



SUFISA SUGAR BEET REPORT AN EXTENDED SUMMARY

MAY 2018



“As for power. In the sugar sector it’s extreme, of course, ...”

Researcher: Let’s check, OK, what are the options?

Farmer: I’m still missing one.

Researcher: Yes, there are quite a few more. Go ahead, go ahead.

Farmer: Opening your own refinery.

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Introduction

The purpose of this report is to investigate the nature of policy requirements and market imperfections, and their implications for the resilience of sugar beet cultivation in Belgium, as part of the EU-funded Horizon 2020 project, SUFISA (Sustainable finance for sustainable agriculture and fisheries).

Data collection methods

Key to the approach taken has been to put the farmers themselves at the center of the research, in order to get their perspectives on the critical issues that need to be considered. In the first instance, a media analysis was conducted (which covered national, regional and specialized media from 2005 to 2016), as well as a desk-based analysis of market conditions and regulations (sources reviewed included: academic publications; government and policy documents; market research and consultancy reports; industry reports and NGO documents), supplemented with nine interviews with Flemish sugar beet farmers. Following analysis of the resultant data, two focus groups (FGs) were held with Flemish sugar beet farmers at two different locations in Flanders. This step was followed by a workshop composed of stakeholders involved in the Belgian sugar beet production.

Sugar beet in Belgium

Sugar production in Europe was introduced due to the Napoleonic wars, which led to a blockage of the sugar trade. Napoleon incentivized the construction of sugar beet refineries in Europe. After the fall of the First French Empire, the beet sugar industry collapsed too. Only due to governmental support of the industry and gradual import restrictions all over Europe, the beet sugar industry recovered (Draycott 2006). By 1872, 174 sugar beet factories could be found in Belgium (CBB 2017). Sugar beet cultivation in Europe became so successful that by the end of the 19th century, globally more sugar was produced from sugar beet than from sugar cane. Only the repeal of the import levies on sugar cane, changed the situation again (Draycott 2006). The reduction of governmental support led to a shrinking sugar beet industry once more. Today only three refineries remain in Belgium, which are owned by two companies; *Iscaal Sugar* and *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* (CBB 2017).

Despite the **concentration** on farm and refinery level the importance of the crop remained, which may have been one reason why sugar beet cultivation had been under a quota system until the end of 2017. Due to this quota regulation farmers enjoyed above-average prices until 2016. Draycott (2006) reports that the sugar beet industry was valuable to countries' economies since it increased independence from imports, stabilized farmers' income and positively contributed to soil quality.

Innovation is an important aspect for sugar beet production to increase sugar output per hectare. The sugar content rose from initially 12% to 20%. Apart from this the crop experienced improvements for example in the area of disease resistance. Other improvements regarding the germination of the crop also contributed to increased productivity. Without these innovations profitable production of sugar from sugar beet would not have been possible. Despite this continuous progress in terms of sugar content and yield, it can be questioned whether further improvements of the crop will be possible (Draycott 2006). Apart from improved seeds, also pesticide usage is a critical issue. The abolition of the usage of certain plant protection products awakens the fear that current yields cannot be met in the future.

Belgium is the fifth largest sugar beet producer in the EU with total harvested sugar beet area of about 60,000 hectares in the 2014/2015-crop season. This represents about 4.5% of the agricultural area in Belgium. In Belgium, the total sugar production from sugar beet is about 646,000 tons (CBB 2017). There are about 7,500 sugar beet farmers in Belgium spread across the 14 agro-ecological zones (CBB 2018; Peeters 2010). The number of sugar beet growers has been declining steadily over the last decade with a sharp decline occurring between 2007 and 2008.

While the number of refineries decreased drastically since 1968, the sugar production illustrates an increasing trend. Though it has to be pointed out that since the reform of 2006, the trend is rather decreasing. Since refineries intend to increase their production in the post-quota period, output



levels may increase again. Despite the decreasing number of sugar beet farms and sugar beet cultivation area the sugar beet yield remained rather stable.

Within Belgium the provinces Liège, Hainaut and Walloon Brabant produce most sugar beet. Research shows that the crop grows well in loamy and sandy-loamy soils, which are the characteristic of soils found in these provinces. The yield is, therefore, highest across the middle belt provinces of Belgium that are all in the Walloon region.

Policy and regulatory conditions

Since 1967 sugar production is regulated within EEC, later by the EU and hence also within Belgium. Apart from international regulations by the World Trade Organization (WTO) and the Generalized Agreement on Tariffs and Trade (GATT), there is a series of European regulations for the sugar sector. In the beginning, the European regulations aimed at protecting the national sugar market and sugar supply. However, over time these regulations loosened and the sugar market was gradually liberalized. The most important regulations since 1967 have been regulation (EEC) No 741/75 of the Council of 18 March 1975 laying down special rules for the purchase of sugar beet, this was repealed by (EC) No 1260/2001 in 2001, which was repealed by (EC) No 318/2006 in 2006, which was repealed by (EC) No 1234/2007 in 2008, and finally repealed by (EU) No 1308/2013 in 2013, which is still valid today. The regulations established a Common Market Organization (CMO) for sugar which was later (in 2013) transformed into a Common Market Organization (CMO) for agricultural products. Until 2006 a main feature of the sugar market was the establishment of the **quota system**. Among EEC/EU countries quotas were distributed among refineries, which then were distributed among farmers. Quota could be distinguished in “A”, “B” and “C” quota, whereat the latter was sugar that was sold at world market price. For the other quota types a minimum price well-above the world market price was determined. The reform of 2006 led to a significant reduction of quota and the minimum price, preparing farmers for the transition to **market liberalization**. Moreover, these measures should increase the competitiveness of the domestic sugar market. Another special feature of the EEC/EC regulations is that they require refineries to negotiate delivery conditions (and now also prices) with the farmers’ union. Thus, refineries are not allowed to negotiate with farmers individually. This is a mechanism that particularly now, with the termination of the quota system, promotes the creation of a level playing field in this highly concentrated market.

The reform from 2006 led to a reduction of the quotas, which also means that the number of farms cultivating sugar beet needed to be reduced. At the same time farm size increased continuously. For

“We’ve warned people that we’re heading the same way as milk, but to no avail, apparently.”



the plantation year 2017/18 the overall sugar beet sowing increased (CBB 2017). This is possible, due to the termination of the quota system. This means that there are no restrictions on sugar beet cultivation anymore. It is open to speculation which effects this is going to have. **Overproduction** may lead to a price drop which may make the cultivation of sugar beet unprofitable.

Draycott (2006) points out that while sugar production from sugar beet had been protected within the EU until 2017, protection for the USA phased out over 30 years ago. Since then sweeteners from sugar beet have been replaced by other sources such as corn. Hence, farmers switched to other more profitable crops. Similar developments may occur in the EU now. Though, the complete abandonment of sugar beet is doubted, due to its positive agronomic characteristics.

Markets and marketing

Within Belgium sugar beet farmers have **only one sales channel**, via the *Confederation of the Belgian Beet Growers (Confederatie van de Belgische Bietenplanters – CBB)*, which is a Producer Organization that was installed in 1965. According to the CBB its goal is to represent and defend the interests of Belgian sugar beet farmers at local, regional and national level (CBB). In this respect one of the most important tasks is to negotiate the sales of the crop to sugar refineries. Apart from this CBB also controls the reception of the crop in the refineries. This means that in each factory up to five inspectors from CBB are permanently present in order to control the work of the personnel of the sugar refinery and test whether all reception conditions are fulfilled. They moreover control the pulp and report their results to the farmers (CBB 2017).

Sugar beet marketing is regulated by **interprofessional agreements** concluded between refinery and farmers' union (CBB). As pointed out above, the minimum price was set by the European Commission. While a premium was paid in years with higher world market prices, the price could not fall below this minimum price. Also, farmers were sure that their production was taken over by a refinery. Though, since 2006 the minimum price reduced and now with the termination of the quota system prices may fall even further. In the marketing year 2016/17 the two refineries *Iscal Sugar* and *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* had different approaches. While *Iscal Sugar* maintained their past price strategy, the price that *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* payed reduced. It will be seen, in the coming years how prices will develop and whether *Iscal Sugar* will be forced to reduce their price as well. However, another aspect is that transparency decreases since the base line for the sugar price is set differently. While one company uses the sugar beet without the top (which has less sugar content and is therefore chopped off) the other uses the whole sugar beet but deducts a certain percentage to trade off the lower sugar content.

Our analysis regarding farmers' income indicates that while costs for production rise, the income from sugar beet per hectare reduces. Although the revenue increases, if compared with costs, it becomes evident that the overall **profitability** of sugar beet cultivation has been decreasing. So far one of the main strategies to counteract this development is intensification and increasing farm size.

SWOT analysis

The SWOT analysis is used as an integrative assessment tool, aiming at finding a relation between external and internal conditions. Strengths and weaknesses are internal conditions that farmers face, while opportunities and threats are external.

Strengths:

The increasing market concentration on the refinery level within Belgium (as well as in the European Union) could potentially be counterbalanced by the **farmers' union**. However, the power of this institutionalization of farmers' interests seems to deteriorate. The cause for this deterioration is not only that a certain factory ostensibly tried to circumvent this institution by making individual contracts. The problem seems to be rooted in farmers' perception of the limited influence and **power of the farmers' union**. This (perceived) lack of power and influence of the farmers' union makes farmers question the very usefulness of the institution. A process that in turn allows factories to further weaken the institution. Still, the farmers' union is an internal factor. Thus, it is within farmers' realm to developing strategies to strengthen this institution.

“Considering how we, as an organized Producer Organization, are treated, we are nowhere near reaching our goals. We are not appreciated at all.”



The second important strength is **farmers' knowledge**. When asked about the competitiveness of the Belgian sugar beet farmers, this condition was mentioned together with other external conditions (such as climate). Farmers' knowledge will become even more important under free market conditions, as competition will increase. Other factors regarding competitiveness, such as climate or the costs of production cannot be influenced by farmers. Thus, this is the only possibility for farmers to increase their competitive advantage. It should be mentioned, that indeed costs for production can be reduced. According to farmers all means to do so were already undertaken. Thus, the reduction of input quantities is exploited to its maximum. Prices of inputs cannot be influenced by farmers. The option to also strive for price negotiations with input companies performed by the farmers' union was rejected. Nevertheless, these two points (cost reduction and negotiations with input companies) can be seen as aspects that could be transformed in strengths.

Regarding competitive advantages, **transportation costs** constitute another advantage of Belgian farmers. The proximity to the factories results in reduced production costs, a clear competitive advantage for Belgian sugar beet farmers.

Also, the **climate** contributes to the pole position of Belgian sugar beet farmers in terms of output. Generally, the climatic conditions and the soil are favorable for sugar beet production. However, it has to be pointed out that this may change in the future due to climate change. The season 2016/2017 illustrated the negative effect of excessive rain. Thus, climate change represents a threat as more extreme weather events will most probably have adverse effects on the sugar beet production.

Weaknesses:

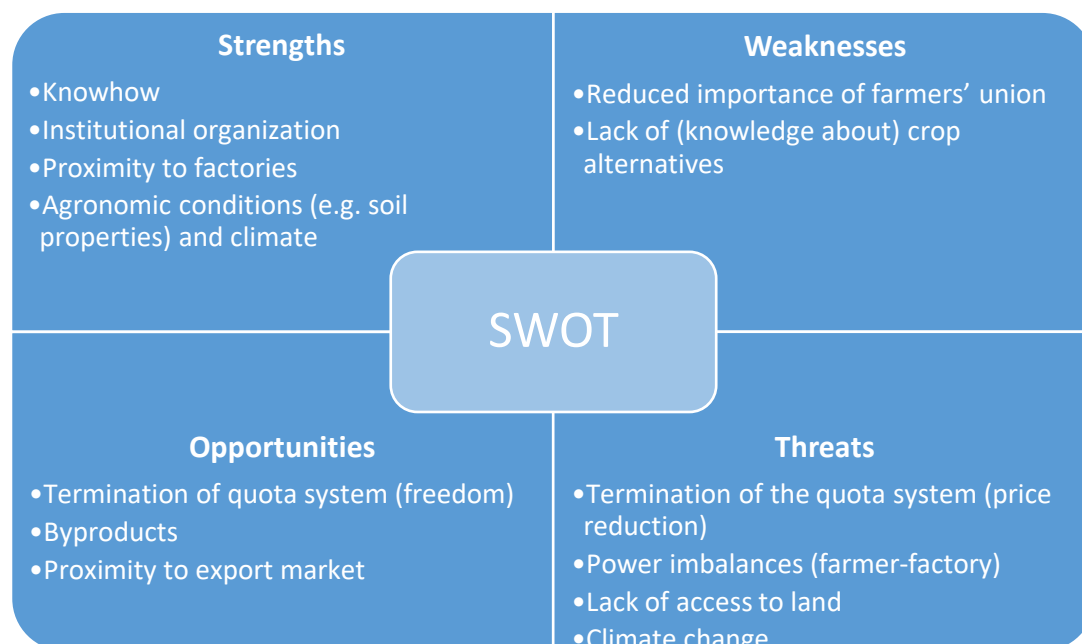
One weakness, the **reduction of the importance of the farmers' union** was already mentioned. A second is the lack of knowledge about **alternative crops**. Indeed, crop alternatives are limited by the general agronomic conditions as well as by the economic viability of alternatives. However, the interviews made clear that farmers think about alternatives, but that no alternative could be identified. In the advent of plummeting prices for sugar beet, the lack of crop alternatives represents a weakness.

Opportunities:

There are a couple of opportunities for Belgian sugar beet farmers that could be identified, such as **byproducts**. Nevertheless, the existence of this opportunity is determined by the **world market prices** of fossil fuel carriers. Developments in this sector will also depend on big players such as Brazil. The **geographic conditions** constitute opportunities. Not only the proximity to the factories are a strength, but also the closeness to the seaway represents an opportunity. The opening of the market may increase exports, thus the proximity to harbors, that again reduce production costs, may contribute to the competitive advantage of the Belgian sugar sector in the future. However, it is not clear who will profit most from these opportunities, the farmers or the factories.

External conditions are conditions that cannot be influenced by farmers but that influence farmers' strategies and performance. The internal conditions allow farmers reacting to the external conditions. Means to actively change external conditions are very limited, as they depend on many other conditions that are outside of the direct sphere of influence of farmers. This is an important

observation, as it calls for the action of **policymakers** to change the conditions that farmers face or support them in the development of strengths. One example of the power of policymakers is the **quota system**, which was installed and is now abolished by political decision.



Threats:

What can be seen from the SWOT analysis is that the **termination of the quota system** is found on both the opportunity and the threat side. Due to the termination of the quota system farmers will have more freedom in choosing how much sugar beet they want to grow. Still, they will not be completely free as now the decision of cultivating sugar beet will be much more influenced by **market forces**. Moreover, the freedom of farmers to choose other crops is limited by the respective agronomic conditions. The effect of the termination of the quota system is not only related to the quantity that can be produced, but also to the price evolution. This is within Belgium highly dependent on the respective factory. Current price suggestions by *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* represent a threat to sugar beet farmers as their economic viability would be further reduced. This situation remains although the world market price is high. Therefore, a further reduction of the world market price would worsen the situation even further. Interviews indicate that the low price offered by *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* is related to the **power imbalance** on the domestic sugar beet market. Accordingly, this power imbalance constitutes another threat.

Another threat is the **lack of access to land**. The costs for inputs were mentioned already. The costs for land as well as the availability of land are definitively a threat for Belgian sugar beet farmers. The wish to increase production is related to high costs for purchasing or leasing land and limited by the lack of land availability.

The SWOT analysis conducted is very similar to the conclusions drawn by the CBB in 2013. On the one hand, this increases the validity of the analysis presented here. On the other hand, the time span between the SWOT analysis undertaken in 2013 and this one allows to see whether certain aspects changed. Unfortunately, there is one development that seems to be an additional threat. While the relationship between refineries and farmers was good in 2013, this seems not to be the case anymore. Particularly the atmosphere between the farmers' union and *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* seems to have worsened. In 2013 the refineries were seen as partners in



the venture for the post quota period. Now, they are seen as antagonists. At the time, this executive summary is written the second post quota period negotiations are taking place. It will be seen, whether the relationship between farmers and refineries improves again or not.

Resilience

In order to deal with changing conditions as well as shocks, farmers have to develop a set of **strategies**. A resilient farm system is a system that remains profitable despite changing circumstances and shocks. Additionally, resilience may also mean the deliberate termination of a farm operation as a strategy to tackle **changing conditions** or shocks. The analysis revealed several (potential) strategies farmers applied or may apply in the future.

The identified strategies are:

| Strategies | |
|------------|-------------------------------|
| | Choosing another refinery |
| | Vertical integration |
| | Innovation |
| | Intensification - upscaling |
| | Branding |
| | Alternative crops |
| | Alternative end-products |
| | Additional income |
| | Striking for better prices |
| | Stronger sugar beet syndicate |
| | Freedom of choice |
| | Risk management |

Although, this list seems to be promising, it has to be pointed out that many of these strategies have been taken up already. Thus, the further exploitation of these strategies to maintain or even improve farmers' situation is limited. However, the termination of the quota may open up some more space in this regard.

Focus groups and workshop feedback: drivers, strategies and future performance

Two focus groups and one workshop were conducted in Flanders in 2017. These qualitative research steps helped researchers to validate previously collected data and gain more insights about the conditions and possible strategies farmers may apply.

Power imbalances

The topic power imbalances included: a) the role of the syndicate, b) the number of farms, c) the lack of alternative marketing channels, d) multinational company, e) farmers' holding in the refinery, f) profit margin, g) risk distribution, and h) biophysical conditions. All of these factors contribute to the power imbalances in the sugar sector. For example, since farmers have no alternative marketing channel, they are **forced to accept** the conditions offered by the refineries. Further, the extent to which farmers have to accept these conditions depends on the alternatives that farmers have in terms of income generation. This is determined by the biophysical conditions (amongst others). Thus, there are a couple of factors that have to be considered in order to tackle the issue of power imbalances.

Market

For the market conditions, two main topics were discussed, **demand** and **globalization**. While global demand for sugar is rising, European demand is decreasing. The market liberalization puts pressure on Belgian farmers to produce at the same price as Brazilian farmers, for example. However, due to different standards, Belgian farmers are not able to compete with them.

“Because today the price beet farmers receive per hectare compared to what the sugar factory earns per hectare, let’s just say it’s two whole different levels. Our profits are a fraction of theirs. Everyone at this table knows that.”



Politics

The political conditions were manifold: a) low importance of farmers, b) focus on consumers, increasing burdens, c) the sugar beet syndicate as a role model, d) rural versus agricultural policies, and e) support of large scale actors. For farmers, there is a divergence between politicians wanting them to act as business men, while asking them to put stronger emphasis on **environmental protection**. While they would theoretically be willing to do so, if the **economic situation** does not allow to do so, tensions result. For example, the promotion of large scale players or the societal lack of appreciation for the work of farmers is in discrepancy with a focus on environmental protection.

Sustainability

Regarding sustainability there are two main aspects to consider. First the **continuation** of the sugar beet cultivation in Belgium, second the more environmental aspect. The latter implies a comparison between sugar cane and sugar beet cultivation. Stakeholders pointed out that the cultivation of sugar beet is **friendlier to the environment** than sugar cane cultivation. Moreover, since in western countries certain **social standards** need to be followed, social sustainability is also higher. Thus, apart from pure economic considerations the continuation of sugar beet cultivation may have positively influenced sustainability.

Strategies

In order to tackle the above listed problems several strategies have been discussed. Though, it has to be stated that stakeholders were not very optimistic about the success of these strategies. During the workshop, it turned out that the most important strategy may be innovation.

Choosing another refinery

Although there are two refineries in Belgium, choosing the refinery that offers the best conditions is not an option. Farmers are bound to the closest refinery due to transportation costs.

Vertical integration

Vertical integration was one strategy that came up during the interviews, but was rather related to either, farmers buying more shares of the refinery, or the refinery getting more engaged in farm activities. Regardless, another strategy was suggested during the focus groups: farmers opening up their own refinery. While this strategy is not very concrete yet, it indicates the severity of the sugar beet farmers' situation.

Selling the land to the refinery is a highly contested option. Nevertheless, farmers stated that they are forced to do this as a last resort. By far this is not a welcomed strategy, since farmers would not be able anymore to hand over their farm to their offspring. Also, by such a step, farmers would no longer be entrepreneurs, but employees, which is neither seen as a favorable situation.

"I think when it comes to reducing costs, we've reached the end of the line."



Innovation

Innovation is seen as the main strategy for the time being in order to increase output and thus hopefully increase income.

Intensification – upscaling

Farmers point out that they do not have an influence on prices, thus the only possibility to increase income is to produce more. Increasing production is the only aspect farmers can influence. On the other hand, it is argued that farmers should abstain from producing more, since this would result in increased production and thus in lower prices. Farmers suggest that premiums should not increase with the amount of sugar beet delivered but should rather be a flat premium.

Increasing the farming area is an approach taken up by farmers if possible. However, they doubt that this is a real remedy and state it would only be a means to improve the structure. Moreover, it is pointed out that they will never be able to compete with larger countries, which have generally much larger plots. Additionally, farmers doubt whether increasing plot sizes, will result in higher farm-gate prices. Overall, increasing plot sizes, which is related to decreasing the number of farms, may be more beneficial for refineries, than for farmers themselves, since this will reduce transaction costs.

Interestingly, what seems to be a more promising strategy is to limit supply. For them this is a means to stabilize prices. This strategy is based on the assumption that increased production may lead to falling prices. Thus, while individual farmers may want to increase their farm land in order to have a greater income, farmers in total aim at stabilizing the output.

Branding

Regarding branding, farmers do not see much opportunities. On the one hand, they realize that this is already partly done, but they also point out that these activities do not have a positive effect on them. This is related to the problem of power imbalances. Farmers stated that profits are generated only downstream the supply chain, but not on farm level.

Alternative crops

While choosing an alternative crop is indeed a strategy that farmers may need to take up, if prices are not acceptable, the practicalities of changing crops are by far not simple. Several aspects need to be considered, such as the demand for the alternative crop, or climatic and soil conditions necessary for the cultivation of the alternative crop. Additionally, farmers are aware that many farmers switching to an alternative crop could lead to reduced profits of the respective crop. Further, farmers appreciate sugar beet as a good rotational crop maintaining soil quality. Thus, suspending the cultivation of sugar beet may have adverse effects on the soil. Finally, farmers cannot simply stop cultivating sugar beet without bearing certain consequences. If a farmer does no longer wish to cultivate sugar beet he/she needs to sell his/her refinery shares.

Alternative end-products

Bio-plastics and bio-ethanol would offer alternative end-products for sugar beet. Up until now farmers see a limited solution in this strategy, since the demand is not big enough. Moreover, they do point out that using food for the production of these alternative end-products is related to the *food versus fuel debate*.

Additional income

Generating additional income is a common strategy employed by farmers. Often their partners have an additional job and many farmers seek a second income stream as well. Mostly farmers get jobs outside of the agricultural sector. However, they point out the limitations of finding a side job, since farmers usually do not have another education that would allow them to find a high paying job.

Another issue brought up by focus group participants is the dependency from governmental subsidies. While subsidies are acknowledged as providing a basic income, this is not seen as something positive. Farmers express that it should not be necessary to provide farmers with subsidies to guarantee their persistence. Farming should be profitable enough on its own.

Striking for better prices

This strategy was quickly neglected in the focus group. Theoretically it might be a reasonable option. Though farmers pointed out that if the refinery has to stop working for one season, it would terminate its operations completely. The costs would be too high for the refinery as that they could tolerate one year without production.

“The only thing we, as farmers, can do is to get a higher yield in kilos, so that we potentially boost our income.”



Stronger sugar beet syndicate

Interestingly the topic of creating an even stronger farmers' union was not discussed in detail. One reason may be that the farmers' union is seen as an effective tool already. However, the effectiveness of the organization is restricted by policies that create diverging comparative advantages across Europe as well as globally.

Risk management

This strategy is related to the freedom of choice strategy. In fact, farmers who have to deliver in an unfavorable period got a certain amount of money to compensate for the loss. While this strategy worked well in the past, it seems to lose effectiveness. This is because refineries intend to increase campaign length, which has the effect that more farmers have to deliver in an unfavorable period. Second, the money for the compensation is mainly funded by farmers themselves. The money stems from the premium farmers received. However, if farmers' income and thus premium reduces too, the fund for the compensation scheme runs dry. Thus, this strategy is threatened by two different factors.

Survey results

We further examined all the issues which arose during interviews, focus groups and the workshop in the producer survey (e.g., the conditions that farmers face, what strategies they have employed in the past or may employ in the future, and how effective these strategies are). We applied an observational cross-sectional study design by using an online survey, which was electronically distributed by CBB between November 2017 and March 2018. In total, the survey was answered by 241 sugar beet farmers who confirmed that sugar beet made up at least part of their farm business during the campaign 2016/17. After deleting outliers and observations with illogical answers¹, we dispose of a remaining selection of 182 Belgian sugar beet farmers.

Farmer and farm characteristics

The sample included more males than females (94.94% vs. 5.36%). The region is almost equally distributed around the respondents. 50,55% of the respondents live in Flanders, while 49,45% of the respondents live in Wallonia. According to age, the most common category is 51-65 years (n=88). Almost all respondents are younger than 65 years (n=178). The majority of the respondents is in a relationship (80.77%) and the respondents have on average 2.1 kids. More than one third of the respondents hold a college or university degree. 73.03% of the respondents reported that they had a specific educational qualification in agriculture (e.g., agricultural degree, diploma, etc.). The average total area of land that they farm (i.e., rented and owned land) is 144 ha, of which on average 13.48 ha was cultivated for sugar beet. The average total production of sugar beet in the campaign 2016/17 is 1223 ton.

Sales channels

31.9% of the respondents are a member of a sugar beet cooperative. The most important services that the cooperative provides to the farmers are: the cooperative buys their production, the cooperative negotiates the price for them with a buyer, and the cooperative supports the design of the terms of the contract/transaction with a buyer. All surveyed farmers are a member of a farmers' union, which mainly supports the design of the terms of the contract and transaction with a buyer. Farmers would change some things if they could improve the farmers' union, namely increase the





impact of each individual farmer within the union, improve the cooperation with sugar beet farmers' unions in neighboring countries, get engaged in sugar production, and improve the communication within the farmers' union.

Characteristics of sales agreements

The indicative average **price** per unit that farmers received in this sale agreement was 27.89 €/ton for the campaign 2016/17. The price of sugar beet determined by the agreement is based on delivered quantity, delivered quality, and on the share of organization's profit. According to the 2016/17 agreement of this sale, the farmers get paid an advance on December 22nd, a second advance on January 31st and a balance on December 22nd of the next year (information according to CBB). The farmers perceive refineries to have more influence on setting the price than farmers.

60.44% of the respondents **deliver** to *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* sugar refinery and 39.56% deliver to *Iscaal Sugar*. Regarding distance between farm and refinery, 43 respondents are less than 30 km distant from the sugar beet refinery they deliver to. 78 respondents are between 31 and 70 km away from the sugar beet refinery they deliver to. 33.52% are more than 70 km afar from the sugar beet refinery. 23 respondents even indicate that the distance between their farm and the sugar beet refinery is more than 100 km. Only 17 respondents transport the sugar beets themselves to the refinery.

A large number of the respondents (48.62%) reported to be either "completely unsatisfied" or "somewhat unsatisfied" with this sale agreement. 25.97% is neither unsatisfied nor satisfied with this sale agreement, while 24.86% is "somewhat satisfied" or "completely satisfied". Farmers indicate that the reason for their **dissatisfaction** with this sales agreement is the fact that they do not have alternative options to sell their products, the costs associated with this sale agreement are too high, and this sales agreement does not provide more possibilities for negotiating prices. Moreover, we see that the sales satisfaction for the campaign 2017/18 is lower than for the campaign 2016/17. This might be due to the changing conditions caused by the quota termination in September 2017.

Sustainability

This paragraph refers to the potential impact on sustainability of sales agreement. A large number of the respondents (49.44%) reported to either "agree" or "strongly agree" that the production choices they made in relation to their main sales agreement or membership in collective organization helped them to maintain biodiversity. The responses on the other items of sustainability show a similar pattern, except for the eleventh statement ("The production choices I made in relation to my main sale agreement helped me to sell the products in periods of greater difficulty where prices were low"). This statement shows less pronounced results. 24.29% of the respondents do not agree with the statement, while 39.98% do agree with the statement.

Drivers of farming strategies

The **factors that influence** the farmers' decisions regarding their production and farming strategies for sugar beet the most are: adverse climatic conditions or pests, fluctuation of input prices from year to year, changes in consumers' behavior and/or preferences, change of farming regulations, and severe drop in market prices. Access to loans or credits was considered less important.

The majority (53.85%) is planning to **maintain the existing scale** of operations in the coming five years because they want to wait and see how the market develops, they do not have access to the necessary land, or the crop is unprofitable. Only eight farmers reported that they plan to **abandon farming** mainly because they cannot earn enough money with it. If **sugar beet cultivation is no longer profitable**, the majority of farmers (77.33%) would switch to another crop, mainly vegetables and potatoes, or they (13.33%) will add a non-agricultural income source. Lack of alternative crops was considered as the most important obstacle for substituting sugar beet cultivation, followed by lack of attractive markets for alternative products, difficulty to expand the farm, and insecurity in the alternative markets.

The farmers in our survey indicated that the strategies **innovation** (seed improvements, plant protection, farm practices) and **risk management** (choosing sowing and harvesting period according to the weather) have been the most important ones in the past to maintain or increase their income from sugar beet cultivation. When looking at the future, farmers think that strategies related to **innovation**, **alternative crops** (switching to another crop), and **alternative end-products** (the

development of bio-plastic or bio-ethanol) will be the most important ones in order to maintain or increase their income from sugar beet cultivation in the future.

44.75% of the respondents reported that they have no expectations for the **succession** of their farm at present, while 35.91% indicated that they expect a family member to take over the farm.

Conclusions

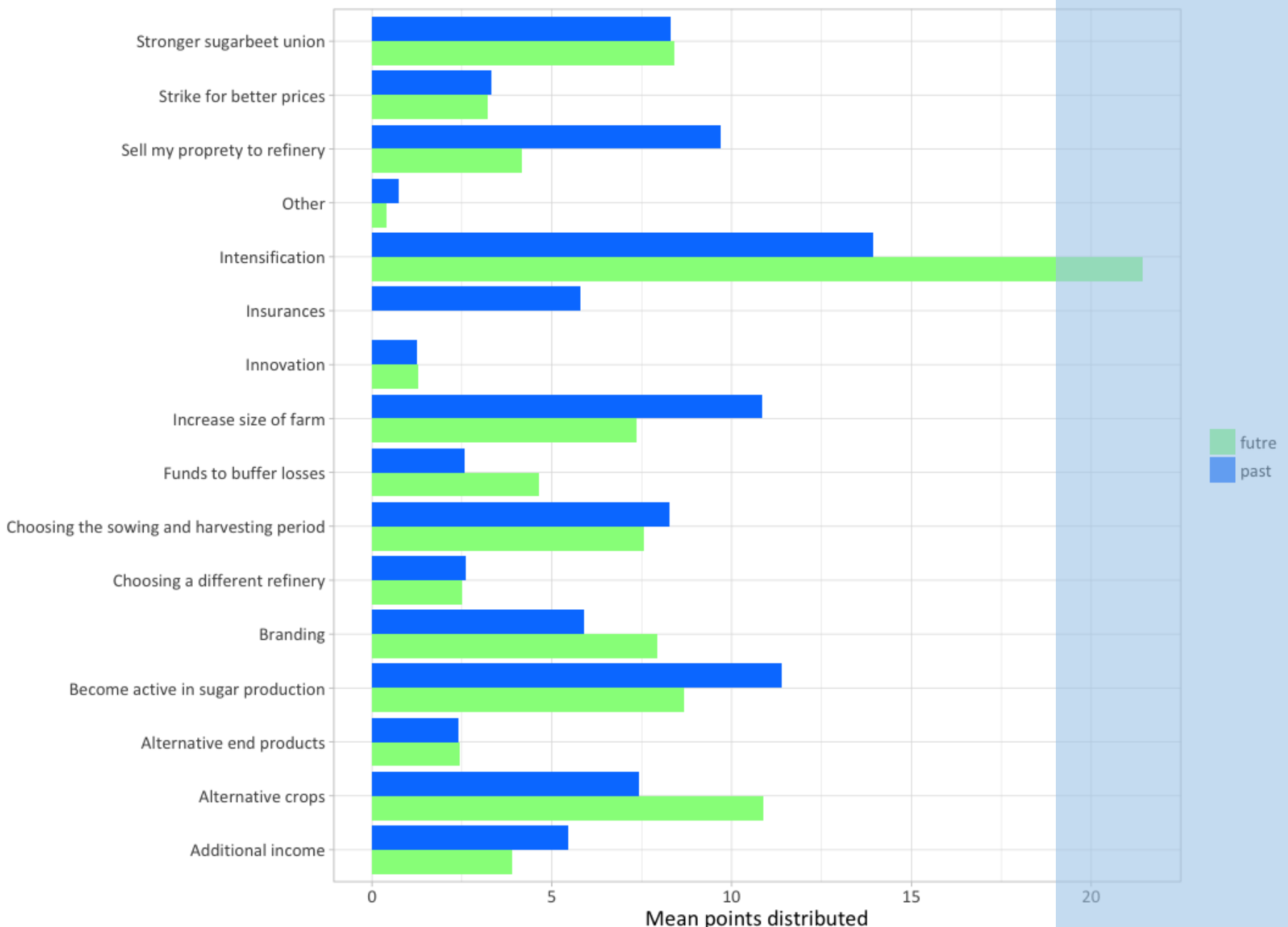
We used a mixed method approach and conclude that the survey results support the qualitative research results.

According to the qualitative research and the producer survey, we know that farmers are less satisfied with their current situation, facing market liberalization. During interviews and focus groups, farmers pointed out the limited intransparency of **pricing mechanisms** as well as their limited impact on the price. Both issues were further examined in the producer survey. For example, the majority of farmers stated that they want to know how prices are determined. Further, farmers' perception about whether the received price is closer to the refinery's or to the farmer's suggestions, indicates that farmers think to have less impact on prices. Nevertheless, the newly gained flexibility is also welcomed, as a majority of farmers stated that they prefer more flexible price setting mechanisms to potentially allow earning higher profits.

In Belgium, all sugar beet farmers are obliged to be part of the **farmers' union** (CBB). The qualitative research indicated that some farmers would like to see changes in the institutional arrangements of CBB. The producer survey revealed that farmers would like to increase the role of the union. Moreover, farmers wish to get engaged in sugar production and found a **cooperative refinery** because they are dissatisfied with the current price situation.

In the past farmers have been developing and applying diverse **strategies** to maintain or improve their financial situation. A list of strategies was identified in the qualitative research. In order to analyze the relevance of each of these strategies, they were further questioned in the producer

Strategies



survey. For example, it was pointed out that expanding cultivation is not possible anymore due to the lack of available land. Therefore, increasing the size of the farm was a strategy in the past but is less important in the future. A similar observation was made for “additional income.” Interestingly, “becoming active in sugar production” was a more relevant strategy in the past than it will be in the future. This result may reflect the missed opportunity to buy shares of *La Raffinerie Tirlemontoise / De Tiense Suikerraffinaderij* in the past. The reduced profitability of sugar beet cultivation may be the reason why “alternative crops” are considered as a more relevant strategy in the future. This is an important finding because the lack of alternative crops was the main obstacle for farmers to substitute the cultivation. Other noticeable obstacles were the lack of attractive markets and the lack of land for expansion. Hence, these factors limit farmers’ flexibility in reacting to the new market situation.

Turbulent times may require the farmers to break new grounds and develop new strategies. In the workshop, innovation was considered as the main **future strategy** for farmers. However, the producer survey indicates that innovation is not a key factor. In contrast, farmers put more emphasis on intensification. Intensification will need to accommodate sustainability requirements in order to not create further problems that might be more difficult to solve in the future (such as reduced soil quality or biodiversity). Regarding future strategies the producer survey revealed that farmers do not yet have concrete plans, which might be because they now want to see how the situation will evolve.

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