives (Arcal-Prince de Bretagne, Savéol, Agrial, Perle-Union). This reflects the result of a long consolidation process that has led many family-owned shipping companies to be sold to co-operatives or to disappear.
- The covered vegetable production is present through 4 co-operative groups, involved in tomato, strawberry, and cucumber production: Arcal-Prince de Bretagne, Savéol, Océane and Rougeline). This structure reflects the changes that have occurred over the last ten years: the renewing of covered production, through new or modernised greenhouses and varietal segmentation policies (especially in tomato and strawberry production). Despite this process, French greenhouses are significantly smaller (surface and height) and older than Dutch ones.

[32] Observatoire des entreprises de gros et d'expédition des fruits et légumes frais en France. Années 2015-2017 – Mai 2019 (Observatory of fresh fruit and vegetable wholesale companies in France)

2.1.4. Retail stage

According to Kantar world panel and to figure 6 hereunder, French households' expenses for fresh fruit, vegetables, and potatoes have been increasing since 2015. Simultaneously, quantities have been reducing. These opposing trends are explained by a rise in the average price. What are the reasons of these changes? First, a general trend to higher prices in this sector, second, the development of market varietal segmentation (tomatoes, strawberries, apple, potatoes, witloof, …), and third, a huge growth of the organic market, followed by an increasing offer in certified products (zero pesticide, 'eco-responsible' and now, HVE).

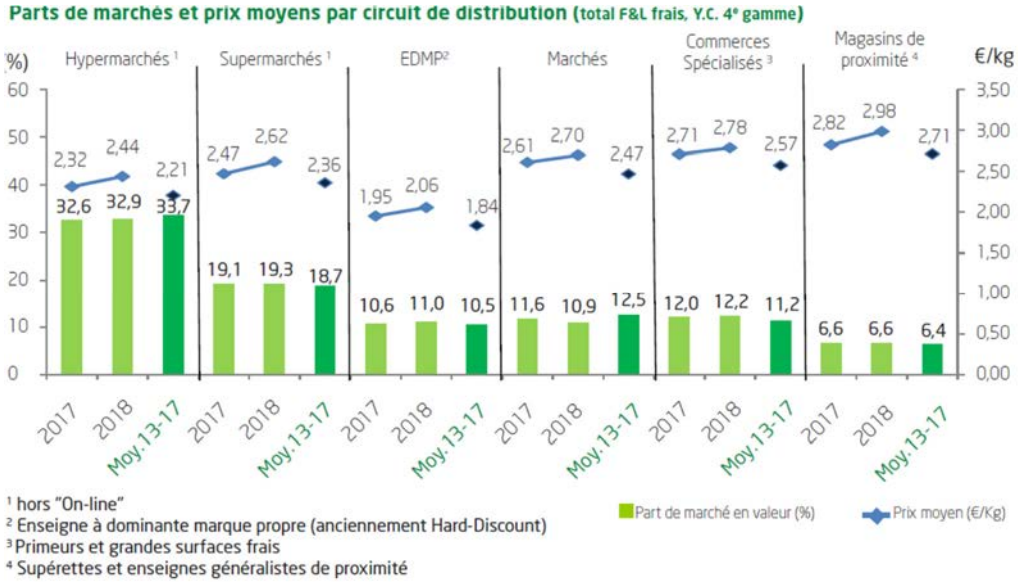
Table 30 Trends in household consumption (index and average price).



Index 100: 2014-2018 average. Sales in quality. Sums spent - Average price (EUR/kg)
Source: Kantar World Panel / FranceAgriMer

FranceAgriMer disseminates KantarWorldPanel results. It offers an image of the importance of the main distribution channels.[33]

Table 31 Main distribution channels. (market shares and average prices according to distribution channels)



33

https://www.franceagrimer.fr/content/download/62829/document/Achats%20de%20fruits%20et%20l%C3%A9gumes%20frais%20par%20les%20m%C3%A9nages_%20Donn%C3%A9es%202018.pdf

Mass retailers dominate the market, especially hypermarkets (surface > 2 500 m2), but recent trends show that their market shares are declining. Conversely, the supermarket (surface between 400 and 2 500 m2) market shares are growing, as well as those of Hard Discounters (Lidl and Aldi), and those of convenience stores (*magasins de proximité*). Traditional channels (markets, small sized specialised shops) did not take advantage of the changes.
Kantar World Panel data do not give a good image of growing channels: direct sales and organic shops. The organic fruit and vegetable market accounts for 8,2% of the total household consumption in 2019 (source: Agence Bio). The market shares of this specific segment are as follows: mass retailers: 35%; organic shops: 43%; direct sales: 22%; traditional shops: 1%.

2.2. Ornamentals and nursery industry

The French ornamentals and nursery industry is characterised by a high diversity of professions and products, and a high level of employment (170 000 jobs). More than 53 000 companies are specialized in the production, use, or sale of plants. They generate 14 billion euros of turnover (this figure includes the landscape sector, which represents a turnover of 6.1 billion euros; production just accounting for 1.6 billion euros of turnover)).
Four specialised activity branches can be distinguished, with specific characteristics and distribution channels at each level:

- cut flowers and foliage,
- potted and bedding plants,
- nursery plants,
- flower bulbs.

2.2.1. Production stage

Based on FranceAgriMer Observatory of structural data of ornamentals and nursery companies, there were 2 926 ornamentals and nursery companies in 2019 at production stage, which employed 16 581 FTE, and generated 1.42 billion euros of horticultural turnover.

-2211- Economic analysis of the sector

Based on FranceAgriMer Observatory of structural data of ornamentals and nursery companies, the horticultural turnover remained constant over the 2017-2019 period, and the average horticultural turnover increased by 6% each year over the same period.

Table 32: Comparison of main socio-economic indicators (2017-2019)

Main indicators	2019	2017	2015	2013	2017 – 2019 evolution	Average annual evolution
Number of companies	2 936	3 308	3 678	4 154	-11,2%	-5,6%
Horticultural turnover (1000 €)	1 418 953	1 417 289	1 435 917	1 584 970	0,1%	0,1%
Production turnover (1000 €)	1 178 106	1 237 841	1 254 945	1 318 841	-4,8%	-2,4%
Average horticultural turnover (1000 €)	483	428	390	382	12,8%	6,4%
Total surface (ha)	15 043	16 152	16 661	16 630	-6,9%	-3,4%
Total employment (FTE)	16 581	18 274	19 901	21 224	-9,3%	-4,6%

Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

In 2019, the total turnover of the sector was **1.6 billion euros**. 11.2% of the total turnover was composed of activities other than plant sales (other agricultural products, sales of service, …). Trading (purchase from French producers or from foreign producers) accounted for 15% of the horticultural turnover.

Table 33: Turnover breakdown in 2019

Total turnover breakdown (2019)	%	Value (1000 €)
Sales of ornamental plants	88,8%	1 418 953
- Including own production	73,7%	1 178 106
- Including trading	15,1%	240 847
Sales of other agricultural products	5,4%	87 002
Sales of garden centre items	1,8%	29 193
Sales of green spaces services	2,3%	35 994
Others	1,7%	27 077
TOTAL	**100,0%**	**1 598 218**

Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

FranceAgriMer financial Observatory, run by CER France, provides data based on a constant panel of 299 companies of the sector. The table below offers a selection of economic and financial ratio from this yearly analysis.

Table 34: Financial situation by category of producer in 2018

ITEM	Outdoor Nursery	Off-ground nursery	Ornamentals (potted and bedding plants)	Cut flower
AWU	5	3.9	4.6	2.5
out of which family AWU	*1.6*	*1.4*	*1.4*	*1.2*
Surface (ha)	28	NA	NA	NA
Out of which covered area (m²)	*NA*	*6 000*	*2 700*	*4 400*
Average turnover (euros)	404 800	309 500	382 700	193 000
Operating expenses (euros)	126 100	112 600	150 600	86 300
Gross margin (euros)	271 000	189 000	224 600	105 300
Added value (euros)	188 300	148 100	162 000	75 500
Labour costs (euros)	120 200	81 200	79 900	37 000
Operating result before tax (euros)	63 600	51 600	69 400	31 800
Family income (euros)	38 900	30 700	48 400	18 800
Net capital assets (euros)	11 400	-4 000	5 700	-7 600

Source: FranceAgriMer financial Observatory, 2018[34]

The following trends can be observed on the companies of the panel:

- Phase of business development for outdoor nursery and ornamentals companies, with reasonable expense and increase of improved profitability.
- Sharp rise in investments and small improvement in turnover for off-ground nursery companies
- Improvement in the market but still low profitability and low investments for cut flower producers.

-2212- Markets by geographical area

The geographical area of influence of French producers is slowly evolving and remains generally oriented towards local (sales on the farm or within a radius of 10 km) and regional markets (sales within radius of 200 km). In 2019, these markets represented about two-thirds of plant sales value.

[34] The overall sample consists of 299 companies with: 171 ornamentals companies (potted and bedding plants) 96 nursery companies (64 in outdoor nursery, 32 in off-ground nursery) 32 cut flower companies.
The marketing methods are distributed as follows: 43% in direct sales (on farms, outdoor markets), 27% to retailers (garden centres, supermarkets, florists), 12% to local authorities and landscape companies, 18% to wholesalers.

Shipping sales over 200 km accounted for less than 30% of sales value, and export for just over 5% of sales value.

Table 35: Evolution of sales by geographical zone between 2015 and 2019 (in value)

Market zones	2019	2017	2015	2013	2019/2017
Local (10 km)	483 753	461 232	478 882	558 626	4,9%
Regional (200 km)	472 007	485 223	478 950	531 301	-2,7%
France (over 200 km)	380 696	392 289	398 766	409 876	-3,0%
Intra-EU sales	68 224	66 670	71 145	72 013	2,3%
Export to third countries	14 273	11 875	8 173	13 155	20,2%

Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

As presented in table 35, **most ornamentals companies are small sized family-owned companies with low turnover and low family income**. In 2019, 32.4% of the sales were local, within a 10 km radius, and 34.2% were regional, within a 200 km radius. In 2019, 58% of producers sold most of their production on their farm (small local shop), on outdoor markets, or by mail-order.

-2213- Markets by channel

The overall outlet by market segment evolved slowly over the 2013-2019 period. Retail sales on farms, outdoor markets and by mail-order remained ornamentals nursery companies' main outlet in 2019 (25.7% of horticultural turnover; 58% of producers) but decreased by 1 point over the 2017-2019 period.

In 2019, other main outlets were garden centres (23% of horticultural turnover), other producers (13.7% of sales), and wholesalers of flowers and plants (12% of horticultural turnover).

Table 36: Sales value (in 1 000 €) by channel over the 2013-2019 period

Sales breakdown by channel (1 000€)	2019	2017	2015	2013	2019/2017
Private individuals	355 055	366 069	389 053	429 522	-3,0%
Wholesalers (1)	170 711	150 022	159 190	199 425	13,8%
Florists (2)	60 083	49 994	49 663	70 035	20,2%
Garden centres	321 472	328 442	315 699	343 774	-2,1%
Supermarkets	115 804	118 540	118 104	135 729	-2,3%
Producers	194 284	204 169	198 182	196 475	-4,8%
Landscape companies	104 990	97 988	99 760	109 305	7,1%
Local authorities	86 355	93 605	98 516	100 707	-7,7%
Mail order and internet	10 198	8 460	7 749	2 312	20,5%

(1) The significant increase in sales to wholesalers was due to the introduction of retail collective marketing structures (cooperative or private) in the survey "Wholesalers group".

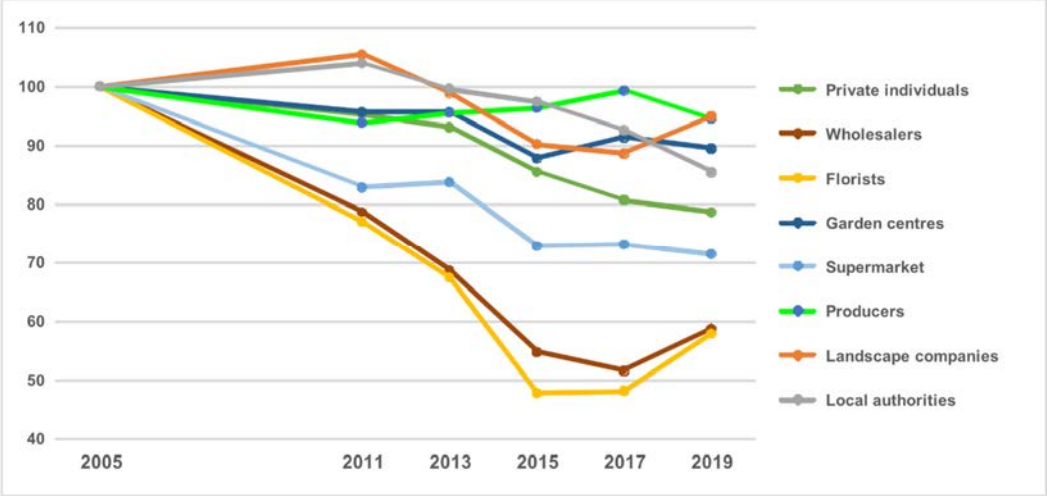
(2) The significant increase in sales to florists was due to a growth of the trading activity of a few producers-wholesalers of cut flowers.

The analysis of trends over a long period shows a sharp decline in wholesale and florist circuits until 2017.

Sales to supermarkets and to private individuals, show a less significant decline (respectively -28% and -20% since 2005).

"Producers" (fruit tree growers in particular), "Garden centres" and "Landscape-companies" are the outlets which held up best over the 2005-2019 period, with decreases in value of 5 to 10% since 2005.

Figure 8: Plant sales evolution by marketing channel over the 2005-2019 period (index base 100 = 2005)



Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

-2214- Strategic market segments

FranceAgriMer Observatory of structural data of ornamentals and nursery companies identifies six typological groups corresponding to distinct positioning and markets:

- **The group of producer-retailers (Prod-Retailers), selling most of their production (at least 60%) directly to individuals, most often on the farm or on open-air markets.**
- The group of producers selling to other producers (Prod-Producers); multipliers of young plants selling to finished plants producers; and fruit nurseries selling to arboriculturists.
- The group of producers selling on the landscape and public authorities' market (Prod-Landscape). This group is made up of nurserymen selling to landscape companies and public authorities, but also producers of forest plants (including poplars) on the reforestation market.
- The group of producers selling to specialised distribution (Prod -Spec. Dist), selling a major part of their production to florists, wholesalers, garden centres.
- The group of producers selling to large and medium-sized retailers (Prod-Supermarkets), selling most of their production to food and DIY superstores.
- The group of growers selling to specialised wholesalers (Prod-Wholesalers), selling most of their production to flower and plant wholesalers.

Each company is assigned to a group according to the market segments in which it is predominantly present (as a rule, more than 60% of the horticultural turnover, with some trade-offs on lower values for multi-market companies).

The table below shows the distribution of French production companies in these different groups in 2019.

Table 37: Distribution of French production companies in these typological groups in 2019

	Companies		Horticultural turnover		
	Number	%	1000 €	%	% trading
Prod-Retailers	1 701	57,9%	361 478	25,5%	20,2%
Prod -Spec. Dist	396	13,5%	505 055	35,6%	12,9%
Prod-Wholesalers	358	12,2%	121 146	8,5%	12,2%
Prod-Landscape	258	8,8%	184 369	13,0%	24,5%
Prod-Producers	141	4,8%	154 354	10,9%	8,8%
Prod-Supermarkets	82	2,8%	92 550	6,5%	31,4%
TOTAL	2 936	100,0%	1 418 953	100,0%	17,0%

Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

The producer-retailer positioning remains predominant among French producers, with nearly 58% of companies (small and medium-sized businesses)

The group of growers working with specialised distribution occupies the first place in terms of the plant sales value. This group is mainly made up of medium and large companies, able to work with the purchasing centres of garden centre chains. It only includes 13.5% of companies but accounts for more than a third of the total horticultural turnover. This phenomenon of the critical size of companies is found among growers working mainly with supermarkets and producers of young plants and fruit plants whose economic weight is much greater than their share in the population of companies.

Based on FranceAgriMer financial Observatory run by CER France, the following trends by market segment were observed in 2018:

- In direct sales, turnover increased in 2018: this marketing method allows greater consistency of results than other outlets.
- End-distributor sales: companies are larger in average size. Their 2018 turnover increased moderately. This is where companies are the most important and most dynamic.
- Sales to wholesalers: in 2018, the sector finally seemed to emerge from difficult years. The activity and the profitability were on the rise again, resulting in better financial ratios.

-2215- Production stage – main companies

The following table presents key data for 17 companies known as the biggest of the ornamentals production.

What are the findings:

- Cooperatives and their subsidiaries hold the first ranks in this industry.
- Most of the biggest ornamentals' companies are in the Pays-de-la-Loire region, which is a traditional ornamentals production basin.
- Companies with most important covered areas mainly produce mixed horticulture (ornamentals and vegetables), lily of the valley, aromatic plants, and vegetable seedlings.

2.2.2. Distribution stage

Based on Val'Hor key figures, there were 18 932 companies in 2017 at distribution stage, which employed 58 455 FTE, and generated 7.1 billion of total turnover. This includes all kind of shops whit a ornamental department from garden centres to hypermarkets. Cut Flowers can be found in many kind of shops, including restaurants, corner shops, etc.

-2221- Wholesale trade

Based on Val'Hor "key figures for flowers and plants wholesalers", there were 337 wholesale companies in 2016. Cumulative turnover was estimated at **793.5 million euros** in 2016, with 52% in cut flowers, 19% in outdoor plants, 17% in flowered plants, 6% in green plants, and 5% in accessories.

In 2016, the Netherlands was the leading supplier of all products, especially green plants (75%) and cut flowers (68%). France was the main supplier of outdoor plants (45%); it represented 18.6% of wholesalers' supplies in cut flowers.

As regards outlets by channel, the florist traditional outlet was predominant in 2016 (55%). Garden centres constituted another significant outlet (15%) as well as supermarkets (10%). 80% of wholesalers' sales were made within a radius of 200 km, among which one third was made within 20 km.

Main wholesalers are listed in annex.

-2222- Retail trade

- Florists

Based on Val'Hor "key figures for florists", there were 14 096 florists in 2018. There was a strong decrease in the number of companies over the 2015-2018 period (-6.5%) compared with the 2013-2015 period (-1%).

The florists' turnover was **1.73 billion euros** (excluding taxes) in 2018. It decreased by 12% between 2015 and 2018. The decrease was 6% over the 2013-2015 period. According to Kantar study on French people's plant purchase in 2019, florists are the first circuit in value.

In 2018, the average basket of customers was 23 €. Cut flowers represented 40.5% of the total turnover, indoor plants 23%, outdoor plants 8%, and mourning 13%. The proportion of florists working with floral transmission chains increased from 74% in 2013 to 85% in 2018.

- Garden centres and seed companies

Based on Val'Hor "key figures for garden centres and seed companies", there were 1 230 garden centres and 430 seed companies in 2018. In 10 years, the number of garden centres remained stable, whereas the number of seed companies decreased by 26%.

The turnover of the profession was **2.92 billion euros** (excluding taxes) in 2018. Outdoor plants represented 26% of the total turnover, and indoor plants 11%.

- Non-specialised distribution

Based on prospective observatory of commerce (2017 data), non-specialised distribution actors are supermarkets (30 000 points of sales), DIY stores (2 114 points of sales) and home decorating stores. According to Kantar study on French people's plant purchases, mass distribution was the consumer's first frequented circuit over the 2017-2019 period. In 2019, it was French people's main place of supply in volume.

-2223- Services – Landscape companies

Based on Val'Hor "Key figures of landscape companies", there were 30 700 landscape companies and landscape architects in 2018, which employed 100 120 FTE and generated **6.1 billion euros** of turnover. Two thirds of landscape companies had no employees, and 23.5% had between 1 and 5 employees. The private market represented 45% of the turnover, with a 5%growth since 2008; private companies represented 27.5%; and public markets 27%.

2.3. Professional bodies

France is a paradise for professional associations. The vegetable and ornamentals industries are not exempted.

2.3.1. Vegetables

-2311- INTERFEL – Interprofession de la filière des fruits et légumes frais (Interbranch body for fresh fruit and vegetables)

Because of their specificities, professional associations in the fruit and vegetable sectors are grouped within four interbranch bodies.

- The interbranch association of fresh fruits and vegetables (INTERFEL) which represents a long chain with two marketing steps, the first at shipping/packaging stage, the second at retail marketing stage,
- The National Interbranch Association of Processed Fruits and Vegetables (ANIFELT),
- The National Interbranch Potato Committee (CNIPT) for fresh potatoes
- The interbranch association for the processing of potatoes (GIPT)

Created in the form of an association under the 1901 law[35] in 1976, recognized by decree as an interbranch organisation at national level, then at EU level in 1996, INTERFEL, with 15 members, represents almost all the professions dealing with fresh fruits and vegetable. Interfel is financed by an extended voluntary contribution (in French: 'Cotisation Voluntaire Etendue', CVE).

Its members are:

At production stage:

- FNPF Fédération nationale des producteurs de fruits (FNSEA[36] specialised association for fruit production)
- Légumes de France Fédération nationale des producteurs de légumes (FNSEA specialised association for vegetable producers)
- Felcoop Fédération française de la coopération fruitière, légumière et horticole (Specialised Co-operatives' association)
- GEFeL - Gouvernance économique des fruits et légumes (association of producers' associations)
- CR Coordination rurale (general farmers' union)
- CP Confédération paysanne (general farmers' union)

At marketing stage:

- **ANEEFEL -** Association nationale des expéditeurs et exportateurs de fruits et légumes (F&V shippers)
- **UNCGFL -** Union nationale du commerce de gros en fruits et légumes (F&V wholesalers)
- Saveurs Commerce : Les spécialistes de l'alimentation de proximité (F&V specialised retailers)
- **FCD** Fédération des entreprises du commerce et de la distribution (Mass retailers – integrated companies)
- **Restau'Co** Réseau de restauration collective en gestion directe (association of executives in charge of restaurants in the institutional catering sector)
- **SNRC** Syndicat national de la restauration collective (Companies specialised in collective catering services)
- CSIF Chambre syndicale des importateurs français de fruits et légumes frais (Professional association of F&V importers).

[35] French most popular legal form for associations 'without lucrative purpose' (law adopted on July 1, 1901).

[36] There are 3 main farmers' unions in France. *FNSEA (Fédération National des Syndicats d'Exploitants Agricoles*) is the oldest and still plays a central role, two challengers have developed their influence since the 90s': *Coordination Rurale* (strong in the general crops and milk sectors) and *Confédération Paysanne* (close to little sized producers and organic production). Laws about interbranch associations made mandatory the presence of all these organisations in the board of recognized bodies. FNSEA is organised through local federations (at the Departments' and Regions' levels – FDSEA and FRSEA) and national specialised associations such as 'légumes de France' and 'FNPF'.

- SNIFL Syndicat national des importateurs / exportateurs de fruits et légumes (Professional association of importers located in the St Charles' Market in Perpignan)
- FCA Fédération du Commerce Coopératif et Associé (Mass retailers, voluntary grouped companies: Leclerc, Intermarché, Système U).

Interfel budget is about euro 20 million / year. Its missions are, notably:

- Knowledge of production and market.
- Establishment of production and marketing rules.
- Drawing up of standard contracts compatible with European Union regulations.
- Development of product marketing.
- Environmental protection.
- Promotion and enhancement of production.
- Protection of organic farming and designations of origin, quality labels and geographical indications.
- Research aimed at enhancing the value of products, in particular through new uses that do not endanger public health.
- Carrying out studies aimed at improving the quality of products.
- Research into cultivation methods that limit the use of phytosanitary products and ensure soil preservation and the preservation or improvement of the environment.
- The definition of minimum qualities and minimum standards for conditioning and packaging.
- Product quality control.
- Preservation of plant health and food safety.

Interfel has achieved numerous interbranch agreements[37]. It may cover technical questions: maturity, harvest dates, marketing dates, packing, calibration, labelling, transportation. It may also cover marketing practices, for instance an agreement signed in 2020 established rules about price rebates granted by the supplier to his client in case of non-conformity of the delivered products.

To cover its vast field of action (all fruits and vegetables, except bananas and potatoes) INTERFEL established regional committees in some regions, product section (SIPMM) for certain products, and focused working groups. A overview of annual achievements is available on the INTERFEL website[38].

Interfel financially supports two other interbranch bodies: CTIFL and APRIFEL.

-2312- CTIFL (Interbranch technical centre for fruits and vegetables)

The Interbranch Technical Centre for Fruits and Vegetables - CTIFL - is the benchmark applied research organization in the French fruit and vegetable sector. It aims, through its work and innovations, to develop and diversify the production and marketing methods of each of the players. The actions of research, validation and dissemination of technical references are carried out in all the operational centres and branches of the CTIFL: Balandran, Carquefou, Lanxade, St-Rémy-de-Provence, Rungis and Nancy.
In 2020, 305 people contributed to the tasks of the technical centre.

Research and Experiment

[37] https://www.interfel.com/plateforme-numerique/?words=accord&themes=&regions=&vegetable=&typedocs=
[38] https://www.interfel.com/decouvrez-nous/bilans-des-actions

To support all actors in the supply chain and provide responses tailored to their specific needs, CTIFL has structured the Research and Experimentation activity around 6 major thematic axes: Plant Material, Plant health / Biocontrol, Agroecology, Greenhouse, Commercial route, and Product Quality / Measures.
18 product line managers cover around forty sectors. In 2019, the research - experimentation teams carried out a little more than 400 research, expertise, and development actions. CTIFL carries out partnership actions with research, education, professional families, and the inter-profession, in France and abroad.

Transfer and Promote.

In its function as a tool at the service of all actors in the industry, CTIFL has oriented its action towards the transfer of the know-how it produces, beyond mere dissemination. Maintenance and development of training in a context of reform, activities, technical assistance, and dissemination of tools are all responses that CTIFL intends to target and adapt as closely as possible to specific needs.

Study and Anticipate.

CTIFL carries out economic studies for all professionals in the fruit and vegetable sector. The study officers of the Foresight and Economic Studies Department collect and analyse the available figures, conduct surveys of consumers, retailers, or catering companies, and write economic summaries widely distributed within the sector through CTIFL publications.

Disseminate knowledge.

The dissemination and transmission of technical, economic and regulatory knowledge contribute to the support and services offered by CTIFL to professionals. More than 200 publications are thus available for sale and numerous thematic files, databases and technical and economic editions are available online.
To share the knowledge acquired as widely as possible and respond to the specific issues of professionals, CTIFL also organizes events bringing together hundreds of professionals and technicians from across the industry. National days, technical meetings and regional meetings are all privileged moments of sharing and discussion to deal reactively with the thematic subjects discussed.

Certify to have quality plant material.

Fruit certification is voluntary. About sixty nursery establishments adhere to this system in France. The technical scheme is based on the principle of multiplication by descent of fruit material (varieties and rootstock), from a healthy initial plant. The main actions of CTIFL cover the identification of candidate initial mother plants, health analysis carried out in the CTIFL laboratory, biomolecular analysis intended to help with varietal identification, field checks and control of traceability. These resources make it possible to make plant material with maximum guarantees available to the world fruit sector.

-2313- APRIFEL (Interbranch body for promotion)

The Agency for Research and Information in Fruits and Vegetables

Association created in 1981, the Agency for Research and Information in Fruits and Vegetables (Aprifel) has the central mission of working for the popularization and transmission of scientific evidence relating to the importance of the consumption of fruits and vegetables.
Aprifel's mission seeks to translate science into action by mobilizing all stakeholders to collectively promote healthy, sustainable food rich in fruits and vegetables.
Thanks to its specific governance, civil society, fruit and vegetable professionals and scientists are brought together by Aprifel, enabling the association to develop information on a factual and consensual basis. Its governance, which brings together Scientific Council, Consumer Council and Board of Directors, gives Aprifel a certain legitimacy to intervene on subjects strongly linked to sustainable development and in particular issues related to health and environmental protection: climate, water, air, use of fossil resources, carbon footprint, biodiversity, etc.
Three complementary lines of action

Aprifel's action aims to analyze and transmit scientific information related to food, safety and sustainability.
To do this, the association is based on the state of available knowledge and relies on the mobilization of the national and international scientific community.
Its action revolves around three axes:

- Development of scientific content
- Production and distribution of journals and information tools
- Organization of information days and international conferences.

https://www.aprifel.com/fr/global-fruit-veg/ https://www.aprifel.com/fr/qui-sommes-nous/

-2314- Légumes de France (specialised farmer in vegetable productions)

In 1946, vegetable producers created the National Federation of Vegetable Producers (FNPL), which became *Légumes de France* in 2008, to defend and promote their profession. It brings together vegetable producers throughout France and represents all the products intended to be marketed fresh, whatever the production method (greenhouse, "open field" producer, endivier (witloof producer), 'maraicher') and the form of marketing (producer organisation, shipping, physical market, direct sales, etc.).

Vegetable production represents 31,000 companies spread over 202,000 hectares (including 7,500 hectares in greenhouses and cold shelters). With a volume of 5.5 million tonnes, it generates a turnover of 3.5 billion euros. Vegetable production, which is very labour-intensive, generates no less than 200,000 direct jobs.

Privileged interlocutor of French and European public authorities, *Légumes de France* works continuously with the various players in the sector for the future of the fresh vegetable sector, defending the interests of producers. It also works to improve the profitability and competitiveness of their companies by intervening on all subjects that concern them: reduction of operating costs (labor, energy, etc.), human resources in the company and training of people, defence and development of solutions for crop protection, commercial relations ...It is a section of the FNSEA and a member of Interfel.

Actions of Légumes de France aims at defending the interests of French Vegetable producers, especially about public support to investment, labour, and plant protection. The organisation has drawn up a 'livre blanc' (white book) which summaries its institutional and economical objectives[39].
Taking as a basis that 50% of the French vegetable consumption relies on importation, Légumes de France set a 60% market share as a target[40] for 2022 (and 70% for 2025).
Conditions to reverse the past and present trends are shortly described by the organisation:

- To re-launch public support for investments in greenhouses (a survey conducted with other producers' organisation showed a potential for 330 ha between 2017 and 2020).
- To give priorities to young producers and to help them to find the needed funding.
- To give fiscal incentives to producers.
- To reduce distortion of competition within the UE area, notably issues caused by national rules concerning chemical use. French authorities' positions are often tougher than those of neighbouring Member states. *Légumes de France* ask for a real mutual acknowledgment of pesticides' official marketing authorisations and pray French Authorities to stop anticipating EU agenda concerning new chemicals' bans.
- The producers' claims about labour issues is to reduce gaps existing between France and rival countries. A 2016 analysis reflects what is the main competitive handicap for French

39 http://www.legumesdefrance.fr/sites/fnplegweb/livre_blanc_2017.pdf
40 https://www.reussir.fr/fruits-legumes/capitaliser-dans-un-monde-d-apres

producers[41]. Legal labour cost is said to be 26% lower in Germany, 25%, in Italy, 30% in Spain, 37% in Belgium, 302% in Poland and 1580% in Morocco. The French producers' demands are:

- Reduction or suppression of social costs,
- Premiums for jobs creation,
- Tax reduction based on wages expenditures,
- Exoneration of local taxes on public transportation,
- Diverse taxes' exemption,
- Derogations to general labour laws (free organisation of working time, derogation to mandatory supplemental health assurance for short run contracts, abrogation of hardship recognition for social taxes and advantages).

As a matter of facts, 2017 claims of the livre blanc have not matched a large success: gap in labour costs still exists, restriction on chemical use will rise in all EU countries and mutual acknowledgement is in progress, but it is not a result of the French producers' action. All measures taken by French government on labour laws and minimal wage are not specific to farming. Other claims target what exists already, as higher support for young farmers. The objective of reducing trade deficit is already a national objective. Product strategy implemented by large cooperatives in the tomato industry help producers to match good operational result but will not have a large impact on external trade.

Website: http://www.fnplegumes.org/

-2315- ANEEFEL (shippers and exporters) – Association Nationale des Expéditeurs et Exportateurs de Fruits et Légumes)

ANEEFEL is the professional association representative of Fruit and Vegetable Shipping and Exportation Companies. It brings together around a hundred member companies and 4 regional unions located in the different fruit and vegetable production and shipping basins. The organisation is heavily invested in French and European interbranch and confederal bodies thanks to a network of active professionals present at INTERFEL, CTIFL and FranceAgriMer.

ANEEFEL is a member of Freshfel, CGI, FC2A, the International Chamber of Arbitration for Fruits and Vegetables and AFRAA

ANEEFEL is in charge of the secretariat and animation of the National Collective Agreement for the Expedition-Export of Fruits and Vegetables (in French: *Convention collective*, that is to say national agreement defining specific labour rules of the industry)

It pursues its FeL PARTENARIAT ® development objective, co-initiated with CSIF and UNCGFL, an approach agreed with DGCCRF on the quality, traceability, hygiene, and health safety aspects of businesses. At the end of 2018, FeL PARTENARIAT® had 107 companies including 32 shippers.

Website: https://www.aneefel.com/

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-2316- UNCGFL (wholesalers, downstream)

UNCGFL (Union National du Commerce de Gros de Fruits et Légumes – National Union of fruit and vegetable wholesalers) represents the fruit and vegetable wholesale companies.

According to professional sources, the weight of the wholesale of fruit and vegetable industry" represents:

- 919 companies, billion 6.2 euros in turnover and 21.747 jobs
- 40% of fruit and vegetables distributed in France.

Wholesaler's marketing breakdown is: catering: 20%, mass retailers: 36%, F&V specialised shops 42% The remaining 2% are intended for export.

The wholesale profession is at the heart of the industry, it is the essential link between production and a diversity of clients. It consists in focusing, gathering, selecting, controlling, distributing, supplying, delivering.

An expert in all fresh fruit and vegetables, the wholesaler makes fruit and vegetables available everywhere in France in cities and in the countryside. It receives goods from all regions and countries, sold either by the shipper (producer, shipper, cooperative) or by the importer. Because of its proximity to the production, it favours French seasonal products and enhances taste quality.

It therefore offers an extensive assortment of goods of different origins in all seasons: "the right product at the right time in the right place".

There are two families of wholesalers:

- market wholesalers sell directly face to face with their customers. They are grouped together on a "wholesale" market, such as the Wholesale Market in Lyon-Corbas, and on Markets of National Interest, such as the MIN of Rungis, the MIN of Lille, etc. They generate 49% of the turnover generated by the fruit and vegetable wholesale trade.
- full-service wholesalers, on the other hand, are logistics platforms that include in their service the delivery of products to their customers. They generate 47% of the turnover of the fruit and vegetable wholesale trade, their range of products is large and often includes seafoods, dairy products, processed meats and other fresh foods.
- The remaining 4% is generated by "wholesalers-retailers".

The expertise of wholesalers consists of finding and distributing fragile, fresh products that must be delivered at optimum maturity. Respecting product traceability and preservation procedures, their quality control procedures are often certified.

UNCGFL actions are focused on:

- industry representation towards public authorities and workers' unions, participation to interbranch actions (please see paragraph about INTERFEL description). The present Interfel board chairman is a managing director of one of the biggest UNCGFL members.
- actions related to the wholesale industry, through the confederal body (CGI – Confederation du Commerce Inter-entreprises),
- Management of quality control tools adapted to the F&V wholesale industry: Charte du professionalisme, Fel'Excellence, Fel'engagement, Felk Partenariat, L'observaoire de la qualité).
- Partnerships with educational institutions, aiming at developing initial and continuous vocational training.

Website - https://www.uncgfl.fr/

-2317- CSIF (union chamber of fruit and vegetable importers ¨ chambre syndicale des importateurs de fruits et légumes)

The missions of the CSIF can be summed up as follows:

- Bring together companies in the sector, to constitute a place of constructive discussion.
- Develop the import of fresh fruits and vegetables in the current economy by promoting its specificities: Professionalism, complexity, and flexibility.
- Inform its members on economic, regulatory, and social plans, in an increasingly complex and changing environment.
- Promote the profession by:
    - Insight into the different trades that make up the functions of importers, capable of attracting new talents and developing rewarding careers.
    - The place of the import of fresh fruits and vegetables in the economy, to be better listened to in public and professional bodies, in France and in Europe.
    - These missions have only one objective: to support the development of the companies, through a set of services, but also projects like 'Fel Partenariat'. their site provides documentary resources and information.

CISF crew and offices are shared with other related organisations:

- AIB (association interprofessionnelle de la Banane – Interbranch association for Banana). CISF includes a banana section, whose members control 20% of the banana volume imported in the EU;
- UFMB. Union Française des mûrisseurs de banane – French Union of banana ripening companies.
- UDE – Union des entrepôts de Paris-Rungis.

CISF is a member of Freshfel (European federation) and of CAIFL (Chambre d'arbitrage des fruits et légumes – Arbitration chamber for fruit and vegetables).

Website: https://www.csif.eu/

-2318- FELCOOP (Cooperatives association)

Felcoop is the professional federation representing cooperative companies and SICA[42]s of fresh and processed fruits and vegetables, potatoes, and ornamentals. Its missions are:

- To represent and defend the material and moral interests of cooperative companies in the sector within various bodies at national and EU level.
- To participate in the development of cooperatives by informing them and supporting them in their projects.
- To publish all information and to distribute all documentation to members.

Felcoop is a member of the French and European professional or interbranch organizations in the Fruits and vegetable sector as well as of the various official bodies (COPA COGECA, Interfel, CNIPT, CTIFL, LA cooperation Agricole, FranceAgriMer, ...)

Felcoop is leading the negotiations necessary for the development of the two national collective agreements for the sector: cooperatives and SICA of fresh fruit and vegetables, ornamentals and potatoes, Cooperative canneries and SICAs.

Felcoop brings together more than 200 co-operatives and SICAs, generating annual sales of circa EUR 3 billion, 15 000 producers' partners of co-operatives, 40 000 jobs in farms and 8 500 in the cooperative companies. 70% of the recognized Producers' organisations are cooperatives or SICAs.

[42] SICA means Société d'Interêt Collectif Agricole – This legal form was implemented during the 60s'. It is an hybrid form between cooperative and family owned companies.

Among the numerous services brought by Felcoop to its members are technical and juridical support for the implementation of 'Operational Programmes' (OP) to the 'Producers' organisations', in the national strategy implemented by French Authorities as part of the EU CAP support.

Website: http://www.felcoop.fr/

2.3.2. Ornamentals

-2321- Val'Hor (Interbranch body)

Val'Hor is the French Interprofession of Ornamentals Floristry and Landscape. It brings together representative families of plant professionals, divided into three colleges: production (four professional federations), distribution (four professional federations), and landscape (two professional federations). Its missions are to:

- Develop product and service consumption through communication and collective promotion
- Carry out experimentation programmes in technical innovation
- Boost recruitment in the sector by promoting trades and know-how
- Develop and implement quality and certification rules and disciplines
- Develop knowledge of the market and the sector by carrying out studies
- Optimize market mechanisms and synergy between plant professionals

Website: https://www.valhor.fr/

-2322- FNPHP (Producers)

The National Federation of Ornamentals and Nursery Producers (Fédération nationale des producteurs de l'horticulture et des pépinières) aim is to defend and promote horticultural production companies and nurseries with the public authorities. Its missions is to:

- Support and accompany producers individually and in their collective projects.
- Represent producers in collective agreement negotiations.
- Enable producers to benefit from national and regional aid for the modernisation of enterprises.
- Inform producers of news from the profession.
- Answer producers' legal, tax or social questions
- Give producers access to preferential rates with partners.

Website: http://www.fnphp.com/

-2323- FFAF (Flower shops)

The French Federation of Florists brings together florists' union chambers and represents 30 000 florists. Its objectives are to:

- Study, promote and represent florist craftsmen and traders in order to defend their professional, economic, social, material and moral interests, both collective and individual
- Federate florists in all the French departments on the continent and overseas
- Defend the commercial and regulatory perimeter of the profession
- Support the economic activity, independence and competitiveness of artisan florists and florist retailers through the recognition, in France and internationally, of the specific characteristics of their profession, their supply and customers' expectations.
- Consult and involve the profession's major economic players and partners (producers and manufacturers, floral transmission companies, wholesalers, franchises, training organisations, inter-professional organisations, the press, and publishers), as associate members, in the continuous improvement of quality standards, image, innovation and the long-term future of the profession.

- Advise on training (initial and ongoing) and encourage the spirit of excellence (competitions and contests: Le Pétale d'Or, Coupe de France, Oscar des Jeunes, MOF, MAF, Olympiades des Métiers and EuroSkills - COFOM -, Trophée des jeunes fleuristes espoirs).
- Control the proper management and correct orientation of the compulsory levies collected from florists.
- Inform the profession and communicate with consumers.
- Promote the use of new technologies for the benefit of all the players in the sector, right down to the customers.
- Encourage the adoption of quality approaches and concrete practices of social and environmental responsibility.

Website: https://ffaf.fr/

-2324- Jardineries et Animaleries de France (Garden Centres)

This professional organisation gathers 1 650 member stores. Its missions are to:

- Accompany its members in all their procedures (administrative, legal, HR, etc.)
- Develop useful synergies and common initiatives.
- Promote the sector and enhance the value of its professions in a responsible approach to strengthen the attractiveness of garden centres.

Website: https://www.jardineries-animaleries.org/

-2325- ASTREDHOR (technical institute)

ASTREDHOR is the Technical Institute for ornamentals industries, qualified since 2008, and member of ACTA. It is the privileged interlocutor of partners from the economic and research world for innovation in ornamentals. It is supported by six regional units made up of 10 experimentation stations which carry the Institute's project and conduct applied research projects on a regional, national, or international scale.

ASTREDHOR's main missions are:

- To conduct research for professionals:
  - Ensure scientific and technical monitoring in areas related to the horticultural sector.
  - Co-develop new knowledge.
  - Build new solutions with and for professionals.
  - Assess the risks and benefits of new systems and products and produce references for professionals.
- To provide support and expertise to companies:
  - Collect and analyse the research needs of economic and political actors.
  - Provide solid technical and economic expertise to companies and public authorities alike.
  - Value and disseminate results, methods, and tools, in particular by setting up demonstrators.
  - Get involved in initial and continuing training and in dialogue with society.

ASTREDHOR's Board of Directors is made up of 12 directors appointed by each regional unit or representing the professional federations of Val'Hor.
Its Scientific and Technical Council evaluates the national and regional tests of the national and regional programmes, upstream of the strategic guidelines.

Website: https://www.astredhor.fr/

Other bodies are not directly related to the study field (for instance: UNEP, union for landscapers' companies)

2.3.3. Transversal bodies

Table hereunder proposes a short description of other official or professional structures.

Table 38 Other public or professional bodies

Name	Nature	Missions	Comments	Website
FAM (France AgriMer)	Public body, under the authority of Ministry of Agriculture	- Management and monitoring of national and EU funding. - Economic information, research, studies - Common animation and reflection (authorities and professional representatives)	The 'national strategy for fruits and vegetables' is implemented by FranceAgriMer through a dedicated division. Other national actions and funds are implemented by FAM (presently: recovery plan, recently investment support to greenhouses). There are 3 to 4 meetings of a specialised council each year, disseminating information about economic conditions, research results, new regulations, international events. Implementation of the UE funded programme: 'school fruit, vegetables and milk scheme'.	www.franceagrimer.fr
INAO (Institut National des Appelations d'Origine et de la Qualité)	Public body, under the authority of the Ministry of Agriculture	Legal management of the acknowledgement process of GIs, and other certifications including organic. Production monitoring.	Beyond its technical role (management of all products and denomination specifications, acknowledgement of certifying bodies, production monitoring) INAO is the place where the legal framework orientations are negotiated between authorities and professional representatives. INAO can adopt its own directives.	https://www.inao.gouv.fr/
Agence Bio	GIP (Groupement d'interêt public – Public Interest group), with a board constituted by the ministries of Agriculture and Ecology and professional associations	Certified companies recording. Information and promotion. Management of the support fund 'Avenir Bio"	The Avenir Bio fund has received a higher budget for the 2021-2022 period, due to the recovery plan. (EUR 13 million). This fund supports material investments, training, and any immaterial action, since it involves producers and processors, and has also led to significant land conversion to organic cultivation. The new call for projects will stay open during the next 18 months.	https://www.agencebio.org/

AOPn Tomate	Association of Producers' organisations involved in tomato and cucumber production	Research, promotion, representation	The national AOP Tomatoes and Cucumbers of France is the essential point of reference for public authorities, commercial and technical partners. It works in permanent contact with Interfel, the Association for the Economic Governance of Fruits and Vegetables (GEFeL) bringing together national and regional associations in the sector. Since 2019, it has also brought together producers of peppers and eggplants from France since it obtained in 2019, the extension of recognition on these 2 products. AOPn firmly leads its members (21 producers' organisations and 2 independent producers) to a sustainable model, including a zero-pesticide target. The association published the 'charte des productions sous serres' – Rules for covered production.	https://www.tomates-de-france.com/
AOPn Fraise	Association of Producers' organisations involved in strawberry production	Research, promotion, representation	National structure bringing together Producers' organizations, shippers and independent producers - 30 members, more than 550 producers and approx. 45% of the French strawberry production. Actions are : Promotion (see website) Technique (securing production and improving quality) Quality (compliance and life of the National Product Charter)	http://fraisesdefrance.fr/ (promotion only)
GeFEL	Association of associations d'Organisations de Producteurs (OP)	This superstructure federates national POs' association.	Gefel' mission is to help producers and their associations in their actions, aiming at developing: the production of quality products, in a sustainable way that respects people and the environment. the economic development of their activity. the opening of markets. good commercial relations in the sector. communication and promotion of their products.	https://gefel.fr/

2.4. Vertical Relationships

Figure 7 (page 25) presenting the marketing chain, from production to final consumption shows the importance of the French production on its domestic market.
Vertical relationships are strong and well established:

- Between production and shipping stages, relationships are stable, with a high level of loyalty between producers and their organisations. This situation is facilitated by the reduction of the number of shipping companies (cooperatives and family owned).
- Between shipping stage and mass retailers, stability is also encouraged by economic concentration, but there is no secure situation, as price and quality competition between retailing companies remains very sharp. Mass retailers are supposed to prefer French origin, especially for specified seasonal products, highly challenged by foreign offer (peaches, for instance).
- Recent demand trend for 'local' products led wholesalers to develop direct relationships with producers and organise specific traceability tools.
- In 2020, the French government introduced[43] new collaborative tools: standard conventions to be passed between 'local producers' and mass retailers or traditional shops. Public support has helped create ready to use legal documents, and institutional communication (these tools include logo types that may become popular in the years to come.
- The objective of settlement of 'Projets alimentaires territoriaux- PAT' (territory food projects) everywhere in France has been recently reinforced, due to funding of the recovery plan. This will encourage local circuits, direct sales, small sized shops and direct relationships between farmers and public canteens. In some cases, fruit and vegetable local sales will be eased by dedicated small sized plants equipped to produce ultra-fresh ready to use carrots, tomatoes, potatoes, salads, apples and other products.
- Ten years ago, a very strong government action encouraged producers to develop contracts with all downstream partners (shippers, retailers). The result of this policy was not decisive in the F&V sector, because it is very difficult to foresee prices, even in a short term.

2.5. Equipment

Most of French companies involved in the manufacturing, conceiving, and marketing of farms' equipment (including tractors) are part of a large union: Axema. There is no specialised body for greenhouses furnishers. Axema's statistics give a first approach of the French market. In 2019, sales reached a record level: EUR 6 billion. The breakdown by type of products is as follows: tractors: 27%, equipment for maintenance of green spaces, 16%, harvesting equipment 11%, cultivation equipment, 8%, breeding equipment 7%, loaders 7%, haymaking equipment 5%, transport 4%, irrigation and protection 2%, others 9%. Greenhouses are included either in irrigation and protection category or in others category. Further details can be collected directly by AXEMA, but only for members.

2.6. Innovation clusters

2.6.1. 'Pôles de compétitivité' (innovation clusters): a 17 years policy.

In France, innovation clusters are identified as "a grouping of companies, training institutions and public or private research labs in the same territory that work in synergy to implement economic development projects for innovation"[44].
This policy was launched in 2004 to foster competitivity, generate employment and bring private and public research together. In 2020, 56 innovation clusters were accredited. These bodies have a non-profit association status, benefiting from public subsidies and a special tax regime.

[43] https://agriculture.gouv.fr/charte-dengagements-de-valorisation-des-produits-et-des-savoir-faire-des-entreprises-alimentaires-de ; https://www.economie.gouv.fr/charte-dengagements-produits-frais-produits-locaux:
[44] LOI no 2004-1484 du 30 décembre 2004 de finances pour 2005 NOR: ECOX0400222L

R&D collaborative projects developed by these clusters can apply to the call for "Projets Structurants pour la Compétitivité (PSPC)-Regions" (Structuring Projects for Competitiveness).
If selected, they receive state funding from the "Programme d'investissements d'avenir (PIA)" (Investment for the future) and regional funds, with a higher rate when they are labelled by an innovation cluster. In 2019, the awarded projects received a total amount of EUR 40 million of public subsidies, including EUR 20 million from the PIA and EUR 20 million from regional and local authorities[45].
Other support mechanisms include:

- funds from regional authorities for governance structure of the innovation clusters ;
- partnerships with the National Agency for Research ("Agence Nationale de la Recherche" ANRT), and the Investment Public Bank ("Banque publique d'investissement Bpi France") to support SMEs and R&D.

The number of granted clusters is still important, despite the trend to merging between bodies which have the same objectives. When this national policy began, each region, each big town aimed at building its own cluster. After several years, it appeared that merging will provide a stronger competitiveness to these bodies. This section will develop the objective, role, and impact of 3 French innovation clusters involved in greenhouses, ornamental or vegetable projects.

2.6.2. Agri Sud-Ouest Innovation

(https://www.agrisudouest.com/)

The cluster was created in 2007 and covers the Occitania and Nouvelle-Aquitaine regions. It stands among the France's leading agribusiness clusters, and gathers around 400 members in the agriculture, agri-food and bioresource sectors, including:

- more than 300 start-ups and companies,
- public and private research institutions,
- education centres,
- local authorities and stakeholders in economic development[46].

Agri Sud-Ouest Innovation (ASOI) framed a new R&D strategy for the period 2019-2022, identifying 6 priority innovation areas:

- Water-Climate-Soil.
- Livestock and crop sustainable production.
- Operational excellence of farms and factories.
- Full valorisation of biomass.
- Food products for a better diet.
- Innovative food uses and services.

ASOI is a member of several European networks such as the Plant Inter Cluster (PIC) and the European Cluster Alliance (ECA), it is registered as a Digital Innovation Hub and awarded with a Gold Label of Cluster excellence by the European Commission. The Plant Inter Cluster is originally a French consortium gathering the innovation clusters "Agri Sud-Ouest", "Végépolys", "Céréales Vallée" and "Terralia", now extended to Belgian, Italian, Spanish, Portuguese, Romanian and Polish clusters to work on the plant sector at the European level. Other clusters recently joined the governance of the network, such as Greenport Westland NL.

[45] https://regions-france.org/actualites/actualites-nationales/investissements-davenir-lancement-2e-appel-a-projets-pspc-regions/
[46] https://ww.agrisudouest.com/

Between 2007 and 2018, more than 600 projects have been certified by Agri Sud-Ouest Innovation, including 62 projects selected and supported by the state "Fonds Unique Interministériel (FUI) (Unique Interdepartmental Fund)". They attracted EUR 335 million of public subsidies[47],[48], and EUR 442 million of private investments. Agri Sud-Ouest also coordinates the European program "DIVA" with partners from 6 European member states, to foster digital innovation in the agricultural, agri-food, environmental and forestry sectors. In 2019, 66 projects were selected through the program, allowing 100 SMEs to get EUR 1,3 million in subsidies.
As a preview of future opportunities currently supported by Agri Sud-Ouest Innovation, the cluster has already certified 4 projects in 2021, on management tools for market gardening, biorefinery, data management in the agri-food industry, and creation of a supply chain dedicated to production of bio-inputs. Through the DIVA program, it also promotes the development of digital solutions in agriculture, such as for precision farming and biocontrol.

In 2020 ASOI developed with local partners (Digital 113 a numeric cluster and Occitanum[49] another cluster dedicated to agro food local projects) a project about digitalisation of local distribution (short food circuit). Food Log proximity.

Among the success stories written in the shade of Agri Sud-Ouest Innovation one can mention:
- les Jardins d'Occitanie, a local start-up company managed to produce organic ginseng in greenhouse. The product was launched on the French market in 2020;
- Absoger, another local start-up company, developed skills and know how about the use of ethylene to preserve fruits in cold stores.

2.6.3. Végépolys Valley

https://www.vegepolys-valley.eu/

The cluster, created in 2004, is settled in 4 regions (Pays-de-la-Loire, Auvergne Rhône Alpes, Bretagne and Centre-Val de Loire) but covers the whole French territory. It is specialized in the plant value chains (seeds and plants, arable crops, market gardening and fruit tree growing, ornamental horticulture, wine growing and cider growing, and aromatic and medicinal plants) and gathers around 500 members, organized in 4 colleges:

- Firms, mainly SMEs and cooperatives (Limagrain, Pileje, Vilmorin, Fleuron d'Anjou, Terrena, Premier Tech, Koopert…).
- **Trade unions and development** agencies.
- **Research and training cent**re**s (such as INRA**E**, Agrocampus Ouest, ESA, CTIFL…) and partner laboratorie**s.
- Consular chambers and other institutional partners.

This body results of the recent merger of two competitiveness clusters: "Végépolys" and "Céréales Valley Nutravita", specialized in field crops. As stated on its website, Vegepolys Valley "aims at being the leading international plant cluster for more competitive, qualitative, environment and health-friendly agriculture"[50]. Végépolys Valley has been granted the **Gold cluster label by the** ECEI (European

[47] https://www.ladepeche.fr/article/2018/06/05/2811509-un-relais-local-pour-le-pole-agri-sud-ouest-innovation.html
[48] https://www.agrisudouest.com/slides/slide/2019-bilan-moral-et-financier-11
[49] https://occitanum.fr/ - Occitanum, « the Living Lab Digital Agroecology in Occitania: we are experimenting on a full scale the contribution of digital technologies to agro-ecological transition and local food».
[50] https://www.vegepolys-valley.eu/en/the-plant-industry-and-ambition/

Excellence Initiative), it partners with European projects and it is involved in several international networks: Plant InterCluster, the European Cluster Collaboration Platform, Agri-food S3P (Smart Specialization Platform),…
Its new R&D strategy 2019-2022 identifies 7 innovation axes to achieve a plant production which is competitive, qualitative, environmentally friendly and respectful of the health of consumers and producers:

- Varietal innovation and seeds and plants performance.
- Plant health.
- New technologies and practices for plant production systems.
- Plant for food and feed.
- Nutrition health prevention, well-being, cosmetics.
- Biobased materials and bioprocessing.

Activities of the cluster include knowledge sharing (webinars, conferences), networking, technologic and market monitoring, project support and certification, international collaboration, training, communication… Since its creation, Végépolys Valley has certified more than 750 projects, with an investment value of 2,2 billion euros.
Some of these projects directly relate to greenhouse production, such as the "Cap Vert" project which aims at developing an innovative closed or semi-closed greenhouse to produce salads free of pesticides, based on an off ground aeroponic cultivation[51]. Further developments for the year 2021 will focus on R&D projects related to the sustainability of crop production systems to climate change, addressing specifically the issues of water resources, soil quality and reduction of fossil fuel use in greenhouses [52].
This 'Serres +'project aims at answering to the following question: '*Soil-less crops in a heated glass greenhouse are very productive while employing little or even no chemical inputs. Although economical in phytosanitary products and water, the overall balance is limited by their energy needs. Is it possible to define a new sustainable concept plant production enclosure and independent of fossil fuels?*'. It gathers several research partners in a multidisciplinary approach (architecture, energy, farming, chemicals, aeraulics, …), producers organisations (Savéol, Maraichers d'Armor) and the 2 technical centres: CTIFL and Astred'hor. Program will last 4 years with a Eur 1,7 million cost. Agrocampus Ouest coordinates works.
Végépolys Valley is also currently setting up a special support system for businesses to face the Covid-crisis.

2.6.4. Innov'Alliance

https://pole-innovalliance.com/

Innov'Alliance results from the merger, in 2019, of two former innovation cluster: "Terralia", specialized in the agriculture and food industry, and "Pass", specialized in cosmetics, perfumes and flavours. The new cluster gathers around 440 members and has 3 offices in the cities of Grasse (near Nice), Avignon and Lyon, to operate in the South-East of France (Auvergne Rhône-Alpes, Languedoc-Roussillon, Provence-Alpes-Côte d'Azur). It supports research and innovation in the sectors of nutrition, cosmetics, health ingredients & food supplements, and fragrances & flavours, all along the value chains. Since 2006, it has certified 472 projects, funded through EUR 545 million of R&D investments and EUR 130 million of public subsidies[53]. The cluster is involved in the European network "Smart Specialisation Platform Agrifood" (S3Food), and the consortium "Plant Inter Cluster".

[51] https://www.vegepolys-valley.eu/media/rapport_ag_2019_perspectives_2020.pdf
[52] https://www.vegepolys-valley.eu/projet-serres/
[53] https://pole-innovalliance.com/ressource/rapport-dactivite-2019/

Innov'Alliance's ambition is to help companies meet the consumers' growing expectations for more natural and environmentally friendly products. It promotes innovative production and transformation processes towards:

- Traceability and safety of raw materials.
- Environmental sustainability.
- Sensory performance.
- Health and well-being efficiency.
- Products' accessibility.

The cluster has identified 4 strategic priorities to accelerate the digital and environmental transition of plant sectors:

1. Sustainability of plant resources and production
2. Eco-efficient processes and "industry 4.0"
3. Products' safety and security
4. Products' performance

Among other initiatives, it has developed an "Eco Responsible Ingredient" label ("ERI 360") in partnership with 12 companies from the aromatic and cosmetic sectors to support improvement in environmental performance of natural products manufacturing.

The cluster organizes every year a programme of events to share information on a range of topics: organic agriculture, packaging, greenhouses production, project funding, biocontrol, growing of cannabis … It also offers a financial support to innovative and sustainable start-ups in the agriculture and agri-food sectors through its own seed fund "Terralia Venture Innovation" (450 000 € invested between 2017 and 2020)[54].

Two members of Innov Aliance' are focused on greenhouses' technology: Agrithermic, a design office focused on greenhouses' energy systems and Agroasis a design office offering monitoring tools for greenhouses.

2.7. Public support

2.7.1. National schemes

-2711- National Strategy for fruit and vegetable sector

The 'National Strategy for Fruit and Vegetable / National strategy for sustainable operational programs' was elaborated in accordance with EU common market regulation (Reg (EU) No 1308/2013, Reg (EU) No 2017/891 and (UE) No 2017/892.) It grants a specific support to the fruit and vegetable sector. It presents a sectoral vision, the stakeholders' needs, and the objectives to be reached through specific EU support. The French strategy defines 5 global objectives[55]:

- Developing competitive products
- Increasing the consumption of fruits and vegetables in France
- Preventing and managing crises and securing producers' income
- Developing environmentally friendly production and marketing methods
- Increasing the production potential that relies on viable farms covering the territory.

European funds are granted annually to recognized producer organizations or associations of producer organizations which submit operational programmes to Member states on a duration of 3 to 5 years. Support is limited to 4,1% of the marketed production value of the beneficiaries, and co-finance 50% of the programme's expenditures, which shall aim at:

- improving production planning

[54] https://www.pole-terralia.com/fr/services-aux-adherents/fonds-d-investissement-terralia-venture-innovation.html

[55] https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/plants_and_plant_products/documents/fruit-veg-national-strategy-france_fr.pdf

- improving product quality
- developing the commercial value of products
- promoting products, whether fresh or processed
- implementing environmentally friendly measures and production methods, in particular organic agriculture
- preventing, or improving the management of crises.

Member States -including France- must comply with the regulatory obligation to evaluate the progress towards the overall objectives of their national strategies for the period 2013-2018. The French strategy evaluation is currently being conducted by FranceAgriMer and the French Agriculture and Food Ministry, for reporting to the European Commission. Its conclusions are expected to feed into the next strategy.

-2712- National measures for knowledge and investment.

Since 2015, the management of subsidies for investments in greenhouses is overseen by Regions. At national level, FranceAgriMer dedicates more than 400 000 euros to the knowledge of the ornamental's' markets. It also dedicates 1.2 million euros to the experimental programmes of the ASTREDHOR technical institute which ensures the development of innovative production techniques and assesses the ranges of varieties adapted to market developments.

Annual calls for projects are regularly launched by FranceAgriMer to support investments in greenhouses and foster their modernization ("projets structurants des filières agricoles et agroalimentaires – structuring projects for the farm and food marketing chain")[56]. This programme is now closed. He has been replaced in 2020 by an aid granted to farm equipment's dedicated to input reduction, which is also closed, due to the great number of demands.

-2713- Covid crisis and recovery plan.

In 2020, the French government implemented a 25-million-euro state aid scheme aimed at compensating ornamental producers' loss of turnover during the containment period (15th March – 15th May). This scheme is currently being validated by the European Commission.
In 2020 and 2021, the "French Recovery Plan" ("Plan de relance"[57]) will exceptionally dedicate 1,2 billion euros to the Agricultural, Food and Forest transition. Its objectives are to strengthen food sovereignty; accelerate the agro-ecological transition to provide all French people access to healthy, sustainable and local food; adapt agriculture and forestry to climate change. There is no mention of specific funds for greenhouse development, but some measures of the plan will finance agricultural equipments for input reduction, and others will support the structuration of the agricultural and agri-food sectors (including High Value Environmental projects).

-2714- Other specific programs:

'**Fonds Avenir Bio (Fund for Organic Future)'**: this national fund, launched in 2008 and managed by the public agency "Agence BIO", helps economic operators in their collective projects for the development of organic supply chains. Projects are supported for 3 years and must involve partners at different stages of the chain. Since 2008, the fund has opened 23 calls for projects, granted 50 million euros, and supported 140 projects in various sectors[58]. The French recovery plan ("Plan de relance") will strengthen the fund by dedicating 13 million euros to it each year in 2021 and 2022.

56 https://www.franceagrimer.fr/filiere-fruit-et-legumes/Aides/Aides-a-la-modernisation-des-serres-maraicheres/2014a mer

57 https://www.gouvernement.fr/france-relance

58 https://www.agencebio.org/vos-outils/financer-son-projet/fonds-avenir-bio/

'Loi EGALIM (EGALIM Law)': the law for "balanced trade relations in the agricultural sector and healthy and sustainable food" was promulgated in 2018, with 3 objectives:

- paying a fair price to producers so they can live decently from their work;
- strengthening the health, environmental and nutritional quality of the products.
- promoting healthy, safe and sustainable food for all.

Among other targets, the law requires that 50% of food products consumed in public catering should be sustainable or certified by a sign of quality or origin by 2022. It also forbids the use of phytosanitary products with modes of action identical to neonicotinoids and provides for the protection of people neighbouring areas where phytosanitary products are used.

Haute Valeur Environnementale (**High Environmental Value certification):** this national certification, managed by the French ministries of Agriculture and Ecology, is granted on a voluntary basis to farms that can demonstrate their environmental performance. It is based on the results of their involvement in agroecological practices: biodiversity protection, limitation of phytosanitary products, management of irrigation and fertilization. In July 2020, 8 218 farms and 366 325ha were certified "High Environmental Value" (1,35% of the national arable land), including 340 vegetable farms and 42 horticultural farms[59]. The system is in progress, since the number of farms increased by 52% between January and July 2020. The government have set an ambitious target of 15 000 certified farms by 2022 and of 50 000 certified farms by 2030.

2.7.2. Regional schemes

-2721- Regional programs for rural development

Eligible investments included greenhouse structure and development, heating and air conditioning equipment, greenhouse operation. They can amount to 1 000 000 €, with a rate of aid around 10-15% that can be complemented by local authorities or even EAFRD funds, within the limits permitted by Community regulations.

Specific measures of the regional programmes implementing EAFRD under the authority of "Conseils régionaux" (regional councils). Over the period 2014-2020, 21 regional programmes have been implemented in France, and have developed the "Plan de compétitivité et d'adaptation des exploitations agricoles - PCEA» (Farm competitivity and adaptation plan) to support investments for the modernization of farms, improvement of environmental and energy performance. Some regions such as Ile-de-France, Brittany, Provence-Alpes-Côte d'Azur, Rhône-Alpes and Occitania provide specific support to co-finance greenhouses equipment's in the vegetable and horticultural sectors (building and harvesting material, thermal insulation, optimization of combustion) through measures 4.1.1 and 4.1.2 of their regional programmes. Eligible investments exclude heated greenhouses in some regions (eg Occitania)[60]. The average annual dotation for the "PCEA" was 200 M EUR between 2014 and 2020.

-2722- Other regional programmes: PACA

Paca region launched in January 2021 a call to project "modernisation of greenhouses and other equipment in the vegetable and ornamental plant sectors". This program is a follow-up of previous plans.

The objectives of this new program are as follows.

- To help in developing greenhouses equipment, through new production capacities (including extension and modernisation of existing plants).
- To improve the technical level and production capacities through modernisation investments.
- To encourage low power consumption, renewable energy use and recovery of energy by-products.

[59] https://agriculture.gouv.fr/les-chiffres-cles-de-la-haute-valeur-environnementale-hve

[60] Rural Development Programme of Languedoc-Roussillon - CALL FOR PROJECTS 2021 Competitiveness and Adaptation Plan for the Farms – Operation type 4.1.1

- To encourage mechanisation and robotization.
- To encourage sustainable production, targeting energy and environment challenges.

Support is accessible by farming legal entities and groups of farming legal entities.
The ceiling of eligible expenses is 1 million euro, and the threshold is EUR 50 000. The rate of support is 15% for vegetable (with a bonus for young farmers and members of producer's organisations); it is 20% for the ornamental production sector.
Projects can be submitted until June 25, 2021.

-2723- Other regional programs: BRITTANY

Support to investment dedicated to energy saving in farms' housing. It includes a special chapter for greenhouses and storage buildings.
Eligible expenses for each beneficiary is Eur 125,000.
The basic support rate is 40%.
Projects can be submitted until April 23, 2021.

-2724- Other regional programs: PAYS DE LA LOIRE.

A running call for project proposes a large range of support to vegetal production. Some greenhouses' equipment is included, such as low power lights, automatised irrigation devices. Support rate is 30%.
Call for project was open until March 1, 2021.
A special program for greenhouses was implemented in 2015, apparently closed nowadays.
No call for projects concerning covered farming presently in Nouvelle Aquitaine, Auvergne Rhône-Alpes and Occitanie.

2.8. Fairs and events

This chapter lists and describes the main fairs and events in France in the F&V sector and in the ornamental plant sector. It includes general fairs during which these sectors are represented.

Name	Number of editions	Usual dates City	Number of exhibitors and professional visitors	Comments
SIVAL	26	January - annual Angers	700 exhibitors 26,000 visitors 1,300 foreign visitors 12% of foreign exhibitors	www.sival-angers.com Largest specialised F&V fair in France dedicated to fruits, vegetables and ornamental sectors.
SALON DU VEGETAL	41	February - annual Angers	240 exhibitors 7,600 visitors 17% of foreign exhibitors	www.salonduvegetal.com The fair is focused on horticultural and nursery production (breeders, multipliers, young plants, seeds), input suppliers (potting soil, pottery, care, alternative methods, greenhouses, materials, and equipment, etc.).
MEDFEL	10	End of April-beginning of May - annual Perpignan	200 exhibitors 5,000 120 international F&V purchasers 26% of international visitors	www.medfel.com Second largest F&V fair in France- dedicated to fruits & vegetables operators of the Euro Mediterranean region.
VINITECH-SIFEL	21	November - annual Bordeaux	800 exhibitors among which 130 are specialized in F&V 45,000 visitors 20% of foreign exhibitors	www.vinitech-sifel.com This fair groups a wine fair (Vinitech) and a F&V fair (SIFEL). The fair is mainly dedicated to wine industry with 2/3 of the area dedicated.
TECH&BIO	8	September – every 2 years Valence + local fairs	375 exhibitors 20,500 visitors 20 international delegations	www.tech-n-bio.com International agricultural fair for organic and alternative techniques. This fair is dedicated to organic production techniques and equipment's. Partnership with Med-agri.

MED-AGRI	2	October-annual Avignon	380 exhibitors 15,000 visitors	www.med-agri.com This exhibition is dedicated to the Mediterranean agriculture. One general block is dedicated to equipment and inputs providers while one block is dedicated to F&V packaging, conditioning and sizing providers.
SIMA	Since 1922	November every 2 years Paris	1,800 exhibitors 230,000 visitors 400 international delegations 25% of foreign visitors from 140 countries	www.simaonline.com This international exhibition groups providers of solutions and technologies for agri-food productions. This fair is dedicated to agricultural equipment and agricultural technologies.
SALON INTERNATIONAL DE L' AGRICULTURE (SIA)	56	February - annual Paris	+ 1,000 (22 countries) 37,950 professional visitors among 633,213 visitors 61 international delegations	www.salon-agriculture.com This is the largest agricultural and rural fair in France visited mostly by non-professional visitors. One block dedicated to F&V.

2.9. Specialised training centres

Trainings in Agriculture in France are under the supervision of the French Ministry of Agriculture, and are distributed in two main educational divisions:

2.9.1. Secondary Education and Short Higher Education:

These educational programmes are conducted in specialised high schools called EPLEFPA (*Etablissements Publics Locaux d'Enseignement et de Formation Professionnelle Agricole*). EPLEFPA can be composed of several structures:

- General, professional or technological high schools
- Training centers or training centers for apprenticeship (CFA)
- Technological centers and/or farms[61]

In 2020, there were 182 EPLEFPA in France. This education can start for 13-14 year old middle-school pupils, and leads to 5 different degrees: *certificat d'aptitude professionnelle agricole* (CAPa), brevet d'études professionnelles *agricole* (BEPA), baccalauréat professionnel *agricole*, *baccalauréat sciences et technologies de l'agronomie et du vivant* (STAV), baccalauréat scientifique, *spécialité Écologie, Agronomie et Territoires* (EAT). These schools also provide apprenticeship and adult training : *brevet professionnel agricole* (BPA), *brevet professionnel* (BP), *certificat de spécialisation* (CS).
There are specialised trainings in ornamentals, such as a *Brevet de Technicien Supérieur Agricole* (BTSA) with a specialisation in ornamentals production[62]. Trainings in ornamentals are based on two main branches: production of ornamental plants (trees, shrubs, etc.), and floriculture.

2.9.2. Long Higher Education

Long higher education is conducted in higher public or private schools and is accessible after a baccalauréat (General School leaving degree) or after two years of preparatory class (curriculum BCPST: *Biologie, Chimie, Physique et Sciences de la Terre*; curriculum TB: *Technologie and Biologie*). These higher education schools provide diplomas for engineers (master degrees), landscape architects, specialist executives, professors, and researchers[63].
There are currently 12 higher agronomy, veterinary or landscape schools in France:

- Agro Paris Tech (Institut national des sciences et industries du vivant et de l'environnement)
- Montpellier Sup Agro (Institut national d'études supérieures agronomiques de Montpellier)
- Agro campus Ouest (Institut national supérieur des sciences agronomiques, agroalimentaires, horticoles et du paysage)
- Agrosup Dijon (Institut national supérieur des sciences agronomiques, de l'alimentation et de l'environnement)
- VetAgro Sup (Institut national d'enseignement supérieur et de recherche en alimentation, santé animale, sciences agronomiques et de l'environnement)
- ONIRIS (Ecole nationale vétérinaire, agroalimentaire et de l'alimentation, Nantes-Atlantique)
- Ecole nationale vétérinaire d'Alfort
- Ecole nationale vétérinaire de Toulouse
- Ecole nationale supérieure de paysage (sites de Versailles et de Marseille)
- Ecole nationale supérieure de formation de l'enseignement agricole de Toulouse
- Ecole nationale supérieure des sciences agronomiques de Bordeaux Aquitaine
- Ecole nationale du génie de l'eau et de l'environnement de Strasbourg

Among these higher education schools of agronomy, some structures offer dedicated training in ornamentals :

[61] https://www.educagri.fr/etablissements-publics.html
[62] https://www.educagri.fr/formation/lenseignement-superieur.html
[63] https://www.educagri.fr/etablissements-publics/enseignement-superieur-agronomique-veterinaire-et-de-paysage.html

- Institut national d'horticulture d'Angers (National institute for agriculture of Angers part of AgriCampusOuest since July 1st 2008, and part of the Institute Agro since January 1st 2020).

The structure is the only higher education institution dedicated to ornamentals. AgroCampusOuest has two master's degrees: ornamentals and landscape management. Equivalent degrees are possible for student, in collaboration with foreign universities in Germany (HSWT), Brazil (UNESP) and Tunisia (INAT). The school also offers the possibility to graduate through apprenticeship[64].

- ISFFEL: Institut Supérieur de Formation

Founded in 1993, the structure is a higher education school specialised in work-study cursus. ISFFEL has been a training centre for apprenticeship (CFA) since 1998 and offers degree from 1 up to 5 years after a Baccalauréat. The school has been created with the support of the CERAFEL (Association d'Organisation de Producteurs), that represents 7 organisations of vegetable, fruit, plant and flower, and potato producers. CERAFEL represents 1 500 farms. According to CERAFEL, the objectives of the school is to train workers in the sector of fruits and vegetables for the downstream sector (distribution, logistics, etc.).
Since 2007, ISFFEL has been developing partnerships with universities and higher educational schools, and offer training in Avignon, La Roche-sur-Yon, Nantes, St Brieuc, Montreuil and Poissy.

2.10. Screening of effects of recent regulations and of possible new regulations

2.10.1. Use of chemical pesticides.

In France, the use of phytopharmaceutical products for the protection of plants and crops is currently subjected to the following regulations:

- Article L213-10-8 of the Environmental Code, enacting a fee for "diffuse pollution" due by distributors/sellers and purchasers of phytopharmaceutical products[65].
- European Regulation (EC) No 1107/2009, establishing the approval criteria and process for the marketing of active substances. The French national agency for Food, Environmental and Labour health safety "ANSES" (in French "Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail") is responsible for the delivering or withdrawing of marketing authorizations for phytopharmaceutical products. Phytosanitary products from other EU member states may be used or placed on the French national market if they comply with specific conditions and receive the approval of ANSES.
- Directive 2009/128/EC of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, including the mandatory implementation of the principles of integrated pest management by all farmers.
- National law No 2014-1170 for the future of Agriculture, Food and Forest, introducing a phytopharmaceutical monitoring system to track the products' side effects.
- National law No 2014-110 (in French, "loi Labbé"), modified in 2015 by law n°2015-992 for energy transition and green growth, that forbids public stakeholders (State, local authorities and public institutions) to use phytopharmaceutical products on public green areas, parks, forests and roads (starting in 2017). A decree published in 2020 extends the ban on pesticides in various areas of public use: private properties, parks and gardens, campsites, hotel and commercial areas, cemeteries, unfenced sport facilities…, from 2022 onward. Since 2019, the law also has forbidden the sale of chemical pesticides to private individuals for nonprofessional purposes. But these regulations do not affect the professionals from the agricultural sector.
- The French Rural Code (article L.253-7) and the ministerial decree of 04/05/2017 on the use of phytosanitary products has made it mandatory for professional users to keep a distance from

64 https://www.agrocampus-ouest.fr/formation/apprenti-ingenieur
65 https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000038846798

5 to 100 meters along water points (watercourses and linear features recognized by the Environmental Code or GAEC standards) without any treatment, to prevent transfers of pollutants. The minimum distance is set by ANSES on the marketing authorization and depends on the product[66].

- The national plan "Ecophyto II+", announced in 2018 subsequently to the Ecophyto I and Ecophyto II plans (2008-2018), targets a 50% reduction in phytosanitary products use by 2025, and the end of Glyphosate use by 2022 at the latest[67].
- The "Egalim law" (in French "Loi EGALIM") for "balanced trade relations in the agricultural sector and healthy and sustainable food", promulgated in 2018, requires among other targets that 50% of food products consumed in public catering should be sustainable or certified by a sign of quality or origin by 2022, including at least 20% of organic products. It also forbids the use of neonicotinoids and phytosanitary products with identical modes of action and provides for the protection of people in neighbouring areas where phytosanitary products are used.

According to a producer, because of the French legal framework, some very effective products, allowed in Italy, Spain, Belgium Germany or Netherlands are forbidden in France. The consequence is a lack of competitiveness of French producers. This fact led many vegetable farmers to develop organic or at least 'without chemicals' production.

2.10.2. Energy

In France, energy transition is currently subjected to the following regulations:

- The European Union climate and energy package: adopted in 2008 and revised in 2014, it consists of a set of directives, regulations and decisions setting specific objectives for 2020 and 2030.
- The French Green Growth Energy Transition Law[68] (2015): it aims at enhancing the national efforts for climate change mitigation, for the preservation of the environment, as well as strengthening French energy independence. Among its middle term and long-term objectives, the law intends to:
    - Reduce final energy consumption by 50% in 2050 compared to the 2012 reference with an intermediate target of 20% in 2030.
        - reduce primary energy consumption of fossil fuels by 30% in 2030 compared to the 2012 reference.
        - Increase the share of renewable energies to 23% of gross final energy consumption in 2020 and to 32% of gross final energy consumption in 2030.
    - The National Low Carbon Strategy (2015), stemming from the French Green Growth Energy Transition Law, is France's roadmap for mitigating climate change. It provides orientations for each sector of activity.
    - The French Environment Code: equipment for the methanation of non-hazardous waste or raw plant material, as well as recovery equipment of non-hazardous and non-inert waste with a capacity exceeding 75 tonnes per day and involving biological treatment, are subject to the rules applying to the "facilities classified for environmental protection." Depending on its size, capacity and localisation, a photovoltaic device on greenhouses may be subject to an environmental impact study.
    - The French Urban Planning Code: Depending on their surface area and their capacity, a biogas plant, or a photovoltaic device setting-up may be subject to prior declaration or building permit.

66 https://www.legifrance.gouv.fr/loda/id/JORFTEXT000034603791/
67 https://agriculture.gouv.fr/le-plan-ecophyto-quest-ce-que-cest
68 https://www.ecologie.gouv.fr/loi-transition-energetique-croissance-verte

- The French Energy Code: Biogas plants and photovoltaic devices with a capacity of more than 50 MW are subject to an operating license[69].

2.10.3. Labour

Labour law has been successively reformed in 2016 (“labour law”) and in 2018 (“labour law 2”) by Hollande and Macron government**.**

The 2016 reform aims to protect employees, promote hiring, and give more leeway to negotiation in the company. It leaves more freedom to companies to set the working time of their employees or to make redundancies. It focuses on working time, redundancies conditions, collective agreements, and new rights for employees regarding prevention of hardship.

The 2018 reform has been designed to simplify the labour code and make internal labour negotiations more flexible regarding globalization, the diversity of companies and sectors, the development of new technologies, and the expectations of employees. It targets SMEs and aims at developing investment and employment. It also provides new rights and new protections for employees. The main provisions are the following:

- Definition of legal and labour compensation for dismissal that gives security and visibility regarding potential disputes between employees and enterprises.
- Simplification of negotiations in small and medium enterprises. The law allows possible negotiation directly between the head of the company and his employees for VSEs (< 20 FTE) and without elected staff. However, the issues discussed will not concern branch agreements. The agreement will be effective with a majority vote.
- Simplification of social representation with the merger of employee representative bodies for enterprises with more than 11 FTEs. The merger of three of the employee representative bodies into the Social and Economic Committee (CSE). This can be carried out with a company agreement. It replaces employee representatives, health, safety and working conditions committee (CHSCT) and works council.
- Elimination of criteria on the recognition of arduousness at work. The reform includes the elimination of four of the ten criteria (manual handling of heavy loads, painful postures, mechanical vibration and chemical risks) giving entitlement to the personal account for the prevention of hardship.
- Competitiveness agreement. This provision allows a company to improve its competitiveness by playing in particular on the working time, on its distribution, and on remuneration. Once the agreement has been made with the unions, the new provisions become immediately applicable, and automatically replace any contrary or incompatible clause in the employees' employment contract. Each employee then has one month to refuse or accept the new clauses of his employment contract. If he refuses, the employer can dismiss him, and the dismissal will be considered as having a real and serious cause. This type of agreement can be used to preserve employment when the company is in a competitive sector.

2.10.4. Packaging

The law provides for a reduction in ‘food waste, by 2025, by 50% compared to its 2015 level in the areas of food distribution and collective catering and, by 2030, by 50% compared to its 2015 level in the areas of consumption, production, processing and commercial catering’.
The text adopted also provides for a ban on plastic packaging for batches of fruit and vegetables weighing less than 1.5 kg from 2022. More specifically, the text indicates that: “As of January 1, 2022, any retail operator for sale of unprocessed fresh fruit and vegetables is required to display them without packaging made entirely or partly of plastic. This obligation does not apply to fruits and

69 https://www.ecologie.gouv.fr/solaire

vegetables packaged in batches of 1.5 kilograms or more, as well as to fruits and vegetables presenting a risk of deterioration when sold in bulk, the list of which is fixed by decree. "

The law also bans labels on fruits and vegetables from January 1, 2022, except for stickers compostable in-home composting.
It also obliges catering establishments to 'serve meals and drinks consumed on the premises of the establishment in cups, including their closures and lids, plates and reusable containers as well as than with reusable cutlery' from January 1, 2023.

2.11. Barriers to entry

Barriers to entry on the vegetable or ornamental market are not important in the context of the EU single market. If the number of competitors has been declining progressively, the total number, including foreigners has been increasing.

If we consider the barriers as the difficulties, for any newcomers, to enter these markets, one of the most important barriers is the **low rate of profitability of many farms**: comparing the assets' amount and the net result which is supposed to pay work and capital often discourages young professional to invest in the fruit or vegetable farming. It is not the case in the covered vegetable farming, where all farms are bought by new producers when the oldest get retired, but it is true in the ornamental sector, where urbanisation is one of the main destinations of former flower and plant farms. In fact, not amany vegetable of ornamental farms are created.

On the food market, French actors, who often cannot fight effectively on the prices front against North European or Spanish competitors, chose differentiation tactics**: indication of French origin** and/or certification, **innovative and large range of product.** That kind of choice explains, the relative success of covered tomatoes producers, with lower yields (60 Kg/ m2 *vs* 80 kg/m2 in the Netherlands) but higher unit value. This is a relative success, because imported tomatoes still dominate a large part of the market.
On the ornamental market, the importance of trade deficit shows that there are no barriers to foreign competitors, especially Dutch, except for a few specialties (a part of the roses market, and lily of the valley).

2.12. Part 2 main findings

The fresh vegetable marketing chain is characterized by the resilience of the wholesale companies, of the main physical wholesale marketplaces (Marchés d'Intérêt National), and of independent specialised retailers. The wholesale stage includes very diverse companies: wholesalers, importers, co-operatives. The covered vegetable production is present through 4 co-operative groups, involved in tomato, strawberry, and cucumber production: Arcal-Prince de Bretagne, Savéol, Océane and Rougeline. At the retail stage, mass retailers dominate the market.

The French ornamental and nursery industry is characterised by high diversity of professions and products. In 2019, retail sales on farms and outdoor markets remained ornamental and nursery companies' main outlet (25.7% of horticultural turnover; 58% of producers). Other main outlets were garden centres (23% of horticultural turnover), other producers (13.7% of sales), and wholesalers of flowers and plants (12% of horticultural turnover). Biggest ornamentals' companies are cooperatives situated in the Pays-de-la-Loire region.

Vertical relationships in the vegetable sector are strong and well established, with the concentration of shipping and retailing companies. Recent demand trend for local products led to various incentives: direct relationships between producers and wholesalers, public support ("Projets alimentaires territoriaux"), traceability tools, ...

The ornamental and vegetable sectors benefit from different kinds of public supports at European, national, and regional levels. At EU level, the 'National Strategy for Fruit and Vegetable sector', elaborated in accordance with EU common market regulation, grants a specific support over the 2013-2018 period. National measures include knowledge on the ornamentals' market and experimental programmes of the ASTREDHOR technical institute. Since 2015, the management of subsidies for investments in greenhouses is managed by Regions, in the context of regional programs for rural development. Eventually, in 2020, the French government implemented a EUR 25 million state aid scheme aimed at compensating ornamentals' producers' loss of turnover during the containment period.

Recent European and national regulations apply to the vegetable and ornamental sectors concerning: the use of chemical pesticides, with some products forbidden in France but allowed in other European countries; energy; labour; and packaging, with upcoming regulations on food waste and ban on plastic packages for fruits and vegetables weighing less than 1.5kg.

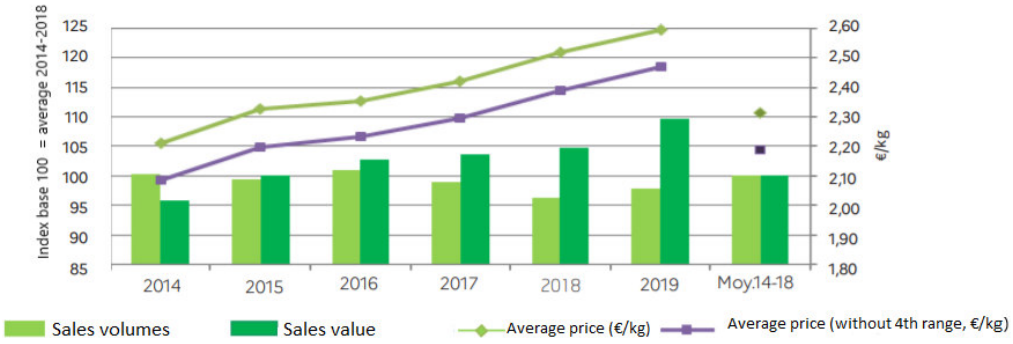
Barriers to entry on vegetable or ornamental market are not important in the context of the EU single market. If the number of competitors has been declining progressively, the total number, including foreigners has been increasing.

3. SWOT ANALYSIS

3.1. Strengths

3.1.1. The size of the French market

Figure 9 French fresh vegetables retail sales from 2014 to 2019



Source: Achats de fruits et légumes frais par les ménages français, FranceAgriMer, 2020

Concerning vegetables, produced in open-air condition and under shelter, sales value increased by +4,7% in 2019 in comparison with 2018., and by +9,5% in comparison with the average value from 2014 to 2018. This increase is mainly related to the increase in price observed over the last five years. However, sales volumes in 2019 decreased by 3,5% in comparison with 2014-2018 average. These figures underline the increase in the French market in terms of value, supported by an important increase in prices (see point 2.5.1).

Concerning flowers and plant products, the French market is one of Europe's most important markets with a high per capita consumption and a large population (76% of households in 2019).

3.1.2. The preference of a significant part of the population for French products

According to FranceAgriMer[70], since 2000 there has been a growing demand of consumers for French products. In 2017, the French origin became an essential condition for buying a fresh fruit or vegetable for 53% of the French consumers (versus 26% in 2000). A wide majority (80%) of consumers expect more local and French products.

To illustrate the growing demand for French products, the label "Légumes de France" was created in 2015. It can be granted to any fruits or vegetable that is produced in France and is a guarantee of origin for the French consumers. This label has been implemented by professional organisations (ANIFELT and INTERFEL) to limit the erosion of the share of French products on the market and has also been developed to satisfy the consumer's demand of local products.

3.1.3. An active communication for French products and for some GI protected products

Various structures regularly organise communication campaigns to promote French fruits and vegetables. From 2012 to 2014, the inter-branch organisation INTERFEL[71] conducted the communication action "*Les fruits et legumes frais, du Plaisir à chaque saison*"[72], with support from the European Union. The same communication campaign was reconducted for the next 3 years, with support from other professional structures: CNIPT[73] (Comité National Interprofessionnel de la Pomme de Terre), SIPMM Melon and Apricot[74] (Sections Interprofessionnelles de Première Mise en Marché),

70 Les acheteurs en rayon fruits et légumes, Synthèse Filière Fruits et légumes, FranceAgriMer, 2018
71 https://www.interfel.com/
72 https://www.areflh.org/fr/promotion/igp-aop
73 http://www.cnipt.fr/
74 https://www.abricotsdenosregions.com/qui-sommes-nous

AOPN Tomatoes-Cucumber[75] and Peaches-Nectarines[76] (Associations d'Organisation de Producteurs), and IFLA[77] (Interprofession Fruits et Légumes d'Alsace). This communication campaign aimed at promoting the diversity of French vegetables and recipes, and the seasonality of the French vegetable production. The objective of the campaign was also to limit the erosion of fresh vegetable consumption in France, that decreased from 169 kg/household in 2009 to 164 kg/household in 2013[78].

In addition to this important communication campaign, targeted actions have been implemented: radio advertisement, social media (Facebook, Instagram, Linkedin, partnership with Demotivateur Food, etc.).

Some vegetables under GI (Geographical Indication) benefit from the communication campaigns carried out to promote PGIs (Protected geographical Indication) and PDOs. (Protected Denomination of Origin). A program of information and promotion of PDOs and PGIs in France, Italy and Germany has been carried out from 2014 to 2017[79]. It targeted 8 fruits and vegetables, among which the French PGI Fraise du Périgord that can be produced in covered areas.

3.1.4. The choice of French products by mass retailers

Historically, French retailers have been pushed to get supplies from French producers when volumes are available. In some areas of the country, such as Pyrénées-Orientales, retailers and wholesalers decided to focus their supply on local or French farmers when possible, to avoid tensions between actors of the supply chain. For instance, in 2008, to complain about the presence of foreign – often Spanish - fresh fruits and vegetables, some producers destroyed supplies in shops in Nîmes and Montpellier[80].

In addition to the demand of producers toward local purchase from the distribution, French consumers have shown a growing demand for French fresh fruits and vegetables, as detailed before. The combination of these two aspects tends to push mass retailers to get French supplies rather than foreign fruits and vegetables and use it as a marketing tool.

3.1.5. The diversity of regions and climates

France is famous for its mild climate, related to Atlantic winds on the shores of the European continent. However, regions present different climates, according to the altitude, the proximity with the sea or ocean, and the position around the 3 main French mountain ranges. Different climates are then defined: oceanic, semi-oceanic, semi-continental, mountain, or Mediterranean.

The diversity of the climates in France implies a diversity of production. As detailed at point 2 on statistical data, agricultural production and covered productions are distributed according to the climate and growing conditions of the French regions.

75 https://www.tomates-de-france.com/

76 https://www.aop-pechesabricots-france.com/

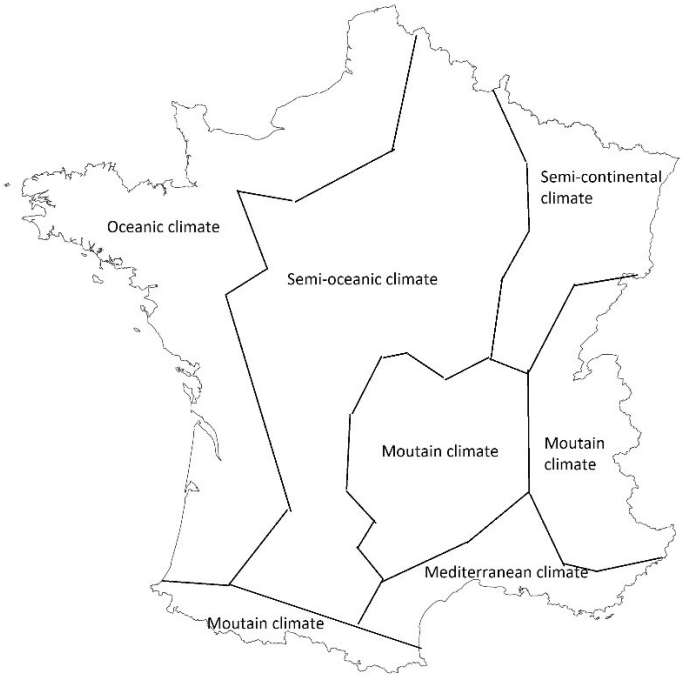
77 https://www.fruits-legumes-alsace.fr/

78 Kantar Worldpanel

79 https://www.areflh.org/images/stories/images-docs/3-thematiques/promotion/Promotion_DOP_PGI_-_Presentation_Info_Day_-_31_January_2018.pdf

80 https://www.lafranceagricole.fr/actualites/fruits-et-legumes-importes-la-distribution-demande-une-reunion-au-ministere-de-l-agriculture-1,0,319858062.html

Figure 10 : Map of the different climates in France



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Source: own elaboration based on Météo-France[81]

3.1.6. A rapid development in organic production

The French organic areas and production have known an important increase over the past decade. Concerning fresh fruits and vegetables, the increase has been constant and high, and has more than doubled between 2011 and 2019.

Table 39 Surfaces of organic fresh fruits and vegetables in France

	2011	2012	2013	2014	2015	2016	2017	2018	2019	%2011-2019
Organic fresh fruits	9 596	11 068	11 554	12 380	13 601	14 598	17 980	21 581	25 822	169%
Organic fresh vegetables	13 896	14 993	16 278	17 680	18 682	20 292	23 799	28 782	34 668	149%

Source: Agence Bio[82]

The rapid development in organic production relies on the growing demand of consumers for what is considered to be healthy and respectful of the environment and animal-welfare[83], public support to develop organic farming through EAFRD for instance, and the change of attitude for a part of producers who are now more likely to get involved in organic production.

Organic production is not allowed for off-ground cultivation. Concerning heated greenhouses, professional organisations and the French Ministry of Agriculture have reached a compromise stipulating that the commercialisation of covered and heated vegetables from 21st of December to 30th of April is not allowed with the organic label. For some products (tomato, cucumber), the use of heated greenhouses is then not an advantage in some regions (Bretagne in particular) as the production of

81 http://www.meteofrance.fr/climat-passe-et-futur/climat-en-france/le-climat-en-metropole#:~:text=%C3%80%20l'%C3%A9chelle%20mondiale%2C%20la,vents%20venus%20de%20l'Atlantique.

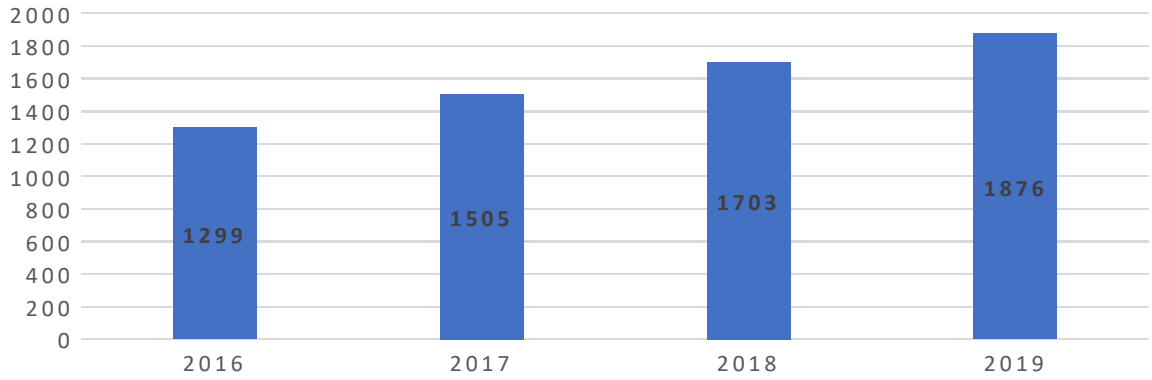
82 https://www.agencebio.org/vos-outils/les-chiffres-cles/

83 https://www.economie.gouv.fr/dgccrf/boom-bio

non-heated greenhouses starts in the southern regions in France at the end of spring. " In addition, producers have had the obligation to use renewable sources of energy[84] to heat greenhouses for new projects on each production site since January 1st, 2020 (January 1st, 2025 for installation that already had an organic certification)[85].

In addition to the rapid growth in organic production, the organic market for fruits and vegetables has also grew. According to the study carried out by AND-International for Agence Bio, the turnover of the sector grew by +45% from 2016 to 2019, to reach EUR 1 876 million.
The rapid growth in organic production and in organic consumption in France is a strong asset for the operators involved in the organic value chain.

Figure 11 Evolution of the turnover of the organic fruits and vegetable market in France (EUR million)



Source: AND international pour Agence Bio

3.2. Weaknesses

3.2.1. Labour costs in agriculture

According to a study of Geopa[86]-Copa (Schröder, 2013), agricultural France labour costs reached 16.61€/h in 2012 which ranks it the sixth among EU MS.

Table 40 Farm labour cost in Europe

	2012	2006
Denmark	28.37	18.88
Sweden	23.77	15.80
United Kingdom	22.16	10.26
Finland	21.58	12.31
Austria	16.63	13.32
France	16.61	10.61
Netherlands	15.73	12.42
Belgium	15.19	12.30
Italy	13.72	11.15
Ireland	11.22	7.28
Spain	9.38	8.50
Hungary	5.28	2.02
Portugal	4.35	4.33
Latvia	3.90	1.22
Poland	3.32	1.85
Lithuania	3.13	2.36

Source: Schröder,2013.

[84] Renewable energy is an energy produced from renewable non-fossil energy sources: wind, solar, geothermal, wave, tidal, hydroelectric, landfill gas, sewage treatment plant gas and biogas. Article 2 of title 1 of regulation (EC) no 889/2008

[85] https://agriculture.gouv.fr/le-comite-national-de-lagriculture-biologique-encadre-le-chauffage-des-serres-pour-la-production-des

[86] Employers' Group of Professional Agricultural Organisations in the European Union

Regarding specifically the ornamentals and vegetable production, according to a study of the IGAS/CGAER of 2015, the labour average hourly wage increased the most in France (+ 18.8%) (excepting Denmark). Italy experienced similar growth (+ 17.3%) but the increase was less in Spain (+ 13.8%), Germany (+ 1.5%) and the Netherlands (+ 8.1%).

No updated data regarding specifically hourly wages in horticultural and vegetable production is available after 2012, but a approach can be done through FADN data for Type2 farms (horticulture, all kinds of). A comparison of annual wage for 2018 is possible (table 37). It shows that France labour cost is comparable with German or Belgium rates. Far lesser than Dutch one and far higher than Spanish case. In front of these kind of official figures, many actors would say that it concerns official matters and that many farmers use illegal employees, in all countries, with much lower rates.

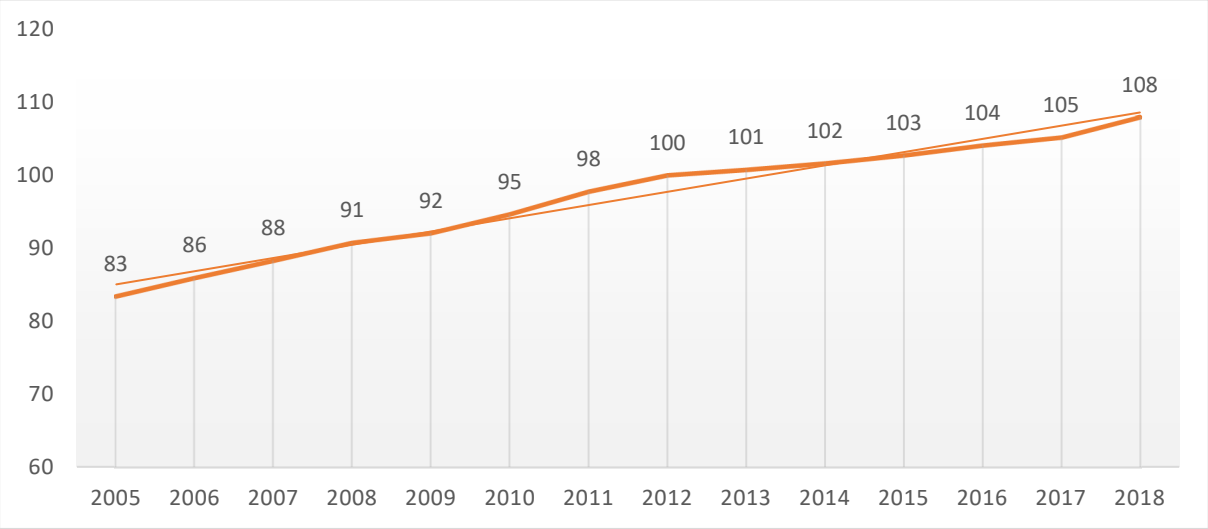
Table 41 – Yearly average wage of paid labour

Member States	EUR/ year	index
Netherlands	35 188	100
Germany	25 514	73
Belgium	24 699	70
France	23 992	68
Spain	17 971	51
Greece	8 667	25

Source: own calculation based on FADN database.

Furthermore, the general trend shows an increase of 8 points of the average labour cost in France (all sectors) between 2012 and 2018.

Figure 12: Evolution of the labour index cost in France since 2005 (index 100 =2012)

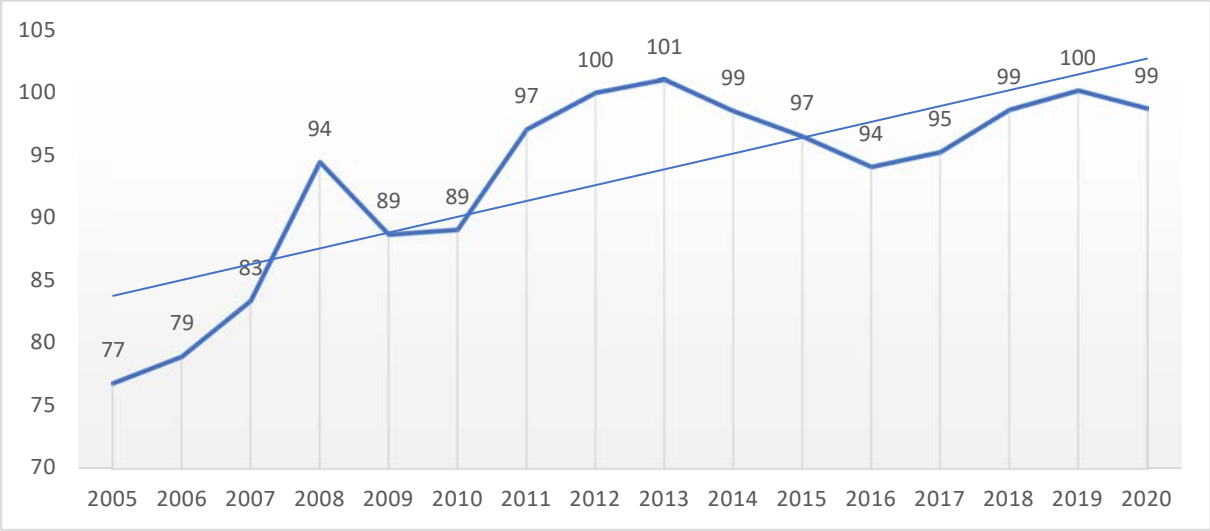


Source: INSEE

3.2.2. Input costs

Over the 2005-2020 period, the index IPAMPA (Purchase price index for means of agricultural production) increased by 23 points. However, inputs costs have decreased to a significative extent between 2012 and 2017 before reaching in 2019 their 2012 level. The figure below presents the evolution of purchase price index for means of agricultural production.

Figure 13 : Evolution of the purchase price index for means of agricultural production in France since 2005 (index 100 =2012)



Source: INSEE

3.2.3. Complexity of French market and high competition at retail level

-3231- Vegetables

The French vegetable retail market is rather complex with numerous marketing channels and a high level of competition between operators at wholesale and retail levels, in particular for the most consumed products (tomatoes, cucumbers, courgette).

As described in § 3.1.1.5, retail is dominated by mass retailers. However, trends show that the market share of hypermarkets is declining in favour of supermarkets (surface area between 400 and 2,500 m2), hard discount (Lidl and Aldi) and convenience stores. In addition, direct sales from producers and organic stores are developing. Competition at the retail level is intense between the leaders Leclerc, Carrefour, Intermarché and Système U (69.3% of total sales at the retail level in 2020).

This competition leads to a double situation: low prices for standardized products and multiple diversifications for other vegetables combined with public or private certification. Indeed, French consumers are attached to the taste quality of products and also to additional attributes such as origin, absence of residues, method of organic cultivation etc. The figures presented in § 3.1.1.5 show that despite a drop in vegetable consumption in volume, their global value continues to grow thanks to the higher value of the vegetables sold.

From now on, the supplier referral purchase policies of the main retailers include for fruits and vegetables at least international quality certification (global Gap, IFS…). In some case, the national origin schemes such as “Légumes de France” became for certain mass operators a strategic purchase criterion. In addition, some retailers demand additional environmental guarantees. Some retailers have included environmental certification such as HVE or its equivalents (“verger ecoresponsable”, “Demain la Terre” etc..) in their purchase policy while others ask for products guaranteed without pesticides (through private certified scheme developed either by the supplier or either by the retailer) or by including those pesticide free requirements into their general purchase policy.

The high competition at wholesale level can be explained by the asymmetry of the bargaining power to the benefit of retailers. Indeed, the six largest mass retailers account for 80% of the global retail market while the number of wholesalers/POs/importers reaches around 2800.

This situation leads to a highly competitive vegetable market for both premium range products that must bear environmental and quality certifications and also standard product that must compete with imports.

-3232- Ornamental plants

The French ornamental plants market is rather complex with numerous marketing channels and a high level of competition between operators at wholesale and retail levels. French market is one of Europe's most important outlet for ornamentals' products but faces stagnant demand in a context of economic crisis and a lack of interest from young generations.

As described in §1.6, with 911.8 million euros of trade balance deficit, French production cannot meet domestic demand and faces high competition from other EU countries.

French production competitivity has been declining over the last decades, with decreasing surface, production turnover, and number of producers. In 2018, 16% of French horticultural farms were on a decline trend, with concerning loss of financial flexibility, and low investment capacity.

Most ornamentals' farms are too small to work with garden centres or supermarkets' central purchasing bodies, which supply themselves in other EU countries (the Netherlands, Italy, Spain, Belgium, …)

The decline in horticultural production also weakened wholesalers, who import a major part of their goods from other EU countries and face high competition from foreign suppliers.

Like wholesalers, florists have been facing an increase in costs and expenses. Purchase volumes at flower shops are in decline in favour of more economical circuits such as supermarkets.

3.3. Threats

3.3.1. The competitiveness of the European production

Concerning vegetables, the French supply balance in 2018 is negative, with a value of exports (977 000 tonnes, excluding strawberries) representing almost half of the imports (1 945 000 tonnes). There is an important competitiveness among European producers in France, with vegetables originating from different countries on the French market. According to the supply balance figures presented in annexe, for the main fruits and vegetables (strawberry, tomato, cucumber, melon and salads) the weight of imports largely exceeds the level of exports.

In 2018, according to FranceAgriMer[87] , Spain is the EU main supplier of France for cucumber (70% of the value of imports), strawberry (62%), salads (65%) tomato (23%) and melon (64%). The Netherlands is also an important supplier for the French market concerning cucumber (17%). Spain is the second fruit and vegetable producer in the EU, and benefits from a wide range of productions, in which 60% is oriented toward exports, making Spain the leader in exports in the EU. At world level, Spain is the 3rd most important exporter of fruits and vegetables, after the United States and China. There is competition between France and Spain in the fruit and vegetable sector, and Spain benefits from a better competitivity[88] related to lower production costs compared to France, in particular regarding the cost of human labour.

87 Les chiffres-clés de la filière fruits et légumes frais et transformés, FranceAgriMer, 2018 (Key figures for the fresh and processed vegetable marketing chain).

88 Les politiques agricoles à travers le monde, Espagne, ministère de l'Agriculture et de l'Alimentation, 2018 (Agricultural policies in the world, Spain, French Ministry of Agriculture, 2018)

For the Netherlands, the main agricultural exports concern ornamentals products, dairy, fruit, and vegetables (with a large part of products cultivated in greenhouses). According to FranceAgriMer studies[89] on the level of competitiveness of European member states in the agriculture sector in 2016, the Netherlands are ranked 3rd for salads in 2016, 4th for strawberries in 2016 and 1st for tomatoes. This position is related to an extra supply balance, with large volumes of production in comparison with the national consumption, a good positioning on exports, and a high level of technicity related to the development of covered cultivation.

3.3.2. Local opposition

There is a systematic and effective opposition of local populations against any project which could be assimilated to "industrial farming", including greenhouses.
Greenhouses do not have a good fame in France. Criticisms rely on two facts**: local disturbance and energy consumption.** Several facts demonstrate defiance of a part of population: the French organic professional bodies agreed to ban domestic tomato production from the 21st of December to 30th of April, the reason is that organic production cannot encourage energy waste. The French organic consumers agree with this policy. Organic shops do not offer tomato and other Mediterranean vegetables during the winter period. Most great greenhouse projects (> 4 ha) are subject to local oppositions.

Oppositions raise and face any kind of new industrial implantation, not only great greenhouses. It is very difficult and very costly to accomplish the establishment of a large farming project. Local opposition is often constituted by retired people who think that the countryside should be calm (without any activities, trucks, noise, mud on the road, dust, etc., …) and that farming should remain small scale. A popular opinion is that large units are totally bad: polluting (chemicals, animal waste), making noise (trucks and machines), ruining little producers, making money with nature, wasting energy (tractors, heating, lighting). The opponents' real interest is often rather selfish: to be quiet at home (without any disturbing activities in the neighborhood), to protect real estate value, to benefit of beautiful territories and landscape (such as coastal areas).

Nevertheless, all projects are not condemned. If the largest projects may sometimes appear as soap operas in national media or at smaller scale may be finally abandoned, reasonable projects can find their way. New greenhouse projects can succeed with public support (especially if jobs are created, or in the cogeneration cases), in well-chosen locations (dedicated areas, industrial parks for instance may suit greenhouse projects), with precautions (planting trees, preventing all disturbing consequences, talking with opponents, demonstrating the validity of project through independent impact studies) and with patience.

Following examples show that time is a key factor but also that French civil society can strongly react to land-use projects that would threat the quality of their natural and cultural landscape:

- The multiple appeals in court against the building permit and local urbanism plan of a logistic platform project launched in 2011 by the agricultural company "Sica Saint Pol du Léon". France's first vegetable cooperative designed this platform (a 50 million euros investment for 7 ha of buildings) to centralize and speed up the shipment of its production. For 10 years, an association of local neighbours opposed to the project, with the arguments that it would consume a large area of agricultural lands and create visual and

[89] Synthèse de l'analyse de la compétitivité du marché européen de la fraise, de la tomate et de la salade, FranceAgriMer, 2016Competitivity analysis of the European market of strawberry, tomato and salad, FranceAgrimer, 2016

noise pollution for the residents. The last appeal was rejected by a court of justice in 2020 and the project finally started in 2021[90].

- The petition launched in 2019 by the "FNAB" ("Fédération nationale d'agriculture biologique des régions de France" or National Federation for Organic Agriculture) calling for a ban in France on the use of heated greenhouses to produce organic fruit and vegetables[91]. The national Committee for Organic Agriculture (CNAB) finally authorized the use of heated greenhouses, but with some restrictions: product marketing is forbidden between the 21st of December and the 30th of April, all newly organic certified greenhouses must use renewable energies starting from 2020, and all organic greenhouses will have to use renewable energies exclusively from 2025 onward.

- the "Europacity" mall project, located on agricultural lands in the Ile-de-France region, was abandoned by the government, after years of protests from an increasingly broad resistance movement[92]. It is designated as one of the "Grands projets inutiles" (or "Boondogles"), a list of big projects supported by public authorities whose benefit for society is questioned by a group of citizens.

- Multiple territorial assessments identify the risk of a landscape impact generated by new farm buildings in historically agricultural regions. They often recommend alternating greenhouses and tunnels with other crops and designing well-integrated buildings to preserve the visual quality of the landscape. The mots emblematic case is the 'ferme des 1000 vaches' (1000 cows farm) in Northern France which is still a privileged target of opponents to 'factory-farms. Designed in 2011 to have 1000 milk cow, this modern unit was immediately criticised by a coalition of opponents, authorities gave an authorisation for 500 animals only. After several years of activity and cases to the court, the company announced the closing of the unit in 2021.

The energy saving issue is more complex. In a next future all energy wasting activities will be attacked by public opinion, because of global warning. Large businesses like automotive or aeronautic industries can prevent such call into question by their communication power, but they also must change, announce large plans to develop electric cars and planes. Greenhouses industry must do so. That is why the cogeneration wave is still running, because it is a way to demonstrate that greenhouses are a way to use unavoidable energy and why the photovoltaic solutions may take some importance. The issue is not only French.

3.4. Opportunities

3.4.1. On the vegetable market, with "eco-certified" products

In the past few years, multiple labels and brands have emerged in France, at production and distribution levels, especially for the food retail sector: "Vergers écoresponsables , "Demain la Terre", "Zéro résidus de pesticides", "Cultivé sans pesticides", HVE (level 2 and 3),… They wish to meet the increasing expectations of the French citizens regarding quality, as environment ranks at the 5th position of the consumers' main considerations when they purchase a product[93]. Among them, HVE[94]

90 https://france3-regions.francetvinfo.fr/bretagne/finistere/finistere-plateforme-sica-lance-son-activite-saint-pol-leon-1917062.html

91 https://www.francetvinfo.fr/economie/emploi/metiers/agriculture/petition-contre-les-serres-chauffees-en-bio-cette-technique-permet-de-repondre-a-une-demande-forte-replique-la-fnsea_3466043.html /

92 https://www.lemonde.fr/economie/article/2019/11/07/emmanuel-macron-annonce-l-abandon-du-megacomplexe-europacity-au-nord-de-paris_6018357_3234.html / https://reporterre.net/Grands-Projets-inutiles

93 https://www.lsa-conso.fr/dossier-fruits-et-legumes-face-au-bio-l-emergence-des-labels-alternatifs,326671

94 https://agriculture.gouv.fr/certification-environnementale-mode-demploi-pour-les-exploitations

certification has taken off and reached more than 8 thousand farms in late 2020 (to be compared with less than 5 thaousand at the beginning of the same year), including 6 699 wine farms, 644 fruit farms, 340 vegetable farms and 42 ornamentals' units. HVE scheme now covers 1,3 % aof the national utilised agricultural land, to be compared to the 8,5% share of organic production.

ECOCERT is a French example of certification schemes' success. This private organization founded in 1991 that certifies food and food products, but also cosmetics, detergents, perfumes, and textile, with its own brand "Ecocert". It has now international subsidiaries and operates in more than 130 countries. Ecocert issues more than 150 certifications with high environmental and social standards, including organic agriculture (France, Europe, USA, Japan…) but also Global Gap, IFS, Rainforest Alliance, Fair trade etc. It is the leader of organic certification in France and worldwide, controlling 64% of the French organic operators in 2015[95].
Certified products will be the key to gain market shares in the coming years. For instance, all covered tomato producers will be HVE certified by the end of 2021. Success of certified products relies also on the proximity or locality of the production.

3.4.2. To take over French farms

In France, transmission in agriculture is now a crucial issue, since half of the farm managers were over 50 years old in 2010 and were expected to retire in the following 10 years[96]. Another study reports that "in 2010, more than 120,000 farm holders, farming a quarter of the national arable land, or 6.8 million hectares of UAA, were 55 years old or older without being retired".[97] Two thirds of them declared that the future of their exploitation was uncertain, or even predicted that it would disappear. Despite the public support to young farmers (subsidies, aids for the setting-up of farms…), economic and land constraints prevent them from taking over. The average price of vacant lands and pastures in France was 6 000€/ha in 2019, and 4760€/ha for rented lands[98]. Prices highly vary depending on the region and type of production, with maximum extremes to 45 000€/ha (PACA region)[99]. It ranges from 4 670€/ha on average in cattle pastures to 6 000€/ha for field crops[100]. Besides, the global cost of installation (take over and first-years investments) is on average 265 000€, a significant burden for young farmers. Vegetable gardening is among the most affected sectors, where farms have a very high asset value. Some operators such as the consulting firm for rural land settlement "Terres d'Europe-SCAFR"[101], affiliated to the 'SAFER' (Sociétés d'aménagement foncier et d'établissement rural) federation, offer to connect European investors who intend to purchase a rural property in France with French property sellers. The SAFER has an English online website listing all properties for sale: https://www.frenchland.com. Few other private companies play agent roles (Agriaffaire – Quatuor).

3.4.3. Opportunities on the ornamental market

France is one of Europe's most important outlet for ornamental products. French consumers are more and more demanding on quality and French origin. The development of labels is an opportunity for French production to differentiate and deal with competition from other countries (the Netherlands, Italy, Kenya, …). Several labels exist, such as "Fleurs de France", "Plante Bleue", "Label rouge", "MPS". More precisely, "Fleurs de France" guarantees the French origin of products". "Plante Bleue" ensures that production practices are environment friendly. "Label rouge" is implemented for some products

95 https://www.lesechos.fr/pme-regions/occitanie/le-certificateur-bio-ecocert-se-renforce-aux-etats-unis-1158534

96 **Romain** Gaté **et Laure** Latruffe, « Difficultés rencontrées lors de la transmission d'exploitations agricoles. Le cas de la Bretagne », *Économie rurale* [En ligne], 351 | Janvier-février 2016, mis en ligne le 15 février 2018, consulté le 19 février 2021. URL : http://journals.openedition.org/economierurale/4792 ; DOI : https://doi.org/10.4000/economierurale.4792

97 Agreste Les Dossiers - n° 29 - septembre 2015, « La transmission des exploitations agricoles », Ministry of Agriculture

98 Le prix des terres - L'essentiel des marchés fonciers ruraux en 2019, SAFER, 2019

99 Agreste – Chiffres et données Juillet 2020 No 5, Valeur vénale des terres en 2019

100 These data do not take vineyard into account.

101 https://terreurosocconsamenagefoncirural.site-solocal.com/#MainAnchor

of special quality: dahlias, rose trees, … "MPS" is a certification on horticultural companies' environmental impact and the way in which sustainability is integrated into their business operations.

Production and distribution companies have developed new commercial practices such as home delivery, online sales, direct sales, in the context of the Covid-19 crisis. The continuation of these practices and the digital transformation of production and distribution companies are key issues to modernise the sector.

3.4.4. Opportunities for farming equipment

As detailed in entry 2.2, the average age of covered installations varies depending on the regions and the type of covered structures. According to CTIFL, the oldest installations are to be found in the South-East, North-East and Val-de-Loire, and the more recent in Brittany, and South-Western France. According to these data, there may be an opportunity for greenhouse manufacturers to support the renewal of French installations. Even in Brittany, where no succession issues are recorded, most greenhouses are considered as 'old tools', built between 2000 and 2005, 4.5 to 5 meters length up to the eaves, while recent greenhouse, 7 meters long to the eave, are not numerous. French recognize that a large share of the equipment market is already controlled by Dutch companies. Only one French greenhouse manufacturer can really compete (CMF Groupe, annual sales, EUR 33 million, 195 employees). This company located between Nantes and Angers takes advantage of its proximity with the main production basins.

FranceAgriMer supported the modernisation of greenhouses and other covers over the period 2002-2012. The evaluation of the support[102] draws various conclusions depending on the sector:

- concerning covered vegetables, the programme of modernisation has been effective, the greenhouses and covers have been modernised with a better technical performance of the farms, and productivity has increased.
- concerning plants and flowers cultivated under covers, producers tend to invest in non-heated low shelters, to limit the cost of energy in their production costs. Automation seems to be an opportunity for the sector, in order to limit growth of labour costs.

In addition, there may be an opportunity in modern farming equipment regarding the growing number of companies involved in digitalisation of agriculture, vertical farming and in precision farming (see point 3.2.2.1)

Local authorities (towns, departments) are often looking to develop equipments including energy saving or GHG reduction devices. From 2015 several projects have emerged, coupling waste incinerator plants and large greenhouses surfaces. One the first projects of this wave is located in Bessieres, near Toulouse (extended to 10 ha in 2018). Other projects are ongoing: Colombelles (Caen suburb), Concarneau (Britanny), Egletons in Corrèze, Lassé near Angers, etc…. Ademe, the national agency for energy saving, published a study about optimization of waste burning plants, including the use of cogenerated heat in greenhouses[103]

3.4.5. Partnerships could be developed:

Greenhouse vegetable production is mostly performed through producers' organisations (PO) that also group in APO associations (association of producer's organisations). The largest POs producing vegetables are in Brittany, which represents 30% of the production of fresh tomatoes. The south-east represents 28% of the total tomato production, most of the production being located in the regions close to the Mediterranean shore, ie PACA, Languedoc-Roussillon and South of Rhône-Alpes.

[102] FranceAgriMer, Évaluation ex post des programmes de financement de certaines dépenses de modernisation dans le secteur des serres maraîchères et horticoles. *Ex post evaluation of funding programmes for the modernisation in the vegetable and flower covered production sector.*

[103] https://www.ademe.fr/etude-techniques-doptimisation-unites-dincineration-dechets-menagers-assimiles

Table 42 Main covered vegetable organisations

Name of the PO	Main greenhouse productions	Turnover in € millions	Number of producers and greenhouse area	Comments
CERAFEL	600,000 t of vegetables Tomatoes: 70,000 t Cucumbers: not known. Courgette: not known Strawberries: not known Organic: 40,000	Vegetables: 300 M EUR (2019) Horticultural: 35 M€ (2019)	2,600 producers 33,400 ha but mostly on field production	The CERAFEL groups 6 PO and is the largest F&V PO in France. Based in Brittany, it produced a large range of on field and covered vegetables (140 varieties). Its members produce also ornamental products. Brand : Prince de Bretagne Certifications : • HVE- level 3 • Produced without pesticides • Organic farming
CERAFEL / SICA DE KERISNEL	Potted plants and vegetable seedlings; cut flowers	36.1 M€ (2019)	50 producers; 50 ha of greenhouse	
SOLARENN	Tomatoes: 30,000 t Strawberries :80 t	47 M€ (2019)	30 producers 65 ha of greenhouse	SOLARENN is a cooperative located in Brittany specialized in greenhouse production. It essentially produces tomatoes. Certifications: • HVE- level 3 • Produced without pesticides • Organic farming
COOPERATIVE MARAICHERE DE L'OUEST - CMO	Tomatoes 80,000 t Straweberries :2,300 t Others: 1%	203 M EUR(2019)	120 producers 275 ha of greenhouse	CMO is a cooperative located in Brittany and is the largest tomato producer in France. The coop is better known by its brand SAVEOL. Brand: SAEVEOL Certifications : • HVE- level 3 • Produced without pesticides • Organic farming
ROUGELINE	Tomatoes: 77,000 t Cuncumbers: 4,400 t Eggplant, sweet pepper, pepper, zucchini: 1,400 t Straweberries and other fruits: 3,600 t	158 M EUR (2019)	230 producers 340 ha of greenhouse	Rougeline is a union of 6 Po s from southern France. It groups 3 production areas: South West, Provence and Roussillon. Brand : Les paysans de Rougeline Certifications : • HVE- level 3 • « Produced without pesticides • Organic farming
OCEANE	Tomatoes : 55,000 t Cuncumbers: 17,500 t	196 (2019)	50 producers	Oceane is a medium size cooperative located in Centre Val de Loire region. Brand : Les paysans de Rougeline Certifications / private label: • HVE- level 3 • « Produced without pesticides
TERRENA / VAL NANTAIS	Vegetables: 38,600 t Ornamental: 400,000 units	92 M€ (2019)	39 producers; 140 ha of greenhouse (big shelters)	Company integrated in the nursery branch of the Terrena cooperative in 1997; works with subcontractors.
TERRENA / HORTIVAL DIFFUSION	ornemental nursery (seedlings)	31,4 M€ (2019)	NA	Subsidiary of Terrena cooperative since 1997 (nursery branch); works with subcontractors

SICA MARCHE AUX FLEURS D'HYERES	Cut flowers	32 M€ (2019)	400 producers	Market place of cut flower. the production of 400 producers to 300 buyers, wholesalers, shippers and florists
PHILA-FLOR	Cut Flowers	NA	140 Cut flower producers	Association of cut flower producers part of SICA Marché aux Fleurs d'Hyères
FLEURON D'ANJOU	Vegetables 14,400 t; mixed ornamental plants	68 (2019)	100 producers	Fleuron d'Anjou is F&V cooperative located in Centre Val de Loire Region. It produces both ornamental products and vegetables . Certifications / private label: • Organic farming

Source: AND-international from specialised magazines.

Partnerships with researchers and producers or advisers, NGO and SME (wholesalers, cooperatives), through the agricultural European Innovation Partnership programme (an EAFRD and Horizon 2020 instrument).

EIP-AGRI was launched in 2012 to "contribute to the European Union's strategy 'Europe 2020' for smart, sustainable and inclusive growth" through research and innovation. Funds are either granted by the EAFRD to operational groups or by the H2020 programme to multi-actor projects bringing together partners from at least 3 Member states. Among the objectives of the EIP, it will help supply food, feed and biomaterials, the preservation of the environment, and the adaptation to and mitigation of climate change (Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013). Hence all projects developing techniques and know-how that can reduce GHG emissions or help in the mitigation of climate change effects should be welcomed. France currently supports 192 EIP-AGRI projects[104], including one research project on "Greenhouse plastics that increase plant growth".

3.4.6. Innovation and public funding: digitalisation, vertical farming, plant ingredients, integrated pest management, energy.

-3461- Digitalization

Operators involved in vertical farming or precision agriculture underline the effectiveness of this system of production, relying on the monitoring of chemical physical parameters of the crops. Digitalization plays an important role in the development of precision farming and its main objectives are:

- agronomic: understand the need of crops and take action in an appropriate manner.
- economic: produce more with less inputs.
- environmental: reduce the impact of agriculture on the environment (water use, pesticides, greenhouse gas, etc.)[105]

In the vegetable sector, according to CTIFL[106], in 2013 producers using heated greenhouses to produce strawberries mainly monitored temperature with computers. However, in the region of Aquitaine and the Mediterranean area, some farms still use control by thermostat, so there may be a potential for

104 https://ec.europa.eu/eip/agriculture/en/find-connect/projects

105 Agriculture de précision, Gilbert Grenier, Editions France Agricole, 2018

106 Parc serre et énergie en fraise hors-sol chauffé – état des lieux de la production sur la campagne 2011-2012, CTIFL, 2013 *Greenhouse installations and heated off-ground production of strawberry – overview of the 2011-2012 production campaign, CTIFL, 2013*

improvement in these regions. In addition, CTIFL[107] also indicates that the digitalization of semi-open greenhouse implies extra-time of work in the short-term, as producers need to get used to the technology. According to CTIFL[50], French producers using semi-open greenhouses need two years of apprenticeship before getting used to the digitalization of their installations. This time of adaptation can be considered long and is explained by the fact no producer scouted in the context of the study had requested support from an advising consultant structure. Meanwhile, improper handling may occur. CTIFL information underlines that producers in some regions may need digital modernization (Aquitaine, Mediterranean regions), and some producers may need technical support to control digitalized tools properly.

Other high-tech tools are being developed in the sector of covered production. Spray tank robots are used for covered conventional agriculture. The main asset of the technology is to prevent any contact of the farmers with the pesticides sprayed on the cultures. In addition, robots use pesticides with precision and avoid an over-use of phytosanitary products. Every year, the SIVAL (Largest specialised F&V fair in France dedicated to fruits, vegetables and ornamental sectors, see point 3.6) awards innovation in different sectors, including the production of ornamental plants[108] and vegetables[109]. Most innovations presented at the SIVAL are digital technologies: software, irrigation monitoring, robots, phone apps, etc.

The Digifermes[110] programme is a French network of experimental farms that are supported by research and R&D structures to evaluate new digital technologies. Farms in the Digifermes network evaluate new technologies developed by startups and private companies and participate in co-constructing new tools with agricultural operators and digital companies. The project was created by Arvalis[111], the French Institute of Vegetal production, and the Digifermes brand was created in collaboration with the *Institut de l'Elevage*[112], *Institut Technique de la Betterave*[113], *Terre Inovia*[114] and *ACTA*[115] (*Association de Coordination Technique Agricole*). The number of ornamental and vegetable farms is very limited in the Digifermes project, with only one farm producing vegetables.

Digitalization also provides commercial assets, through the development of new commercial practices. As mentioned by the French Ministry of Agriculture[116], digitalization in the ornamentals sector should be supported to improve the commercialization of plants and flowers, in the context of the French "Recovery Plan" to support French companies during the Covid-19 crisis. For the ornamentals sector only, the support measure amounts to EUR 25 million, and includes support for digitalization among other measures.

-3462- Vertical Farming

Vertical farming is not widely developed in France, but the number of projects is growing. According to Christine Aubry, INRA researcher[117], as there is no important land pressure at national level, vertical farming must play another role than only provide food: create social dynamism in urban areas,

107 Enquête 2019 sur les serres semi-fermées, Un nouveau concept de développement en France, CTIFL, 2020-*2019 survey on semi-open greenhouses, A new concept to develop in France*, CTIFL, 2019
108 https://www.sival-innovation.com/category/horticulture-ornementale/
109 https://www.sival-innovation.com/category/cultures-legumieres/
110 https://digifermes.com/
111 Institut du Végétal : https://www.arvalisinstitutduvegetal.fr/page-d-accueil-@/view-1318-category.html
112 http://idele.fr/
113 http://www.itbfr.org/
114 https://www.terresinovia.fr/
115 http://www.acta.asso.fr/
116 https://agriculture.gouv.fr/covid-19-le-ministere-en-charge-de-lagriculture-confirme-son-plein-soutien-la-filiere-horticole
117 https://www.geo.fr/environnement/les-fermes-verticales-bonne-ou-mauvaise-idee-199841

enhance biodiversity, reduce emission of CO2, or reduce the use of pesticides. According to the French Ministry of Agriculture, the slow development of vertical farming is explained by the important surface of land available for agriculture, in comparison with countries with mountainous or extreme climate conditions, where vertical farming is more developed: Japan, Middle-East countries, etc[118].

In France, **Agricool** company produces strawberries, coriander, basil and parsley in containers. Plants are grown in vertical trays, and lighted and heated using renewable energy[119]. The company has four production locations: La Courneuve, Courbevoie, Asnières-sur-Seine, and Dubaï.

In 2021 **Jungle** company aims at producing aromatic plants (basil, coriander, parsley, chives), salads (lettuce, arugula), and sprouts (mustard, radish, wasabi). The production system is based on vertical farming in monitored conditions. The production installations are located in Chateau-Thierry (Aisne), 80 km away from Paris.

The company **La Florentaise** is specialized in the production of substrates for indoor agriculture. The company also owns vertical farms that produce various vegetables and fruits. The company has developed the technology HRVST[120] (for *Harvest*) that is an adaptable vertical farm for urban agriculture. Several HRVST have already been developed or are expected:

- "UTOPI'HALL in Angers": vertical farming installation next a bakery where consumers can buy fresh vegetables
- "HRVST Dans le Métro": vertical farming in the Parisian subway

Other high-tech vertical farms have been developed by public structures in order to provide local and sustainable food in urban areas. The "**Cité Maraîchère**"[121] is a project developed in Romainville (93230) since 2012. It was supposed to start to produce in 2020, but the project was delayed due to the COVID-19 crisis. Production should start in 2021. The objective of the Cité Maraîchère is to provide local food, develop high-tech off-ground technics, provide social interactions and create local employment. The project has been carried by the municipality.

For all these structures, it is spotlighted as a marketing argument that vertical faming uses less water, benefits from higher yields, reduces the emission of CO2 in comparison with classic production systems; it also limits the transportation of the products as farms are located near urban centers.

-3463- Plant ingredients.

In 2018, the French production of algae and cyanobacteria was 377 tons in live weight equivalent, two thirds of them spirulina, and generated 7,6 million euros[122]. Most of the spirulina production is concentrated in the regions of Provence-Alpes-Côte-d'Azur, Occitanie, Auvergne-Rhône-Alpes and Bretagne. France is the first European producer of algae and cyanobacteria but represents a negligible share in the world production. Spirulina is mainly intended for human nutrition and marketed through short circuits. The sector is represented by the "Federation des Spiruliniers de France" (Federation of French spirulina producers), comprising 110 member farms[123] (over approximately 140 in total). French spirulina consumption is still mostly imported, but the Federation of producers seeks to promote its traditional trademark with the support of European and national public funds. FranceAgriMer supports

118 Les fermes maraîchères verticales, Centre d'études et de prospective, Ministère de l'Agriculture et de l'Alimentation, juillet 2019Vertical farms for vegetables, Center for studies and strategic foresight, French Ministry of Agriculture, July 2019

119 https://www.agricool.co/fr/product/fraises

120 https://www.florentaise.com/sites/default/files/Pages/espace_presse/pdf/dp-ferme%20verticale.pdf

121 http://lacitemaraichere.fr/

122 Agreste, Graph'Agri 2020, Pêche et Aquaculture

123 http://www.spiruliniersdefrance.fr/

innovative spirulina companies through EMFF (European Maritime and Fisheries Fund) funds for investments and showrooms[124], and public competitivity hubs are currently conducting research on spirulina. The sector is dynamic, as demonstrated by a growing number of farm producers, generated value, and consumer interest in the environmental and nutritional values of the product over the last few years.

-3464- Integrated pest management

IPM (in French: "lutte intégrée" or "protection biologique intégrée"), has been experimented for many years in greenhouses (since the mid '80s by some major tomato producers) to reduce the use of phytosanitary products, as they are costly and increasingly regulated by law. Greenhouses are closed environments that require less treatments and enable a better control of pests, hence well fitted for IPM. Producers have growingly been involved in certification systems whose specifications can match IPM practices: "Plante Bleue", MPS, "Agriconfiance", "Cultivée sans pesticides", Leaf[125]… This dynamic seems to have been accelerating since the introduction of the "High Environmental Value" (HVE) certification in 2012, a national label acknowledging agroecological practices on farms, including alternative methods to chemical pesticides (biological control, sexual confusion…[126]). In 2020, the number of HVE certified farms doubled, reaching more than 8 000. Some major groups of greenhouse vegetables, especially in the tomato and melon sectors (ex: Solarenn, Saveol) have already reported that 90 to 100% of their producers are HVE certified[127], while the Association of Producer Organizations "Tomates et concombres de France" has set a target of all its members certified by the end of 2020. Development and dissemination of IPM is encouraged by public support, such as the operational funds of the "national strategy for the fruit and vegetable sector", EAFRD funds through the regional rural development programmes, technical assistance through the network of "DEPHY farms" launched by the national "Ecophyto plan" etc. The French Recovery Plan has confirmed its ambition to accelerate HVE development through the creation of a tax credit for the farm conversion to HVE, and the organization of calls for projects to support investments in HVE programs ("structuration des filières" or "sector structuration measure")[128].

As the government mentioned the possibility of integrating the HVE certification to the Ecoscheme of the future CAP, this additional public support would strongly encourage dissemination of integrated and agro-ecological practices.

-3465- Energy

As all efforts aim at reducing GHG emissions in agriculture, greenhouses and vegetable production are not in first line, as most GHG emissions from farms are linked to animal breeders, especially in the bovine sector. The "IPAMPA" index (Monthly index of purchase prices of the means of agricultural production) reports high variations of the energy and lubricants purchase price between 2010 and 2020. The index increased between 2010 and 2013, then fell down in 2014 and 2015, rose again until 2019, and again finally decreased in 2020 (-12%)[129]. In 2020, the IPAMPA of energy and lubricants was on average 99.7, while the total IPAMPA for all means of production was 102,3. In the market gardening and horticultural sectors, heating greenhouses is a crucial factor for increasing productivity, as it can help multiply yields by 2,5. Consequently, although greenhouses only represent 1.6% of national farms, they account for 11% of the total energy consumption of the French agricultural sector[130]. Hence, energy is the second main expense for vegetable greenhouses and the potted plant

124 https://www.franceagrimer.fr/layout/set/ajax/Actualite/Filieres/Peche-et-aquaculture/2019/Une-entreprise-francaise-recompensee-au-Seafood-Global-Expo-2019

125 Évaluation Ex-Post des programmes de financement de certaines dépenses de modernisation dans le secteur des serres maraîchères et horticoles, FranceAgriMer, 2013

126 Environmental certification of farms – 3rd level control plan, French Ministry of Agriculture, Food and Forest, 2016

127 https://www.solarenn.com/certification-haute-valeur-environnementale/

128 https://agriculture.gouv.fr/accelerer-le-developpement-du-bio-et-de-la-haute-valeur-environnementale

129 IPAMPA ENERGIE ET LUBRIFIANTS Indice mensuel des prix d'achat des moyens de production agricole (IPAMPA) – Energie et lubrifiants - Base 100 2015 https://www.insee.fr/fr/statistiques/serie/010539009

130 Évaluation Ex-Post des programmes de financement de certaines dépenses de modernisation dans le secteur des serres maraîchères et horticoles, FranceAgriMer, 2013

sector, and the first one for the cut flower industry. Fossil fuels are still dominant as greenhouses energy is mainly supplied by natural gas (45%), fuel oil (32%) and butane/propane gas (15%) on national average. But some energy- efficient facilities are increasingly implemented: heat shield, open buffer, efficient heating (low-temperature boilers, biomass heating), computer-assisted control system etc. In 2013, the national "Energy plan for Methanation and Nitrogen Autonomy"[131] was launched by the French Ministries of Agriculture and Environment. It had an objective of developing 1,000 on-farm biogas plant units in France by 2020, compared with 90 by the end of 2012. Between 2014 and 2017, a call for projects was opened by the government to support the development of 1 500 biogas plant projects, technically through the "Energy Transition Capital Fund". Such projects can also benefit from the "Heat fund" or the "Waste fund" managed by ADEME, to finance digestate treatment equipment, direct heat extraction as well as projects for injecting biomethane into gas networks[132]. Bpifrance (Public Investment Bank) offers unsecured loans. The Saveol cooperative, French leader in tomato production, demonstrates the growing involvement of greenhouse stakeholders in renewable energies, as it created in 2018 a group of energy specialists to advise farmers on the implementation of their energy transition (methanation, biomass, photovoltaic, energy efficiency,…)[133].

3.5. Part 3 main findings

STRENGTHS	WEAKNESSES
• French market size • The preference of a significant part of the population for French products • An active communication for French products and for some GI protected products • The choice of French products by mass retailers • The diversity of regions and climates • A rapid development in organic production	• Labour costs in agriculture • Input costs • Complexity of French market and high competition at retail level
OPPORTUNITIES	**THREATS**
• "Eco-certified" products on the vegetable market • To take over French farms • Opportunities on the ornamental market • Opportunities for farming equipment • Partnerships could be developed. • Innovation and public funding: digitalisation, vertical farming, plant ingredients, integrated pest management, energy.	• Competitiveness of European production • The systematic and effective opposition of local populations against any project which could be assimilated to "industrial farming", including greenhouses.

The SWOT analysis reflects the complexity of French production chains and markets. Internal costs put French growers under pressure of European competitors and lead them to find innovative strategies.
They do not follow a maximum yield and cost cutting through maximal productivity strategy like Dutch actors do.
They do not follow a maximum yield and cost cutting through maximal productivity strategy like Dutch actors do.
They cannot use foreign workers to the largest extent, as it is seen in Germany and Spain (a large part of seasonal workers in France come from abroad, even central America, but with a higher cost than Ukrainian workers in Germany or Moroccan workers in Spain. French farmers do not use 'posted workers' in such a large scale as German do and legal wages are far lower in Spain).

131 https://agriculture.gouv.fr/le-plan-energie-methanisation-autonomie-azote
132 https://www.ecologie.gouv.fr/biogaz
133 https://www.saveol.com/fr/nos-engagements/energies-nouvelles.html

The third way is to respond to French demand: healthy, tasty, original products, wide ranges of products, national or regional products that give trust and pleasure to French consumers. This way will not allow French producers to control all segments, especially low-end categories, but it helps containing the raise of imports and to limit the deficit.
It also stimulates new techniques (the organic marketing chain development is a success) and research.
This singular situation shapes opportunities for Dutch companies: many French farms will need to be taken over, even if the greenhouse farms are less numerous on the market than others, technical partnerships can be developed, special French know-how (how to make money with high production costs) can be learned from.

4. OUTLOOK

4.1. Is there a national vision for the Greenhouse sector in France?

The "plan filière" written by Interfel (fruit and vegetable Interbranch body) during the EGA (États Généraux de l'Alimentation – literally: Peoples' food assembly) does not focus on covered production. Greenhouses are mentioned only one time, in relation to the global objective of reducing GHG emissions. The national plan focuses on products, environment, and climates, but makes no distinction between covered and open-air production.

4.2. Progression of covered surfaces and volumes for vegetables

Concerning vegetables, the recent changes in volumes of production of covered cultivation and covered area show different trends according to the vegetable concerned. When analysing the trends observed from 2010 to 2019 it is possible to foresee the evolution of covered area in 2030. The projection of covered surface shows a global increase, from +10% for cucumber up to +38% for strawberries. Covered melon surfaces show a limited decrease (-11%). At the same time, production volumes shall follow the same trend.

Table 43 Projection of covered surfaces of vegetables (ha)

	2010	2015	2019	2025	2030	2030/2019
Total	4 737	5 081	5 306	5 781	6 238	18%
Tomato	2 026	2 038	2 195	2 323	2 434	11%
Strawberry	1 462	1 842	1 893	2 254	2 607	38%
Melon	746	674	678	637	605	-11%
Cucumber	503	527	540	568	592	10%

Source: Own elaboration

One important constraint to this progression will be the financial burden to be carried by the producers. New installations are very costly, and induce an increase of employment, that is quite expensive in France.

The biggest and newest projects may motivate investment funds like the Agro-Invest company (Paris) who took a share in 2015, in les Serres de Bessiere (North of Toulouse), a pioneer project using unavoidable heat from a local waste incineration plant. In other cases of co-generation, we may see joint investments with the energy or waste management company (for instance the Veolia group). Some project could be financed by participatory funds (Enerfip, a participatory fund focused on renewable energies is involved in several greenhouses project in southern France). But most of the time producers will be the only investors and they can find public support through EAFRD[134] or the National Strategy for F&V program. Chambers of agriculture do not play any role in this matter, but producers' groups (often with a cooperative legal status), thanks to the EU rules for F&V producers' groups support, may decide to focus the support they can get (4,5% of the turnover) on farm investment. This system will still be included in the CAP' measures catalogue after 2022.

Above all, it depends on competitors. If French stay without important challengers on the differentiated market, progression indicated in table 35 is realistic. If foreign competitors follow the French in this market, the result may be lower.

4.3. Potential of modernisation and digitalisation for covered producers

Regarding the current age of the installations (see point 2.2), and in addition to the expected progression of covered areas, new installations will have to be constructed with modern equipment.

[134] EAFRD - European Agricultural Fund for Rural Development is the EC fund dedicated to rural dévelopment, that is to say the CAP' second pillar.

Modernization will require adaptation of farmers, and technical bodies and consultancy in the sector will have to be developed (see Digitalization entry) to optimise digitalised monitoring in greenhouses. The development of digitalisation will also be supported by the development of indoor and vertical farming. The current trend in the sector is still limited, but some companies are developing high-tech cultivation technics (see Vertical Farming entry).

4.4. Limitation of the growth of imported volumes of vegetables?

The growth of imported volumes of fresh vegetables in France may be limited in the coming years because of:

- the interest of French consumers for local products (see the SWOT analysis);
- the success of French specialties (mini vegetables, old varieties, 'tasty' varieties)
- the strategy implemented by mass retailers to propose local vegetables (see the SWOT analysis);
- the development of local labels
- the "Egalim law", that aims 50% of food products consumed in public catering to be sustainable or certified by a sign of quality or origin by 2022. This includes the HVE label, that is a French public label certifying environmental productions. (see point Integrated pest management at point 3.9.2).

On the other side, French handicaps (pesticide limitations, labour cost, taxes) will not disappear, that is why a re-conquest of the entire domestic market is not realistic. Differentiation and national identification strategy could lead to a status quo.

4.5. Potential of quality certifications for marketing value

As discussed in the analysis of innovation and opportunities (see point 3.9.2), French greenhouse producers have demonstrated long-lasting efforts to improve the health, taste and environmental quality of their production. They have been pioneers in the field of varietal diversification (tomatoes, strawberries) and integrated pest management, recently valuated by plenty of labels and certification systems. This marketing strategy is bearing fruit, as French consumers express growing expectations regarding their food quality. Recent national regulations also foster the development of sustainable quality signs and reduction of pesticides use ("Egalim" and "Ecophyto" laws). Public support to the new HVE (High Environmental Value) certification, widely deployed by some major groups of greenhouse vegetables, confirms the national interest in agroecological practices and offers promising prospects to the producers that involve in this initiative.

4.6. Challenge of energy transition

In the face of climate emergency, French heated greenhouses need to quickly address the issue of energy consumption, as they account for 11% of the total energy consumption of the French agricultural sector (2013), mostly supplied by fossil fuels (see Energy at 3.9.2). In some sectors such as tomato-cucumber, producers are increasingly implementing energy-efficient facilities: semi-closed greenhouse, greenhouse with active dehumidification, open buffers, heat shield etc[135]. They can also benefit from public support (ADEME, BPI) to set up biogas/methanation projects or develop partnerships to design innovative techniques and know-how that can help mitigating climate change (EIP-AGRI programmes). Methanation, biomass, photovoltaic devices, energy efficiency are crucial paths for greenhouses to achieve the national Green Growth Energy Transition targets.

[135] Grisey a., Eric b., Decker., Évolution du parc de serres chauffées en tomate et concombre-résultats de l'enquête CTIFL 2016, juillet-août 2017 n°333

4.7. Financial consolidation.

Compared to other agri-food activities, fruit and vegetable industry is not very concentrated. The process is long, voluntary grouping is as frequent as financial take over. The Covid crisis may accelerate the changes because many wholesalers saw huge sales drops. The commercial catering lock down still causes a difficult situation.
Upstream, the number of producers' organisation has slightly reduced but remains high. The most important change is the internal and external growth of the Agrial cooperative group, as the European leader of fresh cuts salads.

4.8. Irrigation

Public water management bodies (Agences de l'eau, designed by large catchment areas, such as Loire-Bretagne, Adour-Garonne, etc …) do not like farming and farmers, mainly because of the bad sanitary quality of ground and surface waters caused by agriculture. Even if most French territories do not have recurrent and heavy drought issues, financial support to irrigation devices is mainly granted in case of perspectives of water saving. The next EFREAD program, which design is still in progress, will show if creation of new irrigated areas and if creation of new hillside storage reservoirs will be supported.
Water is an increasing subject of debate, dispute, and regulation. Priority is rarely given to farming; towns, industrial plants, nuclear plants are judged as more important than farming.
Due to global heating, French climate will change. Experts predict, in 2050, that an Andalusian climate will prevail in South West France. In these conditions, all farming activities will have to adapt. Working and reflexion groups are already constituted aiming at preparing this incredible and terrifying change.

4.9. Retail stage.

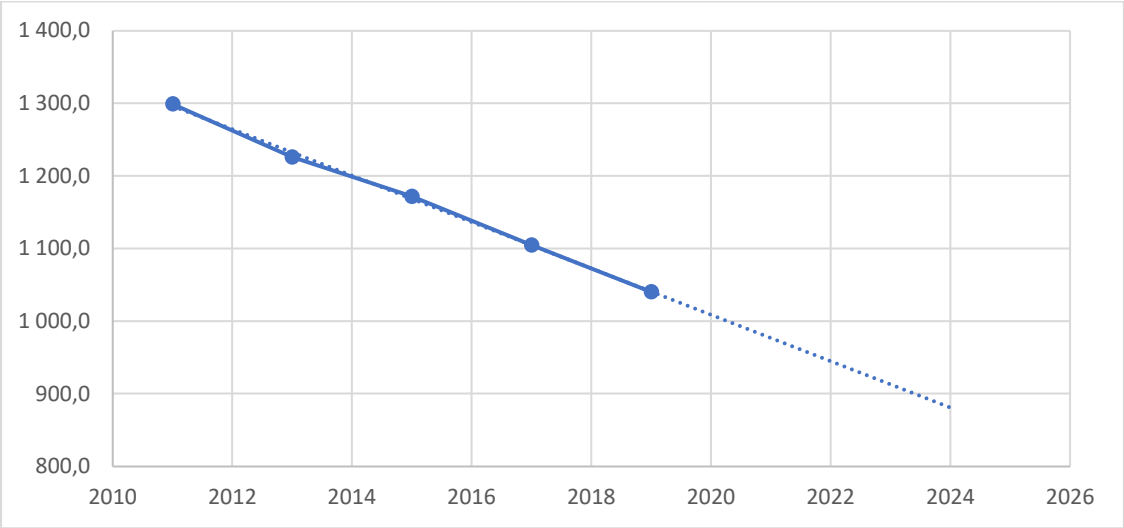
The retail sector is also at a crossroads. Typical French hypermarket (shops with a surface over 2500 square meters) is not adapted anymore to consumer attempts and a way of life less dependent of cars. This explains the success of 'hard discount' (Lidl) of proximity shops (Carrefour and Casino), of organic shops (Biocoop), of fresh products' specialised shops (Grand Frais).
Consequently, giant integrated retail groups have recently seen bad results (Auchan, Casino, and to a less extent, Carrefour). Casino has just sold its hard-discount chain (Leader Price) to the Aldi group. Auchan announces losses.

After the Covid crisis, new consolidation may happen.
Small Fruit and vegetable shops are resilient, that is why there are still numerous wholesalers, even if their shares know a long and limited erosion.

4.10. Outlook on the ornamentals sector

Competitivity of the French ornamentals sector has been eroding for the last decades. In this context, covered greenhouse areas decreased by 20% over the 2011-2019 period.
This decline reflects the lack of perspective for existing ornamentals producers. Most of them run small farms with ageing production tools. The lack of commercial perspectives; the low rentability of greenhouse production which suffers high energy and labour cost; and the limited support from public and private sectors inhibit the investments and transmission of companies.
The following graph presents the evolution of covered greenhouse areas from 2011 to 2019. The continuation of the trend over the 2019-2024 period shows that, without change of situation, the covered greenhouse area might fall under 900 ha by 2024.

Figure 14: Evolution of covered greenhouse areas from 2011 to 2019, and continuation of the trend over the 2019-2024 period. (ha).



Source: FranceAgriMer Observatory of structural data of ornamentals and nursery companies

As developed in the SWOT analysis (opportunities of the ornamental market), the use of quality or origin labels and the development of environmental certification might be an opportunity for the sector, in response to French consumers' demand.

In terms of product range, sales of vegetable seedlings and aromatic plants for private individuals have been on an upstream trend over the last years. They could be an interesting greenhouse production to further develop.

Eventually, considering the investment difficulties of the producers, a sharing of the risk with the downstream part of the sector (distributors) could help to modernise production tools. This could also secure the upstream part of the sector in the context of the actual Covid-19 crisis.

The State recovery plan announced last year also aims to support the horticultural sector in the context of the Covid-19 crisis. Its methods of implementation are not defined yet, and the scheme is currently being validated by the European Commission.

5. ANNEXES

5.1. Evolution of total French vegetable production (tomato, cucumber, melon, strawberry) : covered and open-air production

	2010	2015	2016	2017	2018	2019	%19/10	Trend 2010-2019
Total	**1 325 244**	**1 256 211**	**1 314 432**	**1 299 076**	**1 156 565**	**1 163 363**	**-12%**	**-0,8%**
Tomato	845 689	785 691	821 103	810 719	710 178	714 030	-16%	-1,1%
Cucumber	137 223	135 115	174 955	144 885	137 862	140 996	3%	1,2%
Strawberry	51 801	57 901	59 929	56 909	53 275	60 310	16%	1,1%
Melon	290 532	277 505	258 445	286 564	255 250	248 027	-15%	**-1,3%**

Source: Agreste

5.2. Supply balance for the main covered and open-air vegetables (tonnes)

5.2.1. Strawberry

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	3 238	3 320	3 320	3 291	3 324	3 319	1%
	(2) Yield (t/ha)	18,0	17,3	18,1	17,2	16,2	18,20	5%
	(3) Harvested volumes (tonnes)	58 387	57 523	60 217	56 529	53 732	60 408	5%
Trade	(4) Exports	13 944	12 786	11 642	11 203	9 000	8 733	-25%
	(5) Imports	86 495	76 902	80 028	73 138	60 000	64 357	-15%
	(6)=(4)-(5) Balance	- 72 551	- 64 116	- 68 386	- 61 935	- 51 000	-55 624	-13%
(3)-(6) Apparent consumption		130 938	121 639	128 603	118 464	104 732	116 032	-4%
(3)/((3)+(5)-(4)) Self-sufficiency rate		45%	47%	47%	48%	51%	52%	9%

Source: from FranceAgriMer

5.2.2. Tomato

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	4 785	4 759	4 577	4 686	4 634	4 663	-1%
	(2) Yield (t/ha)	159,1	160,3	174,6	167,1	147,6	143,1	-11%
	(3) Harvested volumes (tonnes)	761 394	762 806	799 264	782 934	683 804	667 421	-12%
Trade	(4) Exports	248 897	242 919	247 532	230 586	223 557	235 190	-8%
	(5) Imports	555 426	541 333	539 326	507 136	523 913	516 671	-2%
	(6) =(4)-(5) Balance	- 306 529	- 298 414	- 291 794	- 276 550	- 300 356	-281 481	-4%
(3)-(6) Apparent consumption		1 067 923	1 061 220	1 091 058	1 059 484	984 160	948 902	-8%
(3)/((3)+(5)-(4)) Self-sufficiency rate		71%	72%	73%	74%	69%	70%	-4%

Source: from FranceAgriMer

5.2.3. Cucumber

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	550	554	569	585	582	596	**3%**
	(2) Yield (t/ha)	221,0	227,9	222,3	228,2	215,6	203,4	**-4%**
	(3) Harvested volumes (tonnes)	121 574	126 275	126 486	133 497	125 454	121 284	**-1%**
Trade	(4) Exports	15 027	15 564	16 665	17 361	10 814	10 922	**-33%**
	(5) Imports	73 748	74 904	76 948	76 899	74 840	72 610	**-1%**
	(6)=(4)-(5) Balance	- 58 721	- 59 340	- 60 283	- 59 538	- 64 026	-61 688	**2%**
(3)-(6) Apparent consumption		180 295	185 615	186 769	193 035	189 480	182 972	**-2%**
(3)/((3)+(5)-(4)) Self-sufficiency rate		67%	68%	68%	69%	66%	66%	**-2%**

Source: from FranceAgriMer

5.2.4. Courgette

		2014	2015	2016	2017	2018	2019	2019 /average 14-18
Production	(1) Harvested area (ha)	2 801	2 652	2 771	2 691	2 681	2 874	6%
	(2) Yield (t/ha)	46,6	45,0	46,3	43,8	40,4	40,5	-9%
	(3) Harvested volumes (tonnes)	130 641	119 335	128 429	117 770	108 253	116 372	-4%
Trade	(4) Exports	22 455	21 381	24 363	22 992	20 007	25 478	15%
	(5) Imports	135 280	128 158	150 398	137 550	143 548	151 701	9%
	(6)=(4)-(5) Balance	-112 825	-106 777	-126 035	-114 558	-123 541	-126 223	8%
(3)+(6) Apparent consumption		243 466	226 112	254 464	232 328	231 794	242 595	2%
(3)/((3)+(5)-(4)) Self-sufficiency rate		54%	53%	50%	51%	47%	48%	-6%

5.2.5. Melon

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	13 526	13 678	13 538	13 520	12 790	12 542	-6%
	(2) Yield (t/ha)	18,1	19,8	18,5	20,6	19,3	19,2	-1%
	(3) Harvested volumes (tonnes)	244 818	270 520	249 991	278 355	247 241	240 329	-7%
Trade	(4) Exports	48 558	48 281	44 185	42 552	38 576	37 327	-16%
	(5) Imports	174 896	174 896	172 957	180 409	168 787	174 806	0%
	(6)=(4)-(5) Balance	- 126 338	- 126 615	- 128 772	- 137 857	- 130 211	-137 479	6%
(3)-(6) Apparent consumption		371 156	397 135	378 763	416 212	377 452	377 808	-3%
(3)/((3)+(5)-(4)) Self-sufficiency rate		66%	68%	66%	67%	66%	64%	-4%

Source: from FranceAgriMer

5.2.6. Salads: lettuce and chicory

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	10 457	10 563	10 559	10 181	9 901	9 931	-4%
	(2) Yield (t/ha)	28,3	28,0	27,2	27,0	27,6	27,1	-1%
	(3) Harvested volumes (tonnes)	295 516	296 061	287 050	275 176	273 171	269 549	-6%
Trade	(4) Exports	75 639	76 672	75 254	73 560	69 147	66 569	-10%
	(5) Imports	161 431	179 738	178 679	173 725	165 410	131 043	-24%
	(6)=(4)-(5) Balance	- 85 792	- 103 066	- 103 425	- 100 165	- 96 263	-64 474	-34%
(3)-(6) Apparent consumption		381 308	399 127	390 475	375 341	369 434	334 023	-13%
(3)/((3)+(5)-(4)) Self-sufficiency rate		78%	74%	74%	73%	74%	81%	8%

Source: from FranceAgriMer

5.2.7. Carrot

		2014	2015	2016	2017	2018	2019	2019 /average 14-18
Production	(1) Harvested area (ha)	11 817	12 005	12 568	12 489	12 044	12 501	3%
	(2) Yield (t/ha)	45,8	46,7	46,1	46,5	42,9	42,6	-7%
	(3) Harvested volumes (tonnes)	541 297	560 694	579 557	581 051	516 533	532 515	-4%
Trade	(4) Exports	82 689	110 923	118 525	86 588	71 751	78 779	-16%
	(5) Imports	143 425	144 675	152 321	154 676	157 052	154 360	3%
	(6)=(4)-(5) Balance	- 60 736	- 33 752	- 33 796	- 68 088	- 85 301	- 75 581	34%
(3)+(6) Apparent consumption		602 033	594 446	613 353	649 139	601 834	608 096	-1%
(3)/((3)+(5)-(4)) Self-sufficiency rate		90%	94%	94%	90%	86%	88%	-4%

Source: FranceAgriMer

5.2.8. Cauliflower

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	17 704	17 195	16 980	16 735	16 678	16 447	-3%
	(2) Yield (t/ha)	17,2	16,8	17,5	16,0	15,7	15,5	-7%
	(3) Harvested volumes (tonnes)	304 741	288 539	297 912	267 446	261 056	254 276	-11%
Trade	(4) Exports	141 393	143 395	95 774	145 861	104 725	121 101	-4%
	(5) Imports	48 318	50 450	56 064	52 750	52 599	50 380	1%
	(6)=(4)-(5) Balance	93 075	92 945	39 710	93 111	52 126	70 721	-5%
(3)-(6) Apparent consumption		211 666	195 594	258 202	174 335	208 930	183 555	-13%
(3)/((3)+(5)-(4)) Self-sufficiency rate		144%	148%	115%	153%	125%	139%	1%

Source: from FranceAgriMer

5.2.9. Onion

		2014	2015	2016	2017	2018	2019	2019 / average 14-18
Production	(1) Harvested area (ha)	10 951	12 124	12 857	12 017	12 692	12 899	6%
	(2) Yield (t/ha)	34,2	37,2	36,8	38,1	36,3	39,4	-1%
	(3) Harvested volumes (tonnes)	375 017	451 187	473 005	457 369	460 976	508 204	5%
Trade	(4) Exports	83 773	91 791	98 277	79 979	91 083	98 881	3%
	(5) Imports	128 772	129 098	142 441	136 592	139 976	140 852	4%
	(6)=(4)-(5) Balance	- 44 999	- 37 307	- 44 164	- 56 613	- 48 893	-41 971	10%
(3)+(6) Apparent consumption		420 016	488 494	517 169	513 982	557 095	550 175	412 083
(3)/((3)+(5)-(4)) Self-sufficiency rate		89%	89%	92%	91%	89%		90%

Source: from FranceAgriMer

5.3. FADN data – (Farm Accountancy Data Network)

The farm accountancy data network (FADN) monitors farms' income and business activities. It is also an important informative source for understanding the impact of the measures taken under the common agricultural policy.

FADN is the only source of microeconomic data based on harmonised bookkeeping principles. It is based on national surveys and cover only EU agricultural holdings which due to their size can be considered commercial.

FADN is run by European Commission services.

Otex 2800 – Maraîchage Moyenne par exploitation	Unité	Dimension économique des exploitations			
		PBS de 25 à 100 k€	PBS de 100 à 250 k€	PBS de 250 k€ ou plus	Moyennes et grandes exploitations
Nombre exploitations représentées	nb	2 670	1 294	948	4 913
Nombre d'exploitations dans l'échantillon	nb	78	76	85	239
Caractéristiques physiques					
Nombre d'unité de travail annuel	UTA	2,63	4,65	10,48	4,68
dont : UTA non salariées	UTA	1,38	1,50	1,68	1,47
Age du chef d'exploitation	an	48	51	51	50
Superficie agricole utilisée (en ha)	**ha**	**5,67**	**12,86**	**35,27**	**13,27**
dont : SAU en faire-valoir direct	ha	0,99	3,59	2,09	1,88
Surface irriguée	ha	1,55	6,92	19,97	6,52
Surface en légumes frais	are	167,78	440,05	2 006,06	594,23
plein air	are	136,16	310,95	1 414,08	428,80
sous serres	are	30,17	120,05	489,53	142,49
plein champ	are	1,40	9,05	26,93	8,34
Surfaces en fleurs	are	0,06	0,04		0,04
Effectifs animaux (en Unité-Gros-Bétail)	**UGB**	**0,65**	**0,52**	**3,49**	**1,17**
Total Produits courants (nets des achats d'animaux)	**k€**	**140,44**	**336,51**	**978,87**	**353,89**
Chiffre d'affaires	k€	134,56	319,94	931,73	337,23
Ventes	k€	131,58	317,32	921,00	332,84
dont : Vente de végétaux	k€	2,16	8,10	16,00	6,40
Ventes de produits horticoles	k€	128,53	306,79	901,81	324,71
légumes frais	k€	128,22	306,64	901,81	324,50
plein air	k€	55,25	90,26	304,00	112,47
sous serres	k€	72,65	213,99	587,79	209,29
plein champ	k€	0,15	1,10	2,50	0,86
fleurs	k€	0,31	0,15		0,21
Ventes de produits végétaux transformés	k€	0,25	0,85	0,86	0,52
Ventes d'animaux	k€	0,27	0,66	2,32	0,77
Ventes de produits animaux	k€	0,37	0,91	0,02	0,44
Produits divers	k€	2,98	2,62	10,73	4,38
+ Autoconsommation	k€	0,17	0,06	0,31	0,17
+ Production stockée	k€	-0,46	0,85	0,53	0,08
+ Production immobilisée	k€	1,07	0,82	6,81	2,11
+ Subventions d'exploitation	k€	2,87	12,13	28,67	10,29
Aides découplées (DPB, paiements redistributifs, PV et PAJA)	k€	0,88	2,18	5,08	2,03
Aides couplées	k€	0,06		0,38	0,11
Aides au développement rural	k€	0,18	0,59	0,63	0,38
dont ICHN	k€	0,02		0,21	0,05
dont MAEC et Aides Bio	k€	0,16	0,59	0,42	0,32
+ Autres produits courants	k€	2,28	2,81	10,86	4,08
- Achats d'animaux	k€	0,04	0,11	0,04	0,06
Total Charges courantes	**k€**	**111,99**	**288,91**	**851,01**	**301,21**
= Charges spécifiques végétaux	k€	22,16	57,21	152,25	56,50
Engrais et amendements	k€	4,45	10,30	34,03	11,70
Semences et plants	k€	12,81	30,42	85,47	31,47
Produits phytosanitaires	k€	2,49	5,77	19,25	6,59
+ Charges spécifiques animaux	k€	0,26	0,86	0,81	0,53
Alimentation du bétail	k€	0,20	0,54	0,44	0,34
+ Autres charges d'exploitation	k€	88,45	227,68	689,68	241,15
Fermage	k€	1,97	3,52	13,11	4,53
Charges de personnel	k€	25,62	73,82	210,00	73,90
Dotations aux amortissements	k€	13,17	30,50	101,44	34,77
Energie	k€	11,01	37,68	75,74	30,53
+ Charges financières	k€	1,12	3,15	8,27	3,04
Soldes intermédiaires de gestion					
= Production de l'exercice	k€	135,29	321,57	939,34	339,52
+ Ristournes obtenus	k€	0,31	0,86	1,73	0,73
- Charges d'approvisionnement	k€	34,79	93,81	257,16	93,25
- Autres achats et charges externes (n. c. fermages)	k€	33,86	82,54	257,03	89,75
= Valeur ajoutée	k€	66,96	146,08	426,88	157,26
+ Remboursement forfaitaire TVA	k€				
+ Subventions d'exploitation	k€	2,87	12,13	28,67	10,29
+ Indemnités d'assurance	k€	0,44	1,24	4,22	1,38
- Fermages	k€	1,97	3,52	13,11	4,53
- Impôts et taxes	k€	1,47	1,57	3,99	1,98
- Charges de personnel	k€	25,62	73,82	210,00	73,90
= Excédent brut d'exploitation (EBE)	k€	41,21	80,54	232,67	88,52
+ Transferts de charge	k€	1,43	0,24	1,91	1,21
- Dotations aux amortissements	k€	13,17	30,50	101,44	34,77

Otex 2800 – Maraîchage Moyenne par exploitation	Unité	Dimension économiques des exploitations			
		PBS de 25 à 100 k€	PBS de 100 à 250 k€	PBS de 250 k€ ou plus	Moyennes et grandes exploitations
Soldes intermédiaires de gestion (suite)					
= Résultat d'exploitation	**k€**	**29,47**	**50,27**	**133,14**	**54,96**
+ Produits financiers	k€	0,10	0,48	2,99	0,76
- Charges financières	k€	1,12	3,15	8,27	3,04
= Résultat courant avant impôts (RCAI)	**k€**	**28,45**	**47,60**	**127,86**	**52,68**
+ Plus ou moins value sur cession d'actifs immobilisés	k€	1,05	1,39	5,56	2,01
+ Quote-part des sub. d'inv. affectée à l'exercice	k€	1,68	4,22	11,06	4,16
+ Profits et charges exceptionnels	k€	0,81	-0,02	3,10	1,04
= Résultat de l'exercice	**k€**	**31,99**	**53,19**	**147,59**	**59,89**
Revenu disponible	**k€**	**22,24**	**41,46**	**113,35**	**44,89**
=EBE	k€	41,21	80,54	232,67	88,52
- Charges financières	k€	1,12	3,15	8,27	3,04
- Remboursement d'emprunts LMT	k€	9,55	21,08	81,87	26,54
- Cotisations sociales de l'exploitant	k€	8,31	14,84	29,18	14,06
Financement					
Résultat courant avant impôts	k€	28,45	47,60	127,86	52,68
+ Dotation aux amortissements	k€	13,17	30,50	101,44	34,77
+ Charges et produits exceptionnels	k€	0,81	-0,02	3,10	1,04
= Capacité d'autofinancement	k€	42,43	78,08	232,41	88,48
- Prélèvements privés	k€	31,61	55,42	69,74	45,24
= Autofinancement	k€	10,83	22,66	162,67	43,24
Investissement corporel hors foncier (Acquisitions - cessions)	**k€**	**7,08**	**38,50**	**173,05**	**47,39**
dont : Matériel et outillage	k€	3,27	15,29	51,05	15,65
Construction	k€	2,89	15,44	110,14	26,89
Plantations	k€	-0,20	0,44	0,96	0,19
Animaux reproducteurs	k€	-0,01	-0,04	0,69	0,12
Acquisition immobilisations corporelles (hors foncier)	**k€**	**8,57**	**40,58**	**185,99**	**51,24**
dont : Matériel et outillage	k€	4,15	16,81	55,93	17,48
Construction	k€	3,03	15,67	118,57	28,66
Cessions immobilisations corporelles (hors foncier)	**k€**	**1,48**	**2,04**	**13,63**	**3,97**
dont : Matériel et outillage	k€	0,88	1,53	4,89	1,82
Bilan					
Actif immobilisé	**k€**	**62,17**	**183,42**	**606,37**	**199,13**
Terrains	k€	10,17	22,90	12,00	13,88
Aménagements terrains	k€	0,86	1,44	6,63	2,13
Constructions	k€	12,58	53,94	163,56	52,61
Installations spécialisées	k€	10,83	20,73	144,75	39,28
Matériel	k€	21,36	59,18	227,01	71,01
Plantations (y compris forêt)	k€	0,58	1,36	5,76	1,78
Animaux reproducteurs	k€	0,43	0,10	4,77	1,18
Autres immobilisations	k€	5,35	23,76	41,90	17,26
Actif circulant	**k€**	**49,75**	**137,10**	**381,16**	**136,71**
Stocks et en-cours	k€	9,17	32,20	78,10	28,54
dont : animaux circulants	k€	0,15	0,16	0,79	0,28
Valeurs réalisables	k€	10,81	42,08	100,41	36,34
Valeurs disponibles	k€	29,77	62,82	202,64	71,84
Régularisation actif	**k€**	**0,56**	**2,26**	**5,90**	**2,03**
Total actif	**k€**	**112,47**	**322,77**	**993,43**	**337,87**
Capitaux propres	**k€**	**47,87**	**133,41**	**411,23**	**140,52**
Capital individuel initial	k€	43,69	99,51	93,69	68,05
Variation du capital initial	k€	-0,37	26,15	266,06	58,03
Subventions d'investissement	k€	4,54	7,74	51,48	14,44
Total endettement	**k€**	**64,23**	**189,36**	**582,05**	**197,12**
Dettes à long ou moyen terme	k€	31,48	105,88	377,25	117,80
Emprunts à court terme	k€	2,12	15,34	13,37	7,77
Autres dettes financières à - 1 an	k€	3,01	7,04	10,48	5,51
Dettes auprès de tiers	k€	27,62	61,11	180,96	66,03
Régularisation passif	**k€**	**0,38**		**0,14**	**0,24**
Total passif	**k€**	**112,47**	**322,77**	**993,43**	**337,87**
Ratio					
EBE/ha	k€/ha	7,27	6,26	6,60	6,67
EBE/UTANS	k€/UTA	29,90	53,68	138,89	60,30
RCAI/ha	k€/ha	5,02	3,70	3,63	3,97
RCAI/utans	k€/UTA	20,64	31,73	76,33	35,89
Taux d'endettement (Dettes/Actif)	%	57,10	58,67	58,59	58,34
Taux de marge (EBE/CA)	%	30,63	25,17	24,97	26,25
Rotation du capital (CA/Capitaux propres)	%	281,12	239,82	226,57	239,99
Rentabilité financière (EBE/Capitaux propres)	%	86,10	60,37	56,58	62,99

Otex 2900 - Fleurs et horticulture diverses Moyenne par exploitation	Unité	Dimension économique des exploitations			
		PBS de 25 à 100 k€	PBS de 100 à 50 k€	PBS de 250 k€ ou plus	Moyennes et grandes exploitations
Nombre exploitations représentées	nb	3 206	1 791	1 160	6 157
Nombre d'exploitations dans l'échantillon	nb	53	85	58	196
Caractéristiques physiques					
Nombre d'unité de travail annuel	UTA	1,93	3,94	8,16	3,69
dont : UTA non salariées	UTA	1,30	1,50	1,54	1,40
Age du chef d'exploitation	an	49	51	51	50
Superficie agricole utilisée (en ha)	**ha**	**1,71**	**4,86**	**19,65**	**6,01**
dont : SAU en faire-valoir direct	ha	0,30	1,07	3,02	1,04
Surface irriguée	ha	0,93	2,21	9,92	3,00
Surface en légumes frais	are	43,57	88,88	497,02	142,21
Surfaces en fleurs	are	20,44	82,42	233,29	78,58
Surfaces fleurs sous serres	are	16,63	49,43	168,65	54,82
Surfaces fleurs plein air	are	3,81	31,58	63,11	23,06
Surfaces fleurs coupées	are	6,91	22,07	72,93	23,76
Surface semences et plants horticoles	are	0,88	4,37	3,66	2,42
Effectifs animaux (en Unité-Gros-Bétail)	**UGB**	**0,01**	**0,23**	**0,52**	**0,17**
Total Produits courants (nets des achats d'animaux)	**k€**	**107,43**	**273,13**	**706,22**	**268,47**
Chiffre d'affaires	k€	105,33	269,69	695,59	264,37
Ventes	k€	98,95	265,01	688,86	258,42
dont : Vente de végétaux	k€	11,79	28,18	25,84	19,21
semences et plants	k€	1,04	2,70	5,84	2,43
Ventes de produits horticoles	k€	87,03	234,86	662,69	238,52
légumes frais	k€	18,60	42,66	199,73	59,73
fleurs	k€	68,43	192,20	462,96	178,78
sous serres	k€	64,26	143,20	426,61	155,51
plein air	k€	4,16	48,86	36,22	23,20
fleurs en pot	k€	37,44	127,49	369,47	126,20
fleurs coupées	k€	12,87	38,57	75,70	32,19
Ventes de produits végétaux transformés	k€	0,10	1,48	0,04	0,49
Ventes d'animaux	k€		0,29	0,28	0,14
Ventes de produits animaux	k€	0,03	0,20		0,07
Produits divers	k€	6,38	4,68	6,73	5,95
+ Autoconsommation	k€	0,04	0,03	0,07	0,04
+ Production stockée	k€	0,32	-1,11	-1,34	-0,41
+ Production immobilisée	k€	1,07	0,76	1,50	1,06
+ Subventions d'exploitation	k€	0,40	1,37	7,87	2,09
Aides découplées (DPB, paiements redistributifs, PV et PAJA)	k€	0,20	0,58	4,50	1,12
Aides couplées	k€		0,04	0,14	0,04
Aides au développement rural	k€	0,08	0,02	0,59	0,16
dont ICHN	k€			0,05	0,01
dont MAEC et Aides Bio	k€	0,08	0,02	0,54	0,15
+ Autres produits courants	k€	0,28	2,46	2,54	1,34
- Achats d'animaux	k€	0,01	0,07	0,01	0,03
Total Charges courantes	**k€**	**82,26**	**225,26**	**629,23**	**226,93**
= Charges spécifiques végétaux	k€	25,43	74,50	186,33	70,02
Engrais et amendements	k€	5,19	10,98	35,26	12,54
Semences et plants	k€	18,58	59,11	133,73	52,07
Produits phytosanitaires	k€	0,97	2,82	10,66	3,34
+ Charges spécifiques animaux	k€	0,02	0,13	0,18	0,09
Alimentation du bétail	k€	0,02	0,11	0,15	0,07
+ Autres charges d'exploitation	k€	56,14	149,39	438,50	155,32
Fermage	k€	2,12	2,88	18,25	5,38
Charges de personnel	k€	13,43	59,39	174,41	57,13
Dotations aux amortissements	k€	9,77	15,75	45,97	18,33
Energie	k€	5,57	12,29	44,05	14,78
+ Charges financières	k€	0,67	1,23	4,22	1,50
Soldes intermédiaires de gestion					
= Production de l'exercice	**k€**	**106,75**	**269,30**	**695,81**	**265,04**
+ Ristournes obtenus	k€	0,01	0,13	0,31	0,10
- Charges d'approvisionnement	k€	32,61	96,91	248,97	92,09
- Autres achats et charges externes (n. c. fermages)	k€	22,85	47,08	133,87	50,82
= Valeur ajoutée	**k€**	**51,30**	**125,44**	**313,29**	**122,24**
+ Remboursement forfaitaire TVA	k€				
+ Subventions d'exploitation	k€	0,40	1,37	7,87	2,09
+ Indemnités d'assurance	k€	0,15	0,38	1,48	0,47
- Fermages	k€	2,12	2,88	18,25	5,38
- Impôts et taxes	k€	0,81	2,01	3,55	1,68
- Charges de personnel	k€	13,43	59,39	174,41	57,13
= Excédent brut d'exploitation (EBE)	**k€**	**35,49**	**62,91**	**126,43**	**60,60**
+ Transferts de charge	k€	0,09	1,52	0,08	0,51
- Dotations aux amortissements	k€	9,77	15,75	45,97	18,33

Otex 2900 - Fleurs et horticulture diverses Moyenne par exploitation	Unité	Dimension économiques des exploitations			
		PBS de 25 à 100 k€	PBS de 100 à 250 k€	PBS de 250 k€ ou plus	Moyennes et grandes exploitations
Soldes intermédiaires de gestion (suite)					
= Résultat d'exploitation	**k€**	**25,82**	**48,68**	**80,55**	**42,78**
+ Produits financiers	k€	0,02	0,43	0,66	0,26
- Charges financières	k€	0,67	1,23	4,22	1,50
= Résultat courant avant impôts (RCAI)	**k€**	**25,17**	**47,87**	**76,99**	**41,54**
+ Plus ou moins value sur cession d'actifs immobilisés	k€	0,33	0,47	1,37	0,57
+ Quote-part des sub. d'inv. affectée à l'exercice	k€	0,75	0,53	2,22	0,96
+ Profits et charges exceptionnels	k€	-0,05	3,63	-0,38	0,96
= Résultat de l'exercice	**k€**	**26,20**	**52,50**	**80,20**	**44,02**
Revenu disponible	**k€**	**21,52**	**35,06**	**59,30**	**32,58**
=EBE	k€	35,49	62,91	126,43	60,60
- Charges financières	k€	0,67	1,23	4,22	1,50
- Remboursement d'emprunts LMT	k€	6,38	13,28	39,50	14,63
- Cotisations sociales de l'exploitant	k€	6,92	13,34	23,41	11,90
Financement					
Résultat courant avant impôts	k€	25,17	47,87	76,99	41,54
+ Dotation aux amortissements	k€	9,77	15,75	45,97	18,33
+ Charges et produits exceptionnels	k€	-0,05	3,63	-0,38	0,96
= Capacité d'autofinancement	k€	34,89	67,25	122,58	60,83
- Prélèvements privés	k€	25,78	47,81	61,89	38,99
= Autofinancement	k€	9,10	19,44	60,68	21,83
Investissement corporel hors foncier (Acquisitions - cessions)	**k€**	**7,03**	**13,29**	**49,49**	**16,85**
dont : Matériel et outillage	k€	3,91	5,60	14,32	6,36
Construction	k€	1,96	5,61	26,44	7,63
Plantations	k€	0,10	0,58	4,05	0,98
Animaux reproducteurs	k€		0,02	0,04	0,01
Acquisition immobilisations corporelles (hors foncier)	**k€**	**8,82**	**13,99**	**51,58**	**18,38**
dont : Matériel et outillage	k€	4,46	6,02	15,63	7,02
Construction	k€	3,19	5,61	26,53	8,29
Cessions immobilisations corporelles (hors foncier)	**k€**	**1,79**	**0,72**	**2,13**	**1,54**
dont : Matériel et outillage	k€	0,55	0,42	1,31	0,66
Bilan					
Actif immobilisé	**k€**	**51,19**	**90,02**	**237,69**	**97,63**
Terrains	k€	6,95	16,45	23,68	12,87
Aménagements terrains	k€	0,99	2,05	17,55	4,42
Constructions	k€	17,23	23,50	53,89	25,96
Installations spécialisées	k€	11,36	15,61	53,84	20,60
Matériel	k€	10,72	20,82	56,41	22,27
Plantations (y compris forêt)	k€	0,53	2,31	8,49	2,55
Animaux reproducteurs	k€		0,33	0,57	0,20
Autres immobilisations	k€	3,41	8,96	23,26	8,77
Actif circulant	**k€**	**41,03**	**101,79**	**262,18**	**100,38**
Stocks et en-cours	k€	14,84	26,25	96,10	33,47
dont : animaux circulants	k€	0,01	0,09	0,20	0,07
Valeurs réalisables	k€	9,74	26,29	79,70	27,74
Valeurs disponibles	k€	16,46	49,26	86,38	39,17
Régularisation actif	**k€**	**0,69**	**1,13**	**2,12**	**1,09**
Total actif	**k€**	**92,92**	**192,94**	**501,99**	**199,10**
Capitaux propres	**k€**	**47,93**	**101,60**	**199,66**	**92,14**
Capital individuel initial	k€	43,84	98,40	161,68	81,91
Variation du capital initial	k€	1,02	1,08	30,00	6,50
Subventions d'investissement	k€	3,08	2,13	7,98	3,73
Total endettement	**k€**	**44,98**	**90,17**	**302,34**	**106,62**
Dettes à long ou moyen terme	k€	26,68	42,55	165,13	57,39
Emprunts à court terme	k€	0,54	3,56	4,62	2,18
Autres dettes financières à - 1 an	k€	2,44	2,86	9,24	3,84
Dettes auprès de tiers	k€	15,32	41,20	123,34	43,21
Régularisation passif	**k€**	**0,01**	**1,16**		**0,34**
Total passif	**k€**	**92,92**	**192,94**	**501,99**	**199,10**
Ratio					
EBE/ha	k€/ha	20,80	12,94	6,43	10,09
EBE/UTANS	k€/UTA	27,35	42,06	81,93	43,24
RCAI/ha	k€/ha	14,75	9,85	3,92	6,92
RCAI/utans	k€/UTA	19,40	32,01	49,89	29,64
Taux d'endettement (Dettes/Actif)	%	48,40	46,74	60,23	53,55
Taux de marge (EBE/CA)	%	33,70	23,33	18,18	22,92
Rotation du capital (CA/Capitaux propres)	%	219,74	265,43	348,39	286,94
Rentabilité financière (EBE/Capitaux propres)	%	74,05	61,91	63,32	65,78

5.4. Vegetable in Greenhouses – Post 2016 trends

No statistical data are available about the total area since 2016, what are the trends?

1) An interview with a vegetables shipment company's manager in Brittany reveals that greenhouses are – most of the time – old. Most greenhouses were built between 2000 and 2005 and are only 4,5 to 5 meters high. Nevertheless, in Brittany, all old equipments are taken over, because they are suited for organic production (in France organics production cannot be heated between 1st of December and 1st of April). Digital tools are the same as those used in the Netherlands (and most of the greenhouses' equipments are Dutch). There are some new equipments built after 2016, 7 meters high but with average areas of less than 4 ha (4 ha is a threshold for providing an environmental evaluation when the authorisation dossier is submitted).

2) Tomato oriented producers' groups are doing well. The product strategy of the western and southern cooperatives is successful. French consumers like diversity, old varieties, cherry tomatoes and tasty fruits. According to specialised press in 2020, five leading cooperatives control 65% of the 500 000 tonnes of tomatoes that are produced each year in France. These 5 leaders have developed greenhouses:

    a. Prince de Bretagne: (80 000 t) in Brittany,

    b. Rougeline: 77 000 t in southern France,

    c. Saveol in Britany: 76 000 t,

    d. Océane in Pays-de-la-Loire: 50 000 t,

    e. Solarenn in-Pays-de-la-Loire: 30 000 t).

Members of these groups keep on investing in greenhouses (in modern, 7 meters high equipments), often progressively. Main limits are the market's size and the risk of overproduction.

3) A new trend is cogeneration, that allows to reduce heating cost and carbon footprint. Numerous co-generation projects were developed during the last years, some examples:

    a. An analysis of five projects co-financed by the Département of Bouches-du-Rhône (PACA) and FranceAgriMer with EAFRD subsidies that were confirmed in 2018, shows the following characteristics: few investments, all in cogeneration, most of them to produce tomatoes, with a current surface smaller than the Dutch standard.
        i. Cogeneration: 6 cases out of 6.
        ii. Tomato production: 6 cases out of 6.
        iii. Type of investments: 4 new plants, 2 modernisations.
        iv. Cost: between EUR 800 000 and 1 m EUR – Subsidy rate: 40% of investment eligible expenses.
        v. Surfaces; new plants: 2 ha and 1,3 ha.

    b. Built in 2015, a cogeneration device allows its owner, a member of UCPT-Maraichers d'Armor (CERAFEL / Prince de Bretagne group), to heat his greenhouse and to sell electricity to ENEDIS, the national electricity network.

    c. Saveol Group tries to develop a new plant in South-West Brittany, near Concarneau: a 13ha greenhouse, heated by the local waste incineration plant (lost energy). In May

2020, a local and dedicated association protested the project. A public enquiry is still ongoing and may decide of the future of the project.

d. At Mont St Michel another company, created in 2015, is controversial: *the Serres du Mont St Michel.* The criticism, carried by the 'Manche-Nature' association, concerns the consumption of natural gas, the size of the installations (17 ha of glass greenhouses, which would be the largest greenhouse in France), the cost of the investment (40 million euros) and a considerable impact on the French market (12,000 t). This project was the work of a Dutch citizen.

e. Overall, estimates show that 500 mw cogeneration installations have been built by covered vegetable producers until 2020 (Source: Assemblée Nationale). Farmers benefited until 2020 of tax cuts on natural gas, but this advantage no longer exists in 2021. Some of these installations allow to sell electricity at a special price (the so-called C13, C16 and CR16 contracts).

f. Several projects based on cogeneration are carried out in the region Grand-Est. The geothermal plant of Vendenheim (department of Bas-Rhin, Alsace) should be able to heat 70 ha of greenhouses[136]. However, the project is currently suspended for further investigations, after several earthquakes took place in the region that may be linked to the geothermal plant.

4) The "plan chaleur" (Heat plan - https://fondschaleur.ademe.fr) exists since 2009. It is run by ADEME (National agency for energy savings) and was relaunched in 2021 as part of the national recovery plan, post Covid crisis. A section of the ADEME website is dedicated to energy management in greenhouses. (https://www.ademe.fr/entreprises-monde-agricole/performance-energetique-energies-renouvelables/lenergie-exploitations-agricoles/dossier/productions-sous-serres-chauffees/outils-liens). However, bibliography is rather old (2007 to 2011) and hyperlinks not working anymore. Nevertheless, the current call for projects, that will be closed on May 13, 2021, is focused on biomass exploitation. (https://appelsaprojets.ademe.fr/aap/BCIAT2020-28). It is not sure that many greenhouse projects will benefit from this support. A regional system also exists, open to industrial and farming companies, including co-generation projects.

5) What about the diversity of French greenhouses? We have no official data about the age, the size, and the technical level of French greenhouses. The French greenhouses stock is rather old but not totally obsolete. Beyond the big projects in Mont St Michel or southern Brittany, some little or medium sized producers keep on investing, but they are not numerous.

In some regions (PACA, Brittany, Pays-de-la-Loire) a local EAFRD program helped greenhouse creation or modernization, but this development is limited.

There is currently no specific program dedicated to the modernization of greenhouses, but there are important expectations from the vegetable sector. According to an interview with CTIFL, expectations from the sector in terms of modernization rely on:

- the program Projets Agricoles et Agroalimentaires d'Avenir (*Agricultural and Food Industry projects for the Future*) that has been running over the period 2015-2017. It has been an important tool for modernization of the sector in France. No evaluation of the program

136 http://www.geoven.fr/wp-content/uploads/sites/2/2020/09/CP-2020-2509-Centrale-de-g%C3%A9othermie-profonde-%C3%A0-Vendenheim-la-pr%C3%A9fecture.pdf

has been published yet, which would provide an overview of the impact in terms of new installations of greenhouses. However, CTIFL considers the program to be ambitious, and popular among producers. This call for project is now over, as many producers registered for the program.

- The new CAP program. CTIFL expects the new CAP to continue to support investments in modernization of greenhouses, as it was the case during the 2014-2020 period in some regions through measures 4.1.1 (Investments in farms: fruits and vegetable sectors) and 4.1.2 (Improvement of competitiveness of farms).

5.5. 2016 French territory reform

Passed in 2014 and implemented in 2016 the territory reform aimed at modernizing and simplifying the territories' national system. The most visible effect was the merging of some ancient Regions. The number of regional authorities changed from 22 to 13 according to the following table.

Ancient Region	Capital	Changes
Ile de France	**Paris**	Unchanged
Nord Pas-de-Calais	**Lille**	Merged with Picardie in Hauts de France
Picardie	Amiens	Merged with Nord Pas-de-Calais in Hauts de France
Brittany (Bretagne)	**Rennes**	Unchanged
Pays-de-la-Loire	**Nantes**	Unchanged
Centre	**Orléans**	Unchanged but name (Centre Val de Loire)
Provence Alpes Côte d'Azur (PACA)	**Marseille**	Unchanged
Corsica (Corse)	**Ajaccio**	Unchanged
Basse Normandie	Caen	Merged with Haute Normandie into Normandie
Haute Normandie	**Rouen**	Merged with Basse Normandie into Normandie
Alsace	**Strasbourg**	Merged with Lorraine and Champagne Ardennes in Grand Est
Lorraine	Nancy	Merged with Alsace and Champagne Ardennes in Grand Est
Champagne Ardennes	Chalon sur Marne	Merged with Lorraine and Alsace in Grand Est
Bourgogne	**Dijon**	Merged with Franche-Comté in Bourgogne-Franche-Comté
Franche-Comté	Besancon	Merged with Bourgogne in Bourgogne-Franche-Comté
Midi-Pyrénées	**Toulouse**	Merged with Languedoc Roussillon in Occitanie
Languedoc Roussillon	Montpellier	Merged with Midi-Pyrénées in Occitanie
Limousin	Limoges	Merged with Poitou-Charente and Aquitaine in Nouvelle Aquitaine
Poitou-Charente	Poitiers	Merged with Limousin and Aquitaine in Nouvelle Aquitaine
Aquitaine	**Bordeaux**	Merged with Poitou-Charente and Limousin in Nouvelle Aquitaine

In bold: chief town after the reform.

5.6. List of French Départements (DPT).

N°	Département	Région	N°	Département	Région
1	Ain	Auvergne-Rhône-Alpes	51	Marne	Grand Est
2	Aisne	Hauts-de-France	52	Haute-Marne	Grand Est
3	Allier	Auvergne-Rhône-Alpes	53	Mayenne	Pays de la Loire
4	Alpes-de-Hte-Provence	Provence-Alpes-Côte d'Azur	54	Meurthe-et-Moselle	Grand Est
5	Hautes-Alpes	Provence-Alpes-Côte d'Azur	55	Meuse	Grand Est
6	Alpes-Maritimes	Provence-Alpes-Côte d'Azur	56	Morbihan	Bretagne
7	Ardèche	Auvergne-Rhône-Alpes	57	Moselle	Grand Est
8	Ardennes	Grand Est	58	Nièvre	Bourgogne-Franche-Comté
9	Ariège	Occitanie	59	Nord	Hauts-de-France
10	Aube	Grand Est	60	Oise	Hauts-de-France
11	Aude	Occitanie	61	Orne	Normandie
12	Aveyron	Occitanie	62	Pas-de-Calais	Hauts-de-France
13	Bouches-du-Rhône	Provence-Alpes-Côte d'Azur	63	Puy-de-Dôme	Auvergne-Rhône-Alpes
14	Calvados	Normandie	64	Pyrénées-Atlantiques	Nouvelle-Aquitaine
15	Cantal	Auvergne-Rhône-Alpes	65	Hautes-Pyrénées	Occitanie
16	Charente	Nouvelle-Aquitaine	66	Pyrénées-Orientales	Occitanie
17	Charente-Maritime	Nouvelle-Aquitaine	67	Bas-Rhin	Grand Est
18	Cher	Centre-Val de Loire	68	Haut-Rhin	Grand Est
19	Corrèze	Nouvelle-Aquitaine	69	Rhône	Auvergne-Rhône-Alpes
2A	Corse-du-Sud	Corse	70	Haute-Saône	Bourgogne-Franche-Comté
2B	Haute-Corse	Corse	71	Saône-et-Loire	Bourgogne-Franche-Comté
21	Côte-d'Or	Bourgogne-Franche-Comté	72	Sarthe	Pays de la Loire
22	Côtes d'Armor	Bretagne	73	Savoie	Auvergne-Rhône-Alpes
23	Creuse	Nouvelle-Aquitaine	74	Haute-Savoie	Auvergne-Rhône-Alpes
24	Dordogne	Nouvelle-Aquitaine	75	Paris	Île-de-France
25	Doubs	Bourgogne-Franche-Comté	76	Seine-Maritime	Normandie
26	Drôme	Auvergne-Rhône-Alpes	77	Seine-et-Marne	Île-de-France
27	Eure	Normandie	78	Yvelines	Île-de-France
28	Eure-et-Loir	Centre-Val de Loire	79	Deux-Sèvres	Nouvelle-Aquitaine
29	Finistère	Bretagne	80	Somme	Hauts-de-France
30	Gard	Occitanie	81	Tarn	Occitanie
31	Haute-Garonne	Occitanie	82	Tarn-et-Garonne	Occitanie
32	Gers	Occitanie	83	Var	Provence-Alpes-Côte d'Azur
33	Gironde	Nouvelle-Aquitaine	84	Vaucluse	Provence-Alpes-Côte d'Azur
34	Hérault	Occitanie	85	Vendée	Pays de la Loire
35	Ille-et-Vilaine	Bretagne	86	Vienne	Nouvelle-Aquitaine
36	Indre	Centre-Val de Loire	87	Haute-Vienne	Nouvelle-Aquitaine
37	Indre-et-Loire	Centre-Val de Loire	88	Vosges	Grand Est
38	Isère	Auvergne-Rhône-Alpes	89	Yonne	Bourgogne-Franche-Comté
39	Jura	Bourgogne-Franche-Comté	90	Territoire de Belfort	Bourgogne-Franche-Comté
40	Landes	Nouvelle-Aquitaine	91	Essonne	Île-de-France
41	Loir-et-Cher	Centre-Val de Loire	92	Hauts-de-Seine	Île-de-France
42	Loire	Auvergne-Rhône-Alpes	93	Seine-St-Denis	Île-de-France
43	Haute-Loire	Auvergne-Rhône-Alpes	94	Val-de-Marne	Île-de-France
44	Loire-Atlantique	Pays de la Loire	95	Val-D'Oise	Île-de-France
45	Loiret	Centre-Val de Loire	971	Guadeloupe	Guadeloupe
46	Lot	Occitanie	972	Martinique	Martinique
47	Lot-et-Garonne	Nouvelle-Aquitaine	973	Guyane	Guyane
48	Lozère	Occitanie	974	La Réunion	La Réunion
49	Maine-et-Loire	Pays de la Loire	976	Mayotte	Mayotte

A 'département' (abbreviation DPT) is a French territorial subdivision (EU nuts3 level), most of them were created and defined at the end of the eighteenth century, after the French Revolution. They are commonly and frequently referred by their number. Départements are the most popular territorial references in France.

5.7. French lobbying of the ornamental sector

Val'Hor is the French Interbranch association of Ornamentals Floristry and Landscape, which brings together representatives of plant professional bodies (production, distribution, and landscape). One of its missions is the defence of the sector and to increase its visibility at regional, national and European levels.
At the European level, the year 2020 was marked by a strong collaboration with international associations for Covid-19 crisis management, and to obtain European funding for promotion.
Val'Hor mobilized with Union-Fleurs, ENA, AREFLH, and via COPA-COGECA, to inform the European Commission and Parliament about the difficulties of the sector. They enhanced the need for a concerted European response.
This mobilization and this visibility created a favourable environment for the demands of the sector. Thus, in terms of product promotion, a multi-state program is being supported by 6 countries including France and The Netherlands and co-financed by CHAFEA, for a promotional campaign of European floriculture in 2021.

5.8. 'Souveraineté alimentaire' / food sovereignty

The main economic problem of France is its lack of competitiveness. Large industries as cars, consumption goods, tires, etc. used to produce commercial surplus. This is not the case anymore. Every month an important factory is closed, and production is relocated, often in the Eastern part of the European Union. This happened also in the food industry, even if the external balance of the agri-food sector is still positive, thanks to cereals, wine, and dairy products.

As a matter of fact, the low competitiveness of the French economy is caused by high wages, that cause high prices for all kinds of supply; a declining efficiency of the transportation network (train and water transport are still decreasing, motorways taxes are expensive); administrative complexity; aging factories. International comparisons hardly ever put France at the 1st rank in Europe. That is why French factories continue to be delocalised abroad either directly (seed industry, sauce industry, and others) or indirectly (meat and poultry industry).

What are the actions implemented by public authorities to stop this phenomenon? A simple strategy based on subsidies or any advantage of this kind is not possible anymore in the context of the single EU market. General decisions aiming at reducing the workers' cost and simplifying labour laws were not implemented at sectorial level. Social taxes are reduced for the salaries that remain below 1,6 times the minimum wage (SMIC – Salaire minimum interprofessionnel de croissance – Minimum interbranch salary, whose level is fixed by the Ministry of Economy). Even with these kinds of cuts, labour cost is still more expensive in France than in Poland. And this will last.

Food sectorial strategy to re-gain food sovereignty is based on following actions:

- Support **innovation** (see section 2.5 about innovation cluster);
- Support **certified products.** The PGI/PDO European tools were inspired by France and Italy. The concept comes from the wine sector: the protection of a territorial name can lead to the protection of the products' value. This approach works, most of time. Another axis of this policy lies in the support and encouragement granted to organic production (through the CAP support and national support with the "fonds avenir bio").
- **The EGALIM law**, passed in 2018 obliges local authorities to buy 50% of quality foods for public ischools, hospital, retirement residence, prison, public administration restaurants. The list of "agreed" certification includes national certification brands (such as Label Rouge and HVE – high environmental value). French Authorities cannot openly favour French nor local origins in tenders, but they think that request for certified quality will help French suppliers.

- The same EGALIM law aims at protecting farmers against processors and retailer's bargaining power, but the results do not meet expectations: retailers cannot raise prices as if there was no international competition. Even if experts plead for farm prices based on production costs, this concept is not compatible with a free market.
- The 'Projets Alimentaires territoriaux' or PAT **(local food projects).** Often built at a municipality level, PAT's aim at coordination of local food actors (farmers, processing plants, craftsmen as bakers or butchers, independent and public restaurants, retailers) to increase the share of locally produced foods in the local consumption. It may take different forms. Projects can be labelled and granted by the Ministry for agriculture. The global project is to constitute a network, exchange experiences, and enhancing this kind of local development.
- Support to investment in new industrial plants may happen, thanks to the FEADER funds.

All these policies lead to new **patterns of food consumption,** whose market share is still limited, but growing[137]. In the vegetable industry, lack of competitiveness should have led to a larger loss of market share, but certification and differentiation allowed French tomatoes and strawberries producers to protect their businesses, abandoning low end segments to foreign competitors and establishing a strong relationship with French consumers through typical and high valued products (Gariguette strawberry, Coeur de Boeuf tomatoes, for instance).
In 2020 households' expenses for fresh fruit and vegetable grew steadily: + 5% in volume, + 13% in value, with an average price raised by 7%. Organic products hold a 10% market share. By the end of 2021, all tomatoes grown in greenhouses will be certified "integrated plant protection", as well as most of the French apple production. These facts illustrate the "new consumption" pattern on which relies the French policy.
Will this lead to food sovereignty and growth of external surplus? It may not, but it allows French actors to run a profitable businesses and French consumers to enjoy diversified foods and, in some circumstances to better the environment or fight against global warming.

5.9. What about cannabis cultivation in France?

France is the second fibre-hemp producer in the world. When most of western countries gave up and banned this production after the second world war, to comply to US government wishes, French authorities did not accept to ban this traditional production. Most of French fibre-hemp production is used as raw material for cigarette paper fabrication and more recently in new uses (textiles, building sectors). The THC rate of fibre-hemp must be less than 0,2%, frequent controls are carried out by authorities to check whether fibre-hemp growers do not fraud. Therapeutic and recreational use of cannabis is still banned in France. A 2019 law forecasted an experimentation of therapeutic use of cannabis during 2020 and 2021, but the execution decree was not published until October 2020 (Decree 2020-1230). At the very moment we are writing, cannabis should be allowed for an experimentation involving 3 000 patients suffering serious, painful, and incurable illness (namely: neuropathic pains, multiple sclerosis, palliative situations, some cancers, some epilepsy cases) without other effective means to relieve pain. Authorisation is given only in case of importation of cannabis or cannabis products.
Anyway, one should consider that:

1) the experimentation may never start, due to the Covid crisis. And even if it starts, results will be limited.
2) the experimentation does not include the production stage: all cannabis and cannabis products will be imported.

[137] Between 2015 and 2019 growth in organic food households' market represented more than the half of the total growth of the household food market.

5.10. Labels in the ornamental horticulture sector

France is one of Europe's most important outlets for ornamental products. French consumers are more and more demanding on quality and French origin. The development of labels is an opportunity for French production to differentiate and deal with competition from other countries (the Netherlands, Italy, Kenya, …). Several labels exist, such as "Fleurs de France", "Plante Bleue", "Label rouge", "MPS or *Milieu Programma Sierteelt*".

5.10.1. Fleurs de France:

This label was launched in 2015, at the initiative of the Minister of Agriculture, Food and Forestry, Stéphane Le Foll. The "Fleurs de France" logo certifies the French origin of flowers, trees, plants, or bulbs.

The right to use the Fleurs de France label is granted to producers registered in France, who produce plants from seedlings, cuttings, etc., regardless of their origin. It is reserved for plants produced by French horticulturists or nurserymen committed to an eco-responsible or recognised quality approach (Plante Bleue environmental certification, MPS, Label Rouge, Organic Agriculture, Charte Qualité Fleurs).

5.10.2. Plante Bleue:

Created by VAL'HOR and recognised by public authorities, "Plante Bleue" is a French environmental and social certification. It identifies ornamental plants (trees, plants, flowers) produced in an eco-responsible manner. Plante Bleue certifies that horticulturists and nurserymen respect strict and precise specifications aimed at limiting environmental impacts by attesting to their good practices in the following 7 areas:

Irrigation management, Fertilisation strategy, Crop protection, Waste management, Energy management, Biodiversity and the environment, social and societal rules.

5.10.3. Label rouge:

Created in 1960, the Label Rouge is one of the oldest **official signs of quality** in France.
It is awarded by the State via the National Institute of Origin and Quality (INAO), based on specifications which precisely define the characteristics of the product, the production requirements throughout its manufacture and the labelling criteria.
All plants meet quality requirements, whether it means greater vigour, better performance (flowering, disease resistance, productivity, fragrance) or even better aesthetics.

The players in the ornamental sector decided to join forces to provide consumers and customers with information and labels guaranteeing the superior quality of the plants they buy.
The approach is supported by the "Excellence Végétale" association, which brings together producers, wholesalers and retailers and members by right or partners, including consumer associations.
The Excellence Végétale association is organised into sections by product family: Dahlia section, Rose section, etc.
Each section defines the criteria of the specifications that the plant must meet to be awarded the Label Rouge:

- ✓ Selection of new varieties with superior qualities.
- ✓ Varietal conformity thanks to the traceability of the batches and the information that accompanies the plant.
- ✓ Physical characteristics of the plants.
- ✓ Optimal maturity and freshness of the plants, thanks, for example, to the respect of harvesting dates, to the reduction of the time between harvesting and marketing, to the packaging and storage techniques...

5.10.4. Locavert:

The LOCAVERT sheet, launched by Stéphane Travert, Minister of Agriculture and Food, on 25 February 2018, is a new tool for public purchasers to support the development of local and quality procurement.

The purpose of the sheet is to present a set of non-exhaustive recommendations as tools that can be implemented by public purchasers to develop a local and quality supply of trees, plants, and flowers in the context of contracts relating to the creation or maintenance of green spaces.
This sheet was written by the Ministry of Agriculture and Food, in partnership with FranceAgriMer, VAL'HOR and the FNPHP. It is based on the LOCALIM approach dedicated to public procurement in collective catering.

5.12. Glossary

Acronym	Signification	English translation
ADEME	Agence de l'Environnement et de la Maîtrise de l'Énergie	Environment and Energy Management Agency
AFRAA	Association France Russie pour l'Agro-Alimentaire	France Russia Association for agri-food sector
AIB	Association interprofessionnelle de la Banane	Interbranch association for Banana
ANEEFEL	Association nationale des expéditeurs et exportateurs de fruits et légumes	National Association for fruits and vegetables exporters and importers
ANIFELT	Association Nationale Interprofessionnelle des Fruits et Légumes Transformés	National Association for Processed Fruits and Vegetables
ANSES	Agence Nationale Sécurité Sanitaire Alimentaire Nationale	National Agency for Food Safety
AOPn	Association d'Organisations de Producteurs nationale	Association of Producers' organisations (national bodies)
APRIFEL	Agence Pour la Recherche et l'Information en Fruits et Légumes	Research and Information Agency for Fruits and Vegetables
ASTREDHOR	Association nationale des structures d'expérimentation et de démonstration en horticulture.	Technical Institute for ornamentals industries
AURA	Auvergne-Rhône-Alpes Region	
AWU		Annual Working Unit
CAIFL	Chambre d'arbitrage des fruits et légumes	Arbitration chamber for fruit and vegetables
CER	Centres d'Économie Rurale	Rural Economy Centres
CERAFEL	ex-Comité régional agricole de fruits et légumes	ex- Regional Agricultural Committee for fruits and vegetables
CGI	Confédération du commerce de Gros et International	Wholesale and International Trade Confederation
CISF	chambre syndicale des importateurs de fruits et légumes	Union chamber of fruit and vegetable importers
CNAB	Comité National de l'Agriculture Biologique	national Committee for Organic Agriculture
CNIPT	Comité national interprofessionnel de la pomme de terre	Interbranch National Committee for Potato
COPA COGECA	Comité des organisations professionnelles agricoles de l'Union européenne - Comité général de la coopération agricole de l'Union européenne	EU professional organisation Committee - EU general Committee of agricultural cooperatives

CSIF	Chambre syndicale des importateurs français de fruits et légumes frais	Chamber of the union of fresh fruits and vegetables importers
CTIFL	Centre technique interprofessionnel des fruits et légumes	Interbranch Technical Centre for Fruits and Vegetables
CVE	Cotisation Volontaire Étendue	Voluntary and Enlarged Contribution
DGCCRF	Direction générale de la Concurrence, de la Consommation et de la Répression des Fraudes	Directorate-General for Competition, Consumer Affairs and Prevention of Fraud
DPT	Département	Department
EAFRD		European Agricultural Fund for Rural Development
EPLEFPA	Établissements Publics Locaux d'Enseignement et de Formation Professionnelle Agricole	Local Public Schools for Training and Professional Education
ESANE	Élaboration des Statistiques Annuelles d'Entreprises	Elaboration of Annual Company Statistics
EU CAP		European Union Common Agriculture Policy
FADN		Farm Accountancy Data Network
FC2A	Fédération du Commerce Agricole et Agroalimentaire	Agricultural and Food Trade Federation
FCA	Fédération du Commerce Coopératif et Associé	Cooperative and Associated Federation of Wholesale Trade
FCD	Fédération des entreprises du commerce et de la distribution	Federation of retail companies
Felcoop	Fédération française des entreprises coopératives en fruits, légumes et pommes de terre, frais et transformés	National Federation of fresh and processed fruits, vegetables, and potatoes cooperatives companies
FFAF	Fédération Française des Artisans Fleuristes	French Federation of Florists
FNAB	Fédération National de l'Agriculture Biologique	National Federation for Organic Agriculture
FNPF	Fédération nationale des producteurs de fruits	National Federation of fruit producers
FNPHP	Fédération nationale des producteurs de l'horticulture et des pépinières	National Federation of Ornamentals and Nursery
FNSEA	Fédération National des Syndicats d'Exploitants Agricoles	National Federation of Farm Unions
FranceAgriMer	Établissement national des produits de l'agriculture et de la mer	National Institute for agricultural and aquatic products
FRESHFEL		European Fresh Producer Association

GEFeL	Gouvernance économique des fruits et légumes	Association of producers' organisations' associations (AOP)
GIPT	Groupement Interprofessionnel pour la pomme de terre transformés	Interbranch Group for processed potato
HSWT	Hochschule Weihenstephan-Triesdorf	
INAO	Institut national de l'origine et de la qualité	National Institute on Quality and Origin
INAT	Institut National Agronomique de Tunisie	National Agronomic Institute of Tunisia
INRAE	Institut National de la Recherche Agronomique et Environnementale	National Research in Agronomy and Environment Institute
INSEE	Institut National de la Statistique et des Études Économiques	National Institute of Statistic and Economic Studies
INTERFEL	Interprofession des Fruits & Légumes frais	Interbranch association of fresh fruits and vegetables
IPAMPA	Indice des prix d'achat des moyens de production agricole	Purchase price index for means of agricultural production
IPPAP	Indice des prix à la production agricole, Agreste	Prices at farm stage index
ISSFEL	Institut Supérieur de Formation	Higher Institute of Training
MIN	Marché d'Intérêt National	National Interest Market
PACA	Provence-Alpes-Côte d'Azur Région	
PDO		Protected Designation of Origin
PGI		Protected Geographical Indication
Restau'Co	Réseau de restauration collective en gestion directe	Social Catering network (executives' association)
RGA	Recensement Général Agricole	General Agricultural Census
SIVAL	Salon international des productions végétales	International fair for vegetal production
SNIFL	Syndicat national des importateurs / exportateurs de fruits et légumes	Professional association of fruit and vegetable importers
SNRC	Syndicat national de la restauration collective	National collective catering Union
UDE	Union des entrepôts de Paris-Rungis.	Paris-Rungis storage Union
UFMB	Union Française des mûrisseurs de banane	French Union of banana ripening companies
UNCGFL	Union nationale du commerce de gros en fruits et légumes	National Union of fruit and vegetable wholesalers
UNESP	Universidade Estadual Paulista	Sao Paulo University
VAL'HOR	Interprofession de l'horticulture, de la fleuristerie et du paysage	Interbranch organisation for horticulture, flower production and landscape

5.13. TOP 30 French fresh fruit and vegetable companies

Table 44 Main French fresh fruit and vegetable companies

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
POMONA consolidé	Dewavrin Family and management	Import and wholesale of F&V, deepfrozen products, fresh seafoods, grocery products. Fresh F&V wholesale generates circa EUR 1 billion	4 100 000	Pomona Import, Sicaer, AGD, Savco, Avon….	S: leader in food wholesale in France, Excellent management, good financial situation. W: deeply involved in the catering sector in France.	https://www.groupe-pomona.fr/
AGRIAL - Fresh Vegetable and fruit division	N°1 cooperative in France (12 500 members). Total Turnover: EUR 6.1 billion	Shipping, processing of vegetables. 826 000 tonnes (carrots, leeks, potatoes, turnips,)	1 600 000	Florette, Primeale, Crealine (FR) Van Oers (NL)	S : leader in fresh cuts in Europe, excellent management, good financial situation. W : not involved in covered production. Development of a specific concept (agri-ecological).	https://www.agrial.com/
VIVALYA (Coopérative de grossistes)	22 partners (Family owned small and medium companies)	F&V and sea food shipping and distributing	1 100 000	Main Partners: Estivin Group, Le Saint, Provence Dauphiné (Ginard et Constant), Ribegroupe), SAPAM	S : leader in fresh F&V whole sale, good financial situation of most partners W : deeply involved in catering sector in France. Voluntary partnership and network. No brand. Strictly French	https://vivalya-reseau.com/
GROUPE COMPAGNIE FRUITIERE	Famille Fabre plus Unigrains, Crédit Agricole, Société Générale	Production, transport and marketing of fresh exotic fruits, mainly bananas (750 000 t out of 900 000 t)	740 000	CFP, Dole France, Cie Fruitière Paris, Cie Fruitière Import, Exofarm, Transit fruits, Compagnie fruitière UK, Compagnie fruitière Espana et Portugal - United Fresh Services (NL) et Stradelle (IT)	S: one the world leader in banana production and marketing. Integrated company, from plantation to ripening facilities in Europe. World leader in Fairtrade banana. W : few NGO denounced non fair practices in some African countries	https://www.compagniefruitiere.fr/
CRENO (Groupement)	28 partners	Shipment and wholesale of fresh F&V and of seafood products in France	550 000 (est.)	Ame-Hasle Group, Creno Impex, Transgourmet	S : partnership with French producers, W : this wholesale network is not firmly integrated	http://www.creno.fr/f

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and Weaknesses	Website
Réseau LE SAINT	Family owned (Le Saint)	Wholesale F&V and seafood	550 000 (est.)	FILIALE de FIDEGE (G et D Le Saint). Filiales: Le Saint - Bourguignon - FL 44 - Armor Fruits - Elbé Fruits - Foissier - Devaud - Bouyer Guindon - Garonne fruits - DC Primeurs - Roucaud - Sainfruits - Pons primeurs -Sud primeurs (Cordellane et Toulouse) D-La légumière - Robledo + - Partner VIVALYA	**S:** a well-managed regional network (west and south west) **W:** business dependant on the catering sector	https://reseau-le-saint.com/
UGPBAN-Fruidor	Banana producers of the French West Indies (Martinique and Guadeloupe)	270 000 t of Banana produced in the Islands, out of which 70% are marketed in France and 30% abroad. N°1 In France Banana ripening (225 000 t). Shipping and marketing of vegetables from different French basins.	935 000	Fruidor Murisol	**S**: A large market share in France. Integrated marketing chain. Social importance of Banana production in La Martinique and Guadeloupe **W**: Environmental question in Martinique and Guadeloupe (Chlordecone issue).	https://www.bananeguadeloupemartinique.com/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and Weaknesses	Website
ASSOCIATION REGIONALE DES CADRANS DE LEGUMES ARCAL	1700 Vegetable growers in Brittany	Production, transport, and marketing of fresh vegetables (cauliflower, artichokes, onions, tomatoes, potatoes, strawberries, garlic, beets, Coco beans) and ornamental products. Group of cooperatives, managing one of the oldest vegetable brands in France (Prince de Bretagne), a research centre, and auction houses. (production > 300 000 t). One of the greatest groups of covered producers.	336 308	Sica St Pol, UCPT /Maraichers d'Armor, Terres de St Malo, Socoprim, Triskalia	S: historical leader of the vegetable industry in Brittany. First rank player of the European califlower market. Strong brand and organisation. Strong commitment in environment-friendly techniques: organic, zero pesticide, HEV certified). Important covered tomato procution (> 35 000 t). W: importance of the auction sale model (70%), competition between housing and farming in the coastal area.	https://www.princedebretagne.com/
LES VERGERS DE BLUE WHALE UNION	Cooperatives' Union	Greatest French local fruit company. Orchard: 6620 ha. Apple, pear, prunes, kiwifruit, and grapes. 11 storage and packing facilities. 240 000 t of fruits. Blue Whale has 300 producers and 16 packing stations located in the heart of the best fruit basins in France, for 100% French, 100% local production: along the Garonne Valley, in the Loire Valley, in Provence, in the Center and the Alps	250 000	Main cooperatives: Stanor, Quesrcy Soleil, Jadar fruits, Kiwicoop, Les 2 vallées, Les 3 domaines union fruiière, Novacoop, La Martinoise, BVL…	**S:** A well organised group of cooperatives, with modern orchards and recent varieties, a large export market especially in non-EU countries a good image in the Asian market. Important efforts to reduce the environmental impact of orchards. **W:** Dependence of external markets, that could be disturbed according to political issues (ban on French products in Autumn 2020, Brexit). Uncertainty of the development in organic markets.	https://blue-whale.com/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and Weaknesses	Website
AZURA /SOCIETE DE DISTRIBUTION DE PRODUITS MARAICHERS ET HORTICOLES DU MAROC (DISMA INTERNATIONAL)	Harakat family and others	Import of Marrocan products. Integrated chain, from farm (47 facilities, 986 ha) to wholesale distribution in France, UK and Germany. For 30 years, Azura has been a family group specializing in the fruit and vegetable sector. Azura markets its products through the main retail chains in Europe: tomatoes, aromatic herbs, edible flowers and recently clams. The group has chosen the integrated sector to guarantee control of its business model and its Supply Chain, from the nursery to delivery through production. Totals sales : EUR 304 million	234 000	n.a.	S: committed in environment friendly actions (since 2011 :25% drop in water uses, 20% drop in CO2 emissions). Many certifications: ISO 9001, Global gap, BFC, QS, IFS, GSSP, BSCI, SEDEX, FCS. **W:** in the long run, impact of the global warming in Marocco. In the short run: European demand for local products. Citizens' questions on the impact of imported vegetables.	https://www.azura-group.com/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
Groupe AZ France	Grupo Orsero (Orsero family-33%, Grupo Fernandez, PAM, GPI, FC and public-40%).	For 80 years, the Orsero Group has been a leader in Mediterranean Europe in the import and distribution of fruit and vegetables. 750,000 tons of fruit and vegetables, 1,500 suppliers in more than 70 countries. (Sales: EUR 1 billion)	186 000	French division of the Italian Orsero Group. Connection with production in Tunisia and Mexico. 4 fruit rippening and packing facilities in France. 128 000 t yearly marketed. French branches: AZ méditerranée - AZ Touraine AZ Rungis AZ Grand Est, Fruttica	S: A diversified network (production, species, markets). Very good financial results. Leader in southern Europe W: Limited environment efforts.	https://www.azfrance.fr/
MAITRE PRUNILLE (France Prune)	Coopérative France Prune	The group is focused on dried fruits (prune and other fruits) and condiments (onions, garlic) . It owns 7 facilities in France (in the prune production basin in Nouvelle Aquitaine, in Paris-Rungis and in Marseille region)	186 599	Bargues, Arbona and co, Agricondiments	**S:** Maitre Prunille is the leader structure for PGI 'Pruneau d'Agen'. This prune production basin has shown its resilience through several crisis during the past 20 years. Conversion to organic production is important (> 10% of the orchard) **W:** prune production cost is high compared with extra EU competitors (Chile), coupled support granted by CAP funding may disappear.	http://www.maitreprunille.com/
SAVEOL / CMO - Coopérative Maraichère de l'Ouest	125 producers' partners in Brittany (Plougatel-Daoulas)	Tomatoes (76000 t), strawberries (2300 t), cucumbers, and peppers in greenhouses.	204 083	-	**S:** a success story based on varietal innovation, integrated production, internal discipline, greenhouses constant modernisation. Advanced environment strategy (close to zero pesticide, evolution to clean energy sources) **W:** higher production in France lead to a constant innovation strategy. Local opposition to great greenhouses.	https://www.saveol.com/fr

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
GINARD INVEST (Réseau Provence Dauphiné)	Family Owned	Shipment and wholesale of fresh F&V and of seafood products in France	200 000 (est)	Provence Dauphiné Savoie, , Annemasse Primeur, Léman Primeurs, Dorina Sud, Cussac, Dorina Sud, Marseille, Viale et Dumay, Provence Primeurs, Gavignaud (marée), Prov Dauphiné Grenoble, Clédor Primeur Service, Abeil GAP, Abeil Briançon Grand fruit distribution, Auvergne Primeurs, Union Primeurs Adhérent VIVALYA	**S:** a well-established and managed network in south east France **W:** a large part of sales in catering (weakness in 2020-2021, strength before)	https://www.provencedauphine.fr/
GREENYARD France	Subsidiary of GREENYARD group (Belgium)	Import of exotic fruits: avocado fruits and litchees	175 000 (est)	- Filiales : Greenyard Fresh France / Agrisol / Delta Stocks	**S:** A world leader (Sales: EUR 4 billion - tonnes 1.8 million fresh F&V + 770 000 tonnes preserved or frozen. **W:** Perfectible financial situation and result. Limited importance of organic products and other environmental-friendly productive method.	https://www.greenyardfresh.fr/
PRONATURA	Organic Alliance (CEREA investment fund and management)	Pioneer and historical leader in fresh organic fruits and vegetables in France. Contracting with producers in France and abroad, shipping, importing and wholesaling. Organic Alliance is a holding company that also owns 'Vitafrais' company (wholseale in organic grocery). Organic F&V : 80 000 t / year	182 726	Pronatura and Vitafrais	S: An important market share in a fast-growing market, with solid links with production stage (Brittany, Provence, Togo) and good introduction in specialised as well as general retailers. Very large range of products. **W:** A declining market share as many other actors develop activities on the organic market. Sales growth turned to decrease in 2019.	https://www.organic-alliance.com/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
Groupe TRANSGOURMET FL (AFL)	**COOP GRUPE GENOSSENSHAFT-(CH) -**	Transgourmet is a general food wholesaler, oriented toward the high end traditional commercial restaurants. Transgourmet FL (for fruits et vegetables) is a part of Transgourmet, based on several legal bodies.	160 000 (est)	Speir - Cofida - Sodiexval - La Goële - Mantes Primeurs - TransGourmet Seafood - Delta Logistique	**S:** Transgourmet has a unique position in the market, very coherent, as classical restaurants ask for the same quality for all kinds of food and beverage. As a subsidiary of one of the main Swiss mass retailer, Transgourmet is not vulnerable. **W:** 2020/2021 and the Covid crisis. Due to a very important involvement with independent restaurants, the crisis is going to cause major difficulties to this group.	https://www.transgourmet.fr/
SCA OCEANE	50 producers, located in Vendée and Loire-Atlantique departments (south west of the region Pays de la Loire)	97 000 t (all products). Tomatoes: 55000 t; Cucumbers: 40 million; Corn salad: packs 23 million; radish: bunches : 7 million; leeks : 3 000 t; salads : 6 000 t; other vegetables 1 500 t.	198 329		**S:** a well organised group of producers, with a significant market share on the tomato and corn salad products. Growth' rate regularly surpass the market evolution trend. **W:** no opening on the organic production	http://www.oceane.tm.fr/
NORALIANCE LEGUMES	Subsidiary (potatoes and vegetable) of Norman cooperative NATUP (Sales EUR: 1,3 billion)	French n°1 in fresh potato sector (Pom'Alliance, 250 000 t), N°1 in ready to use cooked potatoes (Lunor)	180 000 (est)	PomAlliance , Lunor, Solpom	S : a stable market share in fresh potato, a vey stable market in processed potatoes and other vegetables (beetroot and carrots). W : few innovation in these activities. Strong domestic competition. High dependence to market fluctuations.	https://www.pom-alliance.fr/ https://natup.coop/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
BLAMPIN FRUITS HOLDING	Family owned group (Blampin Family)	Import of exotic fruits and general F&V wholesaler, premium products	160 000 (est)	Blampin Fruits Import S.A.S. /Blampin Fruits Import Rungis S.A.S./ Bauza S.A.S. / Mighirian S.A.S./ Blampin Fruits Holding S.A.S/ Couton S.A.S./ Frugisol/ Kerleguer/ Favarel	S : a long tradition in fruit trading (established in 1902) + a national wholesale network in the main MIN (Marseille, Paris-Rungis, Lyon, Toulouse, Tours, Rouen, Nice) W : no distinctive product	https://blampinfruits.com/
CHAMPART / PARMENTINE	Collective company controlled by 400 potatoe producers	Production, storage, packing, export and distribution of fresh potatoes	150 000 (est)	Filiales : Parmentine, Jardin de Limagne, Prim nature, France Potato Board, Parmentine production. Agri Parm	S: a pioneer of washed potatoes (since 1990) involved in new practices (Zero pesticide). W: fluctuation and dispersion of fresh potatoes market	https://parmentine.fr/
ROUGELINE	Group of co-operatives (6 producers' organisations)	230 producers in 3 French regions (Provence, Occitanie, Nouivelle Aquitaine). 340 hectares greenhouses. 700 hectares in open air. 90 000 t vegetables out of which : 77 000 t tomatoes, 2 600 t strawberries, 4 400 t cucumbers, Pepper-Eggplant-courgettes : 1 400 t, Asparagus 200 T. Organic vegetables : 700 t.	157 898	Main partners: Polenium, Anais, Nostre, Odelis	S: one of the 4 main French companies on the tomato market (in competition with Prince de Bretagne, Saveol, and l'Oceane). Committed in agroecological production, even in organic production). W: multiregional network, less coherent than the Britton and Ligerian cooperatives.	rougeline.com
Groupe INNATIS (ex POMANJOU)	Family owned (Rauffet Family)	1100 hectares apple orchards (50 000 to 60 000 t)	100 000	Pominter, Cardell export, Les vergers Launay, DSA, Cominpex, Pomone	S: the biggest non cooperative actor in the French apple industry. A ancient commitment in agroecological practices. (Vergers éco responsable). Production in South east and Loire Valley. Strong position in export. Integration of all functions (research and varietal experimentation, nursery, production, storage, marketing and export). W : only apples and pears.	https://www.pomanjou.fr/

Name	Owner	Activities	Sales 2019	Main Subsidiaries	Strengths and weaknesses	Website
AGRI COMMERCE	Munoz Group AMC (Spain)	import of citrus fruits and of citrus juices (especially for private labels)	126 768	Serimpex	-	https://www.amcgrupo.eu/
SIIM	Omer Decujis Family	Import of bananas and other exotic fruits and green beans from Africa	135 000	Omer-Decugis & Fils SA à Conseil de Surveillance et Directoire: holding / SIIM SAS: production, import and rippening /Bratigny and Coicault Thomas wholesale distribution - Rungis	**S**: a long relationship with production in Western Africa (know-how in sourcing and importing) **W:** A family owned business.	https://siim.net/accueil
PERLE UNION	Union of Cooperative	Marketing of witloof salad under the brand "Perle du Nord"	136 000	Cooperative Partners: Phalempin, Sipema,CAP Endives, Primacoop, Endive du Valois	**S:** Circa 50% of the French witloof salads - A well-known brand -effective production system W: Witloof salad market is declining.	https://www.perledunord.com/
GROUPE MANDAR	Family owned	Import, production, distribution of a large range of F&V	110 000 (est)	Filiales : Halles Mandar, Jardins du Midi, Solanès, Halles Orly Sud, Mandar, Valprim	**S:** high ended products and business **W:** condiment market is very fluctuating	https://www.leshallesmandar.com/
ANECOOP FRANCE	ANECOOP (Spain) Union of cooperatives	French subsidiary of the n°1 Spanish citrus fruit cooperative. Import of citrus fruits and other F&V.	86 518	Solagora (organic products)	Evolution of this company is linked to the Spanish orange and tangerine market.	https://anecoop.com/grupo-anecoop/red-internacional/anecoop-france-e-international-fruit-services
SOFRUCE	Family owned (Cebrian)	Import of Spanish products, especially strawberries and red berries (60 000 t) and export to 20 countries (northern Europe)	88 813	-	**S**: solid business **W:** competition with central Europe origin	https://www.sofruce.com/
VALNANTAIS / TERRENA LEGUMES	37 producers' partners. Vegetable division of Terrena,	38 600 t of Fresh vegetable (corn salad, leek, radish, salads, cucumber, tomato) and 3 million bits of lily of the valley.	88 000	Maillard SA (Brittany). Val Nantais packing (42 million packs / year, under the Bonduelle brand).	**S** Terrena can support a little group of producers in their evolution (toward an agroecological or organic mode of production). **W:** This entity is still little on the marmket.	https://www.terrena.fr/ one of the biggest French co-operatives (Sales: EUR 4.9 billion).

- Several major players in France are subsidiaries of national leaders in neighbour countries: Spain (AMC, Anecoop) Italy (AZ/ Orsero), Morocco (Azura), and Belgium (Greenyard). Some of them are dedicated to the imports of products coming from the original countries.
- Wholesalers are heavily dependent from the catering sector. The Covid crisis has had an important impact on their sales in 2020 and 2021, even if the school canteens have not been closed in the second semester in 2021.

5.14. F & V companies complementary list

RANK	Company name	Control	Activity	Annual Sales (1000 EUR) 2019*
34	**COMEXA**	Partnershio with Westfalia fruits	Import / export of mangoes and avocados	121 177
35	**VOICEVALE France**	Voiceval Group (UK)	Dried fruits, coffee trade	95 441
36	**FRUITS DU MONDE**	Subsidiary of UGPBAN	Import / Export Banana and Exotic fruits	87 421
37	**GEORGES HELFER**	Family owned	Import of exotic fruits	86 741
38	**Les 3 MOULINS - VITAPRIM**	Producers group	production and shipment of Cucumber, tomatoes, corn salad, radish, partly organic	81 940
39	**FRUITS ROUGES AND CO**	Producers group	Red berries, production packing, processing, and trade	81 000
40	**LA COMPAGNIE DES FRUITS MURS**	Subsidiary of Grand Frais	Import of exotic fruits	80 749
41	**Groupe AME HASLE**	Family owned	Wholesale – Western France – Creno member	80 000
42	**PRYMEX**	Family owned	Shipment of potatoes and witloof	76 950
43	**LACOUR RENE / ALTERNEA**	Family owned	Import of F&V from Spain	75 841
44	**Groupe ESTIVIN**	**Family owned**	Wholesale - Centre of France - Vivalya member	75 000
45	**NANTIAL (Agrial)**	Common subsidiary of Agrial and vegetable producers around Nantes	Corn salad, Radish, leeks	74 223

46	**MESFRUITS**	**Family owned**	Wholesale Shipment	74 000
47	**MARCHE DE PHALEMPIN**	Co-operative company	Witloof and other vegetables, strawberries	71 157
48	**CONDICHEF**	Family owned	Garlic, Onions, shallots - production, packing and trade	70 000
49	**POMONA IMPORT**	Subsidiary of Pomona	Import (exotic and other	68 231
50	**BOYER**	Family owned	Production and shipment of melon	63 721
51	**CHRONOPRIMEURS**	Family owned	Wholesale of F&V	62 193
52	**GROUPE SAPAM**	Family owned	Wholesale of F&V - Member of VivaLya	62 000
53	**KULTIVE**	Producers group	Open air and covered vegetable production and shipment.	58 195
54	**CARDELL EXPORT**	Subsidiary of Pomanjou / Innatis	Export of apples	57 978
55	**SOCIETE EUROPEENNE DE PRODUITS ALIMENTAIRES (SEPAL)**	Subsidiary of Dole food Inc	Import of canned food	57 937
56	**LYON SELECT**	Family owned	Wholesale of premium F&V	57 843
57	**FRANCE FOOD**	Family owned	Red Berries	56 877
58	**Groupe MARAIS**	Family owned	Corn salad, Radish, leeks	55 000
59	**SODIEXVAL**	Family owned	wholesale of F&V	54 712
60	**CAPEXO**		importation of exotics (Ginger)	53 688
61	**PIERRE DESMETTRE ET FILS**	Family owned	Wholesale of F&V	53 085
62	**SANTERLEG**	Producers group	Witloof	53 037
63	**FERME DE LA MOTTE**	Family owned	Production and shipments of vegetables (partly organic): radish, potatoes, …	52 883
64	**POM'EVASION**	**Family owned**	Shipment of apples	51 921

65	**COMPAGNIE FRUITIERE IMPORT**	Subsidiary of Compgnie fruitière	Import / export of bananas and exotic fruits	51 508
66	**HZPC France**	Subsidiary of HZPC (NL)	Potato seeds	51 236
67	**JOUFFRUIT**	Family owned	production and shipment - Apples and Pears	50 672
68	**BROUSSE VERGEZ**	Family owned	Dried fruits	50 414
69	**DEL MONTE FOODS FRANCE**	**Subsidiary of Del Monte foods**	Import and marketing of fresh and canned grapefruit	50 151
70	**DESMAZIERES ARTOIS BAPAUME**	Subsidiary of Agrico	Potato seeds - Organic potatoes	50 000
71	**Groupe CHARLET**	Family owned	Wholesale of F&V - Member of Creno	50 000
72	**Groupe MAG**	Family owned	Wholesale of F&V - Member of Creno	50 000
73	**ALTERBIO FRANCE**	Family owned	Import and Shipment of organic vegetables	49 294
74	**EXPANDIS**	Producers group	Vegetables for processing (onion, carrot, ..)	48 794
75	**NOSIBE**	Kinobé group	Off-season products' imports	48 572
76	**SOLY-IMPORT**	Family owned	Import of exotic fruits	48 000
77	**SOLAGORA**	Subsidiary of ANEECOOP (Spain)	Import of Spanish products	47 709
78	**ALBERT VINAS**	Subsidiary of SOFIPRIM (family owned)	Wholesale of F&V	47 464
79	**SICA AGRISUD**	Odelis Group	Import from Spain	46 867
80	**SOLARENN**	Producers' group	Tomatoes production	46 791
81	**COLOR**	Vergez Family	Dried fruits	46 777

82	**IDYL**	Family owned	Production and shipment of fruits (citrus, rasberryes, peaches, dates) and vegetables (tomatoes, salads, melon) in Marocco and Provence -	46 304
83	**DOLE PACKAGED FOODS EUROPE**	Subsidiary of Dole food Inc	Import of canned Grapefruit	45 809
84	**BLAMPIN FRUITS IMPORT**	Family owned	Exotic fruit import	45 415
85	**GROUPE BALICCO**	Family owned	Wholesale of F&V	45 000
86	**FONTESTAD FRANCE**	Subsidiary of Fonstetad (Spain)	Citrus fruits	44 818
87	**GERFRUIT**	Producers group	Apples	44 462
88	**ILLE ROUSSILLON**	Family owned	Import and shipment of salad and fruits	44 229
89	**FAUS DURA**	Family owned	Import of Spanish and Moroccan products	43 904
90	**BC PRIM**	Family owned	Wholesale of F&V	43 694
91	**PARISIENNE D'EXPORT-IMPORT (SPEIR)**	Subsidiary of Transgourmet	Wholesale of F&V	43 395
92	**FORNEL FRERES**	Family owned	Wholesale of F&V - Member of VivaLya	42 991
93	**MAXI SEC**	Macéo group	Dried fruits and creole products	42 538
94	**Jardins DU MIDI**	Subsidiary of MANDAR	Wholesale of aromatic herbs	42 529
95	**TERRAGAIA**	Kinobé group	Off-season products' imports	41 958
96	**FLEURONS D'ANJOU**	Producers' group	Open air and covered vegetable production and shipment. Ornamental horticulture	41 652
97	**MUGUI**	Subsidiary of MUGUI grupo (Spain)	Import of citrus and other fruits from Spain	40 943
98	**LUNOR Distribution**	Subsidiary of NatUp (grain Cooperative in Normandy)	Preserved potatoes	40 391
99	**Groupe SAVEUR DES CLOS**	Producers group	Peaches, Apricot, organic products	38 471
100	**ANAIS - PARDI**	Producers group	Covered production	37 900

5.15. Main French ornamentals' companies

Table 45: Main French ornamentals' companies

Name / status	Owner / manager	Dpt	Activities	Main production	Sales 2019 (euros)	Website
FLEURON D'ANJOU S.C.A / cooperative	Christophe Thibault	49	Cooperative with 100 producer members who all together cultivate 900 ha of surfaces. Annual production: 45 000 rolls of flowers and plants; 12 000 tonnes of fruits and vegetables	Vegetable and ornamental	47 145 600	http://www.fleurondanjou.fr/
HORTIVAL DIFFUSION SAS / cooperative	TERRENA / Jean-Marc Poirier	49	Production of ornamental shrubs and trees by the subsidiary "Minier Company", which cultivates 300 ha in Anjou region	Ornamental nursery	31 377 700	https://www.pepinieres-minier.fr
SAS DALIVAL / cooperative	TERRENA / DALIVAL HOLDING / Thierry Ligonniere	02	Specialised company in apple tree nursery. It gathers a wide range of activities: creation of varieties, experimentation, promotion, apple and pear tree nursery, apple and pear production, marketing	Fruit tree nursery	25 276 100	https://www.dalival.com
CERDYS LEBOEUF HORTICULTURE / private group	Marceau Dupont	44	Cerdys gathers 5 potted plant producers. It produces more than 7 billion pots. Clients are specialised garden centres	Potted plants	19 000 000	http://cerdys.fr/

JCT PLANTS SAS / cooperative	FLEURON D'ANJOU	49	JCT Plants cultivates vegetable seedlings, aromatic, and flowering plants on 14 ha of tunnels on 3 main production sites	Vegetable and ornamental	10 522 900	http://www.taugourdeau.fr/
SERRES LES TROIS MOULINS / private group	Charles Vinet	44	Les Trois Moulins is a specialised company in vegetable and lily of the valley production. It realizes production, packaging and distribution on the same site	Lily of the valley	NA	http://www.3moulins.fr/
SAS BIGOT FLEURS / private group	Bigot Fleurs group	72	Bigot Fleurs group gathers 5 companies: Les Fleurs de Nicolas (bouquet production and delivery), Cash Bigot Fleurs (cash and carry for French florists), Bigot flowers Kenya LTD (production of roses on 70 ha among which 53 ha of covered areas), SAS Bigot Fleurs (Lily of the Valley production, packaging, and roses marketing for the French market), EARL Bigot Jean-Philippe (tulip production, packaging and marketing)	Cut flower	14 032 800	http://www.bigot-fleurs.fr/
VINET FRERES	Jean Vinet	44	Vinet Frères is a specialised company in vegetable and lily of the valley production	Lily of the valley		
SAS LANNES et Fils / private group	Patrice Lannes	82	Potted plant production	Potted plants	12 681 000	http://www.lannes.pro/

DOMAINE DE CASTANG / private group	Financière Castang	24	Domaine de Castanggathers 15 producers, and produces 30 000 tons of apples on 650 ha	Fruit tree nursery	11 066 800	https://lapommeduperigord.fr/
BARRAULT HORTICULTURE SARL / private group	Claire Alix	49	Barrault horticulture produces more than 10 million ornamental plants on a surface of 30 ha	Perennials and aromatics	10 417 500	https://www.barrault-plantes-jardins.com/
SAS SONNENDRUCKER / private group	Laurent Sonnendrucker	67	onnendrucker is a family business specialised in flowering plants	Potted plants	12 567 700	http://www.sonnendrucker.fr/
PEPINIERES DESMARTIS SAS / private group	Patrick Chassagne	24	Pépinières Desmartis SAS produces more than 4 500 shrubs on 300 ha, for distribution, landscape companies, and local authorities	Ornamental nursery	11 881 800	https://www.pepinieres-desmartis.com/
MARIONNET SCEA / private group	Marionnet Holdings	41	Marionnet SCEA is specialised in red berries and asparagus production. It cultivates 300 ha of nursery for seedling breeding	Nursery seedlings	12 398 600	http://www.marionnet.com/
PEPINIERES CHARENTAISES / private group	Antoine Daganaud	16	Pépinières Charentaises cultivates shrubs, conifers, ornamental and fruit trees and perennials on 280 ha outdoor and 20 ha off-ground, for landscape companies, wholesalers, green centres and local authorities	Ornamental nursery	8 566 900	https://www.pepinieres-charentaises.com/fr

ANDRE BRIANT JEUNES PLANTS / private group	Aurore investissements	49	André Briant cultivates 100 ha of transplanted plants and "mother-plants", 15 ha of pot liners, 10 ha of liners in hole pot trays, an 9 ha of plugs. It also owns a micro-propagation laboratory	Nursery seedlings	8 250 700	https://www.andre-briant.fr/
PEPINIERES TURC ERNEST / private group	Bertrand Turc	49	Ernest Turc creates, produces, and distributes flower bulbs, vegetable and flower seeds and plants resulting from own bulb production. The company has its own laboratory of integrated research Florinov. Production is realised on two sites of 70 ha and 180 ha. Main clients are specialised distribution, horticultural professionals and local authorities.	Bulbs	8 162 600	https://www.ernest-turc.com/
BRL PEPINIERES / private group	Jean-François Blanchet	30	BRL produces 1 million of seedlings, 50 000 trees and 600 000 containers on 50 ha (10 ha off-ground including 10 000 m2 covered, and 40 ha outdoor). Clients are private individuals, landscape companies, local authorities and green centres	Ornamental nursery	10 304 600	https://pepiniere.brl.fr/

Source: societe.com; companies' websites

Table 46: Main French flower and plant wholesalers

Raison Sociale	SIREN	Owner / manager	Turnover	Year	Website
FLORIS CARVIN - AGORA FLORIS SAS	342132099	Gerda Nagels	NA		https://www.agoragroup.com/en/
FLEURAMETZ France	788428068	Caspar de Groot	35 085 100	2019	https://www.fleurametz.com/fr/home
SOC DIFFUSION FLORALE EN ABREGE SODIF	411298466	JC Distribution	30 883 100	2018	
FLOWER SYSTEM SAS	314910985	M. FRANCOIS MAXIME	20 066 000	2019	
VIVAPLANTE	409889185	Aurelie DUPERRAY	15 837 200	2019	http://www.vivaplante.fr/
VEGETAL RUNGIS	500029798	CONTACT PLANTES	17 926 800	2019	https://www.vegetal.fr/
LES SERRES DU DAUPHINE	333170785	Luc Blanchet	14 092 600	2018	
CONTACT PLANTES	380719773	ALIFONIA	15 946 300	2019	
DIRECT FLO	444192728	Benoît Ganem	13 499 100	2019	
LYON GAILLOT DREVON	353091168	Denis GAILLOT-DREVON	11 810 000	2019	
SARL MOINET ET FILS	334079316	Groupe Moinet	9 862 600	2019	https://www.moinetfils.fr/
SARL UNIPERSONNELLE FLORIS ANJOU	400492146	Gerda Nagels	12 007 100	2019	
BIANCHINI INTERNATIONAL	407711795	Laurent Bianchini	11 411 400	2019	https://www.bianchini.fr/
DIFFORVERT	316619758	Caroline LAVAIRE	15 506 100	2019	https://www.difforvert.com/
ROSEDOR SA	353783921	Philippe ALARY	21 951 400	2019	https://www.rosedor.fr/

Source: societe.com; companies' websites