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Strukturberichterstattung Nr. 60/1

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**Fertilizers and pesticides:
Price differences between
Switzerland and
neighbouring countries**

Schwerpunktthema:
Vor- und nachgelagerte
Wertschöpfungsstufen
der Landwirtschaft

**Study on behalf of the State
Secretariat for Economic Affairs
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FERTILIZERS AND PESTICIDES: PRICE DIFFERENCES BETWEEN SWITZERLAND AND NEIGHBOURING COUNTRIES

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LIST OF ACRONYMS

Acronym	Description
CAGR	Compound Annual Growth Rate
EC	European Commission
ECHA	European Chemical Agency
EFSA	European Food Safety Authority
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOAG	Federal Office for Agriculture
FOEN	Federal Office for the Environment
FSVO	Federal Food Safety and Veterinary Office
HH	Herfindahl-Hirschman (Index)
JMPR	Joint Meeting on Pesticide Residues
PIC	Prior Informed Consent
SCFCAH	European Commission's Standing Committee on the Food Chain and Animal Health
SECO	State Secretariat for Economic Affairs
WHO	World Health Organization
WSL	Swiss Federal Institute for Forest, Snow and Landscape Research

EXECUTIVE SUMMARY

Previous research found that the prices for agricultural inputs tend to be higher in Switzerland than in other European countries, and that the transparency of the related markets is somewhat limited. This study aims at **quantifying the extent of price differentials for fertilisers and pesticides in Switzerland compared to selected neighbouring countries** (France, Germany and Italy), at exploring the **reasons behind price differentials** and at assessing the **possible influence of the Swiss market and distribution structure** (which may in turn be influenced by the presence of explicit or implicit trade barriers) **on the price of fertilisers and pesticides** in Switzerland. The study is mainly based on quantitative and qualitative evidence collected through desk research, supplemented by qualitative elements and insights from interviews with stakeholders and qualified informants.

The comparative analysis of prices for five typologies of **fertilisers** of widespread use¹ found that price premiums on the Swiss market are well above +20% in most cases: this means that **the price of the analysed fertilisers in Switzerland is often at least 20% higher than in the neighbouring countries**. Price premiums for these five fertilisers on the Swiss market were found to range from +16% to +45%.

The comparative analysis of prices for **pesticides** focused on retail prices for a selection of 50 branded products of widespread use from three main categories: herbicides, fungicides and insecticides. Some of these branded products are authorised for import in Switzerland through a simplified procedure (“parallel import”), whereas the remaining products can only be substituted through parallel import of comparable “generic” products with the same composition, or with similar composition (use of the same active substances). Similarly to fertilisers, significant price premiums on the Swiss market were quantified for basically all the selected products, and against all the countries considered for the comparison. According to the most conservative approach to the calculation of price differentials applied in the study², **average price premiums on the Swiss market were found to range from +63% for herbicides to +68% for insecticides**. Price differentials calculated from average prices were found to be higher (from +68% for fungicides to +81% for insecticides). The highest differentials were observed against German prices, even though differentials against French and Italian prices are also substantial.

Among the **key factors explaining the observed price differentials for fertilisers**, some are strictly related to **specific Swiss regulatory requirements**. Compliance with Federal **reporting requirements** (“Suisse-Bilanz”) for the use of fertilisers requires recourse by most Swiss farmers to **specialist on-farm consultancy and assistance services** provided by domestic operators (mainly distributors). **These services are costly to provide** (mainly because of higher salary levels in Switzerland than in the neighbouring countries), and their provision hence contributes to inflate the price of fertilisers³. It is also important to consider that **the Swiss market for fertilisers is small in comparison to other European countries**, that the **average dimension of Swiss farms is much smaller** and that farms tend to be much less specialised. As a result, the volume of individual purchases of fertilisers by Swiss farmers tends to be limited, and this translates into higher distribution costs⁴.

¹ Ammonium Nitrate 27%; ammonium sulphate; urea; NPK (15-15-15); DAP 18.46 (diammonium phosphate).

² In the “conservative approach” price comparison is carried out using:

- For Switzerland, the minimum price among those reported by the different available sources.
- For Germany, Italy and France, the maximum price among those provided by the available sources.

³ Additional explaining factors related to specific Swiss regulatory requirements are the lower maximum level of cadmium allowed for mineral phosphate fertilisers in Switzerland (which results in the need to import more expensive mineral phosphate fertilisers) and the obligation to hold mandatory stocks for some fertilisers (which may force some operators to purchase fertilisers even when price dynamics are unfavourable).

⁴ Additional economic explanations are related to the negligible importance of bulk delivery of fertilisers to Swiss farms and to the preference for delivery in bags; these specificities result in higher costs for packing, labelling (labels have to be printed

As for the observed price differentials for **pesticides**, a number of **interlinked key explaining factors** were identified. **Specific requirements to meet in the Swiss authorisation procedure** result in **additional authorisation costs** for pesticides in Switzerland compared to the EU. The extent of such costs is further increased by the additional studies and tests which are required by the Federal Office for Agriculture. As the Swiss market for pesticides is small, producers need to get a return on their investments for marketing pesticides in Switzerland through higher margins (and hence higher selling prices), since they cannot leverage on volumes. Also the **demanding requirements that Swiss farmers must meet to get support from direct payments** translate into higher retail prices for pesticides in Switzerland: these requirements encourage **Swiss farmers' preference for high-value branded products over comparable "generic" ones**, and dictate **widespread recourse by farmers to professional counselling services for the correct use of pesticides**, which are provided by both producers and retailers. The cost for providing these specialist consultancy services is covered by operators through higher retail prices. On the other hand, **support from direct payments allows Swiss farmers to afford** the purchase of agricultural inputs and services at higher prices than in the neighbouring countries: this is likely to translate into **the purchase of costlier branded pesticides and innovative products**, and into **the preference for Swiss distributors** of pesticides due to the on-farm specialist counselling services that they can provide.

Another key explaining factor for the observed price differentials for pesticides is related to **important barriers to entry in the final distribution sector** and **significant implicit barriers to import of pesticides**. Barriers to entry of new operators on the Swiss retail market for pesticides mainly derive from the **need for a diffused distribution network** (due to the fragmented structure of the Swiss agricultural sector and to the important presence of farms located in remote mountain areas) and from the above discussed **need to provide costly on-farm consultancy services**. In addition, the aforementioned requirements that farmers using pesticides must meet to benefit from support from direct payments **limit the possibility for imports of "generic" pesticides, and the resulting competition enforcing effects**. Implicit trade barriers mainly include the above-mentioned strict requirements for the authorisation of active substances and their commercialisation in Switzerland, and the high costs of implementing a retail distribution network and the acquisition of specific capabilities to provide on-farm counselling services by any operator willing to bypass established domestic distributors.

All these barriers make it **difficult for new distributors to seriously challenge the position of the established ones, and especially the position of the leading retailer** (Fenaco). By limiting the competitive pressure on established domestic retailers, these **barriers are also likely to reduce the need for increased efficiency in distribution processes**. Economic theory predicts that in case of reduced competitive pressure, inefficiencies are not penalised and are hence more likely to persist. These **inefficiencies may further inflate already high distribution costs**, and may finally contribute to the higher level of retail prices for pesticides in Switzerland than in neighbouring countries.

In conclusion, the study found that **prices paid by farmers for both fertilisers and pesticides are substantially higher in Switzerland than in the neighbouring EU countries** (France, Germany, Italy). The explanation of the observed price differentials was found in a combination of **specificities concerning the relevant Swiss regulatory framework, the economics of the supply chain for these products, the structure of the Swiss agriculture and of the distribution network for both fertilisers and pesticides**, and the presence of **market entry barriers**, which are especially important for **pesticides**.

in at least two official languages of the Confederation, to be selected among German, French and Italian) and marketing of fertilisers.

RESUME

D'après des études antérieures, les prix des intrants agricoles ont tendance à être plus élevés en Suisse que dans d'autres pays européens, et la transparence des marchés associés est quelque peu limitée. L'étude vise à **quantifier l'ampleur des écarts de prix des engrais et des pesticides en Suisse par rapport à certains pays voisins** (France, Allemagne et Italie), à explorer les **raisons des écarts de prix** et à évaluer la **possible influence du marché suisse et la structure de distribution** (qui peut à son tour être influencée par la présence de barrières commerciales explicites ou implicites) **sur le prix des engrais et des pesticides** en Suisse. L'étude est principalement fondée sur des preuves quantitatives et qualitatives recueillies par le biais de recherches documentaires, complétées par des éléments qualitatifs et des renseignements tirés d'entretiens avec des parties prenantes et des informateurs qualifiés.

L'analyse comparative des prix pour cinq typologies **d'engrais** largement utilisés⁵ a révélé que les majorations de prix sur le marché suisse sont largement supérieures à 20 % dans la plupart des cas: cela signifie que **le prix des engrais analysés en Suisse est souvent supérieur d'au moins 20 % à celui des pays voisins**. Les majorations de prix pour ces cinq engrais sur le marché suisse se sont avérées être comprises entre +16 % et +45 %.

L'analyse comparative des prix des **pesticides** a principalement porté sur une sélection de 50 produits de marque largement utilisés, provenant de trois catégories principales : herbicides, fongicides et insecticides. Certains de ces produits de marque sont autorisés à l'importation en Suisse par le biais d'une procédure simplifiée (« importation parallèle ») tandis que les produits restants peuvent être remplacés uniquement par l'importation parallèle de produits « génériques » comparables, ayant la même composition ou ayant une composition similaire (utilisation des mêmes substances actives). Comme pour les engrais, des majorations de prix significatives sur le marché suisse ont été quantifiées pour quasiment tous les produits sélectionnés, et par rapport à tous les pays pris en compte pour la comparaison. Selon l'approche la plus prudente de calcul des écarts appliqué à l'étude⁶, **des majorations de prix moyennes sur le marché suisse se situaient entre +63 % pour les herbicides et +68 % pour les insecticides**. Les écarts de prix calculés à partir des prix moyens se sont révélés plus élevés (de +68 % pour les fongicides à +81 % pour les insecticides). Les écarts les plus élevés ont été observés par rapport aux prix allemands, même si les écarts par rapport aux prix français et italiens sont également importants.

Parmi les **facteurs clés expliquant les écarts de prix observés pour les engrais**, certains sont strictement liés à des **exigences réglementaires suisses spécifiques**. Le respect des **exigences suisses en matière de déclaration** (« Suisse-Bilanz ») sur l'utilisation d'engrais exige que la plupart des agriculteurs suisses aient recours à des **services d'assistance et de conseil spécialisés à la ferme** assurés par des opérateurs suisses (principalement des distributeurs). **Ces services sont onéreux** (principalement en raison des niveaux de salaire plus élevés en Suisse par rapport aux pays voisins), et leur fourniture contribue donc à gonfler le prix des engrais⁷. Il est également important de considérer que **le marché suisse des engrais est réduit par rapport à d'autres pays européens**, que la **dimension moyenne des fermes suisses est beaucoup plus petite** et que les fermes ont tendance à être beaucoup moins spécialisées. En conséquence, le volume des

⁵ Nitrate d'ammonium 27 % ; sulfate d'ammonium ; urée ; NPK (15-15-15) ; DAP 18.46 (phosphate de diammonium).

⁶ Selon cette « approche la plus prudente », la comparaison des prix est effectuée en procédant comme suit :

- Pour la Suisse, le prix minimum parmi ceux rapportés par les différentes sources disponibles.
- Pour l'Allemagne, l'Italie et la France, le prix maximum parmi ceux fournis par les sources disponibles.

⁷ Il faut également noter d'autres facteurs liés à des exigences réglementaires spécifiques en Suisse : une teneur maximale autorisée inférieure pour le phosphate minéral en Suisse (ce qui entraîne la nécessité d'importer des engrais au phosphate minéral plus coûteux) et l'obligation de détenir des stocks minimaux pour certains engrais (ce qui peut contraindre certains opérateurs à acheter des engrais même lorsque la dynamique des prix n'est pas favorable).

achats individuels d'engrais par les agriculteurs suisses a tendance à être limité, ce qui se traduit par des coûts de distribution plus élevés⁸.

En ce qui concerne les écarts de prix observés pour les **pesticides**, un certain nombre de **facteurs clés interdépendants expliquant cette situation** ont également été identifiés. **Les exigences spécifiques à respecter dans la procédure d'autorisation suisse entraînent des coûts d'autorisation supplémentaires** pour les pesticides en Suisse par rapport à l'UE. L'ampleur de ces coûts est encore accrue par les études et tests supplémentaires requis par l'Office fédéral de l'agriculture. Étant donné que la taille du marché suisse des pesticides est réduite, les producteurs doivent récupérer un retour sur leurs investissements liés à la commercialisation des pesticides en Suisse (et donc des prix de vente plus élevés) puisqu'ils ne peuvent pas tirer parti des volumes. En outre, les **exigences strictes imposées aux agriculteurs suisses pour pouvoir bénéficier d'une aide au titre des paiements directs** se traduisent par des prix de détail plus élevés pour les pesticides en Suisse : ces exigences encouragent **les agriculteurs suisses à porter leurs choix de préférence sur des produits de marque à forte valeur ajoutée plutôt que sur des produits « génériques » comparables**, ainsi qu'à recourir **largement à des services de conseils professionnels sur l'utilisation correcte des pesticides**, fournis à la fois par les producteurs et les détaillants. Le coût de la mise en œuvre de ces services de conseils d'experts est couvert par les opérateurs via des prix au détail plus élevés. En revanche, **l'aide apportée par les paiements directs permet aux agriculteurs suisses d'acheter** des intrants et des services agricoles à des prix plus élevés que dans les pays voisins : cela se traduira vraisemblablement par **l'achat de pesticides de marque plus onéreux et de produits innovants**, et par la **préférence accordée aux distributeurs suisses** de pesticides en raison des services de conseil spécialisés à la ferme qu'ils peuvent fournir.

Un autre facteur clé expliquant les écarts de prix observés pour les pesticides est lié aux **obstacles importants à l'entrée dans le secteur de distribution final et aux barrières implicites déterminantes pour l'importation des pesticides**. Les obstacles à l'entrée de nouveaux opérateurs sur le marché suisse de détail des pesticides découlent principalement de la **nécessité de disposer d'un réseau de distribution diffus** (en raison de la structure fragmentée du secteur agricole suisse et de la présence importante de fermes situées dans des zones montagneuses éloignées) et de la **nécessité de fournir des services de conseil coûteux à la ferme**. De plus, les exigences mentionnées précédemment, imposées aux agriculteurs qui utilisent des pesticides, pour bénéficier d'une aide au titre des paiements directs **limitent la possibilité d'importer des pesticides « génériques » ainsi que les effets de la concurrence qui en découlent**. Les barrières commerciales implicites comprennent principalement les exigences strictes susmentionnées pour l'autorisation des substances actives et leur commercialisation en Suisse, et les coûts élevés de mise en œuvre d'un réseau de distribution au détail et l'acquisition de compétences spécifiques pour la fourniture de services de conseil à la ferme par tout opérateur disposé à contourner les distributeurs nationaux établis.

Tous ces obstacles **n'aident pas les nouveaux distributeurs à contester sérieusement la place des distributeurs établis, et notamment la place du détaillant leader (Fenaco)**. En limitant la pression concurrentielle exercée sur les détaillants nationaux établis, ces **obstacles sont également susceptibles de réduire la nécessité d'une efficacité accrue au niveau des processus de distribution**. La théorie économique prévoit qu'en cas de réduction de la pression concurrentielle, les fonctionnements inefficaces ne sont pas pénalisés et sont donc plus susceptibles de persister. Ces **fonctionnements inefficaces peuvent encore gonfler les coûts de distribution déjà élevés**, et contribuer finalement au niveau plus élevé des prix des pesticides en Suisse que dans les pays voisins.

En conclusion, l'étude a constaté que **les prix payés par les agriculteurs pour les engrais et les pesticides sont nettement plus élevés en Suisse que dans les pays voisins de l'UE (France, Allemagne, Italie)**. Les écarts de prix observés s'expliquent par une combinaison de facteurs : **les spécificités du cadre**

⁸ D'autres explications économiques sont liées à l'importance négligeable de la livraison en vrac d'engrais aux fermes suisses et une préférence pour la livraison en sacs ; ces spécificités se traduisent par des coûts plus élevés pour l'emballage, l'étiquetage (les étiquettes doivent être imprimées dans au minimum deux langues officielles de la Confédération, à choisir entre l'allemand, le français et l'italien) et la commercialisation des engrais.

réglementaire suisse applicable, les caractéristiques économiques de la chaîne d'approvisionnement pour ces produits, la structure de l'agriculture suisse et du réseau de distribution des engrais et des pesticides, ainsi que la présence d'obstacles à l'entrée sur le marché, qui sont particulièrement importants pour les pesticides.

INTRODUCTION

Modern agriculture heavily relies upon the use of fertilisers and pesticides⁹ to enhance yields, to protect crops from harmful organisms and more generally to ensure production with a higher level of certainty compared to the past.

In all developed economies, and also across Europe, strict regulations are in place for such products, with the objective to protect human and animal health as well as the environment from potentially harmful substances and to prescribe tests, authorisations and rules for their use.

The level of prices in Switzerland – both for agricultural inputs and for other products – has been compared to that in other European countries in a number of studies¹⁰; most of this research found that the Swiss economy is characterised by higher prices and somewhat limited transparency in the market.

In Switzerland, both fertilisers and pesticides are subject to authorisation to be sold on the market; however, some selected pesticides can benefit from a simplified procedure of parallel import while CE marked fertilisers imported from the EU can be freely marketed on the Swiss territory. Requirements from legislation applying in the EU and in Switzerland differ in a number of aspects; similarly, the Swiss market – intended as the combination of marketing practices, organisation of the supply chain, market transparency and related aspects – presents specific characteristics which are quite different from those observable on the French, German and Italian markets.

It should also be noted that both fertilisers and pesticides represent a significant part of the expenditures for a typical Swiss farm. According to Agroscope data for the 2012-2014 period¹¹, expenditure for fertilisers accounted on average for 24% of material costs for crop farming (2% of overall material costs), whereas expenditure for pesticides accounted on average for 21% of material costs for crop farming (2% of overall material costs). The relative importance of expenses for fertilisers and pesticides significantly increases in farms which are specialised in arable crops and in special crops, as it can be observed in Table 0.1.

Table 0.1 – Incidence of costs for fertilisers and pesticides for Swiss farms – average 2012-2014

	All farms	Arable crops farms	Special crops farms
Fertilisers / material costs	2%	6%	3%
Fertilisers / material costs for crop farming	24%	27%	12%
Pesticides / material costs	2%	5%	7%
Pesticides / material costs for crop farming	21%	23%	27%

Source: Arété elaboration on Agroscope data

⁹ In the report, the terms “pesticides”, “agrochemicals” and “plant protection products” are used indifferently and refer to products and substances used to protect crops from organisms which are harmful to plants; such macro-category includes subgroups of products with specific purposes (e.g. herbicides, growth regulators, fungicides, insecticides, etc.).

¹⁰ BAK (2014). *Landwirtschaft – Beschaffungsseite: Vorleistungsstrukturen und Kosten der Vorleistungen*. Preisüberwachung (2005), *Hohe Produktionsmittel-Preise in der schweizerischen Landwirtschaft*. Preisüberwachung (2006), *Hohe Schweizer Mischfutterpreise und Protektionismus für Futtermittelmöhlen*. Raaflaub M., Genoni M (2005), *Preise für Produktionsmittel in der Schweiz und in der EU*, Agrarforschung Schweiz 12(9), 404-409, 2005.

¹¹ Agroscope, *Grundlagenbericht 2014* (Tables: E1, E3).

This report illustrates the methodological approach used, the analyses carried out and the findings of the study performed on the price differences for fertilisers and pesticides between Switzerland and selected neighbouring countries, namely France, Germany and Italy.

The following topics are illustrated in the different sections of the report:

- Section 1 – overview of the study methodology and of the approaches followed in the collection and analysis of price data.
- Section 2 – overview of the relevant regulatory framework in place in Switzerland and in the EU, with a special focus on the main differences which might have an impact on the extent of price differentials.
- Section 3 – presentation of the analysis of price differences between Switzerland and the selected neighbouring countries.
- Section 4 – explanation of the observed price differentials and analysis of the underlying factors.
- Section 5 – overview of the market and distribution structure for fertilisers and pesticides in Switzerland, analysis of its possible influence on prices, overview of trade barriers and analysis of their possible influence on market and distribution structure.
- Section 6 – conclusions of the study.

1 STUDY METHODOLOGY

The analysis starts from an overall assessment of the **Swiss authorisation procedure** for fertilisers and pesticides; in particular, the different requirements in place in Switzerland are compared with those applying in the EU to understand the main differences and the consequent impacts on the authorised products from both a legal and economic/market standpoint.

The **analysis of price differentials** for the product categories under assessment in the Swiss market and in selected neighbouring countries constitutes the core of the study. This step is particularly critical since both fertilisers and pesticides are broad categories including a wide variety of individual products; a **selection of the most significant products** is carried out, paying particular attention to the comparability of products in the relevant geographical markets (Switzerland vs. neighbouring countries), to the availability of suitable price data as well as to the importance of each product within the related category. The analysis also considers qualitative insights for the correct identification of the main reasons determining price differentials and the evaluation of their impacts on the concerned sectors.

The methodology includes an analysis and description of the **market structures** for fertilisers and pesticides in Switzerland and in the selected neighbouring countries; in this phase, the overall **organisation of the supply chain** is also analysed to identify the differences among countries which can contribute to explain the observed price differentials.

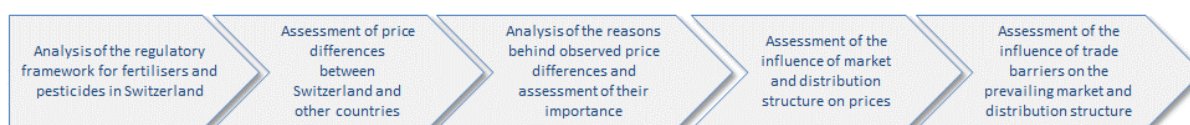
Finally, an investigation of the **influence of possible trade barriers** on the observed market structure is performed.

The overall approach to the study is **based on a combination of both quantitative and qualitative methods** which implies the following advantages:

- a. Allows a thorough understanding of the logical relationships between the different elements which are relevant for the assessment: these are first investigated through qualitative approaches.
- b. Allows tackling complex phenomena where the very nature of the aspects to be assessed makes the use of quantitative methods impossible.
- c. Provides a backup assessment method wherever unavailability of suitable data does not allow the use of quantitative methods.
- d. Finally, consideration of qualitative elements (from literature and from interviews with knowledgeable experts) adds detail and depth to the analysis and nuances to the conclusions.

The **main steps** of the used methodological approach are outlined in Figure 1.1.

Figure 1.1 – Scheme of the used methodology



1.1 Analysis of the regulatory framework for fertilisers and pesticides in Switzerland

Swiss authorisation procedures for fertilisers and pesticides are compared to those in place in the EU. Such comparative analysis allows understanding and describing the impact of legal requirements on production, domestic marketing and international trading of the product categories under assessment; more specifically, particular attention is paid to those distinguishing elements of Swiss regulation which might have a direct or indirect impact on prices (e.g. maximum level of cadmium allowed in mineral phosphate

fertilisers, mandatory stocks for certain fertilisers, additional/stricter requirements for authorisation of active substances/pesticides compared to the EU, etc.).

1.2 Assessment of price differences between Switzerland and other countries

The analysis of price differentials starts with an **in-depth investigation of individual products/sub-categories** within the broad categories of fertilisers and pesticides; this preliminary analysis allows identifying the most important products in the Swiss market and in the selected neighbouring countries.

This preliminary analysis is carried out through a **mix of quantitative and qualitative approaches**. Where quantitative data on volumes are available (this is typically the case for fertilisers), these data are considered to select the most important products to be analysed; by contrast, where such information is not available or is only available at a very general level (this is the case for pesticides, where statistics only cover sub-categories of products), quantitative data are integrated by qualitative indications emerged from interviews with qualified informants (FOAG officers, market players and independent experts).

Once the most important products have been selected, collection of **price data** for the comparative analysis is performed, paying particular attention to the following aspects:

- Consultation – whenever possible – of **multiple sources** for the same product, to triangulate data and to reduce the risk of potential biases.
- Confirmation that the prices used for comparison refer to the **same level of the supply chain** (e.g. retail prices vs. retail prices, wholesale prices vs. wholesale prices). After a preliminary check of the available sources, and also based on qualitative elements emerged from interviews, it was decided to focus the analysis on retail prices.
- Double check of the actual **comparability of prices**, verifying the composition and labelling of each product in the relevant geographical markets. Wherever perfect comparability is not granted, opportune elaborations based on assumptions are performed in order to allow a comparative analysis.
- To level out differences deriving from different size of packaging, minimum and maximum prices per volume unit of product (price per litre, price per Kg) are calculated.
- Calculation of comparable prices per volume unit of product, through conversion of prices in Euros into prices in Swiss Francs by using averages of exchange rates for the different periods considered (typically one-year averages).

1.3 Analysis of the reasons behind observed price differences and assessment of their importance

The quantitative analysis described at § 1.2 is integrated by (and reviewed in the light of) a number of considerations on the possible reasons behind the observed price differentials. The possible influence of different factors is investigated:

1. **Production costs** and cost structures for agrochemical companies in Switzerland and in the neighbouring countries.
2. Impact of **authorisation costs** and main differences between Switzerland and the EU in this respect.
3. Level of **border protection** in Switzerland and consequent advantage for Swiss producers and distributors of agrochemicals.
4. Level of **innovation** (launch of new active substances/new products) for Swiss and EU agrochemical companies.

Additional important inputs are also provided by the review of specific literature in the field and by in-depth interviews with sector experts and operators at different stages of the supply chain in Switzerland and in the neighbouring countries.

The analysis allows to identify the most important **factors influencing prices in the selected markets** and, wherever possible, to estimate their impact on the final price of fertilisers and pesticides.

1.4 Assessment of the influence of market and distribution structures on prices

An analysis of the market structures for fertilisers and pesticides is also performed with the aim of identifying the differences between the Swiss competitive arena and those of the neighbouring countries. The whole organisation of the supply chain is investigated, with special attention to:

1. **Level of concentration** of importers of fertilisers and pesticides (number and size of operators; market shares).
2. **Vertical integration along the supply chains** (especially downstream integration towards the distribution stages in the chain).
3. Possible **imbalances in bargaining power** among the players at different stages of the supply chain.

The analysis provides useful elements to contextualise price differentials and to further substantiate the reasons behind them.

With reference to point 1 above, the level of concentration of importers on the Swiss market is analysed through the calculation of the Herfindahl-Hirschman index (see also Box 1).

Box 1 – Herfindahl-Hirschman index

The Herfindahl-Hirschman index (HH) is concentration index, calculated as the sum of the squares of individual shares of all actors in a market.

HH indexes highlight any polarised distribution of individual shares, i.e. the presence of one or more actors with substantial shares (the “core” of the distribution), together with a number of actors with small shares (the “tail” of the distribution).

The maximum score of the HH index for a single actor holding a 100% share is 10,000 points. A useful benchmark is also the score of the HH index for a hypothetical even distribution for the same number of operators (each operator gets the same share of the total). As a rule of thumb, the “Horizontal Merger Guidelines” of the US Department of Justice classify markets as:

- “non-concentrated” when the HH score is lower than 1,500 points;
- “moderately concentrated” when the HH score is between 1,500 and 2,500 points;
- “highly concentrated” when the HH score is above 2,500 points.

A numeric example may help in understanding the information which gets “revealed” in HH indexes. Considering four operators, the CR-4 concentration ratio is equal to 100% both in the case of an even distribution (each operator gets a 25% share) and in the case of an extremely polarised distribution (the leading operator gets a 75% share, the second and third-ranked operator get a 10% share each, the fourth-ranked operator gets the remaining 5% share). On the contrary, the HH score for an even distribution is $[(25 \times 25) + (25 \times 25) + (25 \times 25) + (25 \times 25)] = 2,500$ points, whereas the HH score for the polarised distribution is $[(75 \times 75) + (10 \times 10) + (10 \times 10) + (5 \times 5)] = 5,850$ points.

The **assessment of the influence of trade barriers on the prevailing market and distribution structures** is based on a two-step approach:

1. **Identification of any explicit and implicit barriers** for trading the relevant products. Explicit trade barriers are related to border protection measures, whereas implicit trade barriers derive from any other factors which can impede trading of the relevant products between Switzerland and foreign countries.
2. Once the most significant barriers have been identified, their possible influence on the prevailing market and distribution structures is investigated on the basis of the available evidence and of qualitative insights from qualified informants.

2 OVERVIEW OF THE RELEVANT REGULATORY FRAMEWORK

This section provides a general overview of the regulatory framework in place in Switzerland and in the EU for the products under study, together with a list of the most relevant provisions concerning production, marketing and use of fertilisers and pesticides in the two geographical areas.

Due to the specific focus of the study, no comprehensive comparative analysis or assessment is performed between Switzerland and the EU; on the contrary, special attention is paid to the elements identified as potentially relevant for the explanation of price differences.

2.1 Overview of the relevant regulatory framework in Switzerland

The Swiss regulatory framework in the field of both fertilisers and pesticides is composed of different ordinances ruling specific areas of interests as well as on common laws on more general themes. Table 2.1 summarises the most important pieces of legislation in these fields.

Table 2.1 – Most relevant legislation in the field of fertilisers and agrochemical products in Switzerland

Product macro-class	Act / Regulation	Main object
<u>Agrochemicals</u>	Ordinance of May 12th 2010; SR 916.161	Introduction on the market of agrochemicals
	Ordinance of December 16th 2016; SR 817.021.23	Maximum residue levels of pesticides in vegetable and animal products
	Ordinance of November 10th 2004 ChemPICO, SR 814.82	Prior Informed Consent (PIC) for chemical products in international trade
	Regulation R-60-6.7	Commerce of chemicals and pesticides (PIC)
<u>Fertilisers</u>	Ordinance of November 16th 2007; SR 916.171.1	Introduction on the market of fertilisers
	Ordinance of January 10th 2001; SR 916.171	Introduction on the market of fertilisers
	Ordinance of May 10th 2017; SR 531.215.25	Creation of mandatory reserves of fertilisers
<u>Common regulation</u>	Ordinance of June 5th 2015 ChemO, SR 813.11	Protection against dangerous substances and formulations
	Ordinance of May 18th 2005 ORRChem, SR 814.81	Risk reduction for chemical products
	Ordinance of June 16th 2006; SR 910.11	FOAG taxes
	Bans based on the ORRChem (September 2015)	List of banned substances
	Restrictions of use base on the ORRChem (September 2015)	Restriction on use

With respect to **agrochemicals**, the Swiss regulation is based on three main pillars:

- Authorisation procedure
- Re-examination of approved regulation of use
- Measures for the reduction of use of agrochemicals and related risks

The authorisation procedure is regulated by the ordinance on plant protection products (SR 916.161). The authorisation is specific with respect to the product's composition, its trade name, its application (e.g. crops, conditions and restrictions for use) and the producing company. When applying for authorisation, the producing company needs to prepare a comprehensive dossier on the product, on each of the active substances, and on each of the other substances it contains. If those substances are not already authorised (Annex 1 to the ordinance), they need to get an authorisation before the product as a whole is authorised. The criteria for authorising active substances correspond to the ones defined in Annex II cipher 3 of RG EC No 1107/2009 of the European Union. However, Swiss decisions might differ from EU ones, as the climate and good agricultural practices differ between the two geographical areas.

The Federal Office for Agriculture (FOAG) is the authority in charge of the authorisation procedure. To evaluate the product and its relative dossier, FOAG collaborates with the Federal Food Safety and Veterinary Office (FSVO), the Federal Office for the Environment (FOEN), and the State Secretariat for Economic Affairs (SECO). Applications potentially including side effects on crops and harvested goods, as well as side effects on humans, animals and environment are evaluated by Agroscope and Federal Institute for Forest, Snow and Landscape (WSL) research agencies under the lead of FOAG. The toxicological properties of substances and their effects on humans during application as well as possible residuals in food are evaluated by FSVO. The FOEN decides about the declaration of environmental toxicity and can request additional risk evaluations in case of new active substances. The SECO evaluates the safety of professional users during application while taking into account the FSVO's evaluation. All evaluating offices take into account the technical documents and guidelines issued at EU level. Thus, the findings of the European Food Security Agency (EFSA) and the European Chemical Agency (ECHA) and the opinions of the Joint Meeting on Pesticide Residues (JMPR) of FAO and WHO are included. During the evaluation, FOAG can ask samples or additional information from the requesting company and it can perform or commission tests on its own.

Thus, the registration dossier prepared by the requesting company has the double objective of proving the efficacy of the plant protection product and of evaluating the risks related to its utilisation for humans, animals and the environment.

For plant protection products, the Swiss regulation also envisages a simplified procedure (the so called "parallel import" or "pink list") for the import of certain specific products. Also in this case, the FOAG is in charge of the release of authorisations for parallel import. Its decision is mainly based on the presence of already authorised products with similar properties and equivalent contents of active substances and on the fact that the product is authorised in the foreign country for an application similar to the one in Switzerland.

The situation of authorised products and substances in Switzerland until July 2018 is summarised in Table 2.2 below.

Table 2.2 – Summary of authorised products and active ingredients (July 2018)

	Authorisations	Out of which parallel import	% of parallel import authorisations
N. of authorised products	3,649	1,651	45%
<i>Herbicides</i>	1,243	603	49%
<i>Fungicides</i>	1,164	667	57%
<i>Insecticides</i>	406	140	34%
<i>Growth regulators</i>	167	78	47%
<i>Acaricides</i>	164	72	44%
<i>Other products</i>	505	91	18%
Active ingredients	392	187	48%
Authorisation holders (companies and groups¹²)	187	129	69%

Source: Areté elaboration on FOAG data

As for plant protection products, also **fertilisers** are subject to certification pursuant to Decree November 16th 2007 and Decree January 10th 2001. Also in this case, the FOAG is in charge to verify their possible side effects on humans, animals and the environment and has the role of analysing documentation, of confirming notifications and releasing the authorisations for the sale.

More specifically, three main categories of fertilisers are recognised by the Swiss regulation, each one with different requirements for its authorisation and marketing:

1. Fertilisers not subject to notification¹³ (most of simple mineral fertilisers, compounded mineral fertilisers, mineral and organic soil improvers, etc.): for these products – even though there is no obligation of notification nor need of authorisation – requirements on minimum levels, quality, harmful substances, characterisation and publicity as prescribed by regulations at Table 2.1 are still valid.
2. Fertilisers subject to notification (most of organic and mineral-organic fertilisers).
3. Fertilisers subject to authorisation¹⁴ (most of the other sub-categories of fertilisers): these products can be imported or marketed only after formal approval by the FOAG.

¹² For illustration purposes, different companies under the same control centre have been grouped and considered as a single legal entity.

¹³ The use of the term “notification” for fertilisers in the report refers to “Anmeldepflicht” under Article 19 of Decree January 10th 2001: <https://www.admin.ch/opc/de/classified-compilation/20002050/index.html>

¹⁴ The use of the term “authorisation” for fertilisers in the report refers to “Bewilligungspflicht” under Article 10 of Decree January 10th 2001: <https://www.admin.ch/opc/de/classified-compilation/20002050/index.html>

Generally speaking, fertilisers which do not correspond to a fertiliser type included in the list published in DüBV¹⁵ or, for instance, fertilisers which contain added microorganisms or animal by-products, are subject to authorisation.

Limit values for contaminants in fertilisers are defined in Annex 2.6 of the ORRChem¹⁶. For mineral phosphate fertilisers the threshold value for cadmium (50 mg Cd/kg P which corresponds to 22 mg Cd/kg P₂O₂) is lower than in neighbouring countries; BAKBASEL estimates that this leads to an increase of fertiliser costs by 8 CHF per ton of mineral phosphate fertiliser¹⁷.

Another relevant regulatory aspect concerning the marketing of fertilisers in Switzerland is the establishment of mandatory stocks as prescribed by Decree May 10th 2017¹⁸. The decree is addressed to producers, importers, processors and sellers of fertilisers and obliges such subjects to hold mandatory stocks of nitrogen fertilisers for 1/3 of the needs for the growing season. In 2015, such stocks were quantified at 17.300 tonnes, and the expected evolution was between 16.000 and 18.000 tonnes of pure nitrogen.

There are regulations also covering the storage of fertilisers (mineral fertilisers mixed with liquids might be hazardous to water¹⁹). These regulations have an impact on the way in which fertilisers are typically sold: while in Switzerland they are mostly marketed in bags, in the majority of the neighbouring countries they are usually sold in bulk.

2.2 Overview of the relevant regulatory framework in the European Union

The EU regulatory framework in the field of plant protection products and fertilisers has a number of elements in common with the Swiss one. The general objective is basically the same: to grant on one hand the efficacy of new active ingredients and on the other hand to manage an accurate risk assessment of their use for humans, animals and the environment.

The most relevant pieces of legislation applying in the EU are reported in Table 2.3 below.

Table 2.3 - Most relevant legislation in the field of fertilisers and agrochemical products in the EU

Product macro-class	Act / Regulation	Main object
<u>Agrochemicals</u>	Regulation (EC) No 1107/2009	Placing of plant protection products on the market
	Directive 2009/128/EC	Sustainable use of pesticides
	Regulation (EC) No 1272/2008	Product classification, labelling and packaging
	Regulation (EC) No 396/2005	Maximum residue levels of pesticides in/on food and feed

¹⁵ *Verordnung des WBF über das Inverkehrbringen von Düngern*, SR 916.171.1: <https://www.admin.ch/opc/de/classified-compilation/20071611/index.html>

¹⁶ *Chemikalien-Risikoreduktions-Verordnung*, ChemRRV: <https://www.admin.ch/opc/de/classified-compilation/20021520/index.html>

¹⁷ BAK (2014). *Landwirtschaft – Beschaffungsseite: Vorleistungsstrukturen und Kosten der Vorleistungen*. It has to be noted that no harmonised maximum allowed limits for cadmium in phosphate fertilisers are currently set in the EU: each Member State has set national limits for cadmium content.

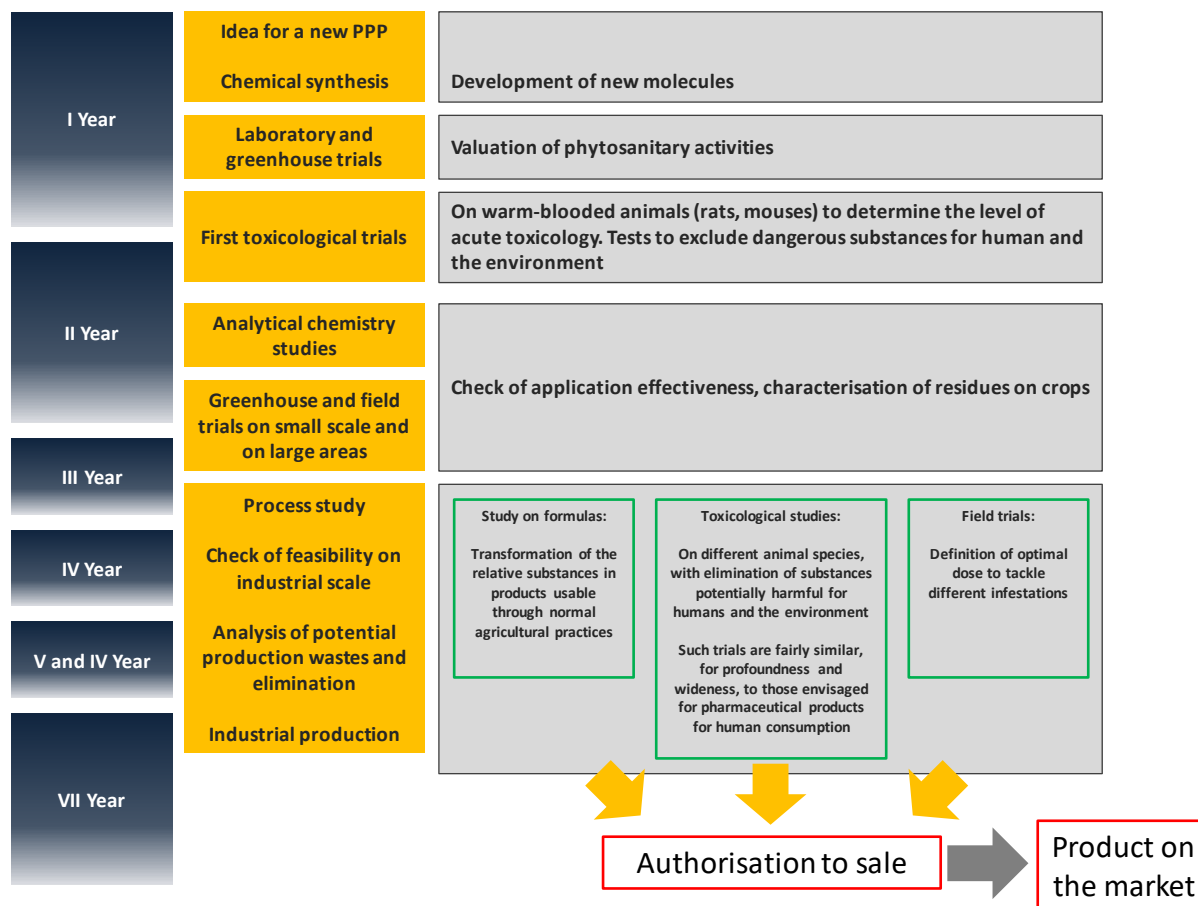
¹⁸ Following Decree April 4th 2007.

¹⁹ Waters Protection Act, art. 25.

Product macro-class	Act / Regulation	Main object
	Regulation (EC) No 1185/2009	Statistics on plant protection products
	Council Directive 91/676/EEC	Protection of waters against pollution by nitrates from agricultural sources
	Regulation (EC) No 2003/2003	Fertilisers
	Regulation (CE) n. 2076/2004	EDDHSA and superphosphate
	Regulation (CE) n. 162/2007	Amending Regulation (EC) No 2003/2003
	Regulation (CE) n. 1107/2008	Amending Regulation (EC) No 2003/2003
<u>Fertilisers</u>	Regulation (CE) n. 1377/2011	Amending Regulation (EC) No 2003/2003
	Regulation (CE) n. 223/2012	Amending Regulation (EC) No 2003/2003
	Regulation (CE) n. 463/2013	Amending Regulation (EC) No 2003/2003
	Regulation (CE) n. 1257/2014	Amending Regulation (EC) No 2003/2003
	Regulation (CE) n. 2016/1618	Amending Regulation (EC) No 2003/2003
	Directive 2000/60/EC	Framework for water policy
	Directive 98/83/EC	Quality of water intended for human consumption
	Directive 2006/118/EC	Protection of groundwater
	Directive 2004/35/CE	Environmental liability
<u>Common regulation</u>	Regulation (EC) No 1907/2006	Registration, evaluation, authorisation and restriction of Chemicals (REACH)

According to Regulation (EC) No 1107/2009 the authorisation procedure for an agrochemical product consists of different steps, fairly similar to those envisaged by the Swiss regulation; Figure 2.1 provides a scheme of the main operational and authorisation steps in the development of a new agrochemical product in the EU.

Figure 2.1 – Scheme of EU authorisation procedure and operational steps in the development of a new agrochemical product



Source: Agrofarma website <https://agrofarma.federchimica.it/Normativa/Iteroautorizzativo.aspx>

A number of National and EU level associations agree on the fact that an average 10-year timespan is necessary for the full approval of a new plant protection product in the EU. In terms of overall costs, estimates range from Euro 200 million²⁰ to Euro 280 million²¹.

The EU authorisation of an agrochemical is split between:

- authorisation of new active ingredients, which is made in case of new substances to be approved and is carried out centrally at EU level, and
- authorisation of individual formulated products, which is made at national level and can benefit from the mutual recognition procedure.

Before being placed on the market, **new substances** developed in EU Member States are evaluated by experts of the relevant national regulatory authority. The preliminary results of this national assessment are then peer reviewed by the European Food Safety Authority (EFSA), before the active substance is considered for approval by the European Commission’s Standing Committee on the Food Chain and Animal

²⁰ Average authorisation costs as estimated by European Crop Protection Association.

²¹ Average authorisation costs as estimated by Italian sector association Agrofarma.

Health (SCFCAH). Once an active substance has been approved at EU level, the formulated product containing it must then be registered in each Member State²².

The approval process for a substance begins with the submission of results of preliminary tests and studies by the applicant to the authority of a designated “rapporteur” EU Member State. This latter compiles a “Draft Assessment Report” which is then peer reviewed by EFSA taking into account, among others, test results on environment, human health, etc. Following expert’s consultations, EFSA submits its conclusions to the European Commission for its decision.

Draft Commission decisions must be approved by SCFCAH, a committee whose members are appointed by Member States and which helps the Commission in its role of implementing EU legislation. SCFCAH bases its vote on EFSA conclusions and on the Draft Assessment Report. SCFCAH may decide for full or conditional approval or for refusal. In most cases, the first approval lasts for a maximum of 10 years, but substances may be reviewed at any time in the light of new available information.

After the EU approval of the active substance, data and information about formulated product(s) containing the approved substance are fully examined; each country where such products are intended to be used takes approval decisions, taking into account specific local variations in climate, cropping patterns and diet. Individual Member States may fully approve the product, opt for an authorisation limited to some crops or reject authorisation; it should be noted that data requirements for plant protection product approval by the Member States, and the criteria used at EU level are harmonised (Uniform Principles).

On the basis of the mutual recognition principle, expressly required by Regulation (EC) No 1107/2009, the EU identifies three geographical zones: Northern, Central and Southern. Whenever one designated Member State in any zone evaluates and authorises a product, the other Member States within the same zone decide on its authorisation, based on the assessment of the designated Member State. It is also possible to request mutual recognition on the basis of an authorisation released by a Member State located in another zone; however this (new) authorisation cannot be used, in turn, by another Member State located in the same zone of the requesting Member State to obtain mutual recognition.

Current EU regulation on **fertilisers** is mainly based on Regulation (EC) No 2003/2003. The Regulation provides a harmonised regulatory framework for mineral fertilisers across the entire EU; however, as it mainly addresses mineral fertilisers, it does not promote the introduction of new types of fertilisers. All the other types of fertilisers are regulated by laws at national level, with lack of harmonisation at EU level and differences between the different Member States.

A proposal is in place and is expected to enter into force in 2020 for a comprehensive review of the current legislation, with a view to full harmonisation at EU level also for other categories of fertilisers.

The current EU regulation lists fertiliser types according to their specific characteristics. Once a fertiliser meets this type designation it can bear the letters “EC”. The fertiliser may then be sold and used throughout the EU. This EC designation guarantees farmers that the fertilisers contain a minimum nutrient content and are safe to use.

For a **new type designation**, the manufacturer must lodge a request with a national competent authority. This request is forwarded to the European Commission, which consults the other EU countries and decides to accept or reject the application based on the advice of a committee set up by the regulation.

To achieve the EC status, a fertiliser must provide nutrients effectively, not harm human, animal or plant health or the environment, and demonstrate it has been subject to the relevant sampling, analysis and test methods²³.

²² “Registering plant protection products in the EU”, European Crop Protection Association, January 2013.

²³ EUR-Lex, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A121278>

2.3 Key differences between the relevant regulatory frameworks

As already highlighted at § 2.1 and § 2.2, the two regulatory frameworks in place in Switzerland and in the EU have a good level of harmonisation: both systems have the main objective to protect humans, animals and environment from potentially harmful substances and to identify the correct use in agriculture for certain products to minimise their undesirable impacts.

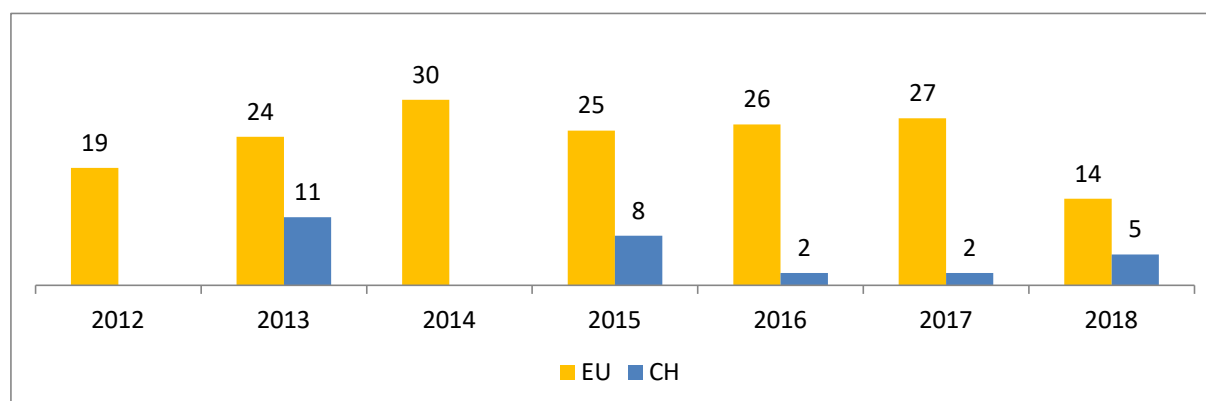
Also in terms of authorisation procedures, the two systems are fairly similar, even if in the EU there is a separate approval for substances (at EU level and mainly carried out by EFSA) and for products (approved at Member State level; individual products can benefit from the application of the mutual recognition principle).

Even if some specific differences have already been highlighted (e.g. the maximum level of cadmium allowed in mineral phosphate fertilisers), the main differences concern pesticides, and derive from the possible additional requirements which Swiss authorities may request to companies before approving active substances and products which are already authorised at EU level.

It goes without saying that in presence of two perfectly harmonised systems and of identical restrictions between Switzerland and the EU, the marginal cost beyond any fees to request an authorisation in Switzerland for a product already authorised at EU level would be zero. Under such assumption, it could be expected that the same substances and products would be introduced in the two markets nearly simultaneously, or with minimal lags.

In the absence of full harmonisation, the actual situation is different; to give a generic indication of the impact of differences in terms of requirements (and therefore of the influence on companies' decisions to apply for authorisation also in Switzerland), Figure 2.2 below reports the number of new substances introduced in the EU and in Switzerland over the 2012-2018 period. The number of new substances introduced in the Swiss market is significantly lower than that at EU level. Even though a number of substances authorised in the EU is solely included in products targeted at crops which are not cultivated for commercial purposes in Switzerland (e.g. citrus fruits, olive trees, etc.), the extent of the difference suggests that the authorisation process in Switzerland presents challenges that producers of agrochemicals based in the EU are often unwilling to tackle. By contrast, an interviewed agrochemical producer based in Switzerland indicated that its product portfolio for the Swiss market is wider than that for the EU.

Figure 2.2 – New substances authorised in the EU and in Switzerland, 2012-2018



Source: CH: FOAG - Ordinance of May 12th 2010 SR 916.161 and its updates. EU: EU pesticides database

The key impacts of the different regulatory framework in terms of costs for the companies are illustrated in chapter 4; that said, another analysis may provide additional useful elements to understand how getting an authorisation for a specific active substance in both the EU and Switzerland is neither automatic (i.e. a simple resubmission of dossiers already presented in one of the two markets) nor simple (because of

additional studies and analyses often required in Switzerland). In some cases, such additional burden in terms of analyses and documentation results in a time lapse between the introduction/authorisation of a certain substance/product in the EU and the moment when it is authorised also for the Swiss market, as observable in the following part of the present section (Table 2.5).

Table 2.4 below reports the breakdown of the 28 active substances authorised at Swiss level between 2012 and 2018: for each substance, the year in which it was approved at EU level is also reported.

Table 2.4 – Breakdown of new active substances approved in Switzerland and comparison with the EU date of approval

CH approval in 2013	EU appr. (year)	CH approval in 2015	EU appr. (year)	CH approval in 2016	EU appr. (year)	CH approval in 2017	EU appr. (year)	CH approval in 2018	EU appr. (year)
Maltodextrin	2013	Fatty acids C7 to C20	2009	Zinc phosphide	2011	Spinetoram	2014	Ametoctradin	2013
Potassium phosphonates	2013	Pelargonic acid	2009	Orange oil	2014	Lime sulphur (calcium polysulphid)	2011	Benzovindiflupyr	2016
Tefluthrin	2012	Fatty acids C7 to C18	2009					Halauxifen-methyl	2015
1-Decanol	2011	Caprylic acid	2009					Metobromuron	2015
Aminopyralid	2015	Capric acid	2009					Quinmerac	2011
Amisulbrom	2014	Oleic acid	2009						
Fenpyrazamine	2013	Bromuconazole	2011						
Fluxapyroxad	2013	Cyflufenamid	2010						
Penoxsulam	2010								
Penthiopyrad	2014								
Z11-14OH	2009								

Out of the total 28 substances, only three (i.e. Aminopyralid, Amisulbrom and Penthiopyrad) were approved in Switzerland before getting EU approval; in all the other cases, active substances were introduced first in the EU and then in Switzerland (in a few cases substances were approved in the EU and in Switzerland in the same year). Table 2.5 summarises the situation in terms of time lags.

Table 2.5 – Summary of time lapses for authorisation of new substances between EU and Switzerland

	Years of difference	Number of substances
Swiss approval before EU approval (3 substances)	2	1
	1	2
Approval in the EU and in Switzerland in the same year (4 substances)	0	4
EU approval before Swiss approval (21 substances)	1	1
	2	3
	3	4
	4	2
	5	3
	6	7
	7	1

From Table 2.5 it is evident that producers usually tend to start the authorisation process in the EU and then they move, in some cases, also to Switzerland. According to the interviewed producers, this is mainly due to the smaller size of the Swiss market, which results in greater difficulties in getting appropriate returns on investments leveraging on volumes, and in the additional costs which getting an authorisation for the Swiss market entails.

It can also be observed that the timespan between EU and Swiss approval may be significant: for the panel of substances considered in Table 2.5 the average lag is around three years. According to information provided by some of the interviewed operators, it is a common practice that a new substance or product is first submitted for authorisation in the EU market, which is much larger than the Swiss one and hence capable of paying back authorisation costs rather quickly; only in a second moment a decision is taken on whether requesting the authorisation also for the Swiss market. Such decision depends on a combination of elements including the actual suitability of the substance/product for the needs of the Swiss market, the added value of the product and the expected interest for it by Swiss farmers. It happens quite unfrequently that a company undertakes simultaneous authorisation processes in the EU and in Switzerland.

3 PRICE DIFFERENCES: SWITZERLAND VS. OTHER COUNTRIES

3.1 Selection of comparable products for the assessment of price differences

The selection of products for the comparative analysis was performed trying to find a balance between the following elements:

1. Depth and width of the analysis, in particular the objective to cover at least the most important sub-groups of products within the two main categories of fertilisers and pesticides.
2. Comparability of marketed products between Switzerland and the selected EU neighbouring countries, in particular the necessity to base the analysis – wherever possible – on products with identical composition or, in case of imperfect comparability, to properly consider differences in composition and their expectable impacts on prices.
3. Availability of suitable price data, especially in terms of availability from official/public sources and of availability of multiple sources of price data for the same product, in order to triangulate price data and to reason on price ranges instead of single price indications.
4. Finally, the need to harmonise prices in terms of reference volume units (i.e. price per litre, price per kg, etc.) despite the different packaging sizes available on the different markets, as well as in terms of currency, converting all the foreign prices in Swiss Francs using average exchange rates.

Based on the aforementioned elements, the selection of products was developed through a **two-steps approach**:

- In the first stage of the analysis a preliminary screening was made to identify all the products for which a comparison is possible; this preliminary analysis has the objective of widening the panel of products to allow for more general considerations on average price differentials for each subgroup of products.
- In the second stage of the analysis, a restricted selection of products was considered for an in-depth investigation. The selection process took into account the importance of individual products on the Swiss market and also their inclusion in/exclusion from the “pink list” for parallel import.

As for **fertilisers**, a preliminary screening was performed on 72 individual products marketed in Switzerland, looking for comparable similar fertilisers in France, Germany and Italy. Table 3.1 provides an overview of the main available data and of the resulting panel used for comparison.

Table 3.1 – Data collection and screening on fertilisers

	Switzerland	France	Germany	Italy
Macro-categories	<ul style="list-style-type: none"> • Nitrogen • NPK • P & K 	<ul style="list-style-type: none"> • Nitrogen • P & K 	<ul style="list-style-type: none"> • Nitrogen • NPK • P & K 	<ul style="list-style-type: none"> • Nitrogen • P & K
Sub-categories	<ol style="list-style-type: none"> 1. Ammonia nitrate 2. Other Amm.nitr. 3. N-based ternary 4. Special NPK fertilisers 5. Ternary fertilisers 6. Special crops 7. PK fertilisers without lime 8. PK fertilisers with lime 9. NP fertilisers 10. Fertilisers N and K 11. Fertilisers P 12. Fertilisers K 13. Fertilisers Mn and Mg 14. Dripping products 	<ol style="list-style-type: none"> 1. Ammonitrate 2. Fertilisers DAP 3. Nitrogen solution 4. Triple 17 	<ol style="list-style-type: none"> 1. Nitrogen fertilisers 2. Compound fertilisers 3. Potash fertilisers 4. Phosphorus fertilisers 	<ol style="list-style-type: none"> 1. Phosphate fertilisers 2. Potash fertilisers 3. Nitrogen fertilisers
Products	72 individual products <u>Selected:</u> <ul style="list-style-type: none"> • Ammonitrate 27% • Ammonium sulphate • Urea • NPK Fertiliser (15-15-15) • DAP 18.46 (Diammonium phosphate) 	<ol style="list-style-type: none"> 1. Ammonitrate 27% 2. Ammonitrate 33.5% 3. Fertiliser DAP 4. Nitrogen solution 5. Triple Super Phosphate 6. Triple 17 7. Urea 	<ol style="list-style-type: none"> 1. Calcium ammonium saltpeter 27% N 2. Urea, 46% N, prilled 3. Urea, 46% N, grained 4. Ammonium nitrate-urea solution AHL 28% N 5. Ammonium sulphate saltpeter 26% N + 13% S 6. Sulfuric acid ammonia 21% N + 24% S 7. Alzon, 46% N 8. NPK 13/9/16/4 9. NPK 14/10/16/5 10. NPK 16/16/8/4 11. Complete fertiliser, 15/15/15 12. 40 kcal + Mg 40% K2O + 6% MgO 13. Kornkali 60% K2O, 14. Kalimagnesia 30% K2O + 10% MgO + 17% S 15. Magnesia kainite 11% K2O + 5% MgO 16. Triple phosphate, 46% P2O5 17. Diammonium phosphate, 18% N + 46% P2O5 	<ol style="list-style-type: none"> 1. Mineral superphosphate 18/20 powder 2. Mineral superphosphate 19/21 grilled 3. Mineral superphosphate 46/46 grilled 4. Pheoscor 5. Magnesium potassium sulphate grilled 6. Ammonium sulfate 21% 7. Ammonium nitrate 26% 8. Calcium nitrate 15.5% 9. Calciocyanamide 19/20% 10. Urea 46% prilled
Available time series	2015 - 2016 - 2017 - 2018	July 2018	June 2018	Monthly prices (July 2015 – July 2018)
Reference period for the analysis	2017 - 2018	July 2018	June 2018	Monthly prices (January – July 2018)
Selected products for comparison	<ul style="list-style-type: none"> • Ammonitrate 27% (CH – FR – IT) • Ammonium sulphate (CH – DE – IT) • Urea (CH – FR – DE – IT) 		<ul style="list-style-type: none"> • NPK Fertiliser (15-15-15) (CH – DE) • DAP 18.46 (CH – FR – IT) 	

As indicated in Table 3.1, the analysis focused on the most recent price data available for all the countries considered, with the sole exception of NPK fertiliser, for which only 2017 prices were available for the Swiss market.

As for **pesticides**, a preliminary screening was performed on 273 individual products marketed in Switzerland; also in this case the research of comparable products and the availability of foreign prices resulted in a smaller panel used for comparison. Table 3.2 below provides the main elements considered for the screening.

Table 3.2 – Data collection and screening on pesticides

	Switzerland	France	Germany	Italy
Macro-categories	<ul style="list-style-type: none"> • Herbicides • Growth regulators • Fungicides • Insecticides 			
Analysed products	273 products	-	-	-
Available prices	199 prices <ul style="list-style-type: none"> • Herbicides: 88 • GR: 7 • Fungicides: 73 • Insecticides: 31 	10 prices <ul style="list-style-type: none"> • Herbicides: 7 • GR: 0 • Fungicides: 2 • Insecticides: 1 	40 prices <ul style="list-style-type: none"> • Herbicides: 15 • GR: 1 • Fungicides: 18 • Insecticides: 6 	25 prices <ul style="list-style-type: none"> • Herbicides: 8 • GR: 0 • Fungicides: 10 • Insecticides: 7
Selected products	50 products <ul style="list-style-type: none"> • Herbicides: 17 (12 in pink list) • Growth regulators: 1 (1 in pink list) • Fungicides: 22 (17 in pink list) • Insecticides: 10 (6 in pink list) 			

Table 3.3 below provides the full list of selected products for price comparison, with details on brands and price data availability in the different neighbouring countries.

Table 3.3 – List of selected comparable products for the assessment of price differences

Product category	Subgroup	Product / typology	Price availability		
			France	Germany	Italy
Fertilisers		Ammonitrate 27% (1)	✓ (1)	✗	✓ (1)
		Ammonium sulphate (1)	✗	✓ (1)	✓ (1)
		Urea (1)	✓ (1)	✓ (1)	✓ (1)
		NPK Fertiliser (15-15-15) (1)	✗	✓ (1)	✗
		DAP 18.46 (1)	✓ (1)	✓ (1)	✗
Pesticides	Herbicides	Adengo (excluded)*	✓	✗	✓
		Ariane C (3)	✗	✓ (1)	✓ (1)
		Bandur (1)	✗	✓ (1)	✗
		Basagran SG (2)	✓ (1)	✗	✗

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Product category	Subgroup	Product / typology	Price availability			
			France	Germany	Italy	
		Basta S (1)	✓ (1)	✗	✓ (1)	
		Calaris (1)	✗	✓ (1)	✗	
		Callisto (3)	✓ (1)	✗	✓ (2)	
		Concert SX (1)	✗	✓ (3)	✗	
		Devrinol (excluded)* Top	✓	✓	✗	
		Dual Gold (1)	✓ (1)	✗	✗	
		Fusilade Max (1)	✗	✓ (2)	✓ (1)	
		Harmony SX (1)	✓ (1)	✓ (1)	✓ (1)	
		Hoestar (excluded)*	✗	✓	✗	
		Reglone (1)	✗	✓ (2)	✗	
		Roundup Power Max (2)	✗	✓ (3)	✓	
		Sencor SC (1)	✗	✓ (2)	✗	
		Select (1)	✗	✓ (1)	✗	
		Stomp Aqua (1)	✗	✓ (1)	✓ (3)	
		Successor T (1)	✗	✓ (1)	✗	
		Trinity (1)	✗	✓ (1)	✗	
		Growth regulators	Moddus (1)	✗	✓ (2)	✗
	Fungicides	Acrobat MZ WG (1)	✓ (1)	✓ (1)	✗	
		Amistar (3)	✓ (1)	✓ (2)	✓ (2)	
		Amistar Xtra (3)	✗	✗	✓ (2)	
		Bordeaux-Brühe (BIO) (1)	✗	✗	✓ (2)	
		Cantus (1)	✗	✓ (1)	✓ (1)	
		Capalo (1)	✗	✓ (1)	✗	
		Cercobin (2)	✗	✓ (1)	✗	
		Chorus (1)	✗	✓ (1)	✓ (1)	
		Delan WG (2)	✗	✓ (1)	✓ (1)	
		Electis (excluded)*	✗	✗	✓	
		Fandango (3)	✗	✓ (1)	✗	
		Fantic F (2)	✗	✗	✓ (1)	
		Folpet 80 WDG (1)	✗	✗	✓ (1)	
		Gladio (1)	✗	✓ (1)	✗	
		Infinito (1)	✗	✓ (1)	✗	
		Input (1)	✗	✓ (1)	✗	
		Magnello (1)	✗	✓ (1)	✗	
		Opus Top (1)	✗	✓ (1)	✗	
		Osiris (1)	✗	✓ (1)	✗	
		Proline (1)	✗	✓ (1)	✗	
		Revus Top (1)	✗	✓ (1)	✗	
		Thiovit Jet (BIO) (1)	✗	✗	✓ (2)	
		Valbon (1)	✗	✓ (1)	✗	
		Insecticides	Affirm (1)	✗	✗	✓ (4)
			Biscaya (1)	✗	✓ (2)	✗
			Decis Protech (2)	✓ (2)	✗	✗

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Product category	Subgroup	Product / typology	Price availability		
			France	Germany	Italy
		Fury 10 EW (1)	✗	✓ (1)	✗
		Karate Zeon (1)	✗	✓ (2)	✓ (3)
		Pirimor (4)	✗	✓ (2)	✓ (1)
		Pyrinex (1)	✗	✗	✓ (1)
		Reldan 22 (1)	✗	✗	✓ (3)
		Steward (1)	✗	✓ (2)	✓ (1)
		Tepeki (1)	✗	✓ (2)	✓ (3)

* (excluded): products finally excluded from comparative analysis of prices because of their poor comparability between Switzerland and the selected neighbouring countries (see the explanation provided below)

The number of collected prices for each product/market is reported in brackets (only for the products considered for the analysis).

The different sources used for the analysis of price differences for pesticides are reported (only for the products considered in the analysis) in Table 3.4.

Table 3.4 – List of sources for the assessment of price differences for pesticides

Subgroup	Product / typology	Source			
		Switzerland	France	Germany	Italy
Herbicides	Ariane C	SS	-	MyAgr	Ag+
	Bandur	RF	-	MyAgr	-
	Basagran SG	RF	AgrL	-	-
	Basta S	RF	AgrLis	-	Int.
	Calaris	RF	-	MyAgr	-
	Callisto	SS	AgrLis	-	ConfAg
	Concert SX	RF	-	MyAgr	-
	Dual Gold	RF	AgrLis	-	-
	Fusilade Max	RF	-	MyAgr	Int
	Harmony SX	RF	AgrLis	MyAgr	Int
	Reglone	SS	-	MyAgr	-
	Roundup Power Max	RF;SS	-	MyAgr	Int.
	Sencor SC	RF	-	MyAgr	-
	Select	SS	-	MyAgr	-
	Stomp Aqua	RF	-	MyAgr	Ag+; FitG
	Successor T	RF	-	MyAgr	-
	Growth regulators	Trinity	RF	-	MyAgr
Moddus		RF	-	MyAgr	-
Acrobat MZ WG		RF	AgrL	MyAgr	-
Fungicides	Amistar	SS	AgrL	MyAgr	ConfAg
	Amistar Xtra	SS	-	MyAgr	ConfAg
	Bordeaux-Brûhe (BIO)	RF	-	-	FitG
	Cantus	RF	-	MyAgr	Int.
	Capalo	RF	-	MyAgr	-
	Cercobin	SS	-	MyAgr	-

Subgroup	Product / typology	Source			
		Switzerland	France	Germany	Italy
Insecticides	Chorus	RF	-	MyAgr	FitG
	Delan WG	RF; SS	-	MyAgr	FitG
	Fandango	SS	-	MyAgr	-
	Fantic F	RF; SS	-	-	Ag+
	Folpet 80 WDG	RF	-	-	Ag+
	Gladio	RF	-	MyAgr	-
	Infinito	RF	-	MyAgr	-
	Input	RF	-	MyAgr	-
	Magnello	RF	-	MyAgr	-
	Opus Top	RF	-	MyAgr	-
	Osiris	RF	-	MyAgr	-
	Proline	RF	-	MyAgr	-
	Revus Top	RF	-	MyAgr	-
	Thiovit Jet (BIO)	RF	-	-	FitG
	Valbon	RF	-	MyAgr	-
	Affirm	RF	-	-	Ag+;FitG
	Biscaya	RF	-	MyAgr	-
	Decis Protech	RF	AgrLis	-	-
	Fury 10 EW	RF	-	MyAgr	-
	Karate Zeon	RF	-	MyAgr	Ag+;FitG
	Pirimor	RF; SS	-	MyAgr	FitG
	Pyrinex	SS	-	-	Ag+
	Reldan 22	RF	-	-	FitG
Steward	RF	-	MyAgr	FitG	
Teppeki	RF	-	MyAgr	FitG	

RF: Reflex 2017 Report by Agridea

SS: Stähler Suisse SA website

AgrL: www.agrileader.fr

AgrLis: www.agrilisa.com

MyAgr: www.myagrar.de

Ag+: agripiu.macommerce.it

ConfAg: Confagricoltura

FitG: fitogarden.com

Int: sourced through interviews

As anticipated at the beginning of the chapter, an analysis on the composition of pesticides in the different countries was performed to ensure comparability; in this respect, three possible alternatives emerged, each of them managed through a different approach:

1. Products with **perfect comparability** = products with identical composition.
2. Products with **good comparability**: this subcategory was further divided into:
 - a. Products with a single active substance with differences in concentration across the four compared markets. In this case, a **recalculation was made in order to correct foreign prices and to take into account the different concentration with respect to the Swiss market**²⁴.

²⁴ This approach was followed on one hand to compare whenever possible a wider range of products, on the other hand to consider slightly different compositions and to reflect them in the recalculated prices. By way of example, for the herbicide *Dual Gold* by Syngenta, French prices are only available for a product with a lower concentration of S-métolachlore (915 g/l) with respect to the product marketed in Switzerland (960 g/l); to take into account such difference, French prices were corrected by multiplying them by a coefficient of 1.05 (960/915 = 1.05).

- b. Products with multiple active substances whose differences in composition can be considered negligible. In this case prices are not corrected, but the products are anyway included in the comparison.
3. Finally, products with **poor comparability**: this is the case for products with an identical or similar trade name but whose composition for the Swiss market is different from that of the neighbouring countries. The different composition makes a reliable recalculation impossible (typically this is the case of products with multiple active substances with very different concentrations between Switzerland and the other countries). These products, although analysed and included in Table 3.3, were excluded from the calculation of price differences. It should be noted that differences in the composition of certain products were observed not only between Switzerland and EU countries but – at least sometimes – also among France, Germany and Italy.

Table 3.5 summarises the outcome of the above analysis, indicating for each foreign price if it falls under the above defined groups 1, 2a, 2b or 3 (products falling under group 3 were excluded from the analysis).

Table 3.5 – Outcome of the analysis on pesticide labels to assess comparability

Pesticide	Product	Comparability assessment			
		France	Germany	Italy	
Herbicides	Adengo (excluded)*	3	-	3	
	Ariane C	-	2A	3	
	Bandur	-	1	-	
	Basagran SG	1	-	-	
	Basta S	1	-	2A	
	Calaris	-	1	-	
	Callisto	1	-	1	
	Concert SX	-	2B	-	
	Devrinol Top (excluded)*	3	3	-	
	Dual Gold	2A	-	-	
	Fusilade Max	-	2A	1	
	Harmony SX	1	2A	1	
	Hoestar (excluded)*	-	3	-	
	Reglone	-	1	-	
	Roundup Power Max	-	1	3	
	Sencor SC	-	1	-	
	Select	-	1	-	
	Stomp Aqua	-	1	1	
Growth regulators	Successor T	-	1	-	
	Trinity	-	1	-	
	Moddus	-	2A	-	
	Acrobat MZ WG	2B	2B	-	
	Amistar	1	3	1	
	Amistar Xtra	-	-	1	
	Bordeaux-Brühe (BIO)	-	-	1	
	Cantus	-	2B	1	
	Capalo	-	1	-	
	Cercobin	-	1	-	
	Chorus	-	1	1	
	Delan WG	-	1	1	
	Electis (excluded)*	-	-	3	
	Fungicides	Fandango	-	1	-
		Fantic F	-	-	1
		Folpet 80 WDG	-	-	1
		Gladio	-	1	-
		Infinito	-	2A	-
Input		-	1	-	
Magnello		-	1	-	
Opus Top		-	1	-	
Osiris		-	1	-	
Proline		-	1	-	
Revus Top		-	1	-	
Thiovit Jet (BIO)		-	-	1	

Pesticide	Product	Comparability assessment		
		France	Germany	Italy
Insecticides	Valbon	-	2B	-
	Affirm	-	-	1
	Biscaya	-	1	-
	Decis Protech	1	-	-
	Fury 10 EW	-	1	-
	Karate Zeon	-	1	3
	Pirimor	-	1	2A
	Pyrinex	-	-	2A
	Reldan 22	-	-	2A
	Steward	-	1	1
	Teppeki	-	1	1

* (excluded): products finally excluded from comparative analysis of prices because of their poor comparability between Switzerland and the selected neighbouring countries (see the explanation provided above)

Finally, Table 3.6 reports the coefficients used to correct foreign prices in case of partially different composition (products under group 2.a in the above list).

Table 3.6 – Coefficients used to harmonise the composition of products

Product name	Swiss composition	Foreign composition	Coefficient applied on foreign price
Ariane C	Fluroxypyr 144 g/l	<i>Germany:</i> Fluroxypyr 100 g/l	x 1.44 (144/100)
	Clopyralid 80 g/l	Clopyralid 80 g/l	
	Florasulam 2.5 g/l	Florasulam 2.5 g/l	
Basta S	Glufosinate 150 g/l	Glufosinate 200 g/l	x 0.75 (150/200)
Concert SX	Thifensulfuron 384.5 g/kg	<i>Germany:</i> Thifensulfuron 400 g/kg	x 0.96 (384.5/400)
	Metsulfuron 38.4 g/kg	Metsulfuron 40 g/kg	
Dual Gold	S-Metolaclo 960 g/l	<i>France:</i> S-Metolaclo 915 g/l	x 1.05 (960/915)
Fusilade Max	Fluazifop-P 125 g/l	<i>Germany:</i> Fluazifop-P 107 g/l	x 1.17 (125/107)
		<i>Germany:</i> Thifensulfuron 480.6 g/kg	x 1.04 (500/480.6)
Harmony SX	Thifensulfuron 500 g/kg		
Moddus	Trinexapac 250 g/l	<i>Germany:</i> Trinexapac 222 g/l	x 1.13 (250/222)
		<i>Germany:</i> Propamocarb 523.8 g/l	x 1.19 (625/523.8)
Infinito	Propamocarb 625 g/l Fluopicolide 62.5 g/l	Fluopicolide 62.5 g/l	
Pirimor	Pirimicarb 500 g/kg	<i>Italy:</i> Pirimicarb 175 g/kg	x 2.86 (500/175)
		<i>Italy:</i> Clorpirifos 223 g/l	x 1.12 (250/223)
Pyrinex	Clorpirifos 250 g/l		
Reldan 22	Clorpirifos 225 g/l	<i>Italy:</i> Clorpirifos 223 g/l	x 1.01 (225/223)

3.2 Price differences for fertilisers

The analysis performed on price differences for fertilisers is based on official prices collected by commodity stock exchanges or market monitoring companies in the relevant countries²⁵.

Table 3.7 reports the indicative prices for the different product categories, together with the calculation of price differentials.

Price differentials in relative terms were expressed as $[(\text{price premium in country } X) / (\text{lower price of country } Y)] \times 100$. By way of example, a price premium of 21% on the Swiss market against the French one for Ammonium Nitrate 27% means that the price of this product in Switzerland is 21% higher than in France.

Table 3.7 – Prices and price differentials for selected fertilisers

<i>Prices (CHF/100 kg)</i>	Switzerland	France*	Δ CH-FR	Germany	Δ CH-DE	Italy	Δ CH-IT
Ammonium Nitrate 27%	31.70	26.24	5.46 21%	25.55	6.15 24%	30.40	1.30 4%
Ammonium sulphate	37.50	n.a.	-	29.02	8.48 29%	28.08	9.42 34%
Urea	47.50	34.68	12.82 37%	35.84	11.66 33%	40.33	7.17 18%
NPK (15-15-15)	54.60	n.a.	-	37.69	16.91 45%	n.a.	-
DAP 18.46 (Diammonium phosphate)	65.50	51.22	14.28 28%	51.33	14.17 28%	n.a.	-

* In the case of France, the differentials may be amplified by the type of price data available (see explanation in the text)

Sources: CH - Fenaco // For NPK 15-15-15: Agridea Reflex Report 2017; FR - terre-net; DE - AMI; IT - Borsa Merci Modena

²⁵ The minimum quantities and the related conditions of sale for the different sources used are as follows:

CH – Fenaco: price referred to an 8 tonnes delivery, DDP (Delivered Duty Paid).

CH – Agridea Reflex Report: price referred to an 8 pallets delivery.

FR – Terre-net: Ammonium Nitrate: ex-works price; Urea and DAP: CIF (Cost, Insurance and Freight) price, port of arrival.

DE – AMI: price referred to a 10 tonnes delivery, ex seller’s warehouse.

IT – Borsa Merci Modena: price referred to delivery of product in plastic bags, ex seller’s warehouse.

Whereas Swiss, German and Italian prices are applicable to final purchases of fertilisers by farmers, French prices are more likely to be applicable to purchases in bulk by importers/wholesalers.

The observed price differentials span from a minimum price premium of 1.30 CHF/100 kg (4%²⁶) between Swiss and Italian price of Ammonium Nitrate 27%, to a maximum price premium of 16.91 CHF/100 kg (45%) between Swiss and German price of NPK 15-15-15.

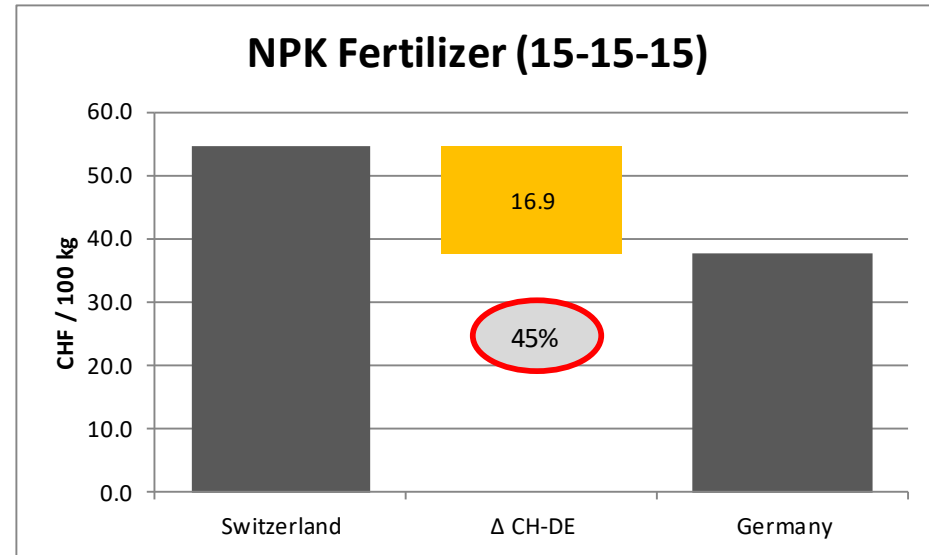
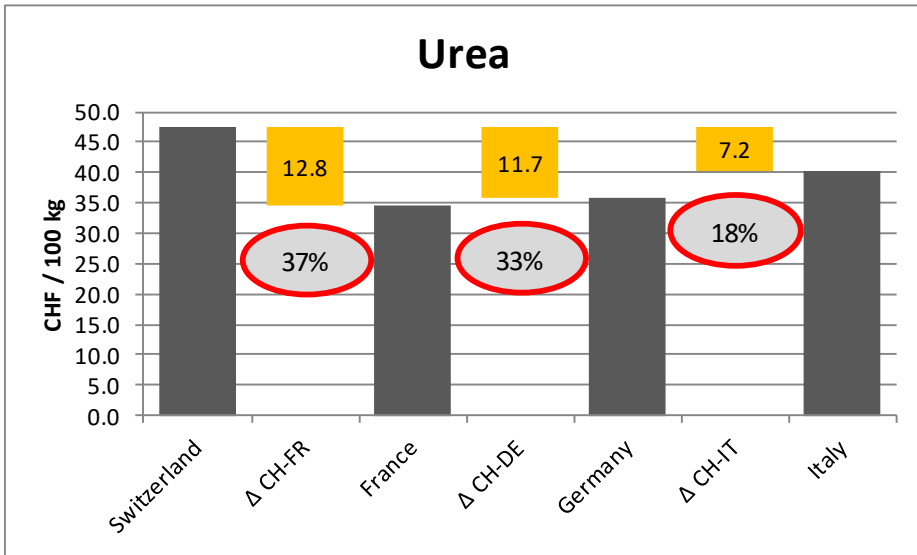
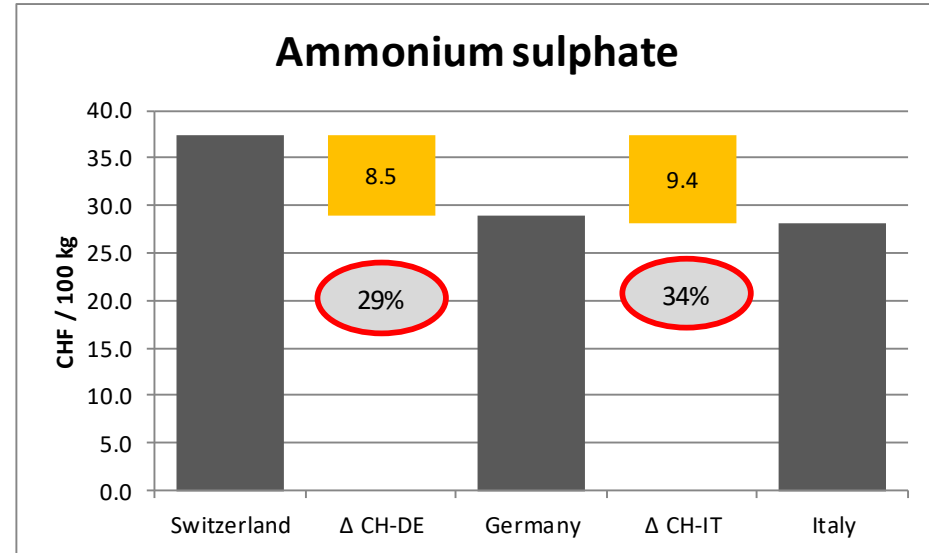
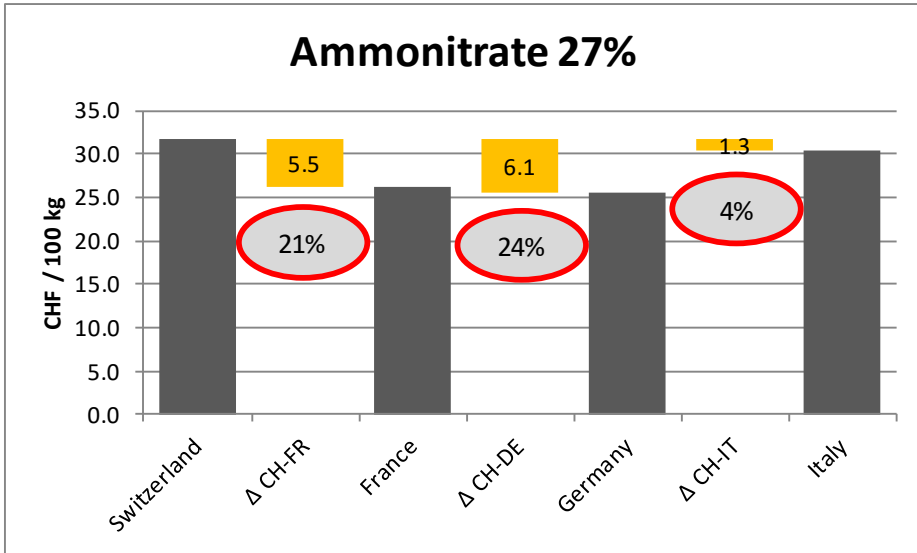
Intra-product comparison shows a lower price differential against Italian prices, especially for Ammonium Nitrate 27% and Urea; on the other hand, price differences against French and German prices are significantly higher.

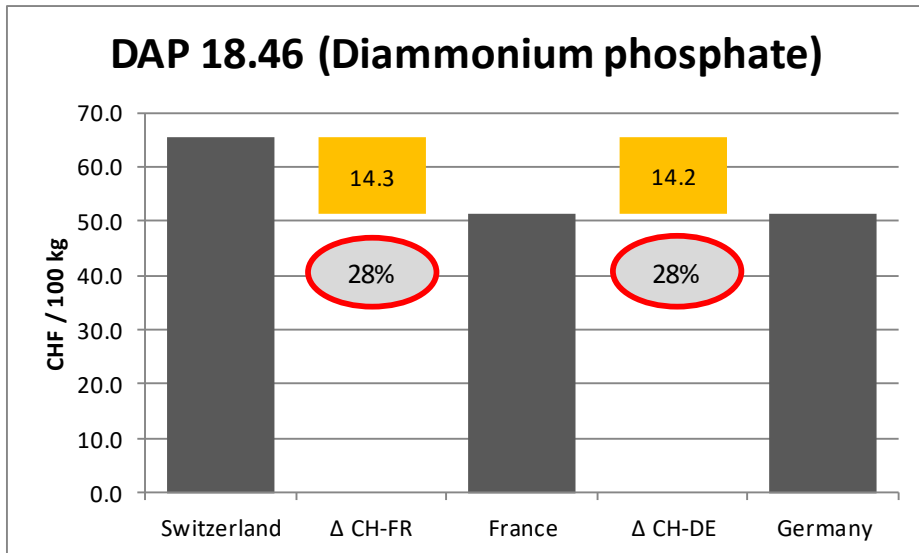
It should be noted that price premiums on the Swiss market against the French one are probably amplified by the fact that the available price data for France are “ex-works” or “CIF (Cost, Insurance and Freight) port of arrival” prices, which are more likely to be applicable to purchases in bulk by importers/wholesalers.

A graphic representation of the above price differentials is provided in Figure 3.1 below.

²⁶ Calculated as (CH price/Foreign price) -1

Figure 3.1 – Graphic representation of price differentials for selected fertilisers*





* In the case of France, the differentials may be amplified by the type of price data available (see explanation in the text)

On aggregate, the average price premium on the Swiss market for the fertilisers considered in the analysis amounts to +27%. Table 3.8 below also reports the average price premiums against each EU Member State and for each type of fertiliser.

Table 3.8 – Summary of Swiss price premiums for selected fertilisers

Product	France*	Germany	Italy	Total
Ammonium Nitrate 27%	21%	24%	4%	16%
Ammonium sulphate	-	29%	34%	31%
Urea	37%	33%	18%	29%
NPK (15-15-15)	-	45%	-	45%
DAP 18.46 (Diammonium phosphate)	-	28%	28%	28%
Total	29%	32%	19%	27%

* In the case of France, the differentials may be amplified by the type of price data available (see explanation in the text).

3.3 Price differences for pesticides

The following subsections present the results of price comparison performed on the selected pesticides; in this context a number of elements should be noted:

1. The comparison is based on retail prices as reported by web catalogues and other publicly available information sources.
2. In order to guarantee a **conservative approach**, the comparison of prices is carried out using:
 - For Switzerland, the minimum price among those reported by the different available sources.
 - For Germany, Italy and France, the maximum price among those provided by the available sources.

Taking into account this conservative approach, it can be argued that the actual average price differentials on the market may be higher than those analysed. Price differentials were hence **calculated also based on averages of the available retail prices in the relevant geographical markets**, and the resulting figures were compared with those resulting from the conservative approach.

Out of the total 50 products analysed (i.e. 17 herbicides, 22 fungicides, 10 insecticides and 1 growth regulator) in only one case Swiss prices resulted to be lower than those in the three analysed countries (herbicide Dual Gold with respect to French price); for the remaining 49 products the price differentials always showed the Swiss price to be higher than the French, German and Italian ones.

3.3.1 Price differences for herbicides

As mentioned at § 3.1, price comparison for herbicides concerned 17 products in total, out of which 12 benefitting from the possibility of parallel import.

Table 3.9 below illustrates the individual products analysed, together with the related prices and price differentials resulting from the comparison between Switzerland and the selected neighbouring countries.

Price differentials in relative terms were expressed as $[(\text{price premium in country } X) / (\text{lower price of country } Y)] \times 100$. By way of example, a price premium of 57% on the Swiss market against the German one for Bandur means that the price of this product in Switzerland is 57% higher than in Germany.

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Table 3.9 – Prices and price differentials for herbicides (Prices in CHF)

Product	Producer	Pink list	Unit	CH	FR	Δ CH-FR	DE	Δ CH-DE	IT	Δ CH-IT
Ariane C	Dow Agro	✓	Litre	53.0	n.a.	n.a.	34.6	18.4 53%	n.a.	n.a.
Bandur	Bayer	✓	Litre	37.0	n.a.	n.a.	23.5	13.5 57%	n.a.	n.a.
Basagran SG	BASF	✓	Kg	74.0	68.0	6.0 9%	n.a.	n.a.	n.a.	n.a.
Basta S	Bayer	✓	Litre	29.6	23.7	5.9 25%	n.a.	n.a.	28.4	1.2 4%
Calaris	Syngenta	✓	Litre	62.0	n.a.	n.a.	40.4	21.6 53%	n.a.	n.a.
Callisto	Syngenta	✓	Litre	69.8	62.4	7.4 12%	n.a.	n.a.	65.9	3.9 6%
Concert SX	Du Pont	✓	Kg	493.0	n.a.	n.a.	239.1	253.9 106%	n.a.	n.a.
Dual Gold	Syngenta	✓	Litre	31.0	45.5	-14.5 -32%	n.a.	n.a.	n.a.	n.a.
Fusilade Max	Syngenta	✓	Litre	35.0	n.a.	n.a.	23.0	12.0 52%	33.5	1.5 4%
Harmony SX	Du Pont	✓	kg	3,000.0	2,180.2	819.8 38%	1,361.6	1638.4 120%	2,629.9	370.1 14%
Reglone	Syngenta	✓	Litre	15.5	n.a.	n.a.	10.9	4.6 42%	n.a.	n.a.
Roundup Power Max	Bayer (Monsanto)	✓	Litre	20.0	n.a.	n.a.	17.9	2.1 12%	n.a.	n.a.
Sencor SC	Bayer	✓	Litre	71.0	n.a.	n.a.	46.1	24.9 54%	n.a.	n.a.
Select	Stähler Suisse SA	✓	Litre	89.8	n.a.	n.a.	17.4	72.4 415%	n.a.	n.a.
Stomp Aqua	BASF	✓	Litre	21.0	n.a.	n.a.	13.6	7.4 55%	16.2	4.8 30%
Successor T	Stähler Suisse SA	✓	Litre	26.8	n.a.	n.a.	10.2	16.6 164%	n.a.	n.a.
Trinity	Adama	✓	Litre	37.0	n.a.	n.a.	14.0	23.0 164%	n.a.	n.a.
n. of products*					5		13		5	
Average CH price premium (%)					+10%		+104%		+12%	

✓ Product included in the pink list ✓ Generic product by other producers (same or similar composition) included in the pink list

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

As shown in Table 3.9, the average Swiss market price premium against the French market is around 10%; this value is however influenced by the inclusion of Dual Gold, for which the French prices result to be higher than the Swiss ones.

Average price premiums against Germany are much higher, +104% on average, while average price premiums against Italy are fairly similar to those against French products (+12%).

The large premium over German prices mainly derives from few products, namely:

- Concert SX by DuPont → price premium of 106%
- Harmony SX by DuPont → price premium of 120%
- Select by Arysta (marketed in Switzerland by Stähler Suisse) → price premium of 415%
- Successor T by Cheminova (marketed in Switzerland by Stähler Suisse) → price premium of 164%
- Trinity by Adama → price premium of 164%

In this respect it has to be highlighted that – as indicated in Table 3.6 – for Concert SX and Harmony SX, German prices were partially corrected with coefficients to take into account the similar but not identical composition that the products have in the two countries; on the other hand, Select and Successor T have an identical composition in Germany and Switzerland, although they are marketed by different agrochemical companies.

Figure 3.2 below illustrates the price differentials both in absolute value and in percentage for the herbicides selected for the in-depth analysis, i.e.:

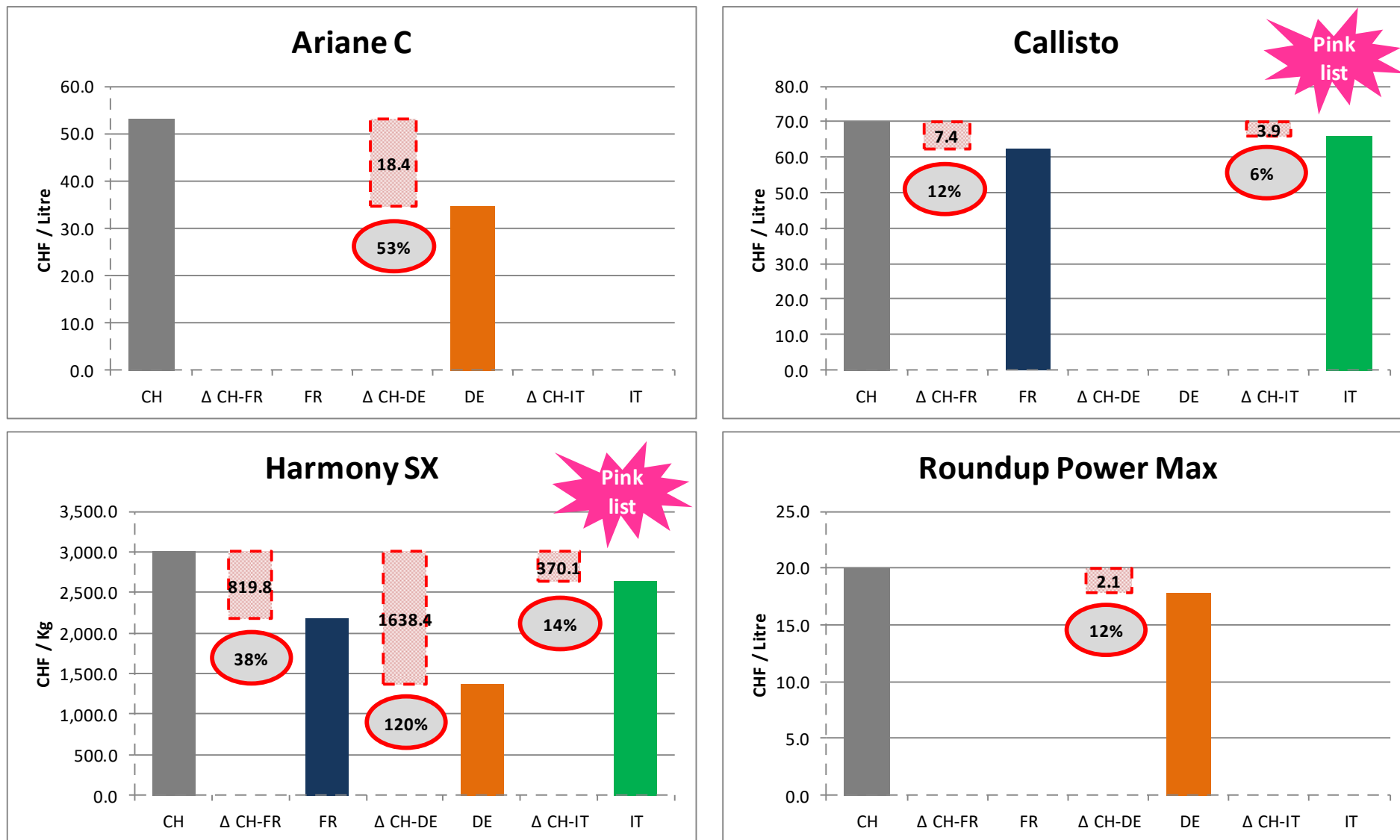
1. Ariane C by Dow Agro;
2. Callisto by Syngenta;
3. Harmony Sx by Du Pont;
4. Roundup Power Max by Bayer/Monsanto;
5. Stomp Acqua by BASF.

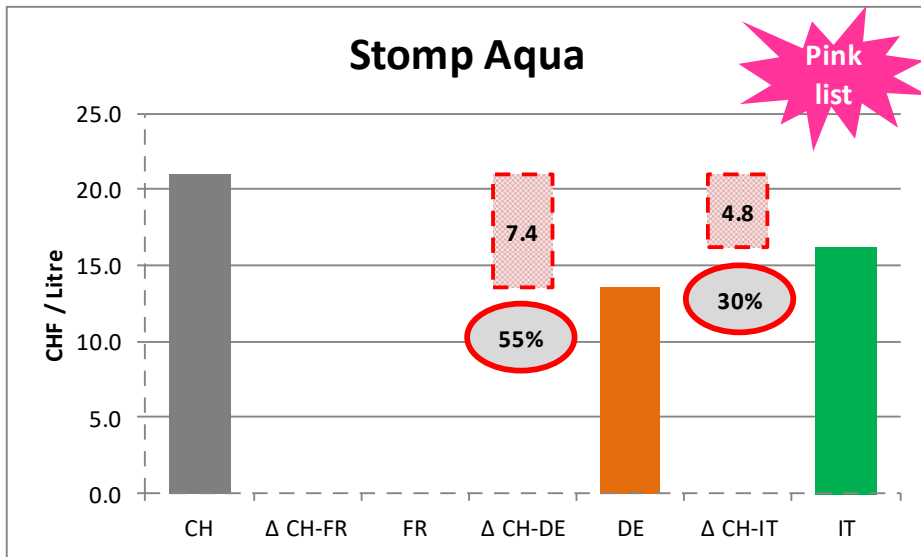
The above selection was mainly made by taking into account the availability of prices in the widest possible set of countries as well as the possibility to have multiple prices to perform triangulations.

The lowest relative price premiums are recorded for Callisto against Italian and French prices (+6% and +12%, respectively) and for Roundup Power Max; on the other hand, price premiums well above 50% were quantified for Ariane C, Harmony SX and Stomp Aqua, especially against German prices.

It should be noted that the possibility to benefit from parallel imports does not seem to have a significant impact in terms of reduction of price differentials with neighbouring countries.

Figure 3.2 – Graphic representation of price differentials for selected herbicides





As anticipated at § 3.3, together with the comparison between Swiss minimum prices and the maximum prices collected in the three neighbouring countries, an additional comparison between average prices was carried out.

Table 3.10 provides a comparison between the price differentials calculated through the conservative approach and those emerged using average prices wherever possible (i.e. in each case where multiple prices were available).

Table 3.10 – Price differentials for herbicides using the conservative approach vs. using average prices (Prices in CHF)

Product category		France	Germany	Italy	Total
	n. of products*	5	13	5	23
Cons. approach	Average CH price premium (%)	+10%	+105%	+12%	+63%
Average prices	Average CH price premium (%)	+16%	+120%	+17%	+75%

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

Basing the comparison on average prices, the overall price premium increases from 63% to 75%; the extent of the price premiums on the Swiss market increases against all the three neighbouring countries (from +5% in the case of Italy to +15% in the case of Germany).

3.3.2 Price differences for fungicides

Price comparison for herbicides concerned 22 products in total, out of which 17 benefitting from the possibility of parallel import.

Table 3.11 below illustrates the individual products analysed, together with the related prices and price differentials.

Price differentials in relative terms were expressed as $[(price\ premium\ in\ country\ X) / (lower\ price\ of\ country\ Y)] \times 100$. By way of example, a price premium of 29% on the Swiss market against the French one for Acrobat MZ WG means that the price of this product in Switzerland is 29% higher than in France.

Table 3.11 – Prices and price differentials for fungicides (Prices in CHF)

Product	Producer	Pink list	Unit	CH	FR	Δ CH-FR	DE	Δ CH-DE	IT	Δ CH-IT
Acrobat MZ WG	BASF	✓	Kg	24.0	18.5	5.5 29%	14.1	9.9 70%	<i>n.a.</i>	<i>n.a.</i>
Amistar	Syngenta	✓	Litre	74.5	35.6	38.9 109%	<i>n.a.</i>	<i>n.a.</i>	43.6	30.9 71%
Amistar Xtra	Syngenta	✓	Litre	75.8	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	41.3	34.5 83%
Bordeaux-Brühe (BIO)	Schneiter Agro AG	✓	Kg	9.0	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	4.4	4.6 107%
Cantus	BASF	✓	Kg	126.0	<i>n.a.</i>	<i>n.a.</i>	89.5	36.5 41%	107.0	19.0 18%

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<i>Product</i>	<i>Producer</i>	<i>Pink list</i>	<i>Unit</i>	<i>CH</i>	<i>FR</i>	<i>Δ CH-FR</i>	<i>DE</i>	<i>Δ CH-DE</i>	<i>IT</i>	<i>Δ CH-IT</i>
Capalo	BASF	✓	Litre	41.0	n.a.	n.a.	29.3	11.7 40%	n.a.	n.a.
Cercobin	Certis Europe	✓	Litre	57.0	n.a.	n.a.	35.3	21.7 62%	n.a.	n.a.
Chorus	Syngenta	✓	Kg	96.0	n.a.	n.a.	93.0	3.0 3%	73.1	22.9 31%
Delan WG	BASF	✓	Kg	64.0	n.a.	n.a.	41.9	22.1 53%	45.8	18.2 40%
Fandang o	Bayer	✓	Litre	71.0	n.a.	n.a.	41.1	29.9 73%	n.a.	n.a.
Fantic F	Gowan	✓	Kg	29.6	n.a.	n.a.	n.a.	n.a.	22.1	7.5 34%
Folpet 80 WDG	Adama	✓	Kg	39.8	n.a.	n.a.	n.a.	n.a.	14.9	24.9 167%
Gladio	S. F.de Pontarlier	✓	Litre	86.0	n.a.	n.a.	45.6	40.4 89%	n.a.	n.a.
Infinito	Bayer	✓	Litre	39.0	n.a.	n.a.	25.0	14.0 56%	n.a.	n.a.
Input	Bayer	✓	Litre	70.0	n.a.	n.a.	41.2	28.8 70%	n.a.	n.a.
Magnello	Syngenta	✓	Litre	54.0	n.a.	n.a.	33.8	20.2 60%	n.a.	n.a.
Opus Top	BASF	✓	Litre	43.0	n.a.	n.a.	26.1	16.9 65%	n.a.	n.a.
Osiris	BASF	✓	Litre	28.0	n.a.	n.a.	19.4	8.6 45%	n.a.	n.a.
Proline	Bayer	✓	Litre	111.0	n.a.	n.a.	63.2	47.8 76%	n.a.	n.a.
Revus Top	Syngenta	✓	Litre	97.0	n.a.	n.a.	61.2	35.8 59%	n.a.	n.a.
Thiovit Jet (BIO)	Syngenta	✓	Kg	4.5	n.a.	n.a.	n.a.	n.a.	3.4	1.1 34%
Valbon	Certis Europe	✓	Kg	33.8	n.a.	n.a.	14.0	19.8 142%	n.a.	n.a.
n. of products*					2		16		9	
Average CH price premium (%)					69%		63%		65%	

✓ Product included in the pink list ✓ Generic product by other producers (same or similar composition) included in the pink list

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

As shown in Table 3.11, the average price premium against the French market is around 69% while the average price differentials against the German and Italian markets are 63% and 71%, respectively.

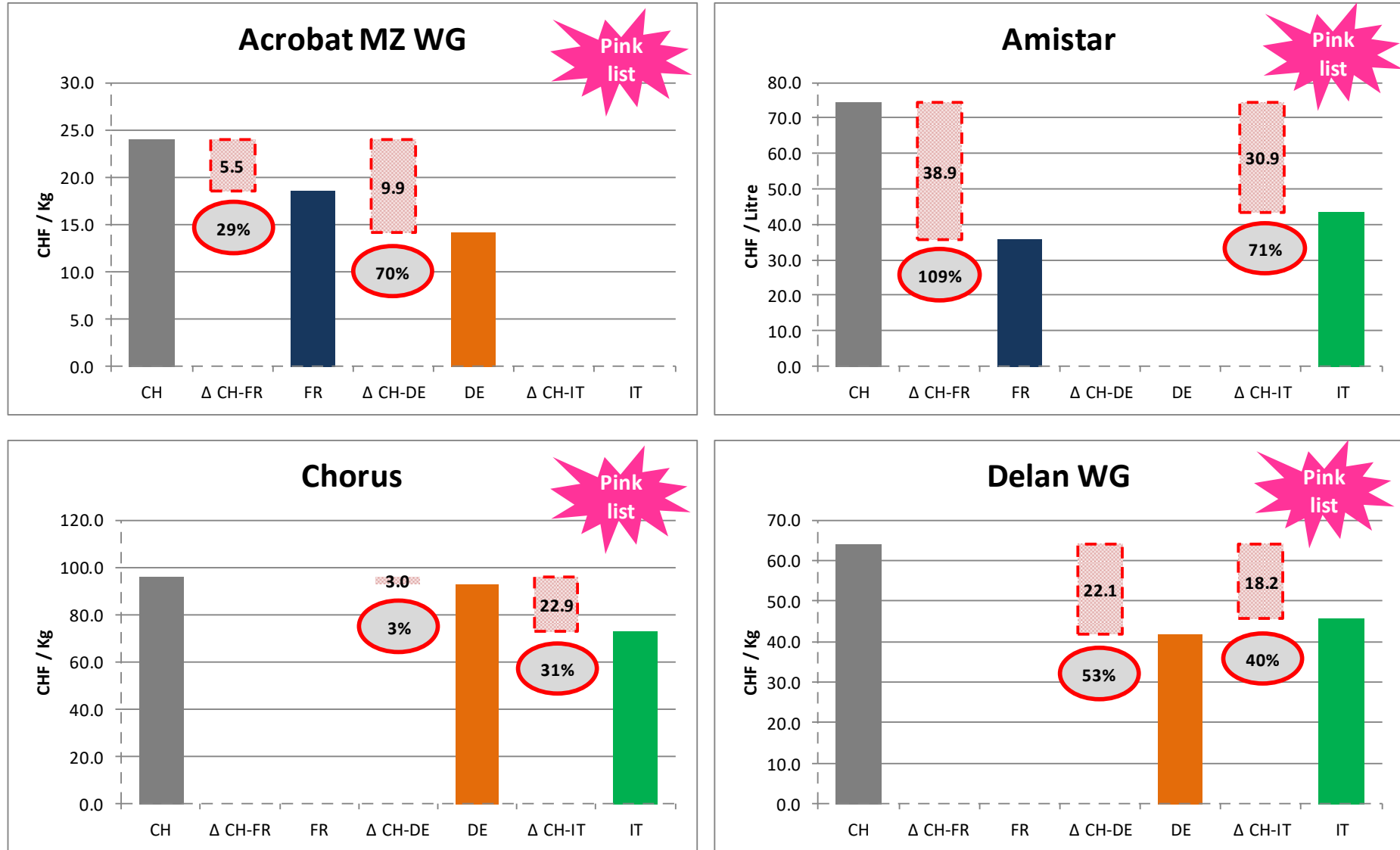
Figure 3.3 below illustrates the price differentials both in absolute value and in percentage for the fungicides selected for the in-depth analysis, i.e.:

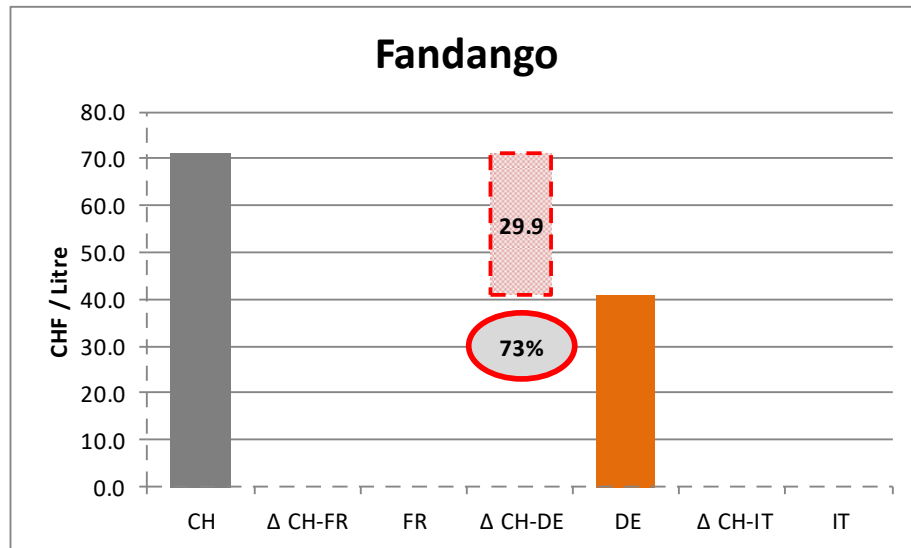
1. Acrobat MZ WG by BASF;
2. Amistar by Syngenta;
3. Chorus by Syngenta;
4. Delan WG by BASF;
5. Fandango by Bayer.

The above selection was mainly made by taking into account the availability of prices in the widest possible set of countries as well as the possibility to have multiple prices to perform triangulations.

Among the products selected for the in-depth comparison, the lowest relative price premium is recorded for Chorus against the German price (+3%). The highest price differentials were quantified for Amistar, whose Swiss price is 109% higher than the price of the same product in France.

Figure 3.3 – Graphic representation of price differentials for selected fungicides





Similarly to what already made for herbicides, the analysis on fungicides was completed by a comparison based on the average prices in the different markets, Table 3.12 reports the results from the comparison between price gaps calculated through the conservative approach and those emerging using average prices.

Table 3.12 – Price differentials for fungicides using the conservative approach vs. using average prices (Prices in CHF)

Product category		France	Germany	Italy	Total
	n. of products*	2	16	9	27
Cons. approach	Average CH price premium (%)	+69%	+63%	+65%	+64%
Average prices	Average CH price premium (%)	+79%	+64%	+73%	+68%

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

Basing the comparison on average prices, the overall price premium increases from 66% to 68%; the extent of the price premiums on the Swiss market increases against all the three neighbouring countries (from +1% in the case of Germany to +10% in the case of France).

3.3.3 Price differences for insecticides

The last category of pesticides considered in the analysis is represented by insecticides; the price comparison was based on 10 products, with 6 of these included in the pink list.

Table 3.13 summarises the outcomes of the price comparison. Price differentials in relative terms were expressed as $[(\text{price premium in country } X) / (\text{lower price of country } Y)] \times 100$. By way of example, a price premium of 8% on the Swiss market against the Italian one for Affirm means that the price of this product in Switzerland is 8% higher than in Italy.

Table 3.13 – Price and price differentials for insecticides (Prices in CHF)

Product	Producer	Pink list	Unit	CH	FR	Δ CH-FR	DE	Δ CH-DE	IT	Δ CH-IT
Affirm	Syngenta	✓	Kg	48.0	n.a.	n.a.	n.a.	n.a.	44.4	3.6 8%
Biscaya	Bayer	✓	Litre	132.0	n.a.	n.a.	65.3	66.7 102%	n.a.	n.a.
Decis Protech	Bayer	✓	Litre	48.0	27.1	20.9 77%	n.a.	n.a.	n.a.	n.a.
Fury 10 EW	Philagro	✓	Litre	120.0	n.a.	n.a.	39.8	80.2 202%	n.a.	n.a.
Karate Zeon	Syngenta	✓	Litre	133.0	n.a.	n.a.	113.0	20.0 18%	n.a.	n.a.
Pirimor	Syngenta	✓	Kg	87.5	n.a.	n.a.	55.7	31.8 57%	86.1	1.4 2%
Pyrinex	Adama	✓	Litre	37.8	n.a.	n.a.	n.a.	n.a.	28.7	9.1 32%

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Reldan 22	Dow Agro	✓	Litre	29.0	<i>n.a.</i>	n.a.	<i>n.a.</i>	n.a.	22.4	6.6
										29%
Steward	Du Pont	✓	Kg	500.0	<i>n.a.</i>	n.a.	308.0	192.0	308.2	191.8
								62%		62%
Teppeki	Belchim	✓	Kg	525.0	<i>n.a.</i>	n.a.	172.9	352.1	420.9	104.1
								204%		25%
n. of products*					1		6		6	
Average CH price premium (%)					77%		107%		26%	

✓ Product included in the pink list ✓ Generic product by other producers (same or similar composition) included in the pink list

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

Similarly to what already observed for herbicides, the highest price differentials for insecticides are those against German comparable products: on average, Swiss insecticides cost 107% more than German ones, while such price premium decreases to 26% when calculated over Italian products.

Figure 3.4 illustrates the price levels and the related differentials for the two insecticides selected for an in-depth analysis:

1. Steward by DuPont,
2. Tepeki by Blechim.

The above selection was mainly made by taking into account the availability of prices in the widest possible set of countries as well as the possibility to have multiple prices to perform triangulations.

Figure 3.4 – Graphic representation of price differentials for selected insecticides

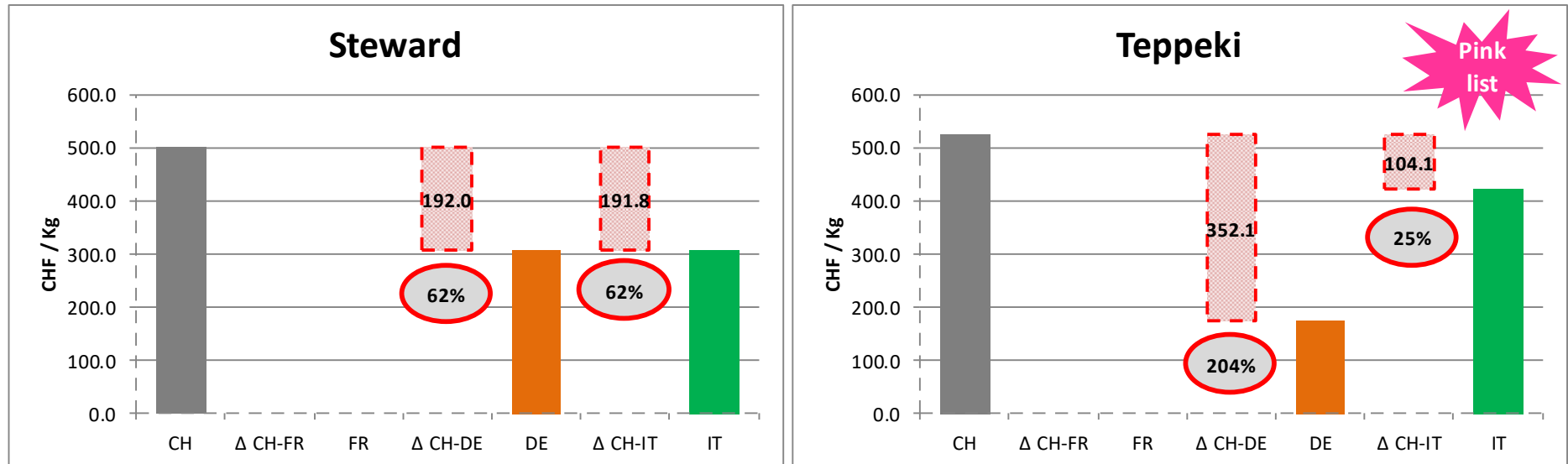


Table 3.14 below provides a comparison between the price premiums calculated through the conservative approach and those based on the average prices in each market.

Table 3.14 – Price differentials for insecticides using the conservative approach vs. using average prices (Prices in CHF)

Product category		France	Germany	Italy	Total
	n. of products*	1	6	6	13
Cons. approach	Average CH price premium (%)	+77%	+107%	+26%	+68%
Average prices	Average CH price premium (%)	+83%	+120%	+41%	+81%

* The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

Basing the comparison on average prices, the overall price premium increases from 68% to 81%; the extent of the price premiums on the Swiss market increases against all the three neighbouring countries (from +6% in the case of France to +15% in the case of Italy).

3.3.4 Summary of performed price comparison on pesticides

The results of the analyses presented at § 3.3.1, 3.3.2 and 3.3.3 show that prices in Switzerland are significantly higher than those in neighbouring countries, and that this applies to basically all the products considered in the analysis.

Average price premiums across the different product categories amount to 33% against France, 85% against Germany and 40% against Italy. Table 3.15 provides a summary of the main outcomes of the comparison.

*Table 3.15 – Summary of findings emerged from price comparison – “conservative approach”**

Product category		France	Germany	Italy	Total
Herbicides	n. of products**	5	13	5	23
	Average CH price premium (%)	+10%	+105%	+12%	+63%
Fungicides	n. of products**	2	16	9	27
	Average CH price premium (%)	+69%	+63%	+65%	+64%
Insecticides	n. of products**	1	6	6	13
	Average CH price premium (%)	+77%	+107%	+26%	+68%
Growth regulators	n. of products	-	1	-	1
	Average CH price premium (%)	-	+46%	-	+46%
Total	n. of products**	8	36	20	64
	Average CH price premium (%)	+33%	+84%	+40%	+64%

* price comparison is carried out using:

- For Switzerland, the minimum price among those reported by the different available sources.
- For Germany, Italy and France, the maximum price among those provided by the available sources.

** The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

The highest average price differentials are those against German prices, followed by those against Italian and French prices (the latter differentials are partially influenced by a single product (Dual Gold), which results to be 32% cheaper in Switzerland than in France).

For what concerns average price differentials by product category, it is not possible to find any specific trend, with very similar average price premiums, spanning from 63% for herbicides to 68% for insecticides (not considering growth regulators, which only include one product/price).

It is worth remembering that such differentials are calculated comparing minimum Swiss prices among those collected, and maximum prices in the three neighbouring countries (so called “conservative approach”); moving to the comparison between average prices, the price premiums in the Swiss market increase significantly (from +68% for fungicides to +81% for insecticides, again not considering growth regulators), as it can be observed in Table 3.16 below.

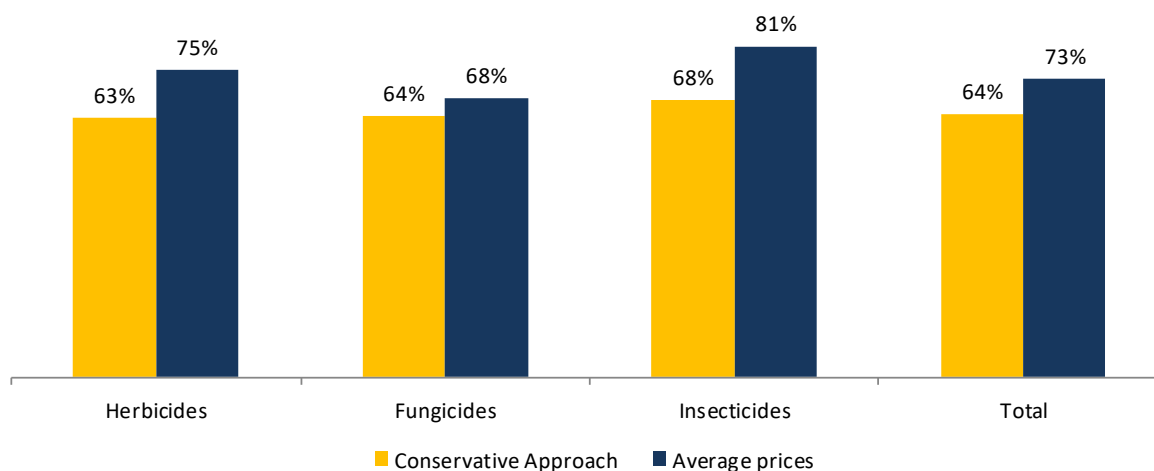
Table 3.16 – Summary of findings emerged from price comparison using average prices in each country

Product category		France	Germany	Italy	Total
Herbicides	n. of products**	5	13	5	23
	Average CH price premium (%)	+16%	+120%	+17%	+75%
Fungicides	n. of products**	2	16	9	27
	Average CH price premium (%)	+79%	+64%	+73%	+68%
Insecticides	n. of products**	1	6	6	13
	Average CH price premium (%)	+83%	+120%	+41%	+81%
Growth regulators	n. of products	-	1	-	1
	Average CH price premium (%)	-	+48%	-	+48%
Total	n. of products**	8	36	20	64
	Average CH price premium (%)	+40%	+93%	+50%	+73%

** The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

The average Swiss price premiums by product category are also illustrated in Figure 3.5 below.

Figure 3.5 – Summary of Swiss price premiums by product category – conservative approach vs. average price approach*



* Price comparison is carried out using:

- For Switzerland, the minimum price among those reported by the different available sources.

- For Germany, Italy and France, the maximum price among those provided by the available sources.

Additional elements can be found through an *ad hoc* analysis on the average price differences between:

- a. branded products directly benefitting from parallel import, and
- b. branded products which can be substituted only through parallel import of comparable “generic” products produced and/or marketed by other companies; these generic products have the same composition of branded products, or at least a similar composition, i.e. they use the same active substance(s).

Table 3.17 shows the main outcomes of this analysis.

Table 3.17 – Price comparison: branded products directly benefitting from parallel import vs. branded products which can be substituted only through parallel import of comparable “generic” products

Product category		Directly benefitting from parallel import	Substitutable through parallel import of comparable “generic” products	Difference
Herbicides	n. of products**	18	5	
	Average CH premium price (%)	36%	162%	126%
Fungicides	n. of products**	22	5	
	Average CH premium price (%)	57%	95%	39%
Insecticides	n. of products**	7	6	
	Average CH premium price (%)	67%	69%	3%
Growth regulators	n. of products	1	-	
	Average CH premium price (%)	46%	-	-
Total	n. of products**	48	16	
	Average CH premium price (%)	50%	86%	35%

** The total number of compared products is reported in the table: the partial overlapping of multiple prices for a single product is the reason why totals differ from those reported in Table 3.2.

For all the product categories, **average price premiums of branded products which can be substituted only through parallel import of comparable “generic” products are higher than those referring to branded products directly included in the pink list.** For herbicides and fungicides the difference is particularly high: the gap in relative terms amounts to +126% and +39%, respectively; by contrast, the gap observed for insecticides is much smaller (+3%).

4 REASONS BEHIND PRICE DIFFERENCES

The analysis of the reasons behind the observed price differences for fertilisers and pesticides between Switzerland and the selected neighbouring countries was based on:

- A review of the relevant literature.
- In-depth interviews with qualified informants (individual producers and distributors of fertilisers and pesticides; representatives of the reference business associations; FOAG officers).

The elements collected through the above methods were **mainly qualitative** in nature, but a significant **convergence was observed among the different interviewees**, and **between these and the reviewed literature**.

The following paragraphs discuss the main reasons behind the observed price differences for fertilisers (§ 4.1) and pesticides (§4.2).

4.1 Reasons behind price differences for fertilisers

The analysis presented at § 3.2 highlighted significant price differences between Switzerland, France, Germany and Italy. Based on the collected data, Swiss prices were found to be higher than those of neighbouring countries, with price premiums spanning from 4% up to 45%.

In explaining and commenting such price gaps, interviewed sector experts and market players, as well as the reviewed literature, indicated both regulatory factors and elements more related to the specific economic context of the Swiss market.

Specific **regulatory requirements** imposed by the Swiss legislation were found to result in higher costs for fertilisers producers and wholesalers, thus explaining at least in part the higher prices.

An important factor in this respect is the **different maximum allowed content of cadmium** in mineral phosphate fertilisers accepted in Switzerland in comparison to the one allowed in most EU Member States. The Swiss regulation only allows mineral phosphate fertilisers with a maximum limit of cadmium of 22 milligrams per kilogram of phosphorus pentoxide (P₂O₅): such limit is generally higher in EU countries, spanning from 22mg/kg in Finland to 90 mg/kg in Belgium. The limit is set at 50 mg/kg in Italy and at 60 mg/kg in France and Germany²⁷. Stricter limits on cadmium content directly affect the necessary quality of fertilisers which can be marketed in a country; as a result, mineral phosphate fertilisers which are produced or imported in Switzerland are generally more expensive than those marketed in the EU. In the framework of the analysis presented at section § 3.2, the differences in maximum allowed limits for cadmium have a role in explaining price differentials for mineral phosphate fertilisers (NPK and DAP).

Another significant – even if indirect – impact of Swiss legislation on prices for fertilisers is related to the obligation for market players to hold **mandatory stocks** of certain fertilisers. The requirement is established by the Decree of May 10th 2017 and is addressed to producers, importers, processors and sellers; these subjects must hold mandatory stocks of nitrogen fertilisers amounting to 1/3 of the needs for the concerned growing season. Even if establishing these stocks might not directly impact fertiliser prices as in the case of cadmium levels, the obligation has to be considered in connection with the market players' need to replenish their stocks during the season. To do so, operators may be forced to purchase certain volumes of fertilisers also in unfavourable market conditions, i.e. during periods of temporarily higher prices, making it difficult to tailor procurement patterns according to price dynamics. It is of course possible for market

²⁷ Source: European Commission (2016), *Limits for cadmium in phosphate fertilisers*, Commission Staff Working Document, SWD(2016) 64 final, Brussels, 17/03/2016. To date, no harmonised EU legislation on maximum allowed limits of cadmium in phosphate fertilisers has entered into force: the matter is still regulated at national level.

players to hedge against the risk of unfavourable price dynamics through derivative contracts and fixed price contracts: however, all these instruments have a cost. The final impact of mandatory stocks is an increase in procurement costs for market participants, which may translate into higher selling prices for fertilisers.

Another element mentioned by a number of interviewees to explain higher prices for fertilisers in Switzerland is represented by the specific **reporting requirements** (Suisse-Bilanz) required by Swiss legislation for each application of fertilisers made by farmers. Similarly to what will also be seen for pesticides, the Swiss legislation imposes on farmers detailed reporting on when, how and for which purpose fertilisers are used on the farm; to comply with such requirements, *ad hoc* calculations and simulations have to be made, and the role of consultants is of paramount importance in this respect. Swiss farmers generally rely on specific consultancy on the use of fertilisers provided – together with the product – by the leading distributors: the costs which these have to bear to provide consultancy services on the farm (mainly in terms of salaries, training and travel expenses of consultants) are incorporated in the price of fertilisers, thus contributing to inflate their level compared to the neighbouring countries, where the provision of similar services is not as widespread as it is in Switzerland.

As for the **economic factors explaining price differentials**, the most important ones were identified in the relatively small dimension of the Swiss market for fertilisers and in the small size of the typical Swiss farm. If compared with French and German farms, **Swiss farms** are generally much smaller²⁸ and much less specialised. As a consequence, individual sales of fertilisers to farmers in Switzerland generally involved limited volumes (less-than-truckload), and this has a direct impact on marketing and logistic costs (limited scope for achieving economies of scale in the distribution of fertilisers). Higher marketing and logistic costs for distributors translate into higher prices.

In a 2016 study by FOAG²⁹, an attempt was made to break down and analyse the different components of price differences for fertilisers between Switzerland and Germany. The study concluded that **packaging costs** have probably the highest impacts on prices, accounting for about 4 CHF/100 Kg. The relevance of packaging costs as an explaining factor behind price differentials was confirmed by qualitative insights from most interviewees. In this respect, it is important to note that Italian prices used in the comparative analysis already include the cost of bags, and therefore packaging should not be considered in explaining the observed differentials in this specific case. Nonetheless, fertilisers remain between 4% and 34% cheaper in Italy than in Switzerland, as indicated in § 3.2 (Table 3.8).

It should also be noted that in some of the EU countries selected for the comparative analysis (Germany and, to a lesser extent, France), delivery of bigger volumes (truckload or multiple truckload) of fertilisers in bulk directly at the farms is rather frequent. By contrast, basically all fertilisers marketed in Switzerland are stocked, mixed and packed in bags for delivery at the farm. Marketing of bagged fertilisers also implies additional costs for **labelling** as well as the need of appropriate facilities for stocking, mixing, packaging and distribution.

Transportation costs for imported fertilisers are another explaining factor behind price differentials. The already cited study by FOAG provides a generic indication of 3.5 CHF/100 Kg of transportation costs for imports from Germany, even if with differences according to the final destination in Switzerland. No quantitative indications on the extent of transport costs from other countries emerged from the reviewed or from interviews. However, most interviewees qualitatively confirmed the relevance of transportation costs as an explaining factor behind the observed price differentials.

²⁸ According to the most recent available official statistics, average farm size (in terms of hectares of usable agricultural area per farm) amounted to over 58 ha in France and Germany (Eurostat Farm Structure Survey 2013) against 20 ha in Switzerland (Farm Structure Census 2017).

²⁹ FOAG (2016) *Rapporto sui concimi minerali - Confronto dei prezzi Svizzera-Germania: scarto variabile tra il 4 e il 31 per cento*.

Since basically 100% of mineral fertilisers marketed in Switzerland are imported, direct production costs are those of the exporting countries (mainly Germany, Netherlands and France); Swiss “production costs” should be intended as the costs incurred by importers for stocking, preparing mixtures, packing bulk fertilisers into bags, applying labelling, and distributing fertilisers to farmers. These costs are generally higher in Switzerland because not all the aforementioned activities are carried out in the other markets (e.g. there is limited need for bagging in Germany) and especially because of the higher cost of land (for distribution facilities) and of labour in Switzerland.

4.2 Reasons behind price differences for pesticides

The analysis carried out on the main reasons explaining price differences for pesticides was mainly based on qualitative elements. The consulted market operators could not provide a quantification of the additional costs to introduce and market the different products in Switzerland, and were unwilling to share information on the extent of their production costs and margins.

Even in the absence of quantitative indications on the importance of the different factors in explaining the observed price differentials for pesticides, most interviewees provided qualitative insights which highlighted the relevance of a number of factors in this respect.

Similarly to fertilisers, some of the key explaining factors derive from the specificities of the **Swiss regulatory framework**. Even though a certain level of harmonisation exists between Switzerland and the EU in terms of requirements for the authorisation of new active substances or products, some notable differences were identified between the two systems. As already highlighted at § 2.3, it is common that **Swiss authorities require specific studies and analyses** on the potential impacts of a new product/substance in the specific environmental conditions of Switzerland. For instance, agrochemical companies are required to test new active substances under Swiss conditions. These tests are very time-consuming and cost-intensive and are mostly performed in two different sites: one in the French speaking part of Switzerland and one in the German speaking part of the country. Dossiers prepared for the authorisation of a specific product in the EU cannot simply be reused for the introduction of the same product on the Swiss market. Producing companies must bear additional costs for the authorisation of a specific product in Switzerland, and these additional costs must be covered in a market whose size – in terms of both marketed volumes and value – is much smaller than that of the EU market as a whole, and also of many individual national markets in the EU³⁰. In this context, more aligned authorisation procedures between Switzerland and the EU (and eventually a full mutual recognition agreement) may positively impact authorisation costs for the introduction of pesticides on the Swiss market.

It should also be considered that in the EU there are specialised research companies that perform tests on pesticides in different geographical zones, as defined and required for the purposes of the EU authorisation. Such companies operate at EU level and can therefore achieve scale economies, which allow optimising the cost of product development and registration. The Swiss requirements differ in some respects, and because of these specific requirements, there are higher development and registration costs. As the **target market is much smaller**, the impact of these costs on the achievable potential sales is comparatively higher in Switzerland than in several EU countries and, because of the smaller volumes, any additional costs incurred in Switzerland have to be covered through higher margins (and hence higher selling prices) to grant a reasonable **return on investments** to companies. In addition and probably as a consequence, the companies’ product portfolios for Switzerland are often different from those for the rest of the EU, and are

³⁰ As illustrated in section § 2.2, mutual recognition in the EU can be requested also between Member States located in different geographical zones under certain conditions; in addition, a Member State can deny mutual recognition from another Member State in the same zone but in this case it has to justify its decision as a result of specific environmental or agricultural circumstances or due to the impossibility to grant a high level of protection of both human and animal health and the environment.

generally much more focused on high-value and more expensive products. It was mentioned by different interviewees that the Swiss demand for high-quality and innovative plant protection products has a role in stimulating producers to request the authorisation for new products launched in the EU also in Switzerland (provided that they are suitable for the specific conditions of the Swiss market). However, the start of the related authorisation process is often delayed with respect to the EU, and this translates into delayed launch of new products on the Swiss market (see § 2.3, Tables 2.4 and 2.5).

The Swiss regulatory framework also envisages a **re-authorisation** protocol after 10 years both for active substances and for final products; this means that FOAG, before renewing its approval, may request additional studies and updates to analyses previously submitted based on new scientific evidence and/or methodologies, with special reference to the environmental impacts and to the effects on non-target organisms. Dossiers have to be updated also whenever producers want to change the composition of products already on the market. The whole re-authorisation procedure is quite complicated and expensive: as a consequence, even once the product or the substance has been approved, the chance of bearing additional fixed costs is high. Re-authorisation procedures (“renewal of approval”) for active substances used in pesticides are applied also in the EU. The related requirements (and the resulting practical implications for applicants) differ according to the programme under whose scope each active substance falls: renewal of approval for certain substances requires the submission of a supplementary dossier³¹.

Fairly similar to the re-authorisation procedure is the **targeted review** procedure³²; in this case the protocol is fairly similar to that in place at EU level, but additional areas of concern are usually addressed in Switzerland, and this requires specific analyses. The targeted review procedure has the main objective of protecting users (farmers and gardeners), consumers, groundwater and the environment (intended as the whole group of non-target organisms); the procedure does not concern active substances but only final agrochemical products which contain a certain substance.

All the requirements for getting the first authorisation, combined with those to be met following the approval, result in additional fixed costs which companies must bear in order to secure marketability of products in Switzerland. It is anyway worth noting that the consulted market operators generally consider the Swiss regulatory framework to be efficient and effective, also taking into account the importance of environmental aspects for the Swiss society.

Another important explaining factor deriving from Swiss regulatory specificities is represented by **social permits** needed in some cases for the application of certain pesticides: such permits are often required for farmers to be eligible for support from direct payments, as well as for them to be authorised to apply labels like “IP Suisse” on products. Social permits are issued to farmers on request by the Plant Protection services of each Canton, but the specific conditions under which a special permit may be granted often differ between Cantons: the system is very complex, and the availability of professional counselling services is hence extremely valuable to farmers.

The centrality of **advisory and counselling** in the use of pesticides at farm level is an aspect on which basically all interviewees agreed. The importance of environmental sustainability for the Swiss society results in very strict requirements and controls for farmers; consultants need to be well prepared on products and on the latest regulatory requirements, and need to be widespread on the Swiss territory to provide assistance directly on the field. Farmers want to feel safe in terms of compliance with environmental prescriptions since this also impacts their eligibility for support from direct payments; as a result, they have a clear preference for getting full assistance from producers or distributors, and for purchasing high quality products. Assistance is not paid separately by farmers: it is instead included in the price of products. This implies that prices of pesticides in Switzerland have to be set at a level which allows

³¹ Five programmes for renewal of approval have been initiated so far by the European Commission (AIR-1, AIR-2, AIR-3, AIR-4 and AIR-5 programmes); each programme covers a group of active substances, according to the expiry date of the previous approval (https://ec.europa.eu/food/plant/pesticides/approval_active_substances/approval_renewal_en).

³² S.c. *Riesame mirato* or *Programm zur gezielten Überprüfung*.

covering also all the costs related to the provision of advisory services by producers or distributors (e.g. working time, training, travels, etc.). To avoid any possible agency conflict, it is not possible for agrochemical companies to pay consultants in percentage of sales: this reinforces the need to cover the cost of advisory and counselling services through higher selling prices. Interviewees also highlighted that the inclusion of counselling costs in the pesticide price is the only way to allow many small farmers to benefit from such services also in the case of small purchases of product. Most of the times, consultants working for agrochemical companies have the highest experience on the products they sell, therefore it is not rare that they do not only provide advisory directly to farmers, but they also train other advisors like those working for cantonal phytosanitary services and Agroscope, or those working for distributors.

In the vast majority of EU countries, consultants provide advice to distributors and these latter, in turn, assist farmers in the selection and proper utilisation of the product; by contrast, the capillarity of service in Switzerland – where assistance is provided directly on the farm – is not comparable to that of most EU countries, thus boosting the number of consultants and the related costs.

Another important aspect to be considered is the fragmented structure of the agricultural sector in Switzerland, with many small size farms often located in remote mountain areas. In addition, very few Swiss farms are specialised in one or few crops: most cultivate up to 7-8 different crops. It is difficult for Swiss farmers to keep themselves up to date about regulatory requirements on correct use of pesticides for a high number of crops; this further increases the perceived importance of a full consultancy service as well as the necessity for advisors to be fully prepared on a wide range of products and environmental requirements.

All in all, there are several reasons why the costs for providing on-farm counselling in Switzerland are much higher than in neighbouring countries:

- Complexity of the provisions regarding the application of pesticides in Switzerland (especially for what concerns the special permits). In case of violation of these provisions, farmers risk a reduction of support from direct payments: plant protection advisors hence need to know about the regulatory specificities applying in the different Cantons, and to be continuously up to date about the relevant legislation.
- Farm structures: small farm size, mixed production. Consultants need to be prepared on the many pesticides used for a wide range of crops, with minimum possibility to achieve specialisation economies.
- Distribution system. Every Swiss supplier has to stock a full range of products for each crop, which implies adequate storage and distribution facilities and a strong sales force to distribute the products. It is difficult to find such a costly distribution network in EU countries.
- Employment and direct expenses related to the advisory service (wages, direct costs, etc.) are significantly higher in Switzerland compared to the neighbouring EU countries, mainly because of higher salary levels.

Besides the Swiss regulatory specificities and the widespread need for costly farm-level counselling services in Switzerland, other elements need to be considered for a full explanation of the observed price differentials for pesticides.

With reference to **direct production costs**, it was noted by different interviewees that the main agrochemical companies operating in Switzerland are multinationals; the active substances are thus produced for the world market and the direct production costs for products sold in Switzerland (e.g. labour, energy, etc.) do not significantly differ from other countries. One company pointed out that according to its information, such costs usually only represent about 20% of the total costs of the product. The rest of the costs (local development and registration, marketing, professional consultancy services to distributors and/or farmers, etc.) arise at local level; therefore also the **currency fluctuations** have a relatively small impact on the breakdown of the final cost.

For what concerns **differences in the composition of products** (and hence in raw materials, production processes etc.) available in Switzerland, interviewees had somewhat diverging views. Some interviewees indicated that presumably the composition of products marketed in Switzerland is the same of, or at least is fairly similar to, the composition of products marketed in EU countries (since the development of *ad hoc* formulations and the related authorisation procedures entail additional costs). It may happen that producing companies try to identify other countries than Switzerland where marketing products with a different formulation makes sense, and only in this case new formulations are developed; in most cases, however, companies assess which of their products fit best into Swiss needs and requirements, and select the most suitable products for the introduction on the Swiss market. According to these interviewees, the Swiss market is not large enough to justify the development of specific formulations. By contrast, another producer pointed out that specific products only available on the Swiss market do exist and that roughly 40% of its product portfolio for Switzerland is not marketed in the EU; the need of **specific formulations** obviously has an impact on the price of certain products.

In any case, all interviewees agreed on the fact that **specific package sizes** have to be designed for the Swiss market. The smaller average size of Swiss farms translates into smaller purchased quantities of pesticides; it is not unusual that *ad hoc* packaging is developed to better respond to the requests of the Swiss market. As for **labelling costs**, it should be noted that the Swiss legislation³³ imposes labels in at least two of the three official languages of the Confederation (French, German, Italian) for all agrochemical products, thus multiplying the cost of hypothetical changes in labels (e.g. in the cases of new indications of use). In addition, the amount of information to place on the label to comply with Swiss legal requirements is not smaller than in the EU: the label is sometimes too small and ad-hoc solutions must be found (e.g. with bags) to place all the required information. This contributes to further inflate the price of products.

Besides the aforementioned purely economic factors, an important element for understanding the Swiss pricing context for pesticides is the widespread **willingness to pay** for high-quality production inputs by farmers. The importance of direct payments for Swiss farmers provides an incentive to pay higher prices for pesticides if their purchase is combined with counselling on how to meet the relevant requirements. The need to ensure eligibility for **direct payments** – together with the generally higher added value of Swiss agricultural products – also encourage farmers to choose **branded products** with **full traceability** and **proven reliability**. Several interviewees agreed that Swiss farmers are more interested to the **quality of production inputs** than to their price. It was reported that in some cases pesticides sourced through parallel imports come from EU countries to Switzerland through several intermediaries based in Eastern European countries: this hampers product traceability and timely deliveries, and reduces **reliability of supply**.

It was also observed that operators across the different stages of the pesticides supply chain generally acknowledge the higher costs for registration of pesticides in Switzerland. In the Swiss context, the priority for companies and farmers is to maintain competitiveness and **access to the newest technologies**; as a result, higher prices are accepted as part of the necessary costs to use state-of-the-art products.

Finally, it should also be considered that the **distribution of agrochemicals in Switzerland is carried out by wholesalers and retailers**, not directly by producers (see § 5). Distributors have to cover their own operational costs and to get a profit: their margins may hence represent an important part of the final price paid by farmers. It should also be noted that the higher the number of intermediaries in the distribution chain, the higher – in principle at least - the retail price needed to ensure the profitability of all the operators involved at the different stages of the chain. Substantial costs for distribution infrastructure, equipment and personnel result in higher retail prices. Due to the fragmented structure of the Swiss agricultural sector, with many small farmers often located in remote mountain areas, multiple retail points are needed, and the small volumes purchased by individual farmers result in complex logistics.

³³ ChemO (Ord. 813.11) and Ord. 916.161 (Art. 57(1)).

5 INFLUENCE OF MARKET AND DISTRIBUTION STRUCTURE ON PRICES

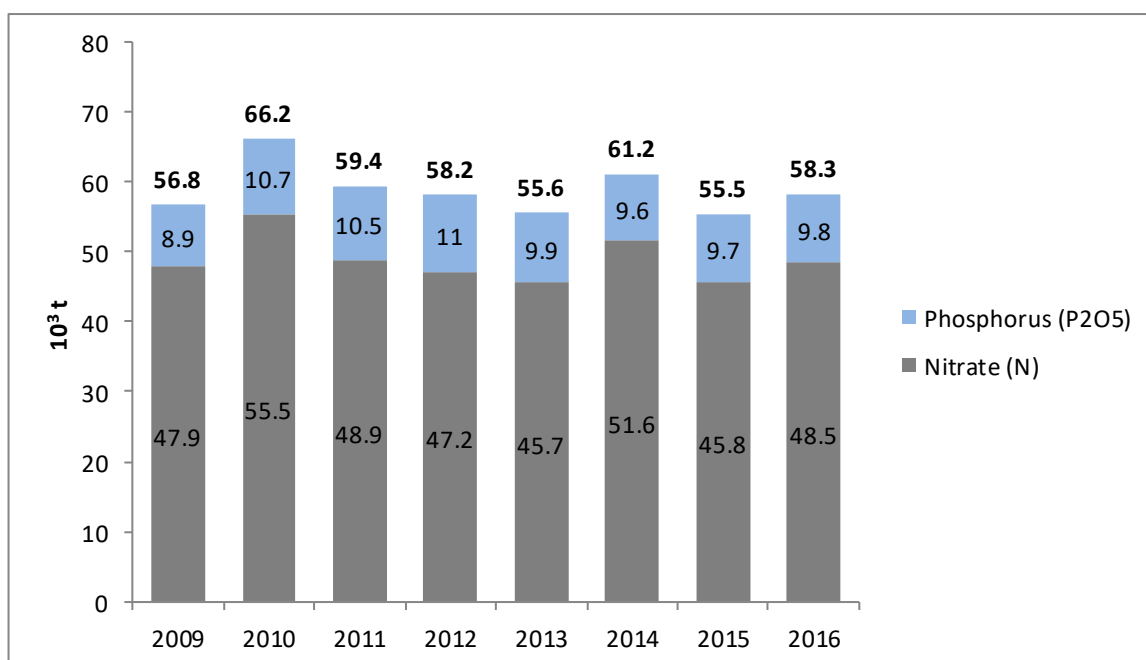
5.1 Market and distribution structure for fertilisers and pesticides in Switzerland

5.1.1 Market and distribution structure for fertilisers

The Swiss market is characterised by a relatively limited portfolio of key fertilisers: two nitrogen-based fertilisers, ammonium nitrate 27% and urea, are by far the most important products marketed in the country; ammonium sulphate and diammonium phosphate have more limited importance, and sales of compound fertilisers (e.g. nitrogen-phosphate-potassium fertilisers - NPK) are rather limited.

The historical evolution of consumption of nitrate and phosphorus in Switzerland over the 2009-2016 period is represented in Figure 5.1.

Figure 5.1 – Consumption of the main typologies of fertilisers in Switzerland



Source: FOAG

Consumption of phosphorus in Switzerland has remained basically stable over the observed period, while consumption of nitrogen recorded significant changes from one year to another.

As anticipated at § 4.1, nearly 100% of mineral fertilisers marketed in Switzerland are imported; Table 5.1 highlights the most important foreign countries supplying fertilisers to Switzerland over the 2013-2017 period (in terms of average volumes)³⁴.

³⁴ A comparative analysis was performed between data provided by Swiss custom authority and EU database Eurostat; despite an overall consistency of the reported information, discrepancies do exist between the two sources, it was therefore decided to base analysis on Swiss custom data only.

Table 5.1 – Fertilisers: leading exporters to Switzerland

Country	Average 2013-17 volumes (tonnes)	% on total Swiss imports of fertilisers	Average 2013-17 values (CHF million)	% on total Swiss imports of pesticides	Unit value (CHF/kg)
Germany	122,124	45.8%	45	42.0%	0.37
Netherlands	68,548	25.7%	23	21.8%	0.34
France	20,841	7.8%	9	8.3%	0.43
Belgium	19,087	7.2%	8	7.1%	0.40
Austria	11,352	4.3%	4	3.8%	0.36
Russian Federation	10,099	3.8%	9	8.7%	0.93
Italy	4,564	1.7%	2	2.2%	0.52
Other	9,932	3.7%	7	6.0%	0.66
Total Swiss imports	266,548	100.0%	108	100.0%	0.40

Source: Federal Customs Administration

Germany is by far the leading supplier, accounting for nearly half of total Swiss imports of fertilisers; the Netherlands account for a 26% share.

An investigation at **individual company level** was also performed on data provided by the Federal Customs Administration, in order to:

- i. Identify the leading importers of fertilisers in Switzerland.
- ii. Assess the overall concentration of the market.

For the first purpose, an in-depth screening was performed on nearly 10,200 Swiss importers of fertilisers. Companies under the same ownership, or anyway operated as a single entity, were clustered under the same group; at the end of the analysis, the original list of importers was shortened to around 8,800 groups and independent companies and importers.

The Herfindahl-Hirschman index (HH index; see § 1.4 for an explanation) was calculated to measure concentration levels in import trading of fertilisers in Switzerland.

Table 5.2 below reports the results of the calculation of the HH index for the import market of fertilisers in Switzerland; also in this case, instead of considering individual years, the calculation was based on average imported volumes over the 2013-17 period.

Table 5.2 – HH index for import trading of fertilisers in Switzerland

Group / company	Avg. volumes 13-17 Tonnes	% on total	HH score
Importer 1	136,970	55%	3,054
Importer 2	17,113	7%	48
Importer 3	13,840	6%	31
Importer 4	8,424	3%	12
Importer 5	6,223	2%	6
Importer 6	5,555	2%	5
Importer 7	4,819	2%	4
Importer 8	4,401	2%	3
Other importers	50,507		5
Overall HH index			3,168

Source: Arété elaboration on Federal Customs Administration data

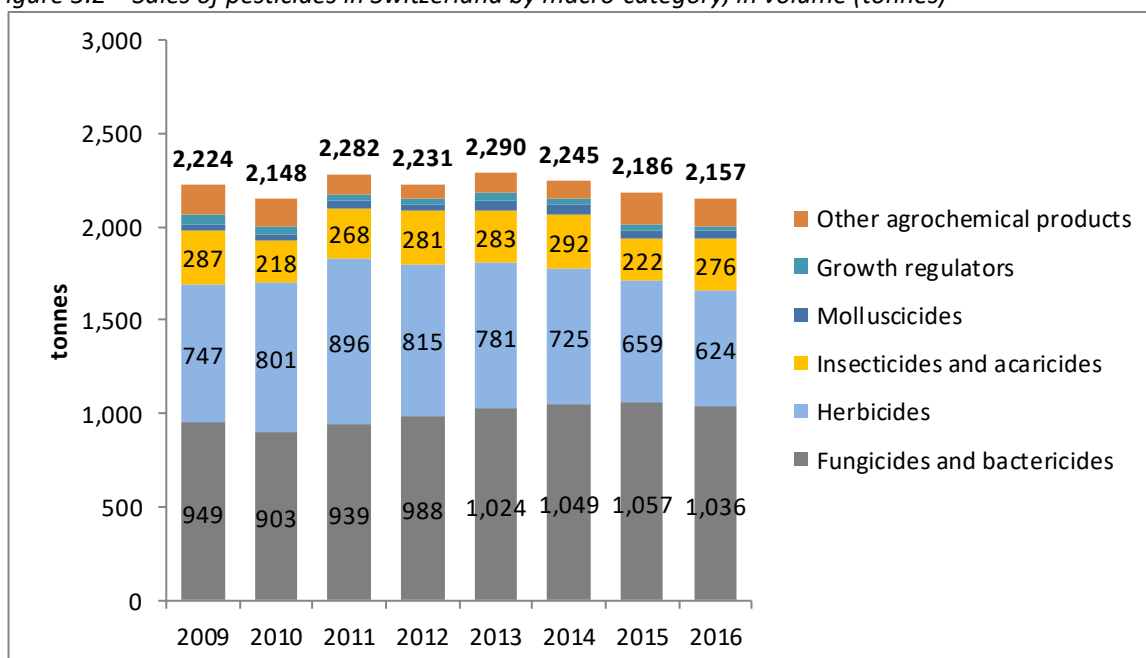
According to the classification reported in Box 1 at § 1.4, the Swiss import market of fertilisers is a highly concentrated one: the strong position of the leading importer, which accounts for more than half of total imports over the observed period, clearly emerges from the analysis.

5.1.2 Market and distribution structure for pesticides

The Swiss market for pesticides as a whole has remained substantially stable over the 2009-2016 period, with year-on-year growth rates between -3% (in 2010 and 2015) and +6% (in 2011).

Figure 5.2 below illustrates the historical evolution of Swiss sales of pesticides, together with their composition by macro-category of products.

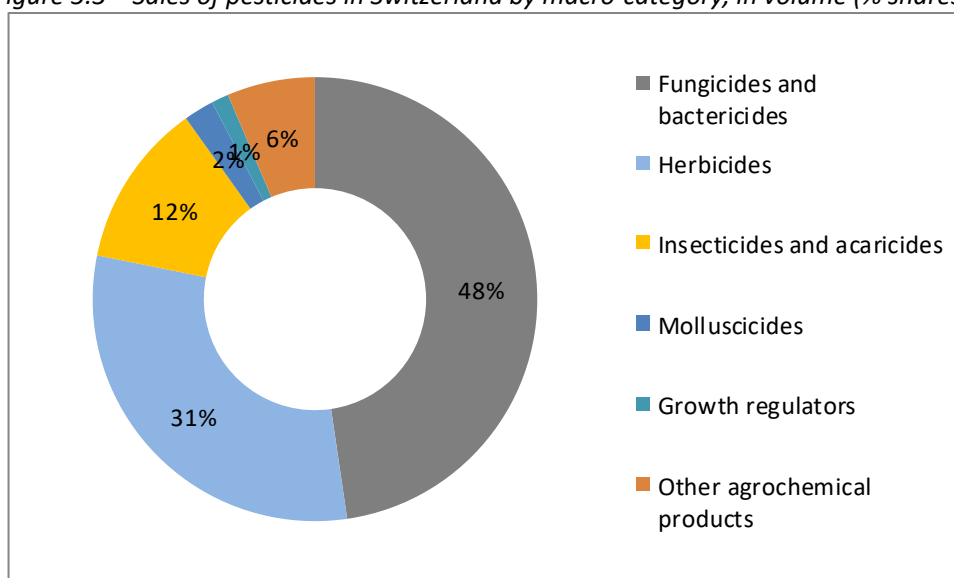
Figure 5.2 – Sales of pesticides in Switzerland by macro-category, in volume (tonnes)



Source: FOAG

The most important category of pesticides in the Swiss market is represented by fungicides and bactericides; considering average 2014-2016 sales in volume, this category accounts for 48% of total sales of pesticides, followed by herbicides (31%) and insecticides and acaricides (12%).

Figure 5.3 – Sales of pesticides in Switzerland by macro-category, in volume (% shares on total)



Source: FOAG

The only two categories recording an increase in sales over the 2009-2016 period are fungicides and bactericides (for a Compound Annual Growth Rate³⁵ (CAGR) of +1.3%) and molluscicides (CAGR +2.8%); the sales of all the other categories decreased over the observed period, with the sharpest reduction recorded for growth regulators (CAGR -7.4%) and herbicides (CAGR -2.5%).

Differently from fertilisers – where Swiss exports are negligible – imports and exports of pesticides to/from Switzerland are comparable in volume terms, but present remarkable differences in terms of unit values: the unit value of Swiss exports of pesticides is more than twice as much the unit value of Swiss imports.

Consulted stakeholders explained such difference in unit prices mainly in terms of:

- a prevalence of “generic/standard/low value-added” products in import trade, and a prevalence of “specialist/innovative/high-value added” products in export trade;
- the higher production costs in Switzerland.

Table 5.3 highlights the leading exporters of pesticides to Switzerland.

Table 5.3 – Pesticides: leading exporters to Switzerland

Country	Average 2013-17 volumes (tonnes)	% on total Swiss imports of pesticides	Average 2013-17 values (CHF million)	% on total Swiss imports of pesticides	Unit value (CHF/kg)
Germany	9,718	44.0%	52	30.7%	5.34
France	3,474	15.7%	34	20.2%	9.82
Italy	2,477	11.2%	14	8.5%	5.79
Netherlands	1,185	5.4%	3	2.1%	2.94
Belgium	995	4.5%	9	5.5%	9.42
Austria	766	3.5%	17	10.1%	22.29
UK	738	3.3%	9	5.3%	12.05
Other	2,715	12.3%	30	17.8%	11.06
Total Swiss imports	22,068		169	100.0%	7.67

Source: Arété elaboration on Federal Customs Administration data

Similarly to what observed for fertilisers, Germany is the leading supplier of pesticides to Switzerland, accounting for around 44% of total imports in volume terms, and 31% in value terms. The average unit value of imported pesticides in Switzerland (7.67 CHF/kg) is obviously much higher than the average unit value of imported fertilisers (0.40 CHF/kg: see § 5.1.1, Table 5.1).

Looking at the composition of Swiss exports to the EU (Table 5.4), it emerges that the three leading suppliers of pesticides to Switzerland (Germany, France, Italy) are also the three leading importers of pesticides from Switzerland. Inbound and outbound volumes from/to these three EU countries are roughly comparable, but also in this case unit values are remarkably different, with the unit value of Swiss exports remarkably higher than that of Swiss imports.

³⁵ The compound annual growth rate (CAGR) is the mean annual growth rate of an investment (or, more generally, a quantity) over a specified period of time longer than one year. In formula: $CAGR(t_0, t_n) = (V(t_n)/V(t_0))^{\frac{1}{t_n-t_0}} - 1$.

Table 5.4 – Pesticides: leading EU importers from Switzerland

Country	Average 2013-17 volumes (tonnes)	% on total EU imports from Switzerland	Average 2013-17 values (CHF million)	% on total EU imports from Switzerland	Unit value (CHF/kg)
Germany	7,129	31%	79	21%	11.13
France	4,578	20%	74	20%	16.27
Italy	1,783	8%	38	10%	21.34
Spain	1,026	4%	34	9%	33.42
Poland	1,646	7%	31	8%	18.60
UK	681	3%	19	5%	28.23
Netherlands	963	4%	18	5%	18.48
<i>Other EU countries</i>	<i>5,290</i>	<i>23%</i>	<i>80</i>	<i>21%</i>	<i>15.09</i>
Total Swiss export to EU	23,096	100.0%	374	100.0%	16.17

Source: Arété elaboration on Eurostat data

An investigation at **individual company level** aimed at clustering Swiss importers of pesticides under the same ownership, or anyway operated as a single entity, was performed on data provided by the Federal Customs Administration according to the same approach followed at § 5.1.1 for fertilisers. Table 5.5 highlights the leading Swiss importers of pesticides over the 2013-2017 period, and the related calculation of the HH concentration index for import trading of pesticides in Switzerland.

Table 5.5 – HH index for import trading of pesticides in Switzerland

Group / company	Avg. volumes 13-17 Tonnes	% on total	HH score
Importer 1	2,221	10%	100
Importer 2	1,371	6%	38
Importer 3	1,132	5%	26
Importer 4	939	4%	18
Importer 5	803	4%	13
Importer 6	786	4%	13
Importer 7	766	3%	12
Importer 8	630	3%	8
Importer 9	570	3%	7
Importer 10	518	2%	5
Importer 11	514	2%	5
Importer 12	512	2%	5
Importer 13	499	2%	5
<i>Other importers</i>	<i>10,911</i>		<i>46</i>
Overall HH index			302

Source: Arété elaboration on Federal Customs Administration data

Import trading of pesticides resulted to be much less concentrated than that of fertilisers. With an overall HH score of 302, and according to the classification reported in Box 1 at § 1.4, import trading of pesticides in Switzerland can be deemed as non-concentrated. However, in contrast to fertilisers, the most important direct importers of pesticides are a mix of producers and retailers. While the HH score for fertiliser imports likely mirrors the retail concentration in Switzerland, this is not the case for pesticide imports, as it will be seen at § 5.2.2.

5.2 Influence of market and distribution structure on prices of fertilisers and pesticides in Switzerland

An important aspect to consider in order to put the analysis of the influence of market and distribution structure on prices of fertilisers and pesticides in Switzerland in the appropriate context is the **limited size of the Swiss markets for these products** in comparison to the markets of such neighbouring EU countries as Germany, France or Italy.

Also the **structural specificities of the Swiss agricultural sector**, as well as the **conditions which Swiss farmers must meet in order to benefit from policy support** should be taken into account, as these have an influence on the structure of the market and of the distribution chains for fertilisers and pesticides.

The key findings of the assessment made for fertilisers and pesticides are illustrated at § 5.2.1 and 5.2.2, respectively.

5.2.1 Influence on the price of fertilisers

The analysis at § 5.1.1 showed that the Swiss market for fertilisers is a highly concentrated one. Switzerland entirely relies on imports to meet the domestic demand for mineral fertilisers, and one of the **leading Swiss importers of fertilisers is also one of the largest distributors in the country**, with an estimated market size of around 50%.

Since there is basically no production in Switzerland for fertilisers at present (the only remaining domestic producer, Lonza AG, ceased production in April 2018), the organisation of the supply chain is rather simple:

1. The first stage deals with purchase and import of fertilisers; professional wholesalers and other operators (such as Swiss chemical companies and Swiss subsidiaries of foreign companies producing fertilisers) are active at this stage.
2. The second stage encompasses stocking, mixing and packing of bulk fertilisers according to customer requirements. It should be noted that small-size bags account for most of domestic sales of fertilisers in Switzerland (sales in bulk or big bags have negligible importance).
3. Finally, retail distribution is carried out through multiple sales points.

According to one of the consulted stakeholders, there is approximately a 1:1 proportion between importers and retailers in terms of number of operators; however, the leading retailer (Fenaco) and a number of other important retailers are active in both import trading and final distribution.

The mission of Fenaco states that the company has the aim to negotiate the best conditions and prices for its members. Individual farmers are members of Fenaco through membership to local cooperatives which are affiliated to Fenaco. Fenaco carries out import trading in a centralised form in order to get more favourable pricing from foreign suppliers of fertilisers, but performs final distribution to farmers through its network of affiliate cooperatives (LANDI)³⁶. This two-level, diffused distribution system is consistent with the small size of most Swiss farms and with the important presence of farms located in remote mountain areas, but entails substantial costs for distribution facilities, equipment, personnel and logistical activities

³⁶ <https://www.fenaco.com/ueber-fenaco/organisation-aufbau>

(also deriving from the generally small volumes delivered to individual farmers, which seriously limit the scope for achieving economies of scale in the final distribution stage). All these costs need to be covered by the retail price paid by farmers, in order to ensure the economic viability of the distribution system itself.

Some interviewees regard the market of fertilisers in general as transparent in Switzerland, with publicly available data on prices and a high comparability of products both within and outside the country; this allows farmers to compare the conditions offered by various producers and wholesalers, including those based in neighbouring countries. Given the price differences, it should be expected that farmers import fertilisers directly from foreign suppliers (see also § 5.3). However these direct imports are actually negligible, and even farmers located close to borders prefer to purchase from Swiss distributors. This preference is mainly due to the reliance of farmers on services that domestic distributors can provide, in the form of mixing/packing tailored to Swiss operational conditions and regulatory requirements, final delivery at the farm, technical assistance to effective and efficient use of fertilisers in compliance with Swiss legislation, etc. These specificities imply high entry barriers for foreign suppliers.

Given the high entry barriers and the high concentration at the retail level, the competitive pressure on established domestic retailers is limited. This is **also likely to reduce the need for increased efficiency in distribution processes**. Economic theory predicts that in case of reduced competitive pressure, inefficiencies are not penalised and are hence more likely to persist. These **inefficiencies may further inflate already high operational costs** (for the reasons discussed above), and may finally **contribute to the higher level of retail prices for fertilizers in Switzerland than in neighbouring countries**.

5.2.2 *Influence on the price of pesticides*

Differently from the case of fertilisers, Switzerland relies on both national production and imports to meet the domestic demand for pesticides. The leading domestic producer is by far Syngenta, which relies on its own sales organisation in Switzerland. Global players such as BASF and Bayer-Monsanto also rely on their own sales organisation in Switzerland, whereas other international players (e.g. Adama or Corteva) work in partnership with Swiss agrochemical importers like Omya, Leu + Gygax and Stähler Suisse.

Consulted stakeholders at all stages of the distribution chain agreed that **competition at the level of producers of pesticides on the Swiss market is rather intense**, also considering the small size of the market in comparison with the French, German or Italian one. Concentration in import trading is also lower than for fertilizers. Besides the significant number of domestic producers (which can be appreciated through the list of member companies to national reference association Science Industries Switzerland³⁷) and the global players (many of them have Swiss subsidiaries), also other foreign players compete on the Swiss market, mainly through parallel imports. Consulted stakeholders at all stages of the distribution chain saw **no significant impacts on the Swiss market deriving from the latest large-scale deals and mergers occurred in the international agrochemicals market** (e.g. Bayer-Monsanto, DuPont-DowAgro, ChemChina-Syngenta), mainly because the shares on the Swiss market of one or both global companies involved in these operations were rather limited.

³⁷ <https://en.scienceindustries.ch/association/our-members> The association represents the interests of the Swiss chemical, pharmaceutical and biotech industries. More than 250 companies within the chemical, pharmaceutical, biotech and other science-based industries operating in Switzerland are members of the association.

However, **concentration in the retail market for pesticides in Switzerland is likely to be high**: even in the absence of more up-to-date figures, it is important to note that the market share of the leading Swiss retailer of pesticides (Fenaco) was estimated as falling between 50% and 60% in 2008³⁸.

The **federation of farmers' cooperatives Fenaco emerged as the leading player at wholesale and retail level also in the distribution of pesticides in Switzerland. Producers of pesticides are not active in the final distribution stages** in Switzerland: they sell their products to Fenaco and to other independent wholesalers and retailers, which distribute them to individual farmers. Besides Fenaco, there is a number of minor private retailers which operate through small retail stores; in general, the presence of retail sellers of pesticides on the Swiss territory is very dense, due to the fragmented structure of the Swiss agricultural sector and to the important presence of farms located in remote mountain areas.

Fenaco performs retail distribution of a wide range of pesticides marketed under a high number of brands from global players and smaller Swiss and foreign producers, also including products supplied through parallel imports. According to their mandate, Fenaco aims at ensuring favourable prices to farmers. However, Fenaco also recognises the substantial authorisation and marketing costs (including provision of on-farm consultancy in the use of pesticides) deriving from Swiss specificities. Combined with the substantial costs of Fenaco's diffused distribution network through LANDI cooperatives (see § 5.2.1 for additional explanations), these authorisation and marketing costs turn into higher retail prices for pesticides in Switzerland than in the neighbouring countries. Due to the demanding environmental requirements and conditions for eligibility to support from direct payments, Fenaco strives to ensure full traceability and reliability of the pesticides it sells: this greatly limits the recourse to parallel imports of generic products as a means to put downward pressure on the price of branded specialist products, as full traceability is often not ensured in this procurement channel. Furthermore, timely deliveries to farmers are difficult to meet in the parallel imports procurement channel. According to Fenaco, LANDI cooperatives have the right to supply pesticides also from other sources than Fenaco.

Some of the consulted stakeholders observed that where the distribution chains are longer (i.e. involve multiple intermediaries), retail prices are likely to be set at a level which allows all the involved operators at least to cover their **operational costs**. These costs **tend to be higher in Switzerland**, where a geographically dispersed distribution network is needed, where delivered quantities to final users tend to be small, and where costly additional services (on-field technical advice) have to be provided to farmers by producers and/or retailers. One of the consulted stakeholders also observed that a certain degree of coordination among the different actors involved, together with a common understanding that margins have to be safeguarded at all stages of the value chain to ensure the viability of the domestic production and distribution system, are an integral part of the Swiss business culture.

As further discussed at § 5.3 with reference to foreign operators, the **need for a diffused distribution network** and the **need to provide costly on-farm consultancy services** constitute **important barriers to the entry of new operators on the Swiss retail market for pesticides**. In addition, the complex and demanding **requirements that farmers using pesticides must meet** in order to benefit from the all-important support from direct payments (see § 4.2) **limit the possibility for parallel imports of "generic" pesticides, and the resulting competition enforcing effects**. All these barriers make it **difficult for new distributors to seriously challenge the position of the established ones, and especially the position of the leading retailer, Fenaco**. Indeed also the leading global producers of pesticides sell their products in Switzerland through established retailers.

By limiting the competitive pressure on established domestic retailers, **entry barriers are also likely to reduce the need for increased efficiency in distribution processes**. Economic theory predicts that in case of reduced competitive pressure, inefficiencies are not penalised and are hence more likely to persist. These

³⁸ Report from the Swiss Competition Authority about the merger between Steffen Ris and Fenaco (<https://www.weko.admin.ch/weko/it/home/documentazione/diritto-e-politica-della-concorrenza--dpc-.html#923387142> - DPC 2008-2 (PDF, 1 MB, 01.01.2006)).

inefficiencies may further inflate already high operational costs (for the reasons discussed above), and may finally **contribute to the higher level of retail prices for pesticides in Switzerland than in neighbouring countries**.

The above elements would lead to conclude that the main **factors which have an influence on retail prices of pesticides in Switzerland** are linked with:

- the **specificities of the regulatory framework** applying in Switzerland (challenging authorisation procedures and demanding requirements to meet for farmers using pesticides);
- the **structural features of the Swiss agricultural sector**, which are reflected in the organisation of the distribution network for pesticides, in the functions that it needs to perform, and in the related costs;
- the **important barriers to entry in the final distribution sector**, which reinforce the competitive position of established retailers (and especially of the leading one), and which are likely to result in inefficiencies in the distribution process, in further inflation of already high distribution costs, and finally in a higher level of retail prices for pesticides in Switzerland than in neighbouring countries.

5.3 Influence of trade barriers on the prevailing market and distribution structure

The analysis of the relevant legislation revealed **no significant explicit trade barriers to the import of fertilisers and pesticides in Switzerland**. No significant border protection measures are applied in Switzerland to final products or to the raw materials which are needed for their production (after domestic production of mineral fertilisers ceased in April 2018, the latter consideration applies to Swiss production of pesticides only).

By contrast, as already observed at § 5.2.2, there are **significant implicit barriers to import of pesticides** deriving from:

- Demanding requirements for authorisation of active principles and commercial products in Switzerland.
- The need for Swiss farmers to comply with demanding requirements concerning the use of pesticides, which result in a diffused demand for on-farm advisory services: meeting such demand entails substantial costs for both producers and retailers.
- The structural specificities of the Swiss agricultural sector. The prevalence of small farms and the high number of farms located in remote mountain areas require a diffused distribution network: a substantial portion of this network is under the control of Fenaco, a federation of farmers' cooperatives.
- Together, the Swiss regulatory system and the structural specificities of the Swiss agricultural sector imply that new entrants in the Swiss market for pesticides or fertilisers have to deal with significant market entry barriers, as bypassing the established retailers requires the costly implementation of an independent retail distribution network in Switzerland and the acquisition of specific capabilities to provide farm-level counselling.

These **implicit trade barriers reduce the pressure of foreign competitors on domestic operators**, and hence **contribute to maintain the current market and distribution structure**.

6 CONCLUSIONS

A number of key findings emerged from the analysis, with respect to the specific conditions (regulatory, economic, social, territorial) in Switzerland and to the reasons behind price differentials for fertilisers and pesticides vis-à-vis its neighbouring countries.

The analysis of the Swiss **regulatory framework** and its comparison with the EU showed that a certain degree of harmonisation exists between the requirements as well as between the authorisation procedures for active substances and products; however, several interviewees indicated the impossibility to rely extensively on dossiers presented at EU level to achieve economies in the authorisation of products for the Swiss market. This observation was confirmed indirectly by the fact that fewer new active substances were authorised in Switzerland than in the EU over the 2012-2018 period.

The comparative analysis of prices for fertilisers and pesticides revealed higher prices in Switzerland for nearly all the products selected for the comparison, and against all the three neighbouring countries considered in the analysis (France, Germany and Italy).

Fertilisers

Price differences for fertilisers were calculated for five different product categories. Price premiums well above 20% were observed in Switzerland, especially in comparison to French and German prices.

Among the **key factors explaining price differentials for fertilisers**, some are strictly related to **specific Swiss regulatory requirements**. Swiss **reporting requirements** (Suisse-Bilanz) are aimed at monitoring safety and the observance of environmental restrictions in the use of fertilisers. Swiss farmers are very concerned about their compliance with the related prescriptions: **specialist on-farm consultancy and assistance services** provided by Swiss operators (mainly consultants working for distributors) are of critical importance to meet the relevant requirements. **These services are costly to provide** (mainly because of higher salary levels in Switzerland than in the neighbouring countries) and their provision contributes to higher prices for fertilisers.

Additional explaining factors related to regulatory requirements particular to Switzerland include a **lower maximum level of cadmium allowed for mineral phosphate fertilisers** (which results in the need to import more expensive fertilisers) and the **obligation to hold mandatory stocks** for some fertilisers (which may force some operators to purchase fertilisers even when price dynamics are unfavourable).

As for **key economic factors**, the **small size of the Swiss market and of the average Swiss farm in comparison to other European countries**, in addition to the fact that farms tend to be much less specialised, were identified as significant. It follows that the volume of individual purchases of fertilisers by Swiss farmers tends to be limited and translates into higher distribution costs. Furthermore, **market entry barriers** and **high concentration at the retail level** reduce the competitive pressure on established domestic retailers of fertilisers. This is **likely to result in inefficiencies which may further inflate already high operational costs** (for the reasons discussed above), and may finally **contribute to the higher level of retail prices for fertilizers in Switzerland than in neighbouring countries**.

Additional economic explanations of the observed price differentials for fertilisers are related to the negligible importance of bulk deliveries of fertilisers to farms and a **preference for delivery in bags**. These particularities result in **higher costs for packaging, labelling** (labels must be printed in at least two of the three official languages, German, French and Italian) **and marketing** of fertilisers.

Pesticides

Comparative **price analysis for pesticides** covered 50 products in the most important product categories: herbicides, fungicides and insecticides. Similarly to fertilisers, the price differentials observed were significant and indicated price premiums in Switzerland for nearly all the products analysed (+63% on average for herbicides and +68% on average for insecticides; the most conservative quantification approach

was applied³⁹). The highest differentials were observed when compared to German prices, although differentials with French and Italian prices are also substantial.

The **key factors explaining the observed price differentials for pesticides** in Switzerland are often interlinked, and can be roughly grouped into four main categories:

1. **Regulatory factors.** The impossibility for agrochemical companies to rely extensively on the dossiers presented for authorisation in the EU due to **specific requirements to meet in the Swiss authorisation procedure**. This results in **additional authorisation costs** for pesticides in Switzerland. The extent of such costs is further increased by the additional studies and tests which are required by the FOAG. Owing to the small size of the Swiss market for pesticides, producers need to obtain a return on their investments through higher margins since they cannot leverage volumes. The Swiss regulatory framework also impacts the price of pesticides by way of **demanding eligibility requirements to obtain financial support through direct payments**. These requirements encourage farmers to prefer high-value products (see point 3 below) and lend greater importance to professional advisory services for the correct use of pesticides (see point 2 below).
2. **Critical role of consultancy services.** Even more than for fertilisers, the importance for Swiss farmers of professional on-farm advisory services for the correct use of pesticides is paramount, and is closely linked with the demanding requirements for eligibility for support through direct payments (highlighted in point 1 above). Switzerland is essentially the only European country where such technical assistance is provided systematically in the field and to the near-totality of farms: a large number of consultants is hence needed to ensure coverage in rural areas. In addition, the typical Swiss farm is non-specialised and cultivates up to 7 or 8 different crops. This prevents from reaching specialisation economies for training costs of consultants who must be well versed on a wide range of different pesticides for several crops, as well as on the related legal requirements. Consultancy services are not paid separately by farmers, but rather their cost is included in the price of pesticides. While this common practice allows small farmers to afford specialist advisory services on the use of pesticides, it also contributes to higher retail prices.
3. **Intensity of financial support to Swiss agriculture and Swiss farmers' preferences.** Support from direct payments is an essential contribution to the economic viability of most Swiss farms, and allows Swiss farmers to afford higher-priced agricultural inputs and services in comparison to the rest of Europe. It is hence a priority for Swiss farmers to achieve compliance with the requirements for eligibility for direct payments support (as explained at points 1 and 2 above) in order to prevent any risk of reduction or exclusion from support. Swiss farmers are generally reluctant to try cheaper pesticides (especially if full traceability is not ensured), if doing so could endanger their eligibility for direct payments. The Swiss agricultural system as a whole is well aware of the additional costs incurred by producers to introduce new products on the Swiss market. Nonetheless, Swiss farmers want to have access to the most innovative products and are willing to pay higher prices for this. These elements also contribute to explain the very limited use of parallel import by farmers. Even farmers located close to the border, who could benefit theoretically from supplying pesticides directly from French, German and Italian suppliers normally prefer Swiss operators, which can provide specialist advisory services and assure timely deliveries.
4. Last but not least, **important barriers to entry in the final distribution sector and significant implicit barriers to import of pesticides**, which are discussed in more detail below, reinforce the competitive position of established retailers (and especially of the leading one). These barriers

³⁹ In the “conservative approach” price comparison was carried out using:

- For Switzerland, the minimum price among those reported by the different available sources.
- For Germany, Italy and France, the maximum price among those provided by the available sources.

Price differentials calculated from average prices are higher, and range from +68% for fungicides to +81% for insecticides.

likely resulted in inefficiencies in distribution, which led in turn to higher distribution costs and higher retail prices for pesticides in Switzerland than in neighbouring countries.

Additional economic factors contribute to explain the observed price differentials for pesticides. As already mentioned for fertilisers, the particularities of the Swiss market impact the prices of pesticides in multiple ways. The average small size of farms and the limited specialisation result in very small volumes of purchased agrochemicals requiring typically **smaller packages** than in other countries, which increases the unit cost for the final product. Lastly, labels are required in the three official languages (French, German, Italian), thereby **adding labelling costs** to the reasons behind the higher prices of the final products.

It is worth noting that for a rather limited number of pesticides the observed price premiums were so high (above +150% and with peaks of +415%) that these likely cannot be explained by the aforementioned factors alone.

The study also explored whether the **market and distribution structure for fertilisers and pesticides** in Switzerland had an **impact on prices**, and whether the **structure is influenced by trade barriers**. The investigations carried out provide only a quantitative indication of the concentration of import trade. The import market for fertilisers was found to be a highly concentrated one, with the leading importer holding around half of the total market. In contrast, the import trade for pesticides was non-concentrated, with the top 5 importers accounting for some 30% of volumes and 45% of values. It is, however, worth noting that the wholesale and retail stages of the distribution chain for pesticides are probably much more concentrated, with Fenaco/LANDI holding a reportedly large size of the final market also for agrochemicals. The mandate of the cooperative Fenaco demands that it operates for the benefit of its members (the farmers); however, it also needs to recoup the costs of a diffused network of retail points-of-sale as well as a high number of consultants providing on-farm assistance. These costs hence need to be covered through the retail prices paid by farmers. By limiting the competitive pressure on established domestic retailers, entry barriers are likely to reduce the need for increased efficiency in these distribution processes, thereby contributing to higher retail prices for pesticides in Switzerland than in neighbouring countries. No significant explicit trade barriers were found for fertilisers and pesticides (or for related raw materials). However, significant implicit trade barriers were detected for pesticides. These included: stringent authorisation requirements for the use of active substances and the commercialisation of products in Switzerland; the reliance of Swiss farmers on specialist on-farm advisory services in the use of such products; and the structural specificities of the Swiss agricultural sector, which lead to extensive and diffused distribution networks for both fertilisers and pesticides. These implicit trade barriers reduce the pressure of foreign competitors on domestic operators, and hence contribute to maintain the current market and distribution structure.

It can hence be concluded that **new entrants in the Swiss market for pesticides or fertilisers face entry barriers**, since by-passing established retailers would require establishing an independent retail distribution network in Switzerland and the acquisition of specific know-how and capabilities to provide farm-level advisory services.

In conclusion, the study found that **prices paid by farmers for both fertilisers and pesticides are substantially higher in Switzerland than in the neighbouring EU countries** (France, Germany, Italy). The observed price differentials can be explained by a combination of factors, including the **particularities of the relevant Swiss regulatory framework**, the **economics of the supply chain for these products**, the **structures of the Swiss agriculture and the distribution network for both fertilisers and pesticides**, and the presence of **market entry barriers**, which are especially important for **pesticides**.

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